

# Renewable Energy: A Veritable Tool for Tackling Youth Unemployment in Nigeria

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## Abstract

The challenge of unemployment, especially among Nigerian youth cannot be over-emphasized. The consequential socio-economic problem attached with this ugly development has battered the image of the country in the comity of nations. Of all the causes of youth unemployment, the epileptic electric power situation of Nigeria has been mentioned as the most severe considering the effects of electricity supply on all the sectors of the economy. In the quest of the country to curb the menace of youth unemployment, this paper argues that renewable energy is a veritable source for tackling youth unemployment. Using photovoltaic (PV) cell, wind energy and biofuel as examples in addition to the completion of ongoing renewable energy projects, this paper reveals that renewable energy is capable of adding 7340 MW into the national grid thereby creating over a million direct and indirect jobs within two years. Recommendations were given as regard how the country should approach her renewable energy programme in order to meet the energy requirement of the nation thereby creating job and achieving economic growth in the process.

Keywords: Renewable energy, economy, youth unemployment, job creation, Nigeria

## 1 Introduction

A high level of unemployment and underemployment is one of the critical socio-economic problems facing Nigeria (Aiyedogbon and Ohwofasa, 2012). With an estimated population of 180 million, Nigeria is the seventh most populous country in the world (Worldometers, 2015). Nigeria is the eighth largest oil producing country in the world, but it has the largest population of poor and unemployed people in sub-Saharan Africa and is ranked 158th on the human development index. There is general high-income inequality, which has perpetuated the concentration of wealth of the nation in the hands of a few individuals (ActionAid Nigeria, 2009). Unemployment, which occurs when a person who is actively searching for employment is unable to find work (Investopedia, 2015a), as classified by economist, could be frictional, structural or cyclical (Duilio, 2004). Of these three types, the most prominent among Nigerian youth are frictional and structural unemployment. Unemployment has become a major problem bedeviling the lives of Nigerian youth causing frustration, dejection and dependency on family members and friends (Ajufo, 2013). The high prevalence of unemployment among Nigerian youth have also increased their criminal tendencies, of which militancy, arson, armed robbery, prostitution and kidnapping are almost becoming the order of the day.

Youths occupy a prominent place in any society. They are one of the greatest assets any nation can have. Apart from being the leaders of tomorrow, they out-number the middle-aged and the aged (Onyekpe, 2007; Ajufo, 2013).

The National Youth Policy defines youth as a Nigerian citizen between the ages of 18 – 35 years (NBS, 2012). It is worthy of note that the population of Nigerians below the age of 35 years comprises 60 per cent of the entire population of the country (NBS, 2012). In Nigeria, it is reported that youth unemployment is as high as 50%. Also, in the third quarter of 2016, it is 59.9% of Nigerians in the labour force aged 15-24 years were, either unemployed or underemployed. Due to the general belief that the Nigerian unemployment figure is underreported, the figure of unemployment and underemployment could be as high as 65% (Doreo Partner, 2015; NBS, 2017). Also, Figure 1 shows that the percentages of unemployed and underemployed youth outnumber those that are employed.

