

PUSHING THE FRONTIERS

#3 | Gender-Inclusive Renewable Energy Delivery Model: A case study in rural Bihar, India

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This publication presents a case study on an initiative led by the Energy and Resources Institute (TERI) and the Bihar Rural Livelihood Promotion Society (BRLPS) in the province of Bihar, India, which is comprised of the promotion of Solar Home Systems in a gender inclusive manner and the provision of access to reliable and affordable electricity to households. The brief discusses the impact of this intervention on energy patriarchy and its impact on gender relations.

It is part of our **'Pushing the frontiers of economic, social and cultural rights'** series, which aims to foster collective reflection among activists, practitioners, organisations and communities on how we can, together, further develop the human rights framework as an axis and tool for transformative change to tackle imbalances of power, social and economic injustices, and environmental destruction.

Introduction

Access to energy is regarded as a critical enabler for economic and human development, as well as for the realization of economic, social and cultural rights. The interlinkages between gender and energy - both the life enhancing aspects as well as the disproportionate effects of the lack of it on both women and men have been established by the literature (Wilhite, 2017), as well as by international human rights mechanisms. The UN Committee on Economic, Social and Cultural Rights (CESCR Committee) in General Comment no. 4 on the right to adequate housing recognized that an adequate house must contain certain essential services and infrastructure, such as access to energy for cooking, heating, and lighting to ensure health, security, comfort, and nutrition (CESCR 1991). In India, judicial activism led to interpreting the 'right to electricity' as a fundamental right under the 'right to life and liberty' as specified in Article 21 of the Indian Constitution (Indian Kanon, 1995).

Section 43 of the Electricity Act of 2003 provides that there is a statutory duty on the distribution licensee to provide electric connection to the applicants within one month after

receipt of the application requiring such supply (Ministry of Law and Justice, 2003). Furthermore, in the context of the climate crisis, the UN Committee on the Elimination of Discrimination against Women (CEDAW Committee) also stated in its General Recommendation No 37 that due to gender inequalities women often do not have control over decisions that affect their lives or access to essential resources including energy (CEDAW, 2018).

The new and the emerging narrative on gender and energy clearly identifies the meaningful role women can play as 'change agents' along multiple segments of the energy value chain as energy users, business owners, service providers and policy makers. Evidence from literature suggests that including women in the energy value chain has led to better adoption of technologies and better management (Shankar, et al., 2018). In this line, the CEDAW has recognized that States need to encourage women's entrepreneurship and create incentives for women to engage in businesses involved in sustainable development in areas such as the clean energy sector.

Women’s participation in the provision of energy solutions is thus being recognised as an effective way of introducing energy products and services to the unserved and underserved communities (SEforALL, 2018).

At the same time, the literature on energy and gender also underlines the fact that the sector is still male dominated and provides unsettling evidence that female entrepreneurs operate much below their potential, due to gender specific barriers and discrimination such as lack of access to socio-political networks and finance, restrictive regulative environment, and cognitive inhibitions while struggling to fit into societal ascriptions of gender roles (IRENA, 2019; Kelley, et al., 2016). This has often resulted in ‘energy-patriarchy’, thereby creating a gender gap in energy business and entrepreneurship. Energy resources and technologies in many social contexts are often linked to and intertwined with gender roles where men’s association with electricity and livelihood related energy use is linked with men’s status as the owners of the house, their higher incomes compared with women, and gender norms concerning decision-making. These factors automatically make men as subscribers and owners of energy systems, which are customarily deemed as energy patriarchy. A logical question thus, arises – in the context of low-income communities, could the introduction of gender sensitive business models of electricity access services result in better gender outcomes?

Motivated by this central idea, this case study discusses the collaborative work between the Energy and Resources Institute (TERI), a research institution in the clean energy, environment, climate science and sustainability space based in India, and Bihar Rural Livelihood Promotion Society (BRLPS). While TERI is a multi-dimensional organisation with capabilities in research, policy, consultancy and implementation having pioneered conversations and action in the areas mentioned above for over four decades, BRLPS is an autonomous body under the Department of Rural Development in the Indian province of Bihar. The main objective of BRLPS is to enhance social and economic empowerment of the rural poor through playing a catalytic role in promoting development of microfinance and towards this is implementing the JEEViKA (livelihood) programme in the state since more than a decade. The initiative by TERI and BRLPS in Bihar is comprised of the promotion of Solar Home Systems (SHS) in a gender inclusive manner and the provision of access to reliable and affordable electricity to households. The article also discusses the challenges of energy patriarchy and its impact on gender relations. The state of Bihar is one of the socially and economically underdeveloped provinces in India, primarily because of its history, one of the lowest per capita income (INR 50,735 for FY 2019-20) and high incidence of poverty (nearly a third of the people are below poverty line). JEEViKA is a livelihood programme of BRLPS focused

on the development of rural women and has been hailed for its positive economic impact (Hoffmann, et al., 2017). The programme, initiated in 2006, is focused on developing women’s self-help groups and building their capacities, thus enabling women to access credit services, and gain opportunities that enhance their livelihoods.

