

Final Essay for Poverty and Inequality

MDEV - DE133

21.12. 2017



# **From victims to actors: Women's inclusion in the energy transition**

A Gender perspective on energy poverty

*Case Study of the Barefoot College*

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Word count: 2 746

“I had no idea what a solar panel is or that sun can bring electricity. I was surprised to even discover a solar lamp when I first came here. But now I can fix a solar light”, explained Florentine, a Solar Mama trained in Tilonia’s Barefoot College in India (Desai, 2017). In only six months she became a solar engineer, returned to her village, electrified it, and shared her knowledge about solar power with her community. The NGO that trained her, the Barefoot College, strongly believes in the power of women to develop sustainably rural communities. But why did it decide to train women only? What are the reasons for such a strong focus on women’s empowerment in the context of energy transition?

The fact that nearly one in five people worldwide still don’t have access to electricity has rung a bell to the international community and the United Nations General Assembly launched the target “universal energy access” by 2030. This call for action is motivated by the popular statement that modern energy — access to electricity and clean cookstoves — can alleviate poverty. The link between the SDG 7 “Affordable and Clean energy” and the SDG 1 “No poverty” has been widely analysed in the literature as the access to energy has clear and strong impacts on health, education, and income (ref. overall picture on Appendix 1). However, a techno-centric and scientific approach has prevailed on this topic and has not been balanced enough with a prioritisation of social and gender inclusiveness (Baruah and Govindan, 2016, p.190; Munien and Ahmed, 2012). International organisations's and NGO’s new emphasis on women’s empowerment in their fight against poverty opens up a gender dimension that is worth exploring.

By introducing the SDG 5 “Gender Equity” in the energy poverty debate, this essay aims at answering the following research question: **To what extent can energy transition be translated into poverty reduction?**

Through a gender-energy-poverty nexus, it will be argued that the energy transition — defined as “the accelerated deployment of renewable energy and energy efficiency measures” (OECD/IEA and IRENA 2, 2017)— can be translated into poverty reduction under three conditions: the recognition of women as major victims of both poverty and lack of access to

energy (I), the support for women as actors of the process (II) and the consideration of wider contextual socio-political complexities (III).

The critical gender perspective adopted here does not assume that all women are similar nor that gender equality is synonymous to providing equal opportunities, but it is rather an approach that looks at inequalities between men and women and takes them into account for future action. Throughout this essay, the theoretical arguments based on the broad literature of energy poverty, gender approaches to poverty alleviation and impact assessment studies will be put into balance with the practical case study of the Barefoot College, at a poor and rural household scale.

## **I) Women as victims - A theoretical background of the gender-energy-poverty nexus**

This first part explains briefly the theoretical foundations of this gender-energy-poverty nexus and introduces the idea that recognising women as the main victim both of a lack of access to energy and of poverty is a necessary condition may the energy transition be translated into poverty reduction.

### *1.1 Energy and Poverty*

As Clancy et al. framed it, energy can help combat poverty through improved health, increased productivity and new opportunities for additional income, and reduced labor and time spent on household activities (2016, p.28). The multidimensional concept of “energy poverty”, that refers to the lack of access to modern energy services (IEA) is useful when trying to show the link between that energy capacity, availability and reliability of supply, the actual use made by the poor, and how that increases economic growth and welfare (IDS, 2013).

## *I.2 Gender and Poverty*

Poverty has a “women face” since women constitute 70% of the world’s poor, as recognised at the Fourth World Conference on Women in Beijing (1995). In rural areas they have both a greater likelihood of being poor due to limited educational and professional opportunities and experience higher levels of poverty than men since they have fewer assets and face many social burdens that prevents them from escaping poverty (Munien and Ahmed, 2012, p.114). For this reason, women are the poorer of the poor. Nevertheless, the opportunities of investing in women’s empowerment are great for reducing poverty levels. Many studies have shown that mother’s education have spillover effects and lead to higher education levels of their children (UN Women, 2015).

## *II.3 Gender and Energy*

Energy is also women’s business (Clancy, 2016, p.25). Research has shown that women have less access to new technologies than men and are marginalised in the energy sector work force (Baruah and Govindan, 2016, p.190). This can be explained by their limited ability to respond to energy interventions and participate in this market to due their lack of productive assets such as land and technology, experience, and other ‘overriding’ factors like mobility, access to information or educational levels in comparison to men. Because they are poorly represented in decision-making, it is also hard to make their voice heard to express their needs and make choices for energy options. There are indeed clear trends of discrimination in both the access and in the participation of rural women in the energy transition.

