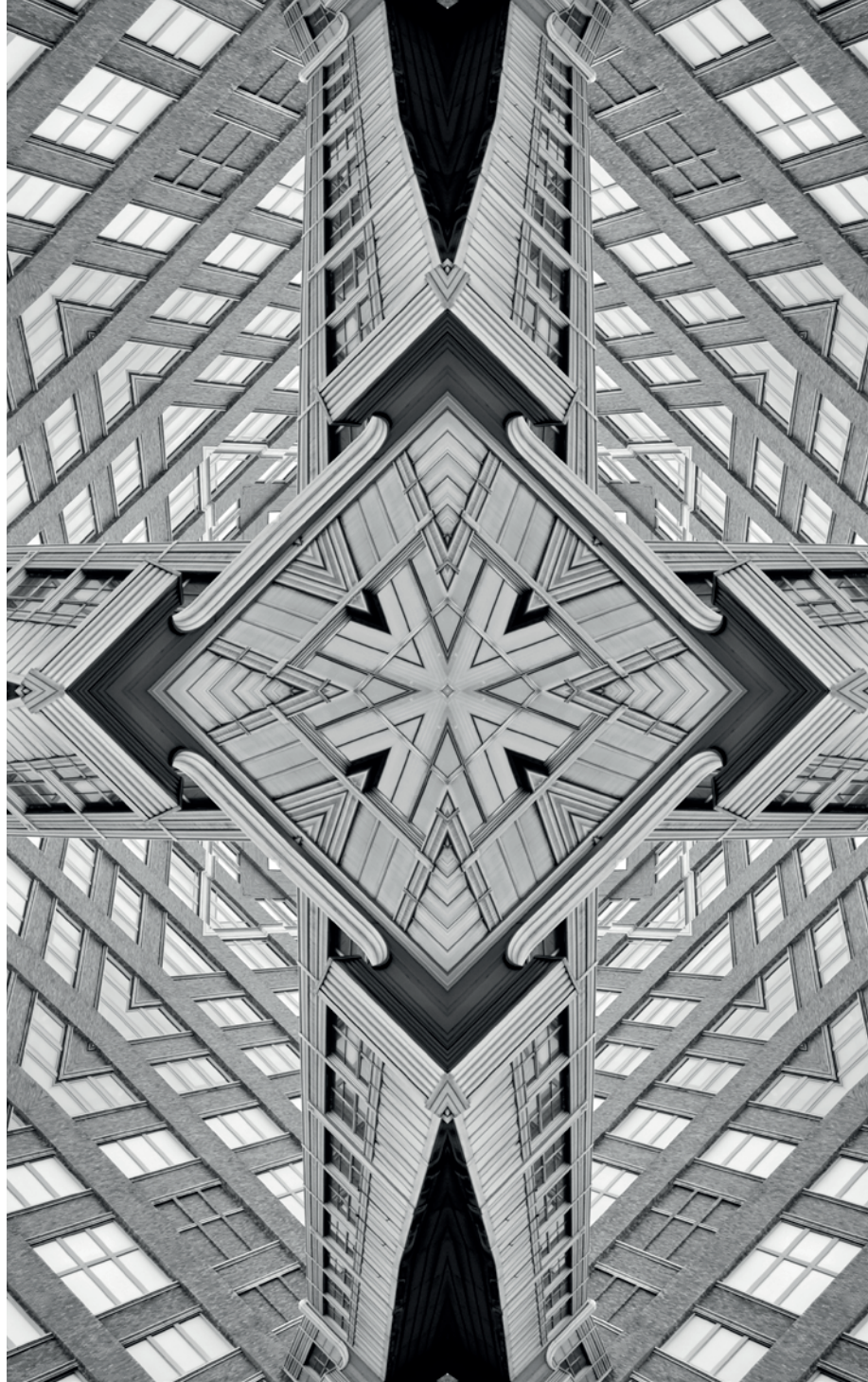


Issue

Brief

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Understanding the Gender Dimensions of Energy Poverty

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Abstract

Among the estimated 1.3 billion people across the world who have no access to electricity, 70 percent are women. This brief discusses the impact of energy poverty on India's rural women. As women are primarily responsible for securing food and energy for their family, they are the ones who are worst affected by the lack of access to clean and modern energy. The brief calls for a more holistic approach in research and policymaking on energy poverty, and argues that involving women in the supply of clean energy by generating green jobs, is a direct pathway that not only ensures sustainable energy access but also empowers women, improves their health, and improves their capacity for climate adaptation and mitigation.

