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An Analysis of the Role of Women in Curbing Energy Poverty in Nigeria

Adama A. Abdullahi

Energy Planning and Analysis Department,
Energy Commission of Nigeria,
701C Central Business District P.M.B 358 FCT Abuja-Nigeria

Corresponding author: adama315@hotmail.com

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ABSTRACT

Despite Nigeria's abundance of fossil and renewable energy resources, Nigerians still experience acute energy poverty; they either lack access to modern energy sources or have to cope with inadequate supply and poor quality. Close to 95 million people are fully reliant on traditional woodstoves for cooking. Poor access to energy is directly affecting livelihoods, lowering quality of life and hurting the economy. Poor Energy Access is the root of energy poverty, it leads to drudgery, greater health risks, severely undermines health, inhibits education, limits livelihood opportunities, and reduces the chances for the poor to rise out of poverty, ultimately diminishing the world's chances to successfully achieve the SDGs by 2030. Even though global efforts are headed in the right direction to end energy poverty, the rate of interventions is far behind the population growth rate and calls for dramatic accelerations in mobilizing resources to increase access to renewable energy alternatives.

This study explores and emphasises that women are not only a special interest group in using renewable energy to alleviate energy poverty in Nigeria; they are the mainstream users and often producers of energy, it has become glaring that women are the fastest growing cohort of entrepreneurs and business owners in many developing countries especially Nigeria. Without their involvement, renewable energy projects risk being inappropriate and failing. Energy researchers who will leave women out of energy research and analysis will be failing to understand a large part of energy consumption and production all over the world. Women are a key resource in the energy service delivery process though underutilized. They are primarily viewed only as energy consumers even while it is the women that experience energy poverty much more severely than men. The result shows that there is great opportunity for collaboration with women on community energy projects that can contribute to ending energy poverty in

Nigeria. Also there is opportunity in development that is yet to be harnessed in women's entrepreneurship & potential impacts for the household and agricultural energy sector in Nigeria because evidently financial liberation of women has a greater impact on the community than any other demographic.

Keywords: Energy poverty, Renewable energy, Women and energy, Gender sensitive energy practices, Energy Access.

INTRODUCTION

Energy poverty is the lack of access to modern energy services. It refers to the situation of large numbers of people in developing countries and some people in developed countries whose well-being is negatively affected by very low consumption of energy, use of dirty or polluting fuels, and excessive time spent collecting fuel to meet basic needs. It is inversely related to access to modern energy services, although improving access is only one factor in efforts to reduce energy poverty. According to the Energy Poverty Action initiative of the World Economic Forum, "Access to energy is fundamental to improving quality of life and is a key imperative for economic development. In the developing world, energy poverty is still rife. Energy access is about providing modern energy services to everyone around the world.

The World Bank's latest report, based on the second edition of the SE4All Global Tracking Framework (GTF 2015), estimates that 1.1 billion people worldwide are still living without access to electricity, with highest concentrations in Africa and Asia. Another 2.9 billion rely on wood or other biomass for cooking and heating, resulting in indoor and outdoor air pollution, attributable to 4.3 million deaths each year (SE4ALL 2015). Although there has been a positive decline of 0.1 billion in the number of people without

access to electricity, in the case of access to clean cooking alternatives, there has been negligible progress overall, and despite concerted efforts in making such alternatives available and accessible globally, the number of people using traditional solid biomass fuels for cooking have largely remained the same. For the country to attain the Vision 20:2020 development targets, energy poverty has to be addressed urgently in a carbon-constrained manner. But by focusing on meeting grid demand by 2020, the power sector reforms neglect off-grid, decentralised solutions for the tens of millions of Nigerians not currently connected to the grid, most of whom do not live in any proximity to it. Any meaningful development vision for Nigeria needs to provide them with better energy supply to improve their livelihoods. As the world transition from the Millennium Development Goals (MDGs) to the Sustainable Development Goals (SDGs), access to sustainable, affordable, and reliable energy becomes an even more critical pre-condition to eradicating poverty and achieving sustainable development.

There are 3 billion people – or 40% of the world population – who still rely on biomass for cooking, lighting and heating. This has immense issues for our planet and for all of us living on it. Exposure to household air pollution (HAP) from traditional cooking practices alone is estimated to kill over 4 million people every year, while millions more suffer from cancer, pneumonia, heart and lung disease, blindness, and burns. In regions such as sub-Saharan Africa, where the lack of access to clean energy solutions and electrification is particularly significant, nearly a third of the urban population and the majority of the rural poor are using biomass for cooking and heating in traditional open fires.

