Overcoming Energy Poverty: The Role of Sierra Leone's Legal System in Advancing Renewable Energy Solutions

By**:** Jamil Sahid Fofanah

S.J.D. Candidate, Elisabeth Haub School of Law at Pace University

Introduction

Sierra Leone faces significant energy poverty, with only 30% of its population having access to electricity, while rural areas lag even further at 5%. The heavy reliance on imported fossil fuels and biomass wood exacerbates economic strain, environmental degradation, and social inequalities.

The blog examines the country's renewable energy potential, including hydropower, solar, and bioenergy, and analyzes the fragmented legal and policy frameworks governing the sector. Challenges such as high initial costs, reliability issues, and technological gaps are explored, alongside lessons from Bangladesh's successful off-grid solar initiatives.

The paper thus argues that Sierra Leone's legal system can accelerate renewable energy adaptation to enhance energy sovereignty by expanding rural electrification, reducing tariff costs, and mitigating climate change. Renewable energy will enhance the country's energy security and sovereign independence by reducing reliance on global crude oil geopolitics. It will also be more cost-effective for the state than fossil fuel energy. Furthermore, it will improve access to electricity for rural communities that often struggle to connect to the national grid due to inadequate road infrastructure and the isolation of their villages and towns. Moreover, renewable energy will support the state's vision of a healthy environment and assist in the fight against climate change, which aligns with the state's efforts to fulfill its Nationally Determined Contributions under the Paris Agreement.

Recommendations include enacting a dedicated Renewable Energy Act, establishing public-private partnerships, and leveraging international climate finance. By addressing these barriers, Sierra Leone can achieve its goals of 85% renewable energy capacity by 2030, fostering sustainable development and energy independence.

The Scale of the Challenge

Sierra Leone's poor energy security hinders its efforts to advance from the ranks of the least developed countries. The country's electricity production ranks 171 out of 189 countries globally. Its total energy installed generation capacity is less than 250 MW, with only 30% of its 7.5 million population having access to electricity, and the percentage in rural areas is just 5%. However, 60% of the population lives in rural areas. Despite being significantly lower than demand, the electricity supply remains relatively expensive compared to other countries in the

sub-region. Imported fossil fuel products used for power generation account for 18%, while a large portion of the population continues to rely on fuelwood biomass, which constitutes 85% of the market's energy consumption.
These statistics illustrate the profound impacts of the nation's energy poverty across all areas of its establishment. The government's heavy reliance on fossil fuels for electricity, combined with substantial burdens from electricity-related subsidies, places pressure on the national budget. Resources that could be allocated to other sectors hinder agricultural potential, thereby stifling economic growth, undermining educational opportunities, worsening health crises, and contributing to environmental harm.

Therefore, as the 2024 International Monetary Fund (IMF) Fiscal Affairs Department country report on Sierra Leone recommends, addressing the issue of poor energy security is crucial for Sierra Leone to achieve middle-income status by 2039. Rebuilding the state's energy security after its eleven-year civil war, which devastated every aspect of the country's infrastructure, has been a formidable task. Steps have been taken in developmental reforms to enhance energy governance and regulation, aiming to attract public and private sector investment in the industry. However, progress has been slower than intended, as the nation's abundant renewable energy resources remain untapped.

Renewable Energy Potential vs Reality

The paper begins this section with an ambitious policy statement from the Government of Sierra Leone regarding its vision for renewable energy: "Increasing renewable energy capacity is central to the government's energy, climate, and development plans, with a target to achieve 85 percent renewable energy capacity by 2030."

Sierra Leone possesses significant renewable energy potential, encompassing a combination of hydropower, solar, bioenergy, wind, and biomass. These resources show strong promise for addressing the country's energy deficiency and creating opportunities for electricity export.

According to the International Renewable Energy Agency's (IRENA) 2025 Energy Profile on Sierra Leone, the country's total renewable energy capacity consists of **53% hydroelectric**, **18% solar**, and **29% bioenergy**. However, the current installed capacity stands at just 115 MW.