### *I.4 Disproportionate effects of energy poverty on women*

As a result of this discrimination, women are considered the first victims of energy poverty. According to Oparaocha & Dutta (2011), the first rural energy crisis for women is linked to the aspect of *time poverty*. It refers to the time and resource constraints that women have due to their triple role: productive, reproductive and community engagement (Chant, 2003). Since the household is the hub of energy in rural life and that rural women are in

charge of it (Wickramasinghe, 2016, p.234), energy provision is often women's responsibility. In Kenya, where 98% of rural population still rely on biomass for cooking, women spend between six and eight hours collecting wood (UNDP, 2004), time that they could have spent otherwise studying, educating their children or generating income.

The second reason for the disproportionate effects of energy poverty on women, refers to the health and safety impacts. Women and children are the first exposed to the smoke of inefficient stoves using solid fuels, responsible for the premature death of 4 million people (WHO, 2016). The effects of indoor pollution are similar than smoking two packs of cigarettes per day (Xu.F et al. 2007). Collecting fuelwood also leads to hazards like fractures, strain injuries, back disorders and physical violence including rapes (Oparaocha & Dutta, 2011, p. 256).

The third aspect of energy poverty for women relates to the economic opportunities. A study made by Dinkleman found that women's employment in South Africa increased by 13.5% after electrification (Haves, 2012) and Grogan and Sadanand (2009) found similar patterns in Nicaragua where it increased by 23%. Indeed, the lack of access to electricity is seen as a barrier for women to enter the labor market (Clancy, 2016, p.28). And considering that for each dollar earned, women will return 80 cents plus to the family and men only about 40 cents, women's economic empowerment obviously matters.

Nevertheless, recognising that women suffer from energy exclusion and high levels of poverty is not enough. More than the object of one's observations and the cause of empathy, shouldn't they be the very first subject of an active empowerment process?

## **II) Women in action - Suggestions to address gender issues in energy poverty**

The second part highlights some policy recommendations for a more gender inclusive energy intervention and brings in the very unique case of the Barefoot College. Supporting

women as actors in the energy transition is indeed the second condition for energy to reduce poverty.

### *II.1 Women as the first beneficiary target*

A first solution could be to increase investments in energy infrastructures that meet poor women's energy needs and reduce their drudgery. An efficient program requires a deliberate gender strategy in all phases of the project (planning, implementation, monitoring and evaluation) with the integration of both women's and men's concerns, needs, constraints and interests (Oparaocha & Dutta, 2011). An other suggestion by Wickramasinghe (2016) is to adopt a structural process that follows principles of equality, social justice, women citizenship's rights, social inclusion and human development. Finally, following the liberal feminist perspective, the solutions lie in widening women's access to tools and technology (Munien and Ahmed, 2012, p.115).

### *II.2 Women as agents of change*

But giving women *access* to modern energy technologies is not sufficient for energy poverty to be reduced. Ferguson and Kabeer following a radical feminist perspective have criticized the liberal approach arguing that state deregulation had actually transferred new time and costs burdens on women. Instead of being targeted only as beneficiaries, women should also be promoted as active agents in the energy transition and become producers and suppliers of energy (wPower Hub).

### *II.3 Case Study: The Barefoot College*

The solution provided by the Barefoot College is a highly relevant example to support this idea that women should be at the heart of the transfer of technical skills. The Barefoot's contribution to making rural communities sufficient and sustainable consists in the delivering of solar electrification by grandmothers, most of the time illiterate. Since 1972, solar engineer have been trained in 83 countries and have installed solar systems in 18,047 households. In

the interview conducted for this paper, Sue Stevenson (Head of Strategic Partnerships and International Development) identified both direct impacts on women and indirect impacts on communities (Interview, 2017). On the one hand, the women trained is herself empowered by new technical skills and more self-confidence. The Solar Mama Sama Tinga in Burkina Faso explained at her return “Now, people look at me differently. People trust me more. People even lend me money. I even get admiration from the municipal and administrative authorities.” On the other hand, the entire community gains better educational, health, and social outcomes as a result of having access to clean and renewable energy. Livelihood development and mitigation against climate change also participate positively in lifting poor communities out of poverty. The choice to train women is explained by the experience that only old women compared to men and young women would actually go back to their rural communities and not sell their new technical skills to the city. Following a bottom up approach, the Barefoot College is a concrete example that trusting the poor communities and investing in old women is one of the solution for sustainable development and poverty alleviation to occur.

The challenges have been recognised, the solutions have been suggested, but why are empirical evidence still so limited and generalised action so scarce ? In fact, expecting women’s empowerment to occur is not as simple as it seems.

### **III) Broader perspectives on the limiting socio-political context**

This last part stresses the importance of taking the wider social and political contexts into consideration and questioning the ability of women to play a major role in energy transition. Development theories such as *Gender and Development (GAD)* are useful when acknowledging structural problems and their implications (Brown, 2007).