Basically, capacities of self-reliance and self-sustenance are developed through formation of self-help groups. It inculcates the habit of savings among the rural women and enable them to pool their own resources to use for their productive and other activities. It also intends to develop the spirit of co-operation and mutual help in the rural community. A ‘Self Help Group’ (SHG) is a financial intermediary committee which comprises of homogenous group (similar socio-economic background) of 15-20 women, who meet at regular intervals to contribute and save small sum of money. The collected pool of money is then lent to the group members on a need basis during times of emergency, financial scarcity; for education and productive uses, important life events or to purchase assets. The loans borrowed from the self-help groups are collateral-free and the peer pressure of the group ensures timely repayment of loans. In many cases, the self-help groups are also linked with the banks for micro-credits. The Reserve Bank of India regulations mandate that banks offer financial services to the self-help groups on very low interest rates. This allows underprivileged women to circumvent the challenges of exclusion from institutional financial services.

The JEEViKA program, in its endeavour to enhance access to electricity to the rural poor, collaborated with TERI, to promote solar home systems in households that are either underserved or unserved. Under the 'JEEViKA - Lighting a Billion Lives (LaBL)' initiative, women were included as target beneficiaries. The women received a clean energy loan called an ‘Energy Security Credit’ to help finance the system cost, beyond a down grant of 40% of the system cost, thus contesting the typical energy-patriarchy where mostly energy assets are owned by men.

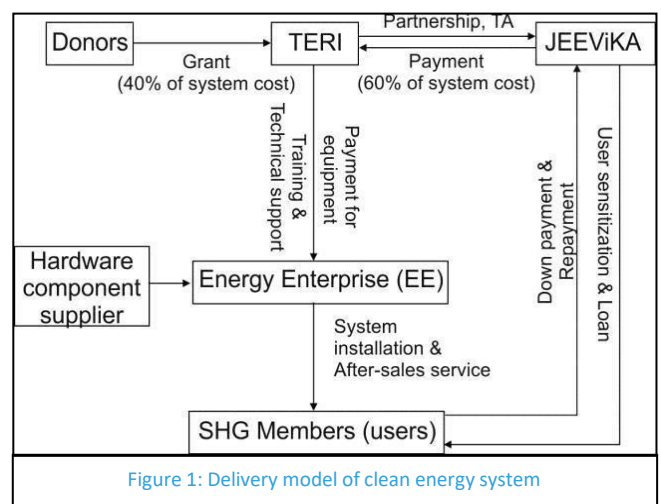


Figure 1: Delivery model of clean energy system

The energy package promoted under the initiative includes two LED lamps of 2-3-Watt each and a mobile charging point powered by a 20-25 Wp solar panel and a battery. While initially only solar home systems were promoted under the initiative, later a forced draft improved cookstove was added as a package named Integrated Domestic Energy Systems. From 2013 to 2020, more than 51,000 systems have been promoted across seven districts (Purnea, Khagaria, Gaya, West Champaran, Madhubani, Aurangabad & Nawada) in the state. In 2020, TERI directly supported the livelihood of self-help group members by training and engaging them in sale and services of renewable energy devices in different clusters and supported 25 Uttam Urja (i.e. best energy) shops in the Purnea, Gaya, West Champaran, Nawada and Aurangabad districts. This initiative covered nearly 4000 households with sale and services of clean energy products by women entrepreneurs.



Figure 1 Solar Home System in Purani Garail (PC- Rashmi Murali)

