

Renewable Energy for Sustainable Development. A Case Study of Ghana.

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Abstract

This research is aimed at investigating renewable sources of energy that will lead to the industrialization of the Global South. Increased access to Renewable energy in the Global South will facilitate and bridge the gap between developed and developing countries and will serve as the event that triggers socio-economic development which will improve livelihood of people living in deprived parts of the world. Enhanced access to energy can be regarded as a silver lining leading to industrialization and highlights the correlation between access to energy and development.

Currently, countries that lead in the production of renewable energy are all found in the Global North. As countries seek to diversify their energy sources, motivated by events like adherence to green policies to reduced cost. However, the quest to improve access to renewable energy is often curtailed by the lack of commitment towards research into the sustainable and modern sources of energy. Basically, sources of renewable energy include biomass, hydropower, solar, geothermal, and wind. To attain a sustainable source of renewable energy in the Global South, states here will need to adopt the right type of renewable energy that will be appropriate for each country.

Countries like Norway depend on hydropower because of its long coast lines, high levels of running water, and steep valleys. Similar to Norway, many countries in the Global South depend on hydropower as a source of renewable energy. Contrary to Norway, these countries lack the environmental conditions required to derive sustainable energy from hydro-power. An example is Venezuela, a country in the Global South that depends on hydropower for energy. Its reliance on this source of energy was tested in 2010 when a reduction of rain water feeding the Guri dam pushed the nation to its edges. This was partly attributed to erratic rainfall making the hydropower as a source of energy unreliable in the face of climate change.

A shrewd solution to a sustainable of energy in the Global South includes investing in a suitable source of renewable energy and to improve storage capacity of generated energy. This is essential because most countries in Global South are geographically stationed to harness solar energy. Such initiative can be achieved through an advancement in technology like 3D printing to reduce the cost of manufacturing solar panels and wind turbines that can lower cost of installing renewable energy facilities. Another way to enhance the efficiency of renewable energy is to adopt improved power storage mediums like a lithium-ion battery which will store energy for future use.

To appreciate the topic at hand the sub-Saharan country Ghana will be used as a case study. The country still grapples with access to sustainable energy despite investing a lot of financial resources in this cardinal sector.

Keywords: Renewable Energy, Global South, Sustainable Development, Climate Change, Inequality, Ghana.

INTRODUCTION

Energy demand has increased all over the world in correspondence to the growing global population. Access to energy is generally relative and often depict socio-economic and political division of the world. While Europe and North America head the chart in terms of access to energy, Africa and most parts of the Global South suffer the worst rate of energy poverty in the world¹. Access to Energy is known to be the driving force of all industrialized states in the international system. However, the energy powering economies of the world are dominated by fossil fuel. The genesis of this can be associated to the onset of industrial revolution beginning from the 18th century where we see a breakthrough and shift from the use of human and animal labor² to employment of technology and machines that efficiently replaced most forms of labor before this period. Primarily these economies depended on the use of coal to produce transformations that will leave a legacy on all aspects of our world. From this point many states have continuously relied on fossil fuels in powering industries, providing essential services and supporting households.

Under current academic discourse it has been established that the limited nature of the conventional energy sources obtained from fossil fuel makes it unsustainable to be depended upon as they have the attribute to be depleted when overexploited. Over reliance on fossil fuel over the years has also exacerbated economic and social inequalities. As this source of energy

¹ International Energy Agency, "Africa Energy Outlook." Paris: International Energy Agency (2011, 2014), quoted in MacLean M. Lauren, Christopher Gore, Jennifer N. Brass and Elizabeth Baldwin, *Expectation of Power: The Politics of State Building and access to Electricity Provision in Ghana and Uganda*. Journal for Africa Political Economy and Development, no. 1 (2016): 104

² Haradhan Kumar Mohajan, "The First Industrial Revolution, Creation of a New Global Human Era," *Journal of Social Sciences and Humanities* 5, no. 4 (2019): 377

entrench inequalities around the world which is because it skews the direction of power into the hands of the few privileged societies and personalities that have access and control over energy from fossil fuel. Coupled with its damaging impact on the environment as seen of its direct effect on the climate causing drought, melting ices and forced migration that continues unabatedly to change the face of our planet³; leading to calls from emerging green movements in contemporary times to demand environmental justice. These are a few but important considerations triggering the need for a shift in sourcing for a future that will bridge the inequality gap existing in most parts of the world especially in the Global South.