Gender is often not a high priority in the energy sector as evidenced by the lack of sex dis-aggregated data from programs and barriers to the development of gender-aware energy policies and gender-sensitive practices. While this is beginning to change due to

energy sector players seeing the benefits of integrating gender-sensitive solutions, additional strategic efforts are required to effectively engage women in the energy sector. Only through building meaningful partnerships and empowering local women and men, can we hope to see the sustainable development goals in access to energy that we seek.

It is possible to address energy poverty by deploying clean, renewable energy resources. A shift might facilitate the transformation of the rural economy, improve human livelihoods, and alleviate poverty. But despite a plethora of policies and actions the government lacks a practical strategy for low carbon development through clean energy generation. Some energy policies do, however, aim to improve efficiency in the management of resources. While renewable energy holds great promise, the investment environment is not conducive enough to attract the required investments. As a result the intended expansion of energy services will stall. Women are a key, though underutilized, resource in the energy service delivery process. Primarily viewed only as energy consumers, in the majority of affected regions it is the women that experience energy poverty much more severely than men.

LITERATURE REVIEW

O'Dell, Peters and Wharton(2014) examines the untapped link between gender and energy, while there are many areas critical to women's development, energy access programs are an underdeveloped lever for women's economic empowerment. They explore questions like under what context does gender equality rise with access to electricity, what are the channels through which this changes occur, what are the significance of economic empowerment in women, can donor institutions and government programs that enhance benefits for women reap more meaningful results by targeting energy development programs that enhance benefits for women? If so how?

To investigate this gender-energy nexus, they analysed a combination of quantitative and qualitative data using both global indicator databases and national census data to examine the complex relationship between electrification and economic opportunity. Data is supplemented by a series of interview with women in developing countries that examines the impact of energy on their personal lives and the lives of other women in their countries. They conclude by offering ideas to accelerate benefits to developing nations through a gender lens approach to energy access programs like soft skills and life skills training, transportation options that accommodate female needs, employing and utilizing women in the electricity value chain, active women leaders in local communities, more productive machinery and inputs in the household sector, equitable access to information and communication technologies and tailored training on how to access them.

Gill, Srivastava, Pak, Singhand and Rehman (2016) Examines and demonstrate the value of engaging women actively in the energy provisioning process, such that each aspect of the role played by them not only has a favourable impact on women's empowerment socially and economically but also enables the overall intervention to be more effective and far reaching. For example, training local women in promoting and demonstrating clean lighting and cooking technologies not only enhances information dissemination and awareness generation but also brings in familiarity and a level of trust in the prospective end user community, leading to faster sales conversions and higher adoption rates. The model recognizes that women and girls are disproportionately and more severely affected by the lack of access to energy, and specifically works to include them as active participants in the delivery of clean energy solutions. In Shramik Bharti's case, women groups are engaged to involve women as consumers as well as diffusion agents in reaching a larger end user mass and to accelerate the last mile delivery of clean

energy solutions. Study was observational in nature and it was observed that women can make significant new economic contributions in the energy sector as participants in the energy value chain. In Shramik Bharti's experience of driving the energy provisioning process by primarily engaging women in the promotions, installation, and dissemination of various technologies, the programme saw several value additions in the design evolution of technology, the influence on purchase decisions towards clean technology products and in the overall socio-economic empowerment and upliftment of women and the wider community.

Cecelski (2000). The paper shows that shows women are not a special interest group in renewable energy, they are the mainstream users and often producers of energy, exploring the question of how sustainable energy development can be used to specifically, decentralize renewable energy technologies to complement and benefit from the goal of increasing women's role in development. Without women's involvement, renewable energy projects risk being inappropriate, and failing. Women are the main users of household energy in developing and industrial countries; they influence or make many family purchases related to energy; they are experienced entrepreneurs in energy-related enterprises; and women's organizations are effective promoters of new technologies and active lobbyists for environmentally benign energy sources.

Mshelia (2012) analyses the role of clean energy in alleviating energy poverty in Nigeria. He re-establishes that Nigeria's ambition to meet the goals of Vision 20:2020 is in danger if the country fails to address energy poverty and poor infrastructure in a participatory manner. A green Nigerian economy is well within reach. As it moves to generate new energy, Nigeria will have to embrace renewable efficient technologies. By involving people it can make this change happen. Vision 2020 needs a participatory review to turn it into a vision for sustainable growth within the limits of a climate

constrained world, and a translation into some national movement, sustained by the belief in a shared present vision, and common bright future. A shared identity can be achieved through robust public participation in decision–making. This, however, requires emphasis on social dialogue and inclusiveness in policy-making. Government must, therefore, inspire and support the people to realise this vision: a fresh green deal vision that delivers good governance, respectable standards of living, and access to efficient clean energy services, good health care and sustainable socio-economic growth. The methodology used is descriptive quantitative approach.

