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ROLES OF RENEWABLE ENERGY TECHNOLOGIES IN IMPROVING THE RURAL ENERGY SITUATION IN NIGERIA: OPPORTUNITIES AND GAPS

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INTRODUCTION

Nigeria is located in West Africa, bordered by Cameroon to the east, Niger to the north, Benin Republic to the west and the Atlantic Ocean to the south. The terrain varies from coastal swamps and tropical forest in the south, to savannah and semi-desert in the north. Nigeria lies within latitudes 4.321N and 14.1N and longitude 2.721E and 14.641 E as shown in Fig. 1, with land area of about 924,000 km² and a population of 165 million [1,2].

Further RE sources include wind energy with a potential of 150,000 terra joule per year, generated by an average wind speed of 2.0–4.0 m/s, solar radiation estimated at 3.5–7.0

kWh/m², and biomass at 144 million ton per year [4]. However, these resources are yet to be explored. The main objective of promoting RETs in Nepal is to achieve energy independence for rural population by introducing renewable energy as the basic energy consumption practice. Renewable energy technologies are well suited to small off-grid applications, sometimes in rural and remote locations where energy is often crucial to human development

Energy is one of several essential inputs to economic and social development. “Modern” energy services—provided by liquid and gaseous fuels as well as electricity—can greatly assist societies in reducing poverty and hunger and meeting the health, education, gender, and environmental elements of the vision 20:2020 Goals.

The impact of Electrification on Rural Area

Electricity can improve the human’s lifestyle by increasing the level of health, education, welfare, and technology. In terms of poverty – as a multidimensional phenomenon – despite of facing with physical weakness, isolation, lack of access to knowledge, income, ignorance, and vulnerability, energy consumption is a way to distinguish the “poor” from the “non-poor”.

Role of Renewable Energy Technologies in Achieving Vision 20:2020 in Nigeria: All forms of development can be achieved sustainably provided that there is adequate and sustainable interaction among energy sources, human beings and society

Hunger: Around 80 percent of the expenditure on energy services by poor people is on fuel for cooking. Studies show that the majority of the developing world’s poor spend 20 percent or more of their monthly income to obtain wood and charcoal. By using the **RETs** to provide sustainable energy for cooking and space heating at low operating costs, improved stoves and alternative fuels can reduce this drain on household income, while freeing up time for education and income-generating activities.

Education: In rural areas where conventional fuels are not affordable to the poor, RETs can make important contributions to education because a school without electricity, delivering quality education is a vast challenge as it means that schools can’t use the technologies central to modern education, from computers to photocopiers.

Health: Studies from Asia, Africa, and the Americas have shown that indoor air pollution levels in households that rely on biomass fuel or coal are extremely high; and much of the disease burden is due to indoor air pollution and un-clean drinking water.

Sustainable Environment: Degraded ecosystems with a considerable amount of standing water and little natural control of invertebrate populations are ripe for high incidence of water and insect-borne disease.

Improving Water Quality: Water and sanitation are among the most important determinants of public health and rank at the top of the World Health Organization's list of primary health care components. The control of endemic and emerging diseases is naturally linked to an intact ecosystem's ability to mediate climate change, mitigate water quality and distribution, and provide alternative hosts for existing and emerging disease vectors.

RENEWABLE ENERGY POLICY ISSUES

The restructuring of electricity in Nigeria has given birth to national policy frameworks regarding distributed generation of electricity mostly in rural areas. A number of policy actions have emerged in favor of renewable energy consumption

CHALLENGES OF INTEGRATING RENEWABLE ENERGY IN THE NATIONAL ENERGY MIX

The Scaling up renewable energy program (SREP) investment plan has been initiated over two decades and will remain effective until September 2037. Under this initiative, the government of Nigeria plans to install small hydropower with a capacity of 250 MW, 230 MW of mini and micro hydropower, install 1,500,000 solar home systems and install 1,160,000 biogas plants (3).

WAY FORWARD

As it has been with various global developmental campaigns, the issue of renewable energy requires full public and private sectors participation and commitment. Therefore Governments should increase investment on RETs, drive supportive policy development and integrate the energy generated into electrification plans for rural off-grid energy-service delivery.

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