In response to the failure of conventional sources of energy, Renewable Energy has been identified as a suitable alternative to fossil fuel such as coal, petroleum, and natural gas. Understood to be nonrenewable, fossil fuel is touted as a damaging source of energy compared to other renewable energies having natural ability to be regenerated after been harnessed and more significantly serve as less threatening to the environment.

Many scholarly works in the field of renewable energy have also been impressed by the potentials that renewable energy present in the areas of redistribution of job, wealth, and political power that accompanies decentralized energy supply systems to the transformation of societies⁴. The need for this transition is regarded as decisive especially in the Global South, because many commentators allude to the fact that access to energy brings about industrialization, improve food security and enhance socio-economic development. The growing debate about the need to

³ Matthew J. Burke and Jennie C. Stephens. "Political Power and Renewable Energy Futures: A Critical Review," *Journal of Energy Research & Social Science* 35, (January 2018): 78, <https://doi.org/10.1016/j.erss.2017.10.018>

⁴ Stephens C. Jennie. "Energy Democracy: Redistributing Power to the People through Renewable Transformation" *Journal for Environment: Science and Policy for Sustainable Development* 16, no. 2 (February, 2019): 4, <https://doi.org/10.1080/00139157.2019.1564212>

democratize renewable energy was first seen in the United States and Europe⁵ where headways have been made over the years to democratize the renewable energy sector to bring about healthy transitions for nationwide development. As a path to sustainable development 'renewable energy-democracies' have in many ways been taken upon by environmental activist and climate justice movement as a bottom-up approach for redistribution of wealth that incorporate environmental concerns.

Since the Global North increasingly continues to see the progress that has been caused partly by democratization of renewable energy sources which in most instances made it possible for ownership of energy to be transferred to communities; proving to be a game-changer and linchpin of accelerated development in most communities. In the developing world, the need for renewable energy which is predicted to initiate an era of sustainable development has inspired evaluative instruments such as the United Nations' Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report. In this report, the relevance of collective action of nations across the globe especially those found in developing world was viewed as indispensable if the world will succeed in overcoming climate crises. The report in this regard encouraged countries in the Global South to find a substitution to end the dominant period of fossil-based human civilization. This will conform to the estimates by the IPCC, which projects 80 percent or more of energy used today is to be harnessed by renewable means if there will be any headway to reach climate sustainability to prevent a climate catastrophe by 2050⁶. Alongside the motive of the IPCC, development policies on the global scale has also transitioned from Millennium Development Goals (MDGs) where limited attention was given to renewable energy to the modern era of Sustainable

⁵ Burke and Stephens. "Political Power," 78.

⁶ Michael Acheampong et al., "Is Ghana Ready to Attain Sustainable Development Goal (SDG) Number 7?-A Comprehensive Assessment of its Renewable Energy Potential and Pitfalls" *Journal for Energies* 12, no. 3. (January 2019): 1, <https://doi.org/10.3390/en12030408>

Development Goals⁷ (SDGs). With the 7th goal of the SDGs specifically focusing on the need to ensure a shift from the use of fossil fuel to renewable energy sources.

From the above antecedents, this paper is aimed at delving into the limitations that hinder the democratization of renewable energy in the Global South. Perceived as the key to enhance the quality of life and general well-being of people. It is important that the cause of these limitations are evaluated to establish appropriate preemptive measures that will contribute in curbing these shortfalls to pave the way for the democratization of renewable energy in the Global South. The case of Ghana, a sub-Sahara country that aspires to be a leader in the Global South in the area of renewable energy will be studied. This is essential because the situation of the country also reflects the condition of most countries in the Global South where state agencies still grapple with the challenges associated to the reliance on fossil fuel after so much investment into the renewable energy sector.