Stephen kerekezi et all explores the development linkages between women and energy which are not limited to cooking fuels and water collection challenges, although policy and analysis in development debates often stops there. Women are disproportionately affected by the lack of cleaner and affordable energy options for maintaining households and enterprises that can be a source of income. This is particularly perverse given that the best means to combat absolute poverty is through the stimulation and increase in women's income – either through productive activities or targeted state transfers aimed at women since women have a relatively higher propensity to reinvest in family welfare expenditures such as food, education, and health, especially for their dependent children. Meta-analysis methodology was used in this study.

METHODOLOGY

Meta-analysis research methodology was used for this paper synthesis of results from multiple studied have been used to determine the average impact of engaging women in curbing energy poverty by attaining sustainable, reliable, affordable, modern energy for all.

ANALYSIS OF RESULTS

Nigeria's renewable resources are as enormous as they are diverse. The table below gives a summary of the potentials identified.

ENERGY SOURCE CAPACITY

Large Hydropower	11,250MW
Small Hydropower	3,500MW
Fuel wood	13,071,464 ha
Animal waste	61 million tons/yr.
Crop Residue	83 million tons/yr.
Solar radiation	3.5-7.0kmh / m2/ day
Wind Average	10m height 2 – 4 m2 annually

Source: Energy Commission of Nigeria: 1st Energy Lecture Series, 2005

Based on the table above, we can see that the renewable energy potential of Nigeria is remarkable, we only need to tap into it and benefit from the availability of unending reserves of these resources.

It is rightly said that once you go solar, you can't ever go back. Solar energy displaces fossil-fuel generated electricity and thus reducesCO2 emissions. It can be harnessed in many ways: in solar cooking, countering the menace of deforestation; through solar-powered irrigation pumps, solar boreholes, creating jobs in agriculture; by manufacturing solar-powered appliances, creating local jobs. At present, despite this massive potential, solar energy is primarily used in small-scale and pilot projects. Solar

energy has been associated with high upfront cost, long recovery of investment period, unclear renewable electricity tariff structure and high cost of importation further hinders investment for far too long. It is actually starting to look like a myth because the cost of solar has dropped immensely and is still dropping. In Kenya for example Kenya's small holder Solar irrigation project, a USAID funded feed the future program has tested, evaluated and is now commercializing a solar water pump kit. Using the kits content, farmers can draw water from a variety of sources including ground water and lakes. Since its source of power is the sun rather than diesel or petrol, the kit doesn't emit smoke that pollutes the air and is a more cost effective solution for their irrigation needs. This kit is going for $345 dollars. Farmers in Kenya have been able to report about 60% increase in productivity using the solar irrigation kit. The major problem we are facing is the lack of knowledge of the new technologies and unwillingness to try them out.

Affordable and reliable energy options can broaden the scope of women's enterprises. In West Africa, for example, mechanical power to grind grains and other agricultural products through a fee-for-service model not only was able to meet household grain consumption processing needs but also freed up women's time for other household and agricultural activities. In addition, the volumes of milled grain produced surpluses that could be marketed, thereby supplementing limited family cash income that was used to support children's schooling. Women are actively participating in entrepreneurship and developmental programs in Nigeria, most women are tired of playing in the background so they are looking for every opportunity to contribute to the household income and improve their standards of living and that of their children. Facilitating trainings on energy access programs like soft skills and life skills training, transportation options that accommodate female needs, employing and utilizing women in the electricity value chain, active women leaders in local communities, more productive machinery and inputs in the household sector, equitable access to information and communication technologies

and tailored training on how to access should be urgently addresses and deployed to yield maximum benefit for the Nation.

Currently, Rice production and processing in Nigeria, is typified by small local farmers operating primitive basic processing technology. Typical issues limiting economies of large scale rice production include lack of access to improved technologies, high costs of energy for parboiling and lower output Quality (post processing). Most women especially in the western part of the country are into rice farming, but they have major issues regarding processing since the machinery for processing is not always available. So what they do is form an association and buy the rice processing machine that will be processing it for them on a turn by turn basis, the husk from the rice is then turned into briquettes used for smoking fish. By establishing an integrated Rice Processing and Power Generating Facility and bringing home the advantages of large scale Rice production, self-generated Power from rice-husk, as well as availability of power to the urban and rural communities will help these women to be better empowered and more productive.

