Women's Inclusion: a key consideration in Sustainable Energy Development in developing nations.

Abstract- *In developing nations, women have always borne the brunt of energy poverty, especially in the rural areas of these nations. To achieve the Sustainable Energy Goal, (SDG 7- Affordable and Clean Energy), women need to be major stakeholders in the development of renewable energy policies. This essay reviews the pivotal role played by women in energy and highlights some of the decisions and opportunities that can be enhanced for women to take part in the renewable energy sector for sustainable development.*

I. INTRODUCTION

Sustainable Development Goals (SDGs) target improving livelihoods universally, particularly for developing countries. However, a major hindrance to their attainment is energy poverty. Lacking access to modern energy technology limits production for economic growth which blunts efforts to escape poverty [1]. Rural areas experience energy poverty the most due to lack of infrastructure for electricity grid connections, therefore, Decentralized Renewable Energy Technologies (DRETs) can provide sustainable energy to drive socio-economic development in these off-grid areas [2].

Collectively, developing countries account for more than half of the global renewable energy capacity yet electrification rates are low [3, p. 30]. Unavailability of technology is not the major problem but inaccessibility due to socio-cultural and economic considerations being excluded in technology design and implementation [4].

Energy projects need to shift from a technocratic approach and focus on addressing the underlying social structures that stifle the transformational potential of DRETs which include patriarchy and exclusion of women from decision-making processes.

II. WOMEN'S PIVOTAL ROLE IN ENERGY

Women are the major users of energy in households, yet it is often male-headed organisations that make decisions affecting energy technology designs [5]. Traditional cookstoves have been known to play an important role in the culture of rural households, as they are perceived to symbolize "the mother of the house" [6]. In a Zimbabwean case study [6]-[7], improved cookstoves were not adopted in many rural households because the technology design failed to consider the realities of the end-users' socio-cultural environment. Women, therefore, influence the social acceptance and purchase of energy-related technologies in their households.

Energy poverty adversely affects women's health [8] since using poorly vented traditional cookstoves is akin to smoking two packs of cigarettes daily [9]. Lack of electricity in hospitals results in women dying whilst giving birth since midwives cannot perform obstetric procedures at night [10], also, surgical tools remain unsterilized, posing a health hazard.

Concerning development, as more trees are cut down women travel farther to accrue firewood which exacerbates health-related issues. Hence the focus of any DRET must be on providing clean, cheap and accessible energy.

Women have a unique knowledge of the importance of sustainability ascribable to their intimate involvement in energy-related activities and direct interaction with the environment, which makes them suitable sustainable energy leaders [11]. Figure 1 below typifies how rural women are mainstream users of energy.

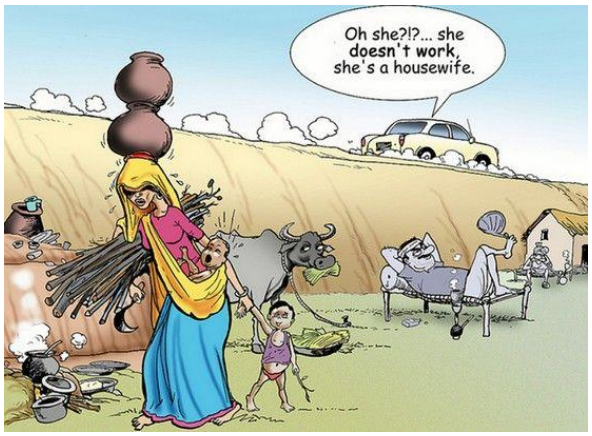

Figure 1: Rural women's energy activities

Adopted from UN Women India's new cartoon campaign [12]

The economic contribution to development by women in household drudgery and income-earning activities is usually unaccounted for within fiscal balances which creates a bias towards large-scale energy infrastructure projects [13]. Cecelski [13, p. 31] asserts that the energy sector defines energy as involving "capital-intensive, large-scale commercial activities which solely consist of inanimate fuels and excludes metabolic human energy". Case in point, trucks transporting maize consume fuels that are valued through market mechanisms, yet the energy expended by women carrying the same maize to the market on their heads is excluded from national energy accounts [13].