THE DEMOCRATIZATION OF RENEWABLE ENERGY IN THE GLOBAL SOUTH

A call for democratization of renewable energy as stated in the introduction is primarily to enhance redistribution of power to trigger reallocation of wealth. Specifically it is expected to change the extent to which fossil-fuel-based energy system and its linkage with high corporate profits of large multinational energy companies have in widening inequalities within many societies around the world especially in developing countries where the price of fossil fuel has increased exponentially in recent years⁴; making it difficult for people to live under strenuous economic conditions.

Just like other developing countries in the Global South, democratization of renewable energy is anticipated to be solution to unequal access to electric power supply in Ghana for four primary factors. Firstly, renewable energy is often indigenous and ensures provision of reliable and ample energy supply. This implies that, renewable energy promote economic stability and reduce the

⁷ Michael Acheampong et al., "In pursuit of Sustainable Development Goal (SDG) number 7: Will biofuels be reliable?" *Renewable and Sustainable. Energy Reviews*. 2017, 75, 927–937: 2, DOI: 10.1016/j.rser.2016.11.074

price fluctuation of goods and services characteristic of fossil fuel-based power supply economies in developing countries. Coupled with added advantage of conserving much need foreign exchange which is used to import crude oil renewable energy is also seen as a good alternative to traditional fossil fuel because renewable energy provides a better option for nationwide electrification which is projected to reach the remotest part of the country where limited access to electricity exacerbate inequalities through the use of viable technologies to boost power supply to reduce poverty and inequalities⁸. Thirdly, most of the activities that are related to the construction and maintenance of renewable power supply are locally based and demand involvement of communities to manage renewable energy sources with training and education indigenes will be empowered to be stakeholders of the new power supply and create jobs for the local economy, that invariably initiate the potential for ownership change to transition power often with corporate bodies into the hands of deprived communities⁹. Finally, renewable energy is expected by many commentators to usher in sustainable growth to limit carbon emission and lessen impact of the climate crisis that has already altered rainfall pattern of most countries in the Global South who depend on rain for agricultural activities which provide the highest source of employment. Importantly, prolong and unpredictable drought also reduce the water that feeds the hydro-power stations scattered across the Global South.

To redistribute wealth and resources in the Global South access to renewable energy must be democratized leading to an equitable and just society, where wealth circulate moving from being concentrated in the hands of the few who control the current source of energy. Into the hands of the vulnerable thereby creating an atmosphere for comprehensive development. To achieve this

⁸ Ishmael Ackah. "Policy interventions in renewable energy for sustainable development: Is Ghana on the right path to achieve SDG 7?" *ResearchGate* (June 2016): 3, DOI: 10.13140/RG.2.1.4338.1369

⁹ Soutar Iain and Mitchell Catherine. "Towards pragmatic narratives of societal engagement in the UK energy system." *Journal of Energy Research & Social Science* 35, (October 2017): 4, DOI: 10.1016/j.erss.2017.10.041

objective, policies to propel these measures must be conscious of the need to prioritize the involvement of community-based ownership so that it will be in line to reform the established ownership structures and prevent the monopolization of renewable energies moving away from the reliance on fossil fuel that do little to meet the needs of the disadvantaged and perpetuate inequalities by giving more power to few and entrench the existing economic and political inequalities in developing countries¹⁰.

Democratization of renewable energy will not only be a welcoming transformation that will conform to the desire to reduce the emission of fossil fuel to overcome the climate crisis. It is also seen as a way by which low-income communities can be empowered. The empowerment of the less privileged calls for ownership transformation as practiced in the United States since the 1880s. Here we witness crucial interventions by the federal states through the provision of financial assistance in the form of loans making it possible for fewer income households to jointly invest in energy system which became their property overtime in what is now known as Energy Cooperatives and Public Ownership. In Wisconsin and Los Angeles such measures aided communities to publicly own their energy¹¹. Such success has been difficult to replicate in the Global South, despite the commitment of most states to increase energy obtained from renewable sources it is often realized that obstacles impede this objective.