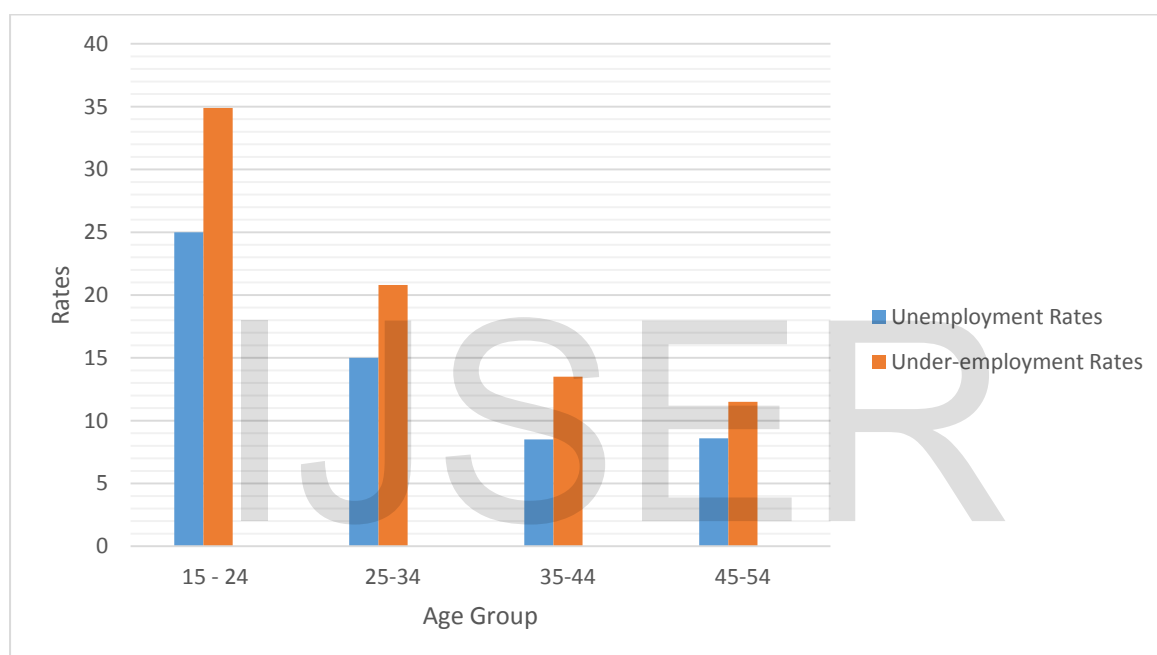


Figure 1: Unemployment and under-employment rate by age-group in Q3, 2016 (NBS, 2017)

Population growth, lack of employable skills, mismatch between skills and available job, poor governance, epileptic electric power supply, neglect of agriculture and other natural resources, and lack of sustainable measures have been identified as some of the factors responsible for high rate of youth unemployment in Nigeria (Musari, 2009; Agufu, 2013; Nigerian Finder, 2015). Of all these factors, lack of regular electric power supply is the biggest cause of unemployment in Nigeria. According to Nigerian Finder (2015), many foreign investors have jettisoned the country for neighbouring countries with regular supply of electricity. This does not augur well for the country considering her quest to be among the top twenty largest economies in the world. Renewable energy is one opportunity that is waiting to be harnessed in order for Nigeria to overcome its high rate of youth unemployment and other economy challenges.

## 2 Status of renewable energy in Nigeria

Renewable energy has not experienced much development in Nigeria despite its long existence in Nigeria's energy sector. 21.55% of the country's energy generation is from renewable energy (Wikipedia, 2015). Kanji Dam, the first national power station with installed capacity of 760 MW was commissioned in 1968. Apart from the addition of two other hydro-electric power stations, much progress has not been made in recent years despite the huge investment by successive administrations. According to ECN-UNDP (2005), only 20% of the nation's hydro-power potential is tapped for use. Also, between 1999 and 2009, several installations of solar PV systems have been executed in the country. In 2008 and 2009 alone, the Commission installed over 300 kW and 1.01 MW respectively of solar PV power systems all over the country. The installations were mainly for water pumping, streetlight applications and powering of offices. The current estimate of solar PV installations in the country is put at 6 MW of power (CREDC, 2007). Also Nigeria, with wind energy available at an annual average speed of 4.0 m/s at the coastal borders and northern regions, the country possesses enormous potential to develop and utilize energy from the wind for electricity generation (Ugwuoke et al, 2012). However, Adebayo (2014) asserted that, today, wind power is not used in Nigeria for electricity production.

Biofuel is another renewable energy source which is believed to be at the core of Nigeria's renewable energy programme. This is unconnected with readily available resources spanning the vast landmass of the country. Feedstocks such as maize and cassava are available in commercial quantity in the country with high percentage of post harvest losses arising from inefficient marketing, processing and storage recorded for them almost every year. Apart from the aforementioned crops, there are some other plants which are capable of making the country a renewable energy giant which at the moment are regarded as weeds and are being removed at accelerated rate to give place to more 'useful crops' and developmental activities. However, plants like *Forest anchomanes* and *jatropha* are now receiving due attention. Biofuel research has also received a boost with sponsorship for biofuel training and research by Nigerian National Petroleum Corporation (NNPC) and the Petroleum Technology Development Fund (PTDF). However much of this fund have not been accessed majorly due to lack of awareness of the availability of these grants and the requirement for accessing them. Also, there is a good prospect for biofuel in the country with the enactment of Nigerian Biofuel Policy and Incentives, 2007 (NNPC, 2007), which makes provision for the establishment of Bio-fuels Energy Commission and Biofuels Research Agency saddled with the responsibilities of regulation biofuel energy, and coordination of bio-fuel crop production optimization programme and collaboration with the research and development efforts of relevant research institutes, respectively, though these corporations are yet to see the light of the day.

