Enlightenment and empowerment through power and light?

From theory to practice

Kaja Sannerud Andersen

Thesis submitted in partial fulfillment of the requirements for the Degree of Master of Philosophy in Culture, Environment and Sustainability

Centre for Development and the Environment

University of Oslo

Blindern, Norway

December 15 2010

Table of Contents

To Farida,

without whom the voices of women would not have been heard…

Acknowledgements

In this surreal moment of finalizing my thesis, I am obliged to thank a number of people who have aided me through the process. Firstly, a great thank you to my supervisor Tanja Winther, who has been so readily available at any time since the very beginning. Our conversations and your feedback have been indispensible. I would also like to thank the staff at SUM and all the students who have accepted extra responsibilities on behalf of the student body, and Karina Standal who took the time to sit down with me in between a busy schedule. My gratitude also goes out to my family; my mother, who can finally exhale in a sigh of relief; my father, who did a great job at never worrying (or at least pretending not to) – you both taught me to be curious and inquisitive, which have been invaluable assets in this process. To my Grandmother, who never gets tired of hearing every detail of my daily life. And to my brother, who convinced me to give it my all at a time when I was ready to take the easy way out. I thank the staff at CSE who first welcomed me to India, and everyone at the Tagore Society for Rural Development. Thank you to Sam for countless cups of bad university coffee, to Nosizwe and Lena for listening to my frets, to Anita for travelling the world with me and my laptop and to Charlo, for calling me every single day and still asking "What did you write about again?" on the night that I finished this thesis. Finally, a massive thank you to the people of Sagar, Kolkata and Delhi, and Farida, Mona and all the women of Sudder Street, Kolkata, who showed me the importance of people meeting people.

I. INTRODUCTION

Solar energy represents one of the most interesting and promising new technologies of today in terms of renewable energy, reducing carbon footprints and climate mitigation, making it a highly relevant field of research. Simultaneously, the technology offers livelihood opportunities and top-level agents claim to be contributing to enlightenment and empowerment on various levels (Akshay Urja 2007:27-30;TERI 2009a:)[1]. One particular area where solar energy is perceived to inherit the possibility for positive contribution is within the gender and energy policy debate. The 1970s and forward shed light to the special position and needs of women in development planning, and identified 'the other energy crisis' (Dutta 2003:11). Initially, this concept referred to the increased burden women had to bear in relation to firewood collection and biomass shortages (Eckholm 1975), but the notion soon spurred a more general focus on the disproportional burden on women in the face of environmental degradation. The gender paradigms of Women in Development (WID) and Gender and Development (GAD) (i.e. Razavi and Miller 1995), were forerunners to the 'eco-feminism' of the 1990's, a movement based on the idea that women were naturally more caring about the environment (Dutta 2003). Many of these ideas have been contested, but the recognition of women as protagonists in rural energy matters persists in most camps, and women's involvement in developmental schemes as active agents is increasingly considered crucial (Thomas 2000:34). In the case of solar energy efforts in West Bengal, the role of women is underlined by many of the actors involved (Akshay Urja 2007:28; TERI 2009a:1;The Norwegian Ministry of Foreign Affairs:2009), and makes for an interesting field of research. More specifically, the energy provider at state level (WBREDA) as well as national and local organizations (hereunder The Energy and Resources Institute (TERI) and The Ramakrishna Mission (RKM)), claim a two-sided aspect of female involvement; 1) women as beneficiaries of a time saving, health promoting and economically empowering technology, and 2) women as entrepreneurs contributing directly to a greater societal success linked to the introduction of named

[1] RNE New Delhi website December 9 2010
URL- http://www.norwayemb.org.in/News_and_events/Climate-and-Environment/Indo-Norwegian-Cooperation/

technology. This notion puts women at the frontline of both sides of the solar energy efforts; as receivers who benefit socially and economically from a provided service, and as implementers of this service, with a specific instrumental value. The possibility to explore some of the actors involved in the solar energy field and their degree and type of participation, made the Sunderban area of West Bengal an ideal starting point for my research and further writing.

In this chapter I seek to sketch out and clarify the background and motives for writing this thesis, both in relation to a larger research project to which it refers, and as an individual piece of material. I start out introducing the location for research and the main research questions that serve as a foundation for the analysis and discussion of the thesis, followed by the rationale and background for the research. I then present the key actors and efforts involved in the particular case I have chosen to examine. Finally, a section on the structure of the thesis provides the reader with a framework for the remaining chapters. This chapter thus aims to present the final scope of the thesis.