FACTORS THAT LIMIT THE UNIVERSAL ACCESS TO RENEWABLE ENERGY

Many government and non-governmental agencies around the world have responded to the noble call to decarbonize. By investing in renewable power infrastructure such as the building wind farms, solar parks, geothermal and hydroelectric power. A shift in focus to renewable energy

¹⁰ Stephens, "Energy Democracy," 6.

¹¹ Bozuwa, Johanna. "Public Ownership for Energy Democracy," The Next System Project, (September, 2018).

sources has ushered in a period of transformations fostering ownership change that have begun to create opportunity for Cooperative and Public Ownership of renewable energy. Research affirms that all the leading countries that have invested massively and produced high amount of renewable energy are all found in the Global North. Contrary to the Global North, researchers have emphasized that the investment in renewable energy in the Global South has failed to significantly improve energy generating capacity. Factors that contribute to such deficiencies include investment in unsuitable renewable energy such as hydropower.

Amounting to about 60% of the country's electricity¹², hydropower has over the years contributed to the power supply of Ghana. The main outlet for hydropower of the country is obtained from the Akosombo, Kpong and recently commissioned Bui Dam adding to extra 400MW¹³. With 72 percent of its population on the national grid, Ghana is only second to South Africa in sub-Saharan Africa in access to electricity in Africa¹⁴. Questions yet remain as to how to improve on the reliability and affordable nature of energy in the country to meet demand for electric power by the citizenry that has emerged to be an essential part of the social contract in Ghana¹⁵. Since these renewable sources of hydro-power weren't enough to generate the needed power, Ghana explored other avenues to add to the national grid. In desperation to find substitution to the failing

¹² International Renewable Energy Agency (IRENA) (n 9) 13; Volta River Authority (VRA), 'Fifty Third Annual Report & Account 2014: 3.

¹³ Francis Kemausuor et al., "A review of trends, policies and plans for increasing energy access in Ghana." *Renewable and Sustainable. Energy Reviews*. 2011, 15, 5143–5154: 5150.

¹⁴ World Bank "Progress Toward Sustainable Energy 2015: Global Tracking Framework Report." *Washington: World Bank* (2015), quoted in MacLean M. Lauren, Christopher Gore, Jennifer N. Brass and Elizabeth Baldwin, *Expectation of Power: The Politics of State Building and access to Electricity Provision in Ghana and Uganda*: 104

¹⁵ MacLean M. Lauren, Christopher Gore, Jennifer N. Brass and Elizabeth Baldwin, *Expectation of Power: The Politics of State Building and access to Electricity Provision in Ghana and Uganda*: 124

hydropower of the country between 2002 and 2004 that caused a national power crisis. The nation on the edges had to deal with pressure for its inability to provide a reliable source of electricity for its citizenry forcing it to undertake load shedding popularly called 'dumsor' in local dialect. This was basically attributed to a fall in rainwater feeding the hydropower stations and compelled the country to invest in thermal plants operating on fossil fuel to argument for the vacuum left for needed capacitate for nationwide electrification¹⁶.

Dependence on thermal plants was further hindered by the increasing price of crude oil need to power the plants. Even with the combined power from the thermal plants and hydropower sources, the country still struggles to provide the necessary power to ensure sufficient energy supply which was experienced in 1998, 2002, 2007, 2008, 2012, and 2014 till today¹⁷. The main power generating medium which is sourced from hydro has shown signs of stress that is attributed to reduced rainfall caused by climate change, increase pressure from the country's growing population, and aging equipment impacting its ability to provide enough power to support household actives and emerging large and small scale businesses¹⁸. In response to the power outages, the government of Ghana instituted the National Energy Strategy of 2010 which targeted the year 2020 as a benchmark to obtain universal access to electricity. This affirms the country's

¹⁶ Michael Acheampong et al., "Is Ghana Ready," 2.