Various efforts put into the utilization of biomass and other renewable energy resources have not yielded much result due to challenges such as inadequacy of renewable energy training and orientation programme, high cost of renewable energy deployment, lack of trained personnel and technical know-how in the sector, and low level of awareness among private sectors in the Renewable Energy and other related energy projects, as identified by Ugwuoke, et al. (2012). Despite the huge renewable energy potential of Nigeria and human resources, the country is still lacking behind among its counterpart as revealed in Figure 2 which shows the population to power ratio of each country represented in the graph.

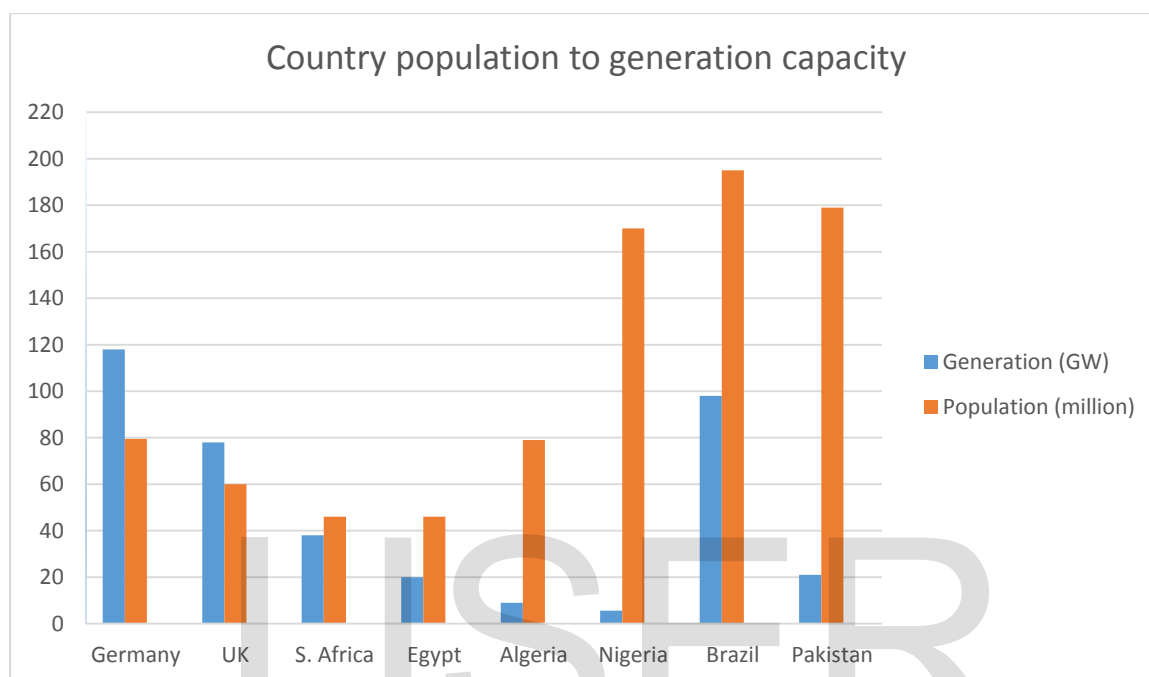


Figure 2: Countries population to generation capacity ratios (Adebayo, 2014)

### 3 Methodology

An extensive literature survey was done using secondary data obtained from the National Bureau of Statistics (NBS), other government fiscal publication, internet, and newspaper reports. In order to ensure accuracy, the data obtained were confirmed from more than one source. The current status of unemployment in Nigeria, especially among the youth was looked into. Various renewable energy options available to the country were analysed. Using two types of renewable energy which are considered as the most feasible for the country at the time of the study, considering the available resources and available technology, the benefits in term of reduction of unemployment in the country were enumerated.