Energy supply is crucial to a country's development,¹ and it is for this reason that energy poverty is a serious concern. As Indian economist and Nobel laureate Amartya Sen has argued, lack of access to energy not only deprives a person of basic necessities (heat, light, cooking fuel) but also strips them of options for a holistic development.²

Multilateral organisations like the International Energy Agency (IEA) and the World Bank recognise energy accessibility as a crucial driver of social, economic and human development. The *Energy Progress Report, 2019* states that globally, the electrification rate has reached 89 percent, and in absolute terms, the number of people without access to electricity has reduced from 1 billion to 840 million in 2016.³

India, however, is far from achieving Goal 7 of the Sustainable Development Goals (SDGs)—i.e., “Ensure access to affordable, reliable, sustainable and modern energy for all.”^a The country is home to 780 million people who have no access to modern energy; they rely on traditional sources like biomass for cooking. Although India has made progress in electrifying households through schemes such as Pradhan Mantri Ujjwala Yojna (PMUY), there are still around 239 million people across India^b who have no access to electricity.⁴ The 2011 Census of India found that nearly 87 percent of the rural population remain dependent on solid fuels for cooking,⁵ and 580 million people across the country will remain without access to clean cooking fuels in 2030.⁶

As societal and cultural norms endow the primary responsibility of securing food and energy to women, it is them who are most affected by energy poverty.⁷ Apart from comprising 70 percent of the 1.3 billion people living in poverty, globally,⁸ women also have poor access to technology and resources, due to societal constraints.^{9,10} This contributes to women's time poverty, ill health, and increased level of drudgery, leaving them at the losing end of economic and social development.^{11,12}

The imperative is to focus on the gender aspects of energy. Indeed, women are underrepresented in all sectors that are crucial to a green economy: renewable energy, manufacturing, construction, and public transportation. India's rural women, in particular, have the potential to be change-makers in the country's efforts to transition to a greener economy; they have immense traditional

a SDG7 Target 7.1- Universal access to modern energy: Through the Pradhan Mantri Sahaj Bijli Har Ghar Yojna, almost all households in India's 603,175 villages have been electrified. SDG7 Target 7.2- Increase renewable

b This number comprises 22 percent of the global population.

knowledge, and a sound understanding of household- and community-level demands.

This brief analyses why India's rural women are disproportionately affected by the lack of access to clean and modern energy. It examines various underlying factors including intra-household dynamics, inequitable assignment of responsibilities, and the women's lack of education and awareness. It offers recommendations on institutional and policy framework changes required to not only achieve the SDG of 100-percent energy accessibility, but to also enable rural women to become change-makers in the green energy sector.

The Energy-Poverty Nexus

Poverty is defined as the absence of choices and opportunities required to lead a life of dignity.¹³ Among these opportunities is clean and modern energy. The United Nations Development Program (UNDP) defines 'energy poverty' as the absence of modern cooking fuel, and of electric light to carry out basic activities after sundown.¹⁴ By this definition, India is energy impoverished, with an estimated 580 million people continuing to be dependent on traditional biomass for cooking even in 2030.¹⁵ As of 2011, 86 percent of rural households, and 20 percent of urban, relied on biomass for cooking.¹⁶ A family of eight in the rural regions, on average, burns 70–80 kg of fuel wood each week. It is most often the women who walk some two km twice a week to fetch the wood.¹⁷

Clean and modern energy can bridge the energy poverty gap and empower rural communities. India should move to transition from conventional fuel to clean and modern energy.

“Poverty is the absence of choices and opportunities to live a life of dignity; clean and modern energy is among those opportunities.”