Between 2015 till date, probably because of the recession, many small businesses are springing up necessitated by the need to solve the huge gap between the energy demand and supply. Energy ventures and businesses in the energy sector have become very popular across the country, most of which are spearheaded by women entrepreneurs. This is a very welcome development and a good indication that we are ready to tackle the problem head on and make meaningful contribution towards the achievement of sustainable, affordable, and modern Energy for all.

The Alliance and governmental stakeholders and partners are working to enable 17.5 million households to adopt clean cook stoves and fuels by 2020. Clean cook stoves and

fuels have the potential to reduce deaths from smoke-related illnesses, mitigate climate change, and lower air pollution. This is an opportunity to promote women leadership, entrepreneurship, and contribute to the realization of the Sustainable Development Goals (SDGs). The program provides new sources of livelihoods for women while reducing the risk and drudgery of fuel collection, and aims to lower household expenditures on cooking fuel. Household Air Pollution (HAP) contributes to 70,000 premature deaths on an annual basis and affects 127 million people within Nigeria. Nigerian enterprises have received both targeted funding support through Alliance enterprise development funds such as the Spark and Women's Empowerment Funds, and are accessing investment and financing opportunities as a result of Alliance partnerships-brokering with microfinance institutions. Country Statistics as at 2016 is:

Population using solid fuels for cooking - 75%

Number of people affected by Household Air Pollution - 136,650,000

Number of deaths per year from Household Air Pollution - 128,500

While women are disproportionately impacted by the health and economic impacts of traditional cooking, they play a crucial role in the widespread adoption and use of clean household cooking solutions because of their central responsibility for managing household energy.

The importance of STEM education cannot be over emphasised STEM education is a direct response to the realization that other nations are gaining competitive advantage by asserting their scientific and technological leadership, and that Nigeria's will be built on its own capacity for innovation, invention and creative problem solving. STEM is the future. It is important because it pervades every aspect of what brings development for a nation. STEM professions build communities and transform nations. The statistics are sobering when it comes to women studying and taking up careers in science, technology,

engineering and mathematics (STEM). Globally, just 14 per cent of the STEM workforce is female. But there are glimmers of hope. In Nigeria, for example, while women only make up 17 per cent of all scientific researchers, there are some excellent role models gaining prominence. After all, you cannot be what you cannot see - and visibility of leading women in the Energy sector is essential if the current generation of school and university students is to be motivated. For girls and women keen to work in the Energy sector, Professor Deborah Enilo Ajakiye of the NNPC is an inspiration. Women can make significant new economic contributions in the energy sector as participants in the energy value chain by primarily engaging women in the policy making, promotions, installation, and dissemination of various technologies and projects. Florida-based, Nigeria born Onyema Ajuogu, who is the President of Benignant STEM Innovation Foundation, is a trained aerospace engineer/pilot, she has been a champion for engaging young people in science and technology because the future of a nation depends on the innovations and advances of today's students. These are the kind of champions we need to encourage our girls to take up STEM education at an earlier age so that they can make meaningful contribution toward promoting Science and technology.

RECOMMENDATION AND CONCLUSION

Women play a key role in the use of renewable energy in alleviating energy poverty, they are an underutilized resource in the energy services delivery process. As the fastest growing cohort of entrepreneurs and business owners in Nigeria and many developing countries, involving women in energy projects, energy research, policy and analysis is essential. In curbing energy poverty in Nigeria, the following recommendations are strongly suggested:

(i) Employ and utilize women participation in the energy value chain. This can be achieved by training them on soft skills on energy access programmes.

(ii) Empowering active women leadership in local communities.

(iii) Donor institutions and government programmes that enhance benefits for women will reap more meaningful results by targeting energy development programmes that are spearheaded by women or women organizations.

(iv) Women need to encourage their children, especially the girls to go into STEM education while they are still young, including them in science clubs, science fairs and science boot camps while in primary and secondary schools will make the child become interested and curious in science and technology related programmes in the future, this is the starting point of raising children that will become professionals that build communities and transform nations. These professionals are in charge of solving the complex problems of today's world and its future in finding solutions for global warming, cancer, world hunger, disappearing habitats, and an interdependent world economy.

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