### 4 Expected impact of adoption of renewable energy on youth employment and Nigeria

It is no gainsaying that the adoption of renewable energy by Nigeria government and Nigerians will benefit the country from social and economic point of view. Implementation of various renewable energy policies and consolidation on the existing renewable energy programmes will bring about reduction in the level of youth unemployment in the country and benefit the country through: (i) creation of more jobs, (ii) stimulation of economy growth, and (iii) expansion of agricultural sector. Currently Nigeria Government is making

frantic effort to create more jobs and boost the economy through the revitalization of the agricultural sector and other natural resources, though the results are not yet encouraging. However, if there could be a shift of attention on renewable energy from fossil fuel which is the focus of the country from the action point of view, there will be the attainment of the country's objective of having a vibrant economy as explained below.

#### 4.1 Job creation

Fuel-free technologies, such as solar or geothermal heat and power, wind, ocean and hydro power, typically involve the greatest number of jobs in the installation, manufacturing, and administration phase (IRENA, 2015a). Worldwide employment related to renewable energy continues to grow significantly, reaching 7.7 million in 2014. Other segments of the renewable energy value chain (namely operation and maintenance and construction and installation but also sales) offer the bulk of employment opportunities for most countries (IRENA, 2015b).

It is essential to consider that employment emerge also from downstream commercial activities such as mobile phone charging businesses, battery or lantern charging, internet cafes, and agriculture-related businesses. Such jobs can arise especially in connection with off-grid solutions in rural areas. For example, it has been established that in rural Bangladesh, selling, installing and maintaining small PV systems provides livelihoods for as many as 70 000 people, and estimated 150 000 people are employed both directly and indirectly. In Nepal as a result of a Biogas Support Programme a private biogas business sector has emerged and generated many direct and indirect jobs (IRENA, 2013).

However, it is necessary to take into account that particular conditions and circumstances of renewable energy deployment vary from country to country. What applies for one country, applies not necessarily for Nigeria. But considering the unmet energy need, the high potential for job creation in the field of renewable energies becomes clear.

In attempt for Nigeria to meet the peak demand of electricity estimated at 19100 MW at the national level, there is the need to inject additional 8000 MW into the national grid with a generating capacity which stood at 5500 MW as of July, 2017 (Vanguard, 2017). Table 1 gives an idea how different renewable energy technologies can close this gap within the next two years. Since one of the factors that determine the output of wind turbine is the location, the location of the turbines in areas of high wind potency will facilitate optimal yield. Also, considering the existing hydropower facilities on ground, it may not be necessary to establish more hydropower plants. However, the refurbishing of the existing ones and the completion of the uncompleted stations such as Manbilla Power Station, which will generate 3050MW upon completion, would stimulate the sustenance of the existing jobs and the creation of new ones.

Table 1: Potential of renewable energy technologies in Nigeria

Renewable energy source	Modality for installation	Expected MW to be derived
Offshore wind turbine	2 <sup>*i</sup> × 100 MW	200
Onshore wind turbine	3 <sup>*ii</sup> × 20 MW	60
Solar PV cells	774 <sup>*iii</sup> × 5 MW	3870
Biomass and biofuel	6 <sup>*iv</sup> × 10 MW	60

Geothermal energy	$1^{*v} \times 100 \text{ MW}$	100
<b>Total</b>		<b>4,290</b>

- \*i Turbines to be sited in coastal cities with highest wind speed.
- \*ii Turbines to be cited in station with highest speed as shown in Figure 3.
- \*iii At each of the 774 Local Governments in the country.
- \*iv 1 plant in each of the six geo-political zones.
- \*v A pilot plant to serve as a model.