The Gender Dimensions of Energy Poverty

It is estimated that one of every four (25 percent) of the annual 4.3 million global premature deaths caused by Household Air Pollution (HAP) occur in India.¹⁸ Some 400 million people in India, of whom 90 percent are women, rely on solid biomass and are exposed to detrimental health conditions that manifest as respiratory and pulmonary diseases, or other disorders like blurred vision.¹⁹ On a global scale, around 3 billion people do not have access to improved cooking technologies.²⁰ A household which has access to improved cooking technologies is exposed to indoor air pollution measured at 25-50 micrograms per cubic meter per day, as opposed to an exposure of 400-500 micrograms per cubic meter per day for a household that does not use improved cooking fuel and technologies.²¹

India's slow transition to clean and modern energy can partly be attributed to the lack of understanding of the gender dimensions of this energy poverty. The impacts of continued reliance on traditional fuel is multi-faceted, especially for women.²² Rural Indian women, on average, spend five to eight hours every day on cooking-related activities; 20 percent of this time is used in securing fuel wood alone.²³ The heavy workload takes a toll on the health of these women who are often, to begin with, undernourished. Poor nutrition, compounded by the workload, including travelling by foot a minimum of 2.5 km at least twice a week, lugging 40 kg of heavy wood, and then cooking in ill-lit conditions and using inefficient biomass stoves that cause indoor air pollution—altogether increase their susceptibility to anaemia and respiratory diseases, and in turn raising their risk to pre-natal mortality and post-natal complications.²⁴

For India's women, energy poverty ultimately accrues in time poverty. It holds them back from engaging in income-generating activities, availing opportunities to enhance their skills set, getting education, and adapting to and mitigating the impacts of climate change.²⁵

Research has found that a woman's lack of agency in household decision-making is crucial in her family's failure to transition from traditional fuel to clean cooking fuel.²⁶ The woman's lack of voice in family decisions, in turn, is caused by her not contributing to household income. Data shows that India's female labour force participation rate (FLFPR) is only 27 percent, as opposed to the males' 96 percent.²⁷ According to research by the Organisation for Economic Co-operation and Development (OECD), around 66 percent of the work done by women in India is unpaid (at 352 minutes per day) as opposed to 12 percent for men (52 min per day).²⁸

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Being involved more in unpaid work, rather than income-generating occupation, renders women voiceless in household decision-making. The men, being the breadwinners of the family, gain control over financial and other decisions.²⁹ The question is *what* it is that men consider worthy of investment: in the matter of cooking fuel, the clean option, as opposed to traditional fuel that is free of cost—does not figure in their priority expenditure.³⁰ With the decision-makers unable to comprehend, or empathise with a woman's hardships with traditional cooking fuel, the family continues to rely on wood. Even those who might be aware of the detrimental health effects of using traditional fuel may still not prioritise the less-polluting alternative as an option to invest their hard-earned money.³¹

It is a situation that needs attention, because the benefits of transitioning from traditional energy source to clean modern energy are well-established. It results in saving money that is otherwise spent in procuring fuelwood and kerosene, improved health conditions,³² reduced household air pollution, and reduced drudgery and time poverty.³³

“Research has found that a woman's lack of agency in household decision-making is crucial in her family's failure to transition from traditional to clean cooking fuel.”

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Energy Poverty and Climate Change

Amongst the multi-pronged effects of energy poverty on women is related to climate change. Rural women, being primarily responsible in their households for securing food and energy, are highly dependent on local natural resources.³⁴ Climate change—and the extreme weather events that it causes—can impact the availability, accessibility and stability of various food systems, local natural resources, and traditional food sources. This forces women to travel longer distances to find clean drinking water and fuelwood.³⁵ Increased floods, in particular, mobilise the arsenic contamination in soil, in turn polluting the ground water. Women and children—assigned by traditional gender roles to be primarily responsible for securing clean drinking water—are the ones who get affected the worst.

Even the benefits attributed to advances in technology fail to accrue to the rural women. Due to lack of resources, their low economic contribution and disposable income, lack of decision-making power and property rights, these women are unable to use technologies that can help them access clean water or modern energy (e.g., solar energy services and LPG).³⁶

“Women are primary responsible for securing food and energy for their family, and are highly dependent on local natural resources whose availability is getting impacted by climate change.”

Off-Grid Energy: A Better Future for India's Rural Women?