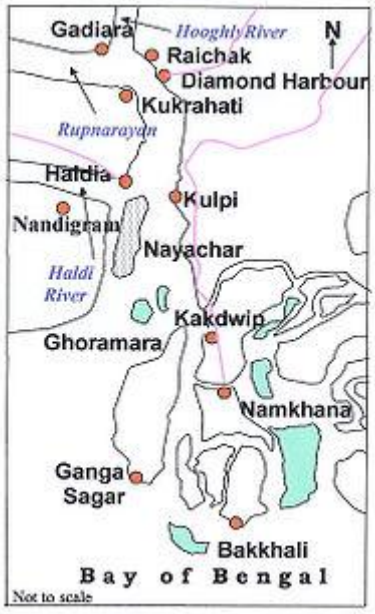
1.1 Solar, Sagar and the Sunderbans

The Sunderban area (formerly Sunderbunds or Sundarbans) of West Bengal is situated in the river delta between India and Bangladesh. The Sunderbans consist of a cluster of islands forming a vast swamp and forest area in the lower part of the Ganges Delta, extending about 160 miles (260 km) along the Bay of Bengal from the Hooghly River Estuary (India) to the Meghna River Estuary in Bangladesh.[2]. West Bengal receives 1600 kWh/m^2 of Solar Energy annually through the average of 250 sunny and 60 partially sunny days per year[3]. This lays the grounds for a great potential for exploiting the sun as a natural energy resource. Adding the fluctuating diesel- and kerosene prices

[2] National Information Technology Promotion Unit website 13.09.10 URL-http://www.wb.nic.in/westbg/sundarban.html
[3] WBREDA website 13.09.10 URL-http://www.wbreda.org/energy

and the geographical remoteness of many areas, solar is increasingly standing out as a competitive energy option.

The West Bengal Renewable Energy Development Agency (WBREDA) is the primary electricity provider in the area, and collaborates with several local clubs and organizations to improve the supply of electricity to the Sunderban population. Some of the islands are very remote and hard to reach, and alternative energy sources like solar plants and wind parks may be the only real options to gain access to electricity. I will demonstrate that the situation is slightly different in the case of Sagar, where I did most of my field interviews. The island, aside from being the largest of the Sunderbans, stands out in several ways to which I will return in later chapters. Most importantly, the population has extensive experience with electricity from various sources, and solar energy has a particular stronghold of the villages. In addition to the WBREDA-run Solar Photovoltaic power plants (SPVPPs), The Energy and Resources Institute (TERI) has a collaboration with the Ramakrishna Mission (RKM) on Solar Lantern Charging Stations (SLCS), where solar-powered lanterns are charged during the day and rented out to the local population at night. The islanders are in general well-educated, and many of them also possess individual solar homes - in addition to or in stead of the mini-grid supply and/or the rented lanterns. The people of Sagar are thus very familiar with the variety of options the technology offers, and refer to all solar energy simply as 'solar', a common term that seems to cover a range of technologies.



Sagar has a seemingly unique position when it comes to experimenting with renewable energy, and was the site for the first solar/wind hybrid power plant in India. The Kamalpur plant started up in 1996 as a collaboration between the Government of India (GOI), the Government of West Bengal (GOWB) and WBREDA (Chaudhuri

2007:50). Onwards, Sagar has continued to host a range of differently run power plants, including solar driven mini-grids, wind parks, hybrids and individual Solar Home Systems (SHS). People are used to adapting to the new technologies, and my informants express their content with the availability of electricity and electrical appliances. As I will show in later sections, Sagar is an unusually successful area in terms of education and social opportunities. The question of the influence of solar technologies is not easily determined, as there is an interplay between many factors and different agents. However, people are unquestionably in favor of solar energy and the electricity it brings, although they often express a wish for more and more stable electricity. This wish will soon be granted for many of them, as work is in process for connecting Sagar to the mainland grid.