¹⁷ Daily Graphic, "Switch off Deep Freezers to Conserve Power- Energy Commission," quoted in MacLean M. Lauren, Christopher Gore, Jennifer N. Brass and Elizabeth Baldwin, *Expectation of Power: The Politics of State Building and access to Electricity Provision in Ghana and Uganda*. Journal for Africa Political Economy and Development, no. 1 (2016): 120

¹⁸ Muiyiwa S. Adaramola, Martin Agelin-Chaab and Samuel S. Paul. "Analysis of hybrid energy systems for application in southern Ghana." *Energy Conservation and Management*. 2014: 284.

belief in sustainable energy supply for sustainable social and economic development¹⁹ that fall in the United Nations Sustainable Development Goals.

For streamlined measures geared toward increasing the renewable energy supply to conform to the Sustainable Development Goals, the country in 2011 passed the Renewable Energy Act²⁰. The purpose of the act was to serve as a legislative framework that will bind the country to reach its objective by 2020. At which point improved access to electricity was forecast to be the game-changer that will initiate a thorough inclusive development. Although the country has made a substantial investment in renewable energy over the years, the failure of hydropower calls for further exploration of other suitable renewable energy sources such as solar, wave, and wind that are underexploited coupled with a monopoly in the distribution of power, the inefficiency of thermal plants along with erratic rainfall which caused dams to dry up has worsened the plight of the country as it seeks to empower people and to find other sustainable sources of energy²¹.

As at the year 2012, the country had no major investment in solar and wind, notwithstanding the huge potential of the country to generate a lot of clean energy from these sources. The country continues to invest in hydropower which unabatedly fails to meet the demand that is associated to the aforementioned climatic reason²². In the table below the potential for harnessing renewable energy was established by the Ghana Energy Commission which issues licenses to prospective individuals and companies to generate renewable energy.

¹⁹ Ministry of Power. National Renewable Energy Action Plan (NREAPs), Period (2015-2020):11.

²⁰ Michael Acheampong et al., "Is Ghana Ready," 31.

²¹ Michael Acheampong et al., "Is Ghana Ready," 2.

²² Muiyiwa S. Adaramola, Martin Agelin-Chaab and Samuel S. Paul. "Analysis of hybrid energy systems," 284.

Table 1: Provision Licenses issues for Renewable Energy Electricity as at March 2015

Category	Number	Total Capacity (Mw)
Solar	44	2,472
Wind	7	876
Hydro	3	101
Biomass	2	68
Waste to Energy	9	554.01
Wave	1	1000
Total	66	5,071.01

Source: Ghana Energy Commission, 2015²³

According to these estimates the country ranks high in the potential for solar energy. Ranging between 4.5 to 6.0kWh/m²/day, the northern part of the country promises to be a good site to harness solar power. To achieve this the country recently invested in solar power intending to increase renewable energy source. This event saw about 38,000 households benefiting from power from solar system and lanterns from the year 2000 to 2014 reaching 120 communities which were previously not on the national electricity grid. Moreover, the country distributed about 50,000 solar lanterns between 2015 and 2016 that was all part of the government’s plan to improve access to renewable energy and implement the objectives of the Renewable Energy Act²⁴.

²³ Ghana Energy Commission, Energy Outlook, 2015: 45.