According to the International Labour Organization (ILO), the green economy, in the next 20 years, will create about 60 million new jobs, a significant proportion of which are in the fields of technology and infrastructure.³⁷ Investments in Renewable Energy such as solar power, wind, geothermal, and hydro, are estimated to be capable of creating some 40 percent of these green jobs.³⁸ In this regard, off-grid energy systems carry a promise in transitioning from traditional fuels to clean and modern energy, as well as with generating green jobs for women.³⁹ Off-grid solar energy (mini-grid, micro-grid, and stand-alone grid) can reach remote areas in the country where grid electrification cannot.⁴⁰ This can set the path to transitioning to renewable energy and combatting carbon emissions; they are also more reliable and affordable in the long run. Rural households, in particular, can benefit from off-grid solar energy as they consume less energy.⁴¹

Moreover, off-grid solar energy has the ability to empower communities, especially the women, by generating economic and welfare opportunities.⁴² The non-government The Energy and Resources Institute (TERI), for example, has a programme called “Light a billion lives” which, along with its implementation of the community project of providing solar lighting system, has helped create income-generating opportunities in the supply chain of clean energy products. The organisation selected women from self-help groups, and trained and mentored them to become local energy entrepreneurs.⁴³

India's National Solar Mission (NSM) aims to reach 100 GW in grid-connected solar energy and 2 GW in off-grid solar energy by 2022. The vision comprises various enabling instruments that offer support to decentralised solar energy strategies, most important of which are the community-based off-grid projects. A progress report on the NSM acknowledges the importance of community engagement in the success of any effort to promote solar energy.⁴⁴ Although community-based projects have gained prominence in some parts of India over the recent years, there is a need to upscale them. They do not only offer direct energy benefits, but also aid in accomplishing climate action targets. The bottom-up approach followed by community-based energy projects allow for better equity and fair outcomes amongst all members of the community.⁴⁵

There are a number of examples of mini-grids and off-grid solar energy systems that have provided economic opportunities to women by involving them in the supply chain of solar energy services. Social enterprises like Frontier Markets, Dharma Life, and Smart Power India have taken initiatives to mentor rural, marginalised women to become sales representatives, and train them in the assembly of solar lamps and other solar-driven products; these organisations also provide their families with solar-powered energy. (See Table 1)

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Table 1
Non-government alternative-energy projects

ORGANISATION	PROJECT	DESCRIPTION
Grassroots and Rural Innovative Development (GRID)	Solar Powered Reverse Osmosis	Pioneered the use of solar energy to power reverse osmosis for water purification; mini grid power to run up to 10-15 hrs day, provides 2000 litres of clean portable water to 1000 households in Haryana. ⁴⁶
TERI	Light a billion lives	TERI's LaBL has provided solar lighting systems and cooking systems to rural households across 16 states in India. ⁴⁷ TERI selected women from the SHGs, trained and mentored them to become local energy entrepreneurs; they procured IDES from accredited manufacturers, installed in households, ensured maintenance with help of scholar technicians who were also trained by TERI's LaBL associates. ⁴⁸
Dungarpur renewable energy technologies private limited (DURGA)	Dungarpur Solar Initiative (DSI)	DSI was responsible for training, mentoring, educating the tribal women of the Dungarpur district, to assemble, repair, maintain solar lamps. They were also enabled to carry out skill transfer and promote solar enterprise in the local community. They manufactured, installed, repaired, maintained several ranges of solar products—solar toys, solar home systems, solar street lights, and off-grid solar projects. ⁴⁹

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These success cases illustrate the potential of grassroots innovation. India would do well to replicate these projects and upscale them. The fundamental lesson is that enabling women to be part of the renewable energy sector can contribute significantly to the economy.

Equally important is to address the social and cultural barriers that undermine women's capability to take part in welfare opportunities. Indeed, the imperative is to acknowledge that energy needs vary based on gender: the vulnerability of women to the impacts of energy poverty is significantly different to that of men. In order to churn sustainable positive outcomes in the long run, there is a need to revamp the way energy policy is designed.

To be sure, the problem is not unique to India; at a global scale, energy policies tend to be gender-blind.⁵⁰ Gender-neutral policies that aim to provide equal opportunities do not always result in equal outcomes; for this reason, gender-sensitive policies are required.⁵¹ For instance, a policy that recognises the prevalent intra-household gender hierarchy will meet with greater success in ensuring that the household not only invests in solar lamps (which men would more easily agree to) but also solar cookers (from which men might not directly benefit, given that they spend less time in the kitchen.)⁵² It is important to view women not only as end-users of the various energy services but also as entrepreneurs, designers, innovators who act as means to achieving energy security.⁵³