Hydroelectric energy is a promising renewable source due to the extensive network of rivers and tributaries that conservatively provide a hydroelectric power potential estimated at 1,200 MW. The latest and most ambitious estimate, a 2013 UNIDO study, covers 300 potential sources and estimates the figures at 5,000 MW. The Bumbuna Hydro plant is the largest hydropower facility in the Tonkolili District. It generates 50 MW during the rainy season and 8 MW in the dry season. Additionally, there are two other smaller hydropower plants: Bankasoka and Charlotte. However, all these sources experience variations in water flow rates between the wet and dry seasons, consequently limiting their overall output.

Bioenergy is another renewable energy source. Currently, Sunbird Bioenergy Sierra Leone produces bioethanol, potable alcohols, and renewable power from sugarcane and cassava.

Solar is the next major renewable energy source. The country experiences 187 hours of sunlight annually, translating to approximately 5 hours and 59 minutes of sunlight per day. Under the Renewable Energy Empowerment in Rural Sierra Leone (RESL), solar mini-grids have been established in 30 communities and at 94 mini-grid sites across Sierra Leone, providing power to over 7,000 customers.

Considering the above, Sierra Leone has significant renewable energy resources but faces challenges in fully utilizing them due to structural, financial, and policy constraints. The goal is to achieve 85% renewable energy capacity by 2030, yet the country's current installed capacity stands at just 115 MW. This is well below the estimated hydro potential of 5,000 MW, as well as the strong solar irradiation (5.9 hours per day) and opportunities for bioenergy.

The Legal and Policy Gap

There is no single legislative framework for renewable energy, but there is legislation regarding the Energy Sector that borders on renewables. Following the civil war, the government launched legal reforms to enhance governance and regulations, aiming to attract both foreign and private investment in the energy sector. Key reforms include the National Electricity Act 2011, which resulted in the unbundling of the vertically integrated National Power Authority (NPA) into two separate entities: the Electricity Generation and Transmission Company (EGTC) and the Electricity Distribution and Supply Authority (EDSA). Furthermore, the Finance Act of 2017 provides duty waivers for imported solar products that meet IEC standards.

Diverse institutional setups regulate the renewable energy sector. The Electricity Act of 2011 established a regulatory body known as the Energy Commission. Additionally, there is a private sector association, the Renewable Energy Association of Sierra Leone (REASL), which was formed by 30 members in 2018.

Sierra Leone's renewable energy policies are grounded in both global and regional agreements. Under the Paris Agreement, the Nationally Determined Contributions seek to enhance access to affordable, reliable, and clean energy. Consequently, Sierra Leone has initiated an energy transition that encompasses its energy, climate, and development plans, aiming for 85 percent renewable energy capacity by 2030. At the regional level, with the agreement of ECOWAS member states to develop National Renewable Energy Action Plans (NREAPs) and SE4ALL Agendas, Sierra Leone has outlined its objectives within these agendas.

It is evident that Sierra Leone has made strides in its renewable energy policy and regulation. However, the current legal framework is fragmented, some provisions are outdated, and it does not adequately support large-scale renewable energy initiatives. Establishing a comprehensive and cohesive Renewable Energy Law would consolidate these policies under a single legal framework and eliminate inconsistencies among various regulations. More importantly, it would

provide legal assurance to investors. Without such legislation, Sierra Leone risks falling behind regional peers like Ghana and Senegal.

The Case for Renewable Energy

Sierra Leone can achieve energy sovereignty, lower costs, ensure access, and enhance climate resilience by harnessing its abundant resources in solar, hydro, and bioenergy. The necessary legal framework could facilitate transitioning from fossil fuel dependency to a diversified, sustainable renewable energy approach.

The state's expense of generating fossil fuel-based electricity compromises its energy security. Each year, the state invests several million dollars in imported diesel and heavy fuel oil for backup generators and thermal plants—money that could be better allocated to local solar, hydro, and bioenergy initiatives. Transitioning to renewable energy would reduce the state's dependence on imported fuel, insulating it from fluctuations in global oil prices. Moreover, decentralizing renewable energy would enhance the economy by creating jobs in installing and maintaining sources like solar panels.

As previously mentioned, despite significant subsidies, Sierra Leone has one of the highest tariffs in the sub-region. Transition to sustainable energy is essential for the government to ensure that energy access reaches those who cannot afford the expensive electricity costs. Furthermore, this transition would alleviate the government's financial strain. By providing cheap and accessible energy, it would also entice foreign investment in manufacturing.