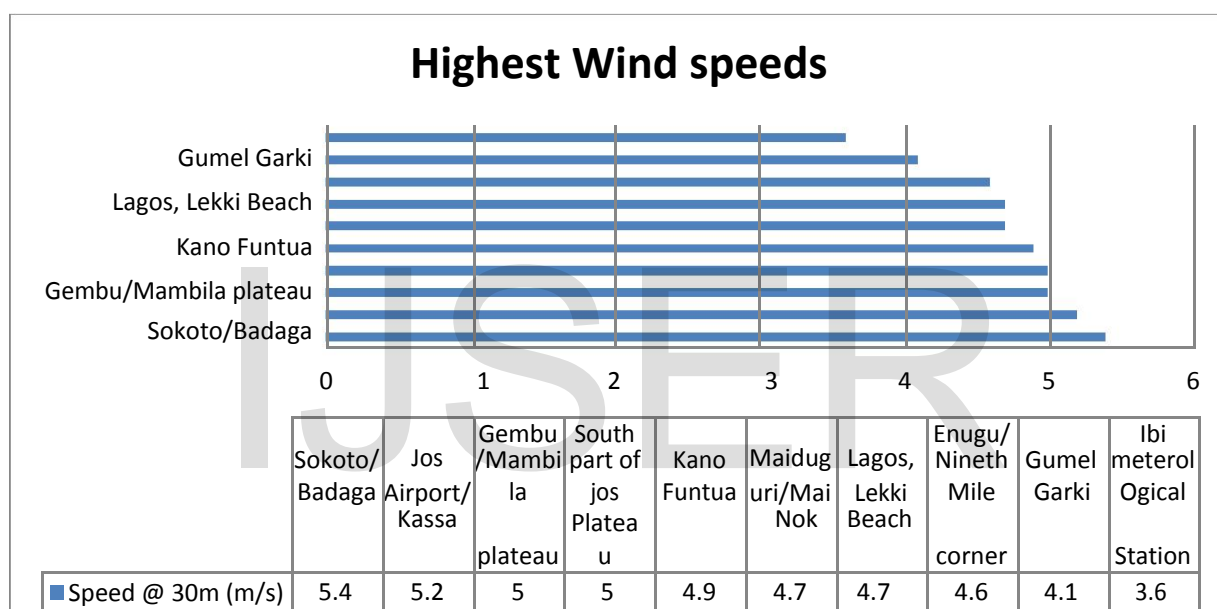


Figure 3: Highest wind speeds at various measuring stations (Adebayo, 2014)

Having the goal of national integration, as illustrated in Table 1, the installation of 5 MW units of the solar photovoltaic (PV) in each of the 774 Local Governments in the Federation within a period of three years will give room for the creation of 10,000 direct and indirect jobs, and realization of 3870 MW of electricity. This implies that the existing laws guiding the operation of the electricity power generation and distribution companies will eventually be reviewed. Also, the installation of 5 MW units of PV cells means that there will be proliferation of power plants in the country. However, if it is well planned, it will allow the usage of local manpower in their areas of location and also pave way for easy maintenance of the facilities. Therefore, with the addition of 3050MW from Manbilla Power Plant to the 4290MW projected above, it is expected that additional 7340MW will be injected to the national grid within two years.

In addition, biofuel and geothermal energy are other renewable energy sources that could be explored to create job directly for those that will be connected directly to the plants and those



that will provide support services. For instance, each Global Biofuel Ltd's bio-refinery together with the associated farm will directly employ 8000 Nigerians in additions to creating 50,000 indirect jobs and by the time the twelve bio-refinery of Global Biofuel Limited are operational, it would generated over half a million job. Also, the Savannah Sugar Company will be employing 10,000 – 25,000 people (beside indirect jobs) to meet the staff required for the expansion of her sugar factory for the production of 100 million litres of ethanol per annum. In addition, the company plans to support over 1000 out growers with the cultivation of 1 ha each of sugarcane (Obada, 2009; Ohimain, 2010).

Apart from the aforementioned avenues of creating jobs, improvement in the electricity supply, owing to utilization of renewable energy, will act as catalyst for the springing up of small and medium scale entrepreneurs. This will also draw foreign investors, who will employ Nigeria youth, to the country. Also the revival of moribund industries will lead to the engagement of more youth in meaningful ventures.

#### 4.2 Stimulation of economy growth

An economic growth is improvement in people's well-being, that is, an increase in the standard of living of the people (Diulio, 2004). The utilization of renewable energy technology can engender this growth in Nigeria.