In this context, how does India's National Electricity Policy weigh? While the policy recognises the importance of clean cooking fuel for women, and it links its absence to ill health and drudgery, it fails to explicitly mention the association of women in the energy supply chain or their involvement in the supply of modern forms of energy. For example, the policy misses out on the supply of adequate affordable electricity to home-based micro-enterprises, post-harvest technologies (e.g. power operated grain thresher and groundnut stripper) that are labour-intensive for women.⁵⁴

Policies have only focused on offering clean and modern energy as substitutes to traditional fuel, because social norms assign cooking-related activities to women.⁵⁵ The policy does not discuss enhancing the use and coverage of clean modern energy for rural employment (especially for women) with the help of decentralised energy systems (or mini solar grids). There is anecdotal evidence of women empowerment achieved through the help of various social enterprises and self-help groups as mentioned earlier. Although there are social enterprises in the energy sector that have been successful in empowering women through job creation, these jobs of assembling, repairing, maintaining solar-related products are contractual and come only as the social enterprise places orders. The imperative is to create more stable job opportunities for women; for that, the state needs to step in.⁵⁶

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Government should take proactive measures to implement socially progressive policies and programmes for women, pump in more stimulus packages, subsidies and grants into community-based energy projects and address gender equality, and make the otherwise expensive clean energy technology available to the rural poor.⁵⁷ An important initiative that could be taken by the government is to direct the National Green Skills Council of India to bring into its mandate, a policy that focuses specifically on women. The rollout of green skill initiatives that are women-centric, would instil a sense of security and encourage women to take part in India's green economy.

Moreover, the government should take into cognisance the positive impact created by various community energy projects and social enterprises. Including self-help groups and community-based projects as instruments while designing energy policies would encourage public involvement especially amongst women.⁵⁸ Successful working models of initiatives like Dungarpur Renewable Energy Technologies Pvt. Limited (DURGA Energy)^c and Barefoot College International,^d can be implemented across India with the aid of the government as well as private institutions.

If the aim is to generate more job opportunities for the women in the lower strata of a green economy, more of them should be enabled to occupy top hierarchical positions in energy institutions and organisations. According to data from UN Women, women occupy only six percent of technical staff positions and less than one percent of top managerial positions across India.⁵⁹ To increase women's representation in the energy sector and ensure gender inclusion, it is important to increase their participation in the fields of science, technology, mathematics, and engineering.⁶⁰

c DURGA Energy Dungarpur Renewable Energy Technologies Pvt. Limited (DURGA Energy) is a module manufacturing plant that makes standard as well as custom-designed solar panel (1Wp-330Wp) modules. It is owned and operated by local tribal women of Dungarpur District, Rajasthan. Women from Punali, Antri, Jhonthri and Biladi co- own the company.


d The Barefoot College International model aims to enhance economic mobility by making vocational and educational opportunities available to women and girls from marginalised communities around the world. It provides training to women to become solar engineers, and does not require them to have prior formal education.

Conclusion

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Energy services interact with social systems at different levels. The differentiated and disproportionate impact of energy poverty on India's rural women makes them lose out on a life of good health—one with even the minimum social and economic opportunities. Energy poverty also increases rural women's vulnerability to climate change by affecting their ability to adapt to and mitigate its impacts. Government policies and programmes, therefore, that aim to provide energy services must be planned with a vision of welfare, rather than merely increasing energy coverage. A green economy should benefit men and women equally. To pave the way for the achievement of such a vision, India would need policies that seek special preferences for women to make up for the years of gender imbalance in the energy sector caused by a succession of gender-blind policies.⁶¹

There is a need to move away from policymaking's top-down approach that only focuses on providing accessibility—to one that is bottom-up and context-based.⁶² Such a strategy considers society's gender dimensions and social-cultural constructs. It is imperative to shed old assumptions that benefits will “trickle down”, with time, to all (irrespective of socio-cultural and economic barriers).⁶³ Policies must explicitly define and state gender inclusion, acknowledge the gender needs that are pre-embedded in energy services, and the gender relations that play a significant role in control and accessibility of energy.⁶⁴

This can happen only if there is enough gender-disaggregated data that will guide a proper analysis of the gender dimensions of energy. Adopting new methods of planning and implementing energy projects in rural areas is required. It would create new opportunities for women in sales, management and technical positions, but will only be sustainable when there is a concomitant attitudinal change amongst various energy institutions and organisations. The incorporation of gender goals in project proposals, and appointing project managers who are aware of the gender dimensions of energy poverty, can be a promising way forward. 

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