Harnessing Nigeria's Natural Resources for a Sustainable Energy Transition: A Path to Decentralized Energy Generation and Climate Resilience.

Has there ever been a time when Nigeria has had uninterrupted electricity supply as a nation for the entire day? Yet we hold our heads and shoulders high, the Giants of Africa we say, but our energy sector cannot hold a candle to a dwarf. The country struggles with chronic power shortages, leaving millions in darkness, crippling industries, education, and daily life, but Nigeria is a cornucopia of sustainable energy sources, which if harnessed properly can provide the entire country with uninterrupted power supply and even excess for exports but she relies heavily on petroleum reserves, natural gas, hydroelectricity, and solar. These are not even utilized properly and are also not climate friendly in terms of the petroleum reserves and natural gas generating massive CO_2 and greenhouse gas emissions which negatively affects the carbon footprint and climate conditions of the country. How can Africa's largest economy break free from this cycle of energy poverty and climate degradation? The answer lies in decentralization, renewable energy investment, and policy reform. The Just transition to sustainable sources of energy cannot be overemphasized as this will combat the problem of climate change while making energy accessible to the common man and if harnessed properly, reliable and affordable; leading Nigeria into a sustainable future.

Nigeria's Energy Crisis stems from the following key issues, Inadequate generation, Grid Instability and Inequitable access. Although approximately 45% of Nigeria's population is actively connected to the energy grid, which is concentrated in urban areas. The other 55% are not. Approximately 71% of Nigeria's population, about 140 million people, lack energy access (World Economic Forum). "The national grid has collapsed", This is a phrase that has been repeated so frequently to the ears of Nigerians that it has become normalized, but this shouldn't be so for a country of our caliber. One reason for the frequent collapse in the national grid is overloading caused by an imbalance between supply and demand, In Nigeria's case, most at times, demand outstrips supply. As of 2023, Nigeria's total installed energy generation capacity is approximately 16,000 MW. For a country which needs more than 60,000MW to cater for its increasingly growing population, this amount is very poor. Hence when demand spikes, the generators to trip off to protect the equipment causing the ever-persistent collapse. This inefficiency stifles manufacturing, foreign investment, and even education—children study by candlelight while businesses fold due to high energy costs.

How can we tackle this? The Nigerian Electricity Act 2023, signed into law on June 9, 2023 provides a breakthrough. A key feature of the Act is that the law recognizes the electricity sector lawmaking powers of federating states, allowing them to generate and distribute power locally. Simply put, Decentralizing power generation.

Geopolitical zones unlike the name connotes are not just regions with similar geography or political representation, they also have similar cultures and presence of resources hence decentralized systems of power generation can be situated in geopolitical zones. States in geopolitical zones can come together, harnessing the renewable and sustainable sources of energy they possess and generate energy, establishing grids in strategic regions in these zones Instead of depending on a failing national grid.

I will give one example, In the North western region of Nigeria, two main natural sources of energy can be noted from the geographical and environmental characteristics of the states located in these regions; wind and solar energy.

The North western zone has some of the highest solar radiation levels making it ideal for solar power. Also, areas like Sokoto and Katsina have significant wind potential especially during the harmattan period. Due to the aridity of land in some parts of the north western zone, Energy farms can be set up. Energy farms are large scale installations designed to generate large amounts of clean electricity by harnessing natural energy sources. Biomass energy can also be utilized, by using the agricultural residue collected from the regions, especially those with concentrated farmlands in the rural areas, Biogas can be produced and this can serve as a more stable form of generation due to unpredictability of the weather conditions for solar and wind. Another back up for the solar and wind farms are Waste to Energy plants. Humans are always going to keep producing waste and as a country, our waste management is also very poor, what better way to kill two birds with one stone by setting up these incineration plants which will collect waste from landfills and convert it to electricity while also reducing pollution and greenhouse gas emissions. This will increase the generation capacity of regions if decentralized, further increasing the that of the country.

Decentralization ensures that these local grids reduce transmission losses, Rural communities gain employment in energy projects and the renewables cut CO₂ emissions thereby aligning with global climate goals. This is just one practical example, there remains vast reserves of untapped potential in the energy sector of Nigeria present in our very own geopolitical zones.

Even with improved generation and transmission, distribution remains a hurdle. Privatized DISCOs (distribution companies) often fail to deliver power efficiently, state or even rural community-managed systems can be employed in rural areas making clean energy accessible and affordable to the low-income households in these rural areas. The government championing just a few of these projects will show the world that she is serious about her energy sector thereby attracting private and foreign investment in infrastructure.

These in totality will ensure an appropriate transition into sustainable energy sources in a manner that is fair and inclusive and ensure energy access to the least Nigerian in the rapidly increasing population of Nigeria. Nigeria's energy crisis is solvable. By decentralizing generation, investing in renewables, and enforcing laws like the Electricity Act (2023), the country can achieve 24/7 power, economic growth, and environmental sustainability. The "Giant of Africa" must stop stumbling in the dark—it's time for our light to shine.