Since women neither go to a workplace nor earn an average salary they are disqualified from loans, and often their work goes unrecognized. Therefore, an understanding of women's economic constraints in the usage of novel energy technologies is crucial and must be integrated with energy technology design.

III. BENEFITS TOWARDS REALISATION OF SDGS

DRETs reduce drudgery and free up time for income-generating activities which make women economically independent. This enables women to purchase more energy technologies that drive social and economic sustainability thereby reducing poverty.

Access to electricity in homes and schools improves the quality of education. For the girl child, instead of staying home to help their mothers, schooling will allow gender equality. Electricity in hospitals improves medical service delivery thereby improving the welfare of the whole community. Solar irrigation pumps boost agriculture thereby increasing food security [10].

DRETs for different services create employment for both men and women which reduces inequality. Women can be trained to do quality control service backup and maintenance. As the main users of the technology, they would know essential design improvements and what causes faults. As mentioned earlier, patriarchal norms in society stifle transformational change therefore, there is a need for awareness campaigns in rural communities on the benefits of DRETs towards socio-economic development and the key role women can play as sustainable energy leaders.

IV. WHAT NEEDS TO BE DONE

For these awareness campaigns to achieve the intended outcomes, adequate funding and government support are required. The government should:

i. Increase access to science and technology education for women.
ii. Establish multidisciplinary teams for gender mainstreaming in energy policy development [14].
iii. Ensure proportional gender representation in energy policy decisions on macro-energy planning and pricing.
iv. Engage developed countries to finance pilot projects that provide micro-credit schemes for women to purchase DRETs.

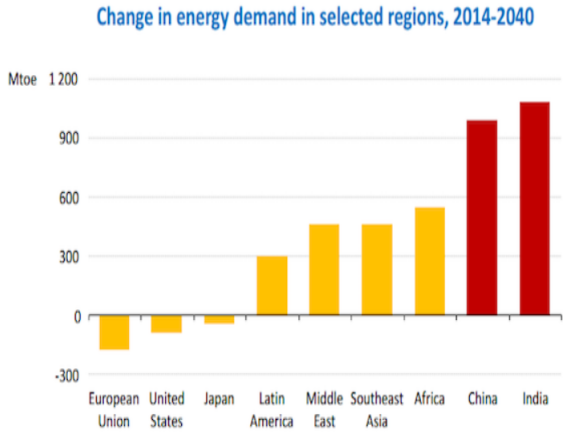

Figure 2: Energy demand trend, 2014 - 2040 Adopted from IEA World Energy Outlook 2015 [15]

Figure 2 above shows how the energy demand for developing countries will increase over the years as they industrialise. It is imperative that the industrialisation is driven by sustainable energy. Developed countries industrialised in an unsustainable way [5 p. 21] and ironically the brunt of the impact of climate change is felt more in developing countries that have inadequate disaster relief mechanisms.

To solve this tragedy of the commons [16], the onus for the deployment of DRETs in developing countries should lie upon developed nations.

Kyoto protocol and Clean development mechanisms have already been put in place to address climate change [16], but these programs must include women's participation for effective sustainable energy development.

Governments in developing countries must impose stringent policies on manufacturing companies from the developed world that have outsourced their manufacturing to them. Each company must finance a renewable energy project to compensate for the environmental pollution caused by manufacturing activities. If renewable energy projects are extended to urban areas, consumers can sell excess electricity to the grid which generates supplemental income for them whilst also increasing grid supply especially for heavy manufacturing industries that cannot solely rely on intermittent renewable energy. This allows both developed and developing countries to find common ground in balancing environmental protection for mutual socio-economic development thereby attaining SDG 17- Partnerships for the Goals [17].

V. CONCLUSION

Energy poverty is not gender-neutral therefore, it is of utmost importance that women participate in the energy sector as they are the most affected. Empowering women to actively participate in sustainable energy projects will aid the advancement of DRETS thereby enhancing the socio-economic development of developing nations. This paves a way towards achieving the global pact for development- the SDG goals.

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