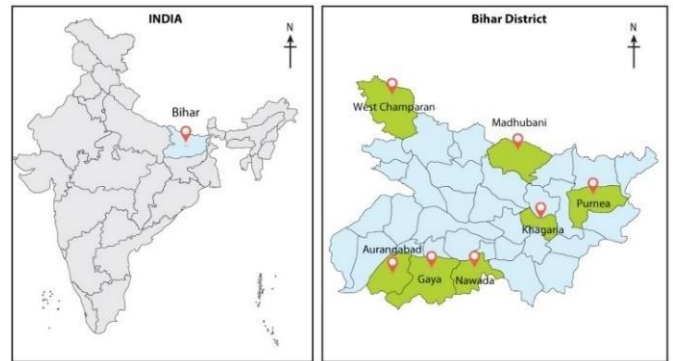


Figure 2 Map depicting operational areas of TERI-JEEViKA initiative in Bihar

Impact of the TERI-JEEViKA initiative

To analyse the lighting programme through a gender lens and also examine some of the fundamental questions related to the energy-patriarchy, a research study was undertaken by a team of researchers from TERI. The study attempted to understand pertinent questions such as how does contesting the energy-patriarchy affect gender equality through the distribution of benefits to women, men, girls and boys and does the ownership of the energy systems by women aid in changing gender relations within the household and beyond? The research was undertaken in two villages - Purani Garail and Rustumpur of Purnea district - and was built on in-depth case studies, using qualitative methods and site visits, as well as discussion with the implementing team, to highlight the nuances of a patriarchal society and gauge the impacts of a women-centric design of energy intervention. This case study does not seek to provide public policy recommendations, but rather share the lessons learned and the co-benefits derived from a specific energy intervention in the hopes that it can help inform and shape the development of a narrative that considers ensuring access to sustainable energy is a key human rights and gender issue.

At the time of visit, Purani Garail and Rustumpur were two of the several under- electrified villages in Purnea district of

Bihar. The relatively stagnant agricultural sector has not been able to generate sufficient employment for a burgeoning population in these villages where the average household size is over eight members. The search for alternative opportunities of livelihoods has driven many male members out of their villages to migrate to other states in India. In their absence, the women work as agricultural labour whenever they find some opportunities in their village.

Since the introduction of the JEEViKA programme in these villages, women have experienced a positive shift in their confidence. They are able to support their families through access to loans from the JEEViKA's programme that was not so easily available earlier. Most importantly, the SHGs, formed under the JEEViKA, have provided them a support system outside their immediate families and a platform where they can talk about their problems, seek help and socialise. Several women have also developed confidence to express their opinions in an otherwise male dominated society. Puspa Kumari, who is in her mid-forties and already a grandmother of three, thankfully stated that, "*being a didi (members of the SHGs address each other as Didi meaning 'elder sister') means a lot to me since I am allowed to step out of the house and attend meetings, and these meetings also provide a platform for women to socialise*".

Electricity as a life-enhancing tool

Electricity supplied through solar home systems is highly valued as a 'labour-reducing' and 'life enhancing' tool by both women and men. The decisions regarding positioning of lights were mostly joint decisions of the wife and husband. During discussions with the community, it was found that every household had a light in the kitchen, or the kitchen was part of the living area which had a light. In terms of immediate benefits, the LED lighting provided a step forward in quality of life and convenience. Furthermore, it alleviated women's time poverty. Better illumination and extended day hours helped women, especially those who were involved as casual agricultural labourers, to clean the house and prepare the morning and evening meals as per their convenience, whilst allowing them to take short breaks in between. An earlier survey indicates that with the solar lights roughly 4% of the houses reported an increase in monthly income due to either increase number of working hours post sunset or starting of indoor income generation activities (Palit D, Malhotra S, Pandey M K, Bankoti N. 2015). The common income generation activities reported were mostly sewing and grocery shop.

As expected, lighting has also allowed increased mobility and socialisation at night for women, invoking a sense of safety. Furthermore, families could hold marriages and festivals for longer hours in the evening within the households, leading to more socialisation and mingling of family and community members, including women. Further, self-help groups have also greatly benefitted schoolchildren (both boys and girls) to study beyond the daylight hours and in some households, women, though illiterate themselves, could still monitor their children while they studied.

Puspa Devi added gleefully "*Now with the solar powered light bulbs, my children spend more time in the evening to complete their schoolwork*". Another didi, Sumitra, couldn't agree more. She further commented, "*earlier after dusk, boys were loitering around in the area, now they at least open their books and spend some time reading and writing*".

As expected, some of the other perceived advantages include health benefits due to reduced incidences of eye and respiratory diseases that were once rampant due to prolonged exposure to kerosene soot emanating from kerosene lamps (that were earlier used by households for lighting purposes). One of the main advantages of having solar home systems is being able to charge mobile phones at home. While going to crowded village markets to get their mobile phones charged was not a big concern for men,

the women had to rely on men or boys to get their mobiles charged, since going to marketplaces without the company of male members of the family was frowned upon.