1.2 Research question

The solar energy efforts in the area can be divided, albeit somewhat roughly, into three categories; 1) Solar power plants providing a limited number of hours of power to a larger group of consumers through electric mini-grids in the local area; 2) Individual Solar Home Systems, consisting of panels and points purchased by the household itself; and 3) Solar Lantern Charging Stations, providing a rental service for local clubs and households in need of lighting sources after sunset. My findings and topics for discussion relate mostly to the latter of these three categories, in particular relation to women. The dual role of women as articulated by the implementing actors involved in the Solar Lantern Charging Stations is a societal phenomenon worth investigating, and the availability of data, both empirical and theoretical, makes the research manageable and replicable. Keeping a main focus on the solar lanterns, I will however not exclude the influence and importance of the two former categories, as the solar efforts on the small island all in all must be seen as variables of the same equation. My main research question will therefore be:

To what extent are women empowered and enlightened by solar energy efforts in West Bengal in their dual role as beneficiaries and entrepreneurs?

The question of women's role related to solar energy can and will include elements of rights and responsibilities, different sets of motives and motivations, community participation and development politics, to name a few other aspects that have shaped the analysis in this thesis. Questions have arisen on the way regarding for instance who has the power to define and identify the needs of the women involved. Hence, I also needed to ask, what motives for action could be found among the different stakeholders in the solar programme. The strong NGO (Non-Governmental Organization) and CBO (Community Based Organization)[4] presence in the community presents further issues. The part these organizations play in the solar context seems to be substantial and I find it interesting to investigate how they perceive themselves and how they are seen by others.

Prior to starting my thesis, I spent some time in India writing about a related topic, namely the democratic pitfalls of environmental politics in India. Wanting to further explore the discrepancies in political discourse and policy implementation, I am writing this thesis as a contribution to an interdisciplinary and multinational research project on *Solar Transitions* (see Chapter 3). My target is to focus on the social aspects of electrification. I will draw on previous studies of the linkages between electricity and its social impacts. Jackie Dugard has written a rights-based analysis of South Africa's electricity services (2008), Karina Standal has investigated the impact of solar energy on rural women in Afghanistan (Standal 2007)[5] and Tanja Winther has documented studies of electricity on Zanzibar (Winther 2008). The Millennium

[4] NGOs were previously often specified and categorized as campaigning and charitable or service-providing NGOs, distinguishing *mutual benefit* organizations from *public benefit* organizations and differentiating Northern-based international and national NGOs with branches in the South from locally founded NGOs operating in its own community (Thomas and Allen:210-212). It is my impression after doing both work and research in the field in India and Kenya that the NGO term has been neutralized and become a widely defined household word referring to a range of organizations that are not directly affiliated with the Government, although they may collaborate on certain projects. In this context, I use the term for organizations not founded by the Government, seeking to ameliorate certain social or environmental aspects of a local or global society, providing aid and resources in the shape of education and training, financial support, material support, manpower or any structural assistance to the society in question.

[5] Standal's master thesis, to which I refer, has also been published as a book by Lap Lambert Academic Publishing in 2010.

Development Goals (MDGs) of 2000 will also be a useful set of tools for the further analysis, as I wish to explore the potential of rights and responsibilities in relation to energy related social benefits, and the foundation these have in top-level development planning. The next section presents some of the key actors and efforts that form part of my fieldwork, as an introduction to the framework within which I analyze the role of women.

1.3 Key actors and efforts in the target area

1.3.1 The Norwegian Ministry of Foreign Affairs

> The Government wants Norway to be a fearless champion of women's rights and gender equality. Accordingly, the rights, participation and influence of women will be at the core of Norway's development cooperation efforts. Our aim is to ensure the realisation of the rights of women that are set out in international human rights conventions. This is vital in order to achieve the UN Millennium Development Goal of eradicating extreme poverty.
>
> Erik Solheim, Minister of International Development (NMFA 2007:6)

With its eight departments and two ministers, the Norwegian Ministry of Foreign Affairs (NMFA) is the largest ministry of the Norwegian government administration[6]. Together with 109 foreign service missions consisting of embassies, consulates and permanent delegations, the ministry forms the Foreign Service. The essential task of the ministry is to represent Norway's interests internationally, and synchronously work towards promotion of peace and security, an international legal system, a fair economic world order and sustainable development. According to the official agenda, the objective of Norway's development policy is to fight poverty and bring about social justice[7].

In 2007 the Government of Norway introduced a new action plan for development strategies with the goal of ensuring gender equality, namely the Action Plan for

[6] NMFA website December 12 2010 URL- http://www.regjeringen.no/en/dep/ud/about_mfa.html?id=838

[7] NMFA website December 11 2010 URL- http://www.regjeringen.no/en/dep/ud/selected-topics/development_cooperation.html?id=1159

Women's Rights and Gender Equality in Development Cