TOPIC: "Assessing the suitable energy mixes for meeting Nigeria's electricity demand; a case study of Renewable and Nuclear technologies"

Rationale for the Subject Matter:

Borne out of the persistent predicament in electricity supply in Nigeria, the study investigated the feasibility of integrating renewable and nuclear energies into the electricity mix of the country. This study is in alignment with one of Ford Foundation's West Africa focus on Natural Resources and Climate Change as it promotes sustainable and climate friendly technologies.

Subject Matter/Write-up

The importance of energy in any economy cannot be over emphasized as it plays a strategic role in its economic, social, and political advancement. It impacts on every sector such as education, health, transportation, communication etc. and a deficiency in its supply will have an adverse effect on socio-economic indicators/activities, constrains economic growth and ultimately affects the quality of life amongst its populace.

Studies have shown that there exists a strong correlation between energy consumption and economic development and an uninterrupted access to energy will translate into poverty alleviation through wealth creation. With the energy shortfall witnessed across the globe, governments are in constant and desperate search for alternatives to help meet the ever-increasing demand in the various sectors of their economies.

Nigeria is also confronted with this challenge. A country with vast amount of conventional and renewable energy resources yet ranked amongst the poorest in terms of GDP from year 2008-2012. Nigeria's current dependency on fossil fuel has not produced the anticipated transformation in all sectors of the economy with high electricity shortfalls, startling greenhouse gas emissions which produces large scale environmental degradation and poverty; all still being witnessed. Energy demand is also on the rise amidst an ever-increasing population despite the presence of enormous reserves of sustainable energy sources.

A concerted drive towards the use of more sustainable and clean energy sources, which Nigeria is well endowed with, would ensure the country contributes its quota to reducing global greenhouse gas emissions.

The use of energy sources such as wind, solar, biomass, geothermal and nuclear energies should be developed and exploited in Nigeria as this would help address the current electricity supply predicament faced by the country and guarantee in the future, security of energy supply which the current use of conventional energy sources has not been able to provide.

A switch to renewable energy in Nigeria is long overdue owing to the ever-increasing contribution it makes to rural development, lowering health cost (which is also linked to reduction in air pollution) and energy independence.

A long-term commitment from the governments and policy makers is crucial for its implementation as witnessed in developed economies such as Germany, United Kingdom, and Austria. With few pilot schemes on Solar PV's, wind power and small hydro in the northern regions, there lies vast potentials with several states having to rely on state owned projects e.g., solar implementation for local water supply, schools, residential lightings, and community centres.

The study shows a great feasibility of solar energy in virtually all parts of the country particularly the northern states, which receive high solar radiation all year round. Biomass energy also proved to be implementable, with the country's favourable and diverse agricultural land mass. Harnessing wind energy has considerable potential across the country especially in the northern, coastal, and offshore regions. The construction of nuclear power plants also showed positive gains when assessed. The economic, social, and environmental factors which were analysed with reference to sustainability parameters and lessons from other countries with Nuclear Power Plants points out key strengths like its stability in global market conditions, superiority in base load generation, negligible GHG emission etc.

Though the energy sources assessed have common associated limitations such as the lack of financing, policy framework and human resource; with the right measures and strategies in place, they could be mitigated.