It has been observed that multinational are willing to invest in the countries despite the socio challenges facing the country. However, the high cost of doing business is scaring investors away. For Nigeria to achieve economic independence, there is a need to have a move from being a consumer economy to a producer economy. Since the gross domestic product (GDP), the indicator that is used to gauge the health of a country economy, is a function of the total dollar value of all goods and services produced over a specific time period in that country (Investopedia, 2015b), the utilization of renewable energy to improve the power situation of the country will provide a favourable atmosphere for primary producers of goods and services to function effectively. Currently, the GDP per Capita in Nigeria of 2,178.0 US\$ (World Bank, 2017) is equivalent to 19 percent of the world's average (Trading Economics, 2017). Also, the standard of living of Nigeria, especially the youth and other vulnerable group is below average. However, the integration of renewable energy into the energy sector will trigger industrial revolution in the country and provide the impetus for economic growth thereby reducing the attendant effects of youth unemployment since larger percentage of the youth would have been gainfully employed.

#### 4.3 Expansion of agricultural sector

Prior to the discovery of oil, the economy of the country which was agro-based was vibrant. However, the advent of oil led to the neglect of agriculture by government and the people of Nigeria. Giving of adequate attention to the renewable energy will bring the good times to Nigeria especially in the agricultural sector.

Aside from the direct job that renewable energy is capable of generating in the agricultural sector, improved power supply will enhance the development of basic infrastructure in the rural areas and farm settlements thereby encouraging rural dwellers to remain on the farm as

well as attract idle youth in the cities to return to the farm. Also, activities will pick up in farm processing centres, dairy farms and farm workshops of established farm. There will also be an increase in the agricultural export as a result of favourable condition for storage of agricultural produce and the personnel manning the equipment.

## 5 The challenge

The already existing National Biofuel Policy and National Renewable Energy Policy by Nigerian National Petroleum Commission and Energy Commission of Nigeria respectively, are capable of making Nigeria to solve its youth employment challenge. However, continued refusal to implement policies on ground, current and future outcomes of research would stand as barrier to the creation of job through renewable energy. Also, the cabals that importing generators to the country may stand on the way of development of renewable energy thereby inhibiting the creation of employment and other economic benefits in the sectors. Other factors such as competency of personnel, sharp practices in the award and execution of projects, poor maintenance culture, sabotage of contractors by government officials and host communities are the other major changes that could stand as impediments to the dream of utilizing renewable in curbing youth unemployment in Nigeria.

## 6 Conclusion and recommendation

Renewable energy is an effective tool for tackling youth unemployment in Nigeria. With due attention and commitment by all concerned, renewable energy will be creating over a million jobs in no distance future. This will therefore make socio-economic problems associated with youth unemployment will be reduced to the barest minimum. However, in order for this to become a reality, the following recommendations are made:

- i. Nigeria needs to study the renewable energy programme of developed countries that have achieved substantial success in renewable energy sector. This will further help in avoiding some of the unnecessary pitfalls.
- ii. It is very essential for the country to show more commitment to renewable energy. This could be done by the reviewing the existing policy statements with a view to remove all bottlenecks to their implementation vis-à-vis translating the documents to action. At this planning stage, it is very important that the programmes are tailored toward generating employment, especially for the youth.
- iii. Since Nigeria has biomass and bio-energy potential more than other forms of renewable energy, government at various levels should focus more on the development of employment-intensive bio-energy technology. More funding should be made available for human capacity development and research that will turn our vast bio-energy tool for the transformation of the country economy and the liberation of her youth from the shackles of unemployment.
- iv. The success of renewable energy depends on the cooperation of all. From the policy formulators, to the contractors that will construct the plants and the host communities. Hence, it has become imperative for the government to publicize the renewable energy policies so that everyone will know what it is expected of them so as to be able to derive the opportunities inherent in them. New graduates need to be made aware of the opportunities embedded in renewable energy. This could



- be done by citing the examples of countries, which have complemented unemployment reduction efforts through renewable energy.
- v. To realize 7340 MW from renewable energy within the next two years, there must be synergy between the three tiers of government. This is to ensure that nobody shies away from their responsibilities in respect of funding, project execution and maintenance of facilities. Also, since every tier knows that its interest is adequately catered for there will not be cases of unnecessary friction and sabotage of efforts.

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