### *III.1. Amartya Sen's capability approach*

“Amartya Sen perceives the capabilities as real opportunities to choose the kind of life one value” (Sadath and Acharya, 2017, p.557). Indeed, although women have the opportunity in theory to participate in the energy sphere, do they really have the ability to make choices and act accordingly? If opportunities are not matched with capabilities, it seems like efforts are vain. Following the main message of Pachauri & Rao in *Gender impacts and determinants of energy poverty: are we asking the right questions?* (2013), any conclusions about the gender-energy-poverty nexus requires a clear and cautious analysis of causal mechanisms and local social and political constraints.

### *III.2 Social and cultural norms: cognitive barriers to women's behavioural change*

Social and cultural norms limit women's ability to become actors in translating the energy transition into poverty reduction. Gender roles in rural areas often require a sharp division of tasks according to which women should take care of the house and the children, what might prevent women from having a job in the energy sector. Even if, in theory, street lightening gives women the opportunity to leave home at night and attend evening classes, the social belief that women should simply not go out at night prevents them from doing so. On top of this, Mobarak et al. (2012) showed that more than 66% of women believed that indoor smoke was less harmful than polluted water, and were therefore reluctant in using well-designed cookstoves. Indeed, constraining external factors and social norms prevent changes in women's behaviours, as mirrored in many situations at Barefoot. For example, when being asked to participate in the programme, the first reactions were often negative as women thought “they could never make it” (Interview, 2017). Sama Tinga could not believe it herself at the beginning: “How could I, as an old lady, bring so much change?”. The rural community traditions that have undermined women's self-esteem for years are so deeply rooted in consciousness that it is hard to change beliefs and give women confidence that they have the capacity to bring light to their communities and change other people's lives.

### *III.3 Power relations and political arrangements: structural barriers to women's behavioural change*

Power relations, institutional and political structures in developing regions often negatively influence women's ability to adopt and benefit from energy services. The dominance of males's control over purchase decisions in the household explain why women struggle in articulating their energy needs and adopting sustainable stoves for example (Pachauri & Rao, 2013, p.210). The argument that women can become micro-entrepreneurs in the energy sector is also questionable, as often, the structure of the local economies prevent them access to credit what limits their scope of business action. In fact, underlying structures such as patriarchy, marginalisation, vulnerability, and exclusion from participation in decision-making processes are responsible for perpetuating poverty (Munien & Ahmed, 2012). For example, when taking these structural constraints into consideration, the Barefoot College realised that it could not train women who still had child at home, as they were in charge of taking care of them. Instead, its decision to train grand-mothers was a concrete alignment with existing power structures and a particular rural organisation.

Developing those final thoughts about a careful analysis of women's social capital in both their cognitive and structural dimensions seemed like a necessity for empirical evidence to avoid failing in the trap of irrelevance and contradiction. To cite an example of contradictory findings, it is interesting to see how Köhlin et al. (2011) consider the health benefits for cooking interventions higher for women than men, while others show the contrary (Ezzati et al. 2000, Xu et al. 2007) or state that there is no difference between the two (Albalak et al. 1999). On a different matter, is the time saved from having access to modern technologies really empowering women? Is there enough empirical evidence that this additional time is used for educational or employment purposes? Can making women working longer hours outside of home be called an empowerment? The actual effects of modern energy technologies on women's empowerment are indeed more complex to assess as soon as one take the broader enabling context into consideration.

## **Conclusion**

The answer to the research question “To what extent can energy transition be translated into poverty reduction?” consisted in arguing that the energy transition can reduce poverty under the conditions that women are recognised as the main victims of both lack of energy access and poverty (I), women are encouraged to be active actors of the energy transition (II) and that the wider complexities of the social and political contexts are taken into consideration (III). Using a Gender-energy-poverty nexus, this essay is a modest contribution at addressing the gender gap in the energy poverty debate, while using empirical evidence with the example of the Barefoot College.

Questions about women’s empowerment remain wide open. Is the time saved from having access to modern technologies really empowering women? Is there enough empirical evidence that this additional time is used for educational or employment purposes? To what extent can making women working longer hours outside of home be called empowerment?

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# APPENDIX 1

## Social and economic impacts of electricity on households

In Chap 3: Barnes et al. "The Development Impact of Energy Access". In: Halff, Sovacool & Rozhon (2015), *Energy Poverty*, p.57, 61 and 65.