Figure 3 Women expressing their views in village Purani Garail, Bihar (PC-Arun Kumar)

As the men from the villages migrated to urban areas in search of gainful employment, mobile phones have become the medium that helped women folk stay connected with their family members. A mobile phone also allows the women to exchange information within the extended family and staying in contact with friends, as was also found by (Winther, 2014) in the case of Sunderbans Islands where solar mini grids were implemented in the 2000s. As Winther (2014) writes, the use of phone may positively affect women's opportunities to take part in the decision-making process, thus directly increasing their autonomy. This shift may also imply that wives, who tend to stay closer to their marital homes than husbands generally have less control over the family's income, obtain increased access to social and material resources (ibid). However, easier access to mobiles did not help women become a part of a more global culture since the use of internet is still not so popular in the villages due to non-affordability of smart phones, especially among women.

The most notable benefit of the collaborative initiative has been the opportunity it gave women to take decisions regarding the purchase and ownership of the energysystems. This decision-making capacity has contested the patriarchy of the households where men are most often regarded as the bread earners and thus the decision makers. The time saving facilitated by the solar lighting is also contributing to increasing women's range of choices. Although women's financial autonomy in the future is still likely to be modest compared to men's, the above-mentioned benefits are signs that women's stock of resources is increasing.

Expressing his views on autonomy, then District Project Manager of JEEViKA proudly emphasised that, "*women are now confidently stepping out of their home without being accompanied by any male member of the family to attend Self Help Groups meetings and also expressing their views without any inhibition*". He further added that, "*providing solar home systems has benefited women the most since they are able to better manage their time*". He indicated that Self Help Groups and Solar Home System jointly could be deemed as 'pathways to women's empowerment.'

Electricity which is valued as a labour-reducing' and 'life enhancing' tool helped to catalyse national human rights perspective and advance social progress by improving some of the health, education and recreational services.

The unfinished tasks

The solar home systems, although owned by women and hailed as a life-enhancing tool, did not match the growing aspirations of the community since they desired 24*7 reliable, adequate and affordable electricity access. The solar home system was designed to offer only basic services, i.e. lighting and mobile charging facilities, keeping in view the costs and the affordability conditions of the users. Hence it hindered their diversified usage both by men and women, particularly in terms of productive use or adoption of electric appliances since women aspired to own essential items like fans and drudgery reduction kitchen equipment such as blenders and grinders if the capacity of the solar home system was increased. The arrival of solar home systems also did not have any bearing on main business activities in the villages, especially women in augmenting their family income, since the operating hours of the shops (from around 8 am to 6 pm) have remained almost the same as before, with entire markets closing after dusk in the absence of outside lighting facilities and less scope of business.

The presence of electricity at home has no doubt enabled the children (both boys and girls) to complete their homework and pay attention to their education. Yet, girls pursuing higher education were not encouraged and the priority for parents was to get the girls married by the age of 20 to the groom of their choice. All the major decisions within the households and the community are still taken by men and women's decision-making power is restricted to roles that are traditionally assigned to them. Though reserved seats for women gave them an opportunity to step out of the house and get engaged in the grass root political system, many men still do not appreciate women to sit in their company and actively participate in decision-making activities.

Further, the small capacity solar home systems are not viewed as a long-term energy solution in most parts of India; rather it is seen by most community members only as a stopgap arrangement. Whether electricity is from the grid or from distributed energy solutions, it does not matter to

a rural community. The key is – as the village community say - "equivalent electricity" to meet both basic and productive loads, and that it should be readily available when required the most and be reliable and affordable. However, a positive aspect of DRE projects is that they are usually designed through "bottom-up" approaches, thus enabling better participation of women and socially marginalised groups.

In both the villages, the self-help groups networks were strong and women were given opportunities to be trained as technicians and to be engaged in installation of the systems. However, the prevalent local social conditions prevented most women to take up such opportunities due to the masculine label attached to electricity related technical jobs. Hence merely owning of SHS by women name does not necessarily contest energy -patriarchy. Nonetheless, JEEViKA has provided a platform for women to express themselves freely, and in such contexts, the effectiveness of the solar home systems have to be identified more in improving and enhancing the existing living conditions of women and the households to realize their right to an adequate standard of living.

Conclusion

By bringing micro-finance to their doorsteps, the presence of a programme like JEEViKA in rural Bihar has certainly given the women a common platform to voice their needs, requirements, and concerns, which are often considered as a first step towards ensuring gender equality. Prior to launching of this collaborative initiative between TERI and JEEViKA, men in the household always had the primary say in purchase of household appliances irrespective of solar or non-solar products. This initiative can proudly claim to have given an opportunity for women to make decisions regarding owning solar home systems, probably in consultation with the male members of the family. With this small step and thereafter collective responsibility provided to the SHGs by JEEViKA to manage funds, some of the women groups opted for forced draft improved cook stoves, which was combined with the solar home systems, to be disseminated as Integrated Domestic Energy Systems package by TERI.