²⁴ Michael Acheampong et al., “In pursuit of Sustainable Development Goal (SDG) number 7: Will biofuels be reliable?” *Renewable and Sustainable Energy Reviews*. 2017, 75, 927–937: 3, DOI: 10.1016/j.rser.2016.11.074

As a call for more investment in renewable energy, the 7th goal of the SDGs focused on ensuring access to an affordable, reliable, sustainable, and modern form of energy for all²⁵ by 2030. The Renewable Energy Act of Ghana has been in line to achieve the stated objective by the SDGs. A major step in the democratization of renewable energy will be achieved when there is a decentralization of renewable power which is perceived to be the silver lining for further development²⁶. Whilst these are seen as encouraging signs by the government, the concern is the medium for procuring and distribution of renewable energy are beset by the lack of policies that will specifically benefit the targeted groups. It is at this point that new initiatives are encouraged to initiate policies that will lead to sector reforms and incorporate a new system of ownership shifting the control of renewable energy to transition into the hands of people in the grassroots.

Records from the Ghana Energy Commission reveal that majority of the interest expressed in the investment in renewable energy is from individual and corporate bodies who are profit-motivated and members of governments who seek such to use access to such essential services as a political tool to win elections. Such challenges makes it difficult to achieve the intended objective that democratization of renewable energy is expected to bring. This is envisioned to incorporate ownership reforms distributed through small-scale installations that are tailored to suit community needs and capacity at the grassroots level making them capable to own and manage their energy infrastructure²⁷. This will also be a new paradigm that will change the status quo and replace

²⁵ Nations U. Sustainable Development Goals- Goal 7: Ensure access to affordable, reliable, sustainable modern energy for all; 2015

²⁶ Uwe Deichmann et al., "The economics of renewable energy expansion in rural Sub-Saharan Africa." *Energy Policy* 2011, 39, 215–227: 24

²⁷ Ministry of Power. National Renewable Energy Action Plan (NREAPs), Period (2015-2020). Ministry of Power: Accra, Ghana, 2015: 11.

fossil-based fuel economy which leads to unequal development across the world. Because fossil fuel is unevenly distributed it provide undue economic advantage to countries that possess them. Contrary to nonrenewable energy, renewable sources of energy are well distributed offer the opportunity for global development which even can be possible in remote locations.

The Ministry of Energy of Ghana with support from ECOWAS Center for Renewable Energy and Energy Efficacy identified four major problems that the country faces in its quest of achieving universal access to renewable energy. This includes the huge initial capital, lack of adequate financial capacity, new and untried regulatory and legal framework and the inadequate capacity to maintain, manage and operate renewable energy facilities²⁸. A big stumbling block that hinders universal access to renewable energy is the lack of policies that include financial support which will aid community ownership of renewable energy. Unlike fossil fuels, harnessing renewable energy that will provide a sustainable option to fossil fuel extraction, known to be nonrenewable and limited in quantity along with its uneven distribution which exacerbates inequalities can be socially transformative²⁹. Even though it is important to note that investment in renewable energy is beset with high upfront capital cost that makes it challenging for communities in the communities to organize enough resources needed to meet the financial demand for installing, managing, and maintaining renewable energy facilities.

It is worth noting that the legal framework that will transform the energy industry face the change of shifting from male-controlled fossil fuel industries to more diversity and inclusiveness. Taking into account the plight of women and the most vulnerable has been a challenge in the country. This is linked to the dominance of men in all the essential sectors of the economy permeating ownership in the fossil fuel industry. Since poverty in Ghana has over the years been linked to

²⁸ Ministry of Power. "National Renewable Energy Action Plan," 11.

²⁹ Stephens, "Energy Democracy," 4.

illiteracy. Questions such as how can women and the categories of people assumed to be the most vulnerable can be prepared in anticipation of reforms that will revolutionize and transition the energy industry to be more decentralized to overcome oppression, racism, and sexism³⁰ remain unanswered. The success of renewable energy reforms will be dependent on measures that will significantly prepare the vulnerable in the Global South to be able to function appropriately in a new era of ownership in the energy sector.