Another key element of the transition is that democratizing renewable energy can provide access to 60% of the population living in rural areas, where fewer than 5% have electricity. Additionally, the transition will replace carbon-intensive energy sources from diesel generators, significantly reducing emissions. Therefore, renewable energy represents a solution to achieving the country's goals of reducing CO2 emissions to 5% by 2025, 10% by 2030, and 25% by 2050.

Challenges of Renewable Energy

To achieve its ambitious goal of 85% renewable energy by 2030, Sierra Leone must address challenges such as high initial costs, reliability issues, and technological and maintenance hurdles.

The first significant challenge is that the high initial costs of renewable energy projects require substantial upfront investments. Sierra Leone depends heavily on international donors; however, delays in financing and bureaucratic inefficiencies impede implementation, like the delay in the completion of the Bumbuna Phase II (estimated at $750 million).

Secondly, investors perceive significant risks due to the lack of a comprehensive legal framework and fragmented policies, leading to instability. Moreover, currency depreciation causes the Leones to be ranked among the weakest currencies in Africa. Combined with high

poverty rates, this diminished purchasing power discourages private capital despite incentives such as duty waivers on solar imports.

Thirdly, reliability issues associated with renewable energy stem from intermittency and seasonal fluctuations. For instance, the Bumbuna hydro plants generate 50 MW during the rainy season but drop to 8 MW in the dry season. Climate change exacerbates this situation due to unpredictable rainfall patterns.

The fourth issue is the barriers related to technology and maintenance, where limited technical expertise and insufficient maintenance capacity hinder the sustainability of renewable energy. Although initiatives like Barefoot College's solar training for women have a positive impact, they remain on a small scale. Additionally, there is concern about dependence on foreign expertise. Lastly, the maintenance challenges of mini-grids and solar systems often stem from a lack of spare parts, weak community ownership, and inadequate after-sales support.

Lessons from Bangladesh

This section explores Bangladesh's success in renewable energy as a reference for Sierra Leone to achieve energy sovereignty by reducing reliance on fossil fuels and decreasing carbon emissions.
Bangladesh boasts 100 percent access to electricity. The Bangladesh Solar Home System (SHS) project began in 2003 with a pilot phase involving 50,000 households. By its completion stages 15 years later (2018), it was responsible for 16% of rural electrification. The program helped reduce greenhouse gas emissions by approximately 9.6 million tonnes of CO2 equivalent and avoided the consumption of 4.4 billion liters of kerosene.

Recommendations

The insights from Bangladesh's success with SHS present a proven model for Sierra Leone.

- Sierra Leone should enact a dedicated Renewable Energy Act to consolidate policies, clarify tariffs, and attract private investment.
- Establish a Sierra Leone Renewable Energy Development Authority (SLREDA) under the Ministry of Energy to oversee off-grid solar expansion.
- Partner with microfinance institutions to offer affordable consumer loans for solar systems.
- Leverage climate finance from the Green Climate Fund and seek South-South cooperation with Bangladesh for technical training.

Conclusion

Sierra Leone's severe energy poverty remains a critical barrier to economic growth, social development, and climate resilience. The paper demonstrates that legal and policy reforms can

accelerate Sierra Leone's transition to renewables by addressing four key areas: energy sovereignty, cost-effectiveness, rural electrification, and environmental benefits. Based on this, Bangladesh's Solar Home System success offers a blueprint through public-private partnerships and microfinancing that enabled 20 million people to access off-grid solar. By addressing these barriers, Sierra Leone can achieve its goals of 85% renewable energy capacity by 2030, fostering sustainable development and energy independence.

About the author

Jamil Sahid Fofanah (S.J.D. Cand.; MTL Cand.; LL.M.s in Environmental, U.S., and European Law; MBA; LL.B. (Hons)) is an international lawyer specializing in Environmental Law, Climate Change Law, Energy Law, International Criminal Law, and Human Rights. As an S.J.D. Candidate at Pace University's Elisabeth Haub School of Law, he researches ecocide, corporate accountability, and climate justice in Africa. He serves as Sierra Leone Country Rapporteur for the Sabin Center's Global Climate Litigation database and as a Student Intern at the Pace Energy and Climate Center.