Hence, the programme contested the existing energy-patriarchy to make women the decision makers to manage funds and own their energy system. However, it is sometimes questioned whether making women the owners of the energy system and improving their material conditions through electricity access would actually result in changed gender relations. Another theory is that access to microcredit will automatically increase women's bargaining power within the household. Yet, a deeper look at the impact of the JEEViKA programme which combines access to microcredit and solar home systems ownership, reveals that while it has facilitated children's studies and enhanced women's social life and their decision making role in certain realms (e.g. the possibility to manage and get microcredit), it has not

necessarily resulted in greater changes in gender relations in terms of women and men's equal societal status, access to resources and decision-making power on matters pertaining to major activities and life decisions. Nevertheless, after the initial reluctance, women were slowly forthcoming to take up income generating activity through undertaking aftersales and maintenance of the products and even ready to move out of their villages as part of their entrepreneurial work.

Taking the initiative forward to the next level, TERI in association with JEEViKA and J-WIRES (JEEViKA Women Initiative Renewable Energy Services) have started to involve selected women SHG members in the sale, installation and maintenance of the clean energy products, such as solar home systems, LED lamps, batteries, and efficient cookstoves, by providing them technical and managerial training, so as to take them to the next level of empowerment. Their active involvement has been made possible only through sensitization of both women and men which is important to bring about the entrenched structural changes. However, to move towards a more sustainable approach, it is important to have associated social sector policies, beyond energy policies and programmes, to make a greater impact on gender relations (Govindan, et al., 2020). Local manufacturing of solar lamps and DRE systems may also motivate women to take part in the activities as case examples from Bangladesh and India indicate. For instance, women are more comfortable to contribute in the decentralized sector by assembling circuit boards, renting energy products from home, and marketing within the villages/neighbouring villages etc., which will not only assist in meeting social objectives of the government, but also empower the women economically and socially. Policy directives for such specialized skill development for women and the marginalized will ensure their committed participation in design, monitoring and implementation of decentralized systems. Furthermore, collateral free credits for clean energy for productive applications to women led microenterprises and necessary capacity building on technical and managerial aspects will pave the way for their income generation and more importantly the exposure to run businesses and take decisions, beyond the social benefits.

Moreover, while we all agree that a well-structured gender mainstreaming in energy policies and frameworks remains largely absent, unfortunately the few attempts to address gender inclusivity in some of the policy provisions also go unnoticed. The problem does not entirely rest on the non-inclusion of gender elements in policy making, rather its conversion into gender responsive outcomes and impacts. Hence, policymakers, among other things, need to emphasise translating some of the well-meaning policies into practice through robust mechanisms for effective implementation.

Changes in gender relations would probably require socio-cultural changes on a deeper level, over a period of time to tackle the root causes of gender inequality. Yet, this does not mean the goal of increasing access and ownership of electricity systems to women should be abandoned but rather work in tandem with supporting policies and social networks to bring the desired change in gender relations. Nonetheless, the 'JEEViKA - Lighting a Billion Lives' project should be seen as an example, which has given women an opportunity to make choices and decisions and hence increased their bargaining power within the household and their communities, thus, challenging some of the existing patriarchy and the traditional gender roles. It furthermore demonstrates that providing access to sustainable energy is a key condition for the realization of women's economic and social rights, namely the right to work, health, education, and to an adequate standard of living. Such initiatives can be far more meaningful, especially in the long run, since every action towards improving gender relations counts and signifies nothing is negligible like the old saying – '*Little drops of water make the mighty ocean*'. Hence, we need to tackle energy access as a key human rights and gender equality issue and consider further pushing the frontiers of the international human rights framework to help key stakeholders drive an energy transition that places women's rights at the centre.

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About TERI

The Energy and Resources Institute (TERI) is an independent, multi-dimensional research organization with capabilities in policy research, technology development, and implementation. An innovator and agent of change in the energy, environment, climate change and sustainability space, TERI has pioneered conversations and action in these areas for over four decades. It endeavours to usher transitions to a cleaner and sustainable future through the conservation and efficient use of energy and other resources. Headquartered in New Delhi, it has centres in six Indian cities, and is supported by a multi-disciplinary team of scientists, sociologists, economists, engineers, administrative professional and state-of-the-art infrastructure. For details, please visit www.teriin.org.

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