Transformation in the energy sector in the Ghana also faces the combined obstacle seen in the lack of the needed structures for operating and maintaining renewable energy facilities. After installing renewable energy periodic maintenance become an issue this is because most people at the grassroots lack the skills that are needed to operate and maintain the facilities that are installed. At the end these communities have to seek assistance from the controlling force that democratization of renewable energy promise to relieve the most vulnerable from. Competing with powerful forces whose influence is rooted in the political regimes of the government in this region by people at the grassroots only lead to one winner which is always going to be the corporate bodies that control the fossil fuel industry and finance most of the political activities.

SOLUTIONS IN PROVIDING SERVICES TO RESOURCE-POOR SETTINGS

In line with the foregoing predicaments associated with the transformation of the traditional ownership systems that empowers a few members of the society, there is the urgent need for reforms that will lead to the democratization of the sector to equip people of the grassroots to occupies important positions which will give them the opportunity that will make them active stakeholders of renewable energy particularly in the Global South

It has been observed that any restructuring of the energy sector should factor in the source of funding that will serve as the overarching tool and facilitate ownership transformation from centralized to a much healthy democratized system with the intension to empower vulnerable

³⁰ Stephens, "Energy Democracy," 8.

people in the grassroots. To provide energy to resource-poor settings several measures must be observed this includes systems thinking, the participation of stakeholders, accountability, evidence-based interventions, and innovative evaluations³¹.

Through systems thinking, the dynamics involved in the shift to harnessed energy from renewable energy sources demand a comprehensive examination of the interrelationship between the major parties in this sector. This encompasses community members and members of government such measures will particularly be helpful to understand embedded interconnected interdependencies to appreciate the detailed measures which can lead to the realization of the intended objective in providing renewable energy resources to the poorest region of the world.

Providing services to resource-poor settings will also demand the involvement of stakeholders. In the diagram above it was evident that contrary to the shared vision of democratization of energy sources, most of the licenses issued for the prospective harnessing of solar power were given to investors through competitive bidding to have the control and a stake in the country's prospective renewable energy sector³². This did little to factor in the concern of the communities to whom the actual burden of paying for the cost of energy often fall. With the major stakeholders in democratize renewable energy sector being the community members it is expected that they are allowed to be involved in decision making which will lead to buy-in for the community members to see themselves as owners of renewable energy and its facilities. Not only will their views be welcomed, but the collective financial contribution of community members will also help in setting up renewable energy infrastructure and also give community members the right to claim ownership of renewable energy facilities.

³¹ Bejoy Nambiar et al, "Improving health-care quality in resource-poor setting," Bulletin of World Health Organization 95, no.1 (January 2017): 1-84 <https://www.who.int/bulletin/volumes/95/1/16-170803/en/>

³² Ishmael Ackah. "Policy interventions," 10.

It will also be imperative that leaders for the drive to democratize renewable energy in resource-poor settings are made accountable to local communities and other stakeholders. Since the current political economy of most parts of the world are reliant on the support that financial assistance from fossil fuel provides accountability is often compromised³³. It is recommended that leaders in the shift to renewable energy prepare to account for the investment made for renewable energy systems as we move from the period of fossil fuel dominated economy.

It is also important that we priorities evidence-based interventions for resource-poor settings to have a complete benefit from renewable energy. There is the need for evidence-based interventions to meet the needs of communities to ascertain the measures that will have the highest possibility to thrive. From a distance it is assumed that taking away import duties on renewable energy facilities will trickle down to benefit members of the community who are the most disadvantage. Contrary to this assertion is the fact that state intervention that is planned to revive the renewable energy sector of the country often fall in the hands of individuals in the corporate world. These bodies benefit from policies that include the reduction of import duty and Value Added Tax (VAT) on solar and wind systems from 1998 threatening the objective to democratizing renewable energy³⁴.

Finally, periodic innovative evaluation is important to ensure that there can be an improvement to make changes that will bring about transformation. For example investment in the production of 3D printing will go a long way to significantly reduce the cost of manufacturing solar panels and wind turbines which will in turn contribute to decrease the cost incurred with its installation. In the last ten years, significant changes have been seen in the reduction of the cost involved in producing solar panels from \$8.50 to \$2.99 per watt representing a 65% decrease in price an encouraging initiative that needs to be commended for further investment to reach lower level. This will substantially reduce the upfront cost often associated with the installation of renewable energy and enhance the patronage capacity of people in the community at the grassroots level.