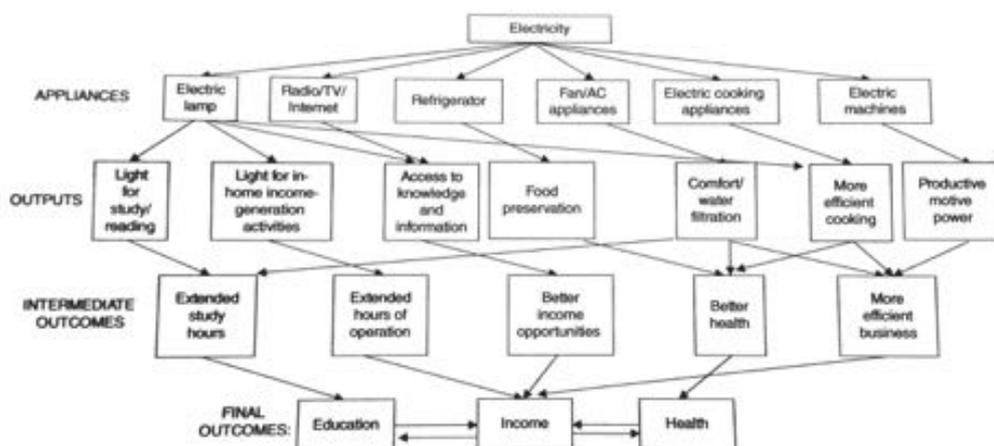


Figure 3.2. Social and economic impacts of electricity on households  
Source: Khandker, Barnes, and Samad 2013

Table 3.1. Rural electrification impacts: improvements in household income due to electricity (per cent change)

Country and type of electricity	Farm income	Non-farm income	Total income
Bangladesh (grid) <sup>1</sup>	31.3	35.3	21.2
India (grid) <sup>2</sup>	0	68.8	38.6
Vietnam (grid) <sup>3</sup>	0	27.5	28.0
Nepal (micro-hydro) <sup>4</sup>	0	11.2	0

<sup>1</sup>Khandker, Barnes, and Samad 2012; <sup>2</sup>Khandker et al. 2012; <sup>3</sup>Khandker, Barnes, and Samad 2013; <sup>4</sup>Banerjee, Singh, and Samad 2011.

Note: Figures show per cent changes in income due to household access to electricity. Zero impact means that the calculated benefits are not statistically significant.

Table 3.3. Rural electrification impacts on education outcomes

Country and type of electricity	Study time in the evening (minutes/day)		School enrollment (per cent)		Grade completion (years)	
	Boys	Girls	Boys	Girls	Boys	Girls
Bangladesh (grid) <sup>1</sup>	21.9	12.3	—	—	0.23	0.16
India (grid) <sup>2</sup>	11.6	13.5	6.0	7.4	0.28	0.49
Vietnam (grid) <sup>3</sup>	—	—	6.3	9.0	0.12	0
Nepal (micro-hydro) <sup>4</sup>	7.7	12.0	—	—	0	9.24
Bangladesh (SHS) <sup>5</sup>	7.0	8.2	—	—	—	—

<sup>1</sup>Khandker, Barnes, and Samad 2012; <sup>2</sup>Khandker et al. 2013; <sup>3</sup>Khandker, Barnes, and Samad 2014; <sup>4</sup>Banerjee, Singh, and Samad 2011; <sup>5</sup>Samad et al. 2013

Note: Figures show changes in outcomes for boys and girls of 5–18 due to household access to electricity. SHS = solar home system.

## Influence of energy on the other components

In: Kanagawa, M., & Nakata, T. (2007). Analysis of the energy access improvement and its socio-economic impacts in rural areas of developing countries. *Ecological Economics*, 62(2), p.321

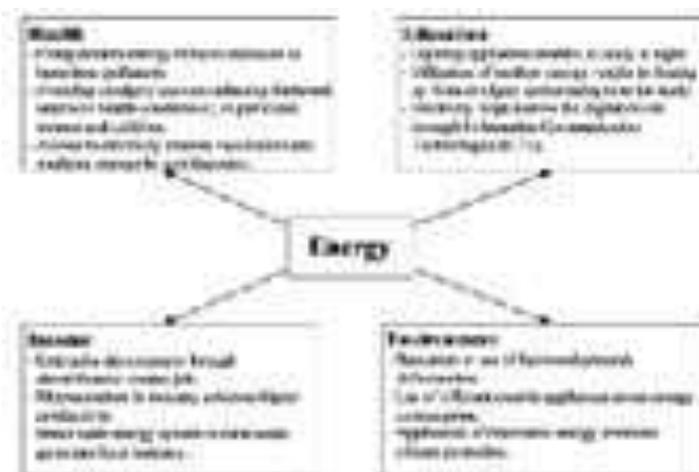


Fig. 3. Influence of energy on the other components.

## APPENDIX 2

### Available Data on Time Spent in Wood Collection, mainly by women and children

In: Poor People's energy outlook (2010)

**Available Data on Time Spent in Wood Collection, Mainly by Women and Children**



Source: Poor People's Energy Outlook, 2010.