³³ Ishmael Ackah. "Policy interventions," 11.

³⁴ Ishmael Ackah. "Policy interventions," 12.

Some intervention in Ghana, however, is seen as encouraging for improving the situation of communities. These include the Renewable Energy Service Project (RESPRO), founded by the United Nations Development Program (UNDP). This project had the objective to reach communities that lack access to electricity in three years starting from 1999. It successfully helped to install over 2,000 solar panels and educated its users on the instructions needed for its operations and maintenance in schools and households across the country. Another encouraging initiative in 2007 saw the Ghana Energy Development and Access Project (GEDAP) embarked upon reforms that had the motive to increase community access to renewable energy. A third joint project between the World Bank, Swiss Economic Compact, and the African Development Bank (AFDB) supported offices, schools, and hospitals with 7,500 photovoltaic (PV) systems. As a policy, the total duty cost was exempted while 50 percent of the cost was sourced with funding from APEX Bank and other Small and Medium Enterprise (SME). The remaining cost was paid by people and organizations that benefited from this initiative³⁵. The success of these initiatives stated above is all associated in some ways to the role played by multinational cooperation and international organizations. Such measures are to be encouraged with the aim that state policies in the Global South will be tailored along the path of democratization of renewable energy sources which will eventually transition the control of energy sources into the hands of the disadvantaged and the most vulnerable in the society.

Finally, findings from the Ghana Energy Commission estimated that out of a total of 5,071.01 megawatts of renewable energy that was produced in 2015, 554.01 megawatts was wasted such grime projections calls form response that will reduce wasted renewable energy. Investment in lithium-ion battery is deemed as a prudent means for the storage of renewable energy like the Tesla battery that has been specially designed and capable of storing 129 megawatt-hours of energy from wind turbines making it the world's highest lithium-ion. Apart from reducing wastage the high storage capacity that the lithium-ion battery provides will be a welcoming opportunity to

³⁵ Ishmael Ackah. "Policy interventions," 12

store renewable energy during the peak period of the year. This is because cloudy atmosphere and relatively high wind-cut of solar and wind respectively makes these sources of energy unreliable to generate the needed capacity of energy throughout the year. With education and investment in storage capacity for renewable energies, it is expected that the high wastage often associated with energy will further be reduced with the intention to enhance the efficacy of the generated renewable energy for members of the disadvantaged communities in the Global South.

CONCLUSION

For accelerated development in the Global South this article has justified the need to decentralize renewable energy sources. The democratization of renewable energy is seen as the most critical transition known to be the appropriate restructuring essential for ownership change. Shifting from being concentrated in the hands of the profit-oriented corporate bodies to grassroots membership and community ownership systems that is necessary for the holistic development of communities. Especially in the developing countries where the gap between the rich and the poor increasingly widens. Many commentators recognize the disruption that is anticipated to be associated to the transformation preceding the deviation from the era of the fossil-fuel-based energy system to a sustainable period dominated by renewable-based energy systems will be truly a radical shift. Some of the negativities that are envisaged will be felt in communities, among people and organizations that are dependent on fossil fuel and its finance³⁶. However, this loss is expected to be compensated for by the creation of well-distributed jobs through the decentralization of renewable energy as energy democracy conforms to the diversity and heterogeneous outlook of grassroots communities. In some instances however such transition has been damaging to members of the communities who lived by the financial resources from fossil fuel. An example is in South African where the policies of the government have not considered the measures that will help assist communities and people to find an alternative to livelihood in an economy dependent

³⁶ Stephens, "Energy Democracy," 4.

on renewable energy so that whiles new jobs are created by a sustainable and much-decentralized means, others who depended on fossil fuel industry will not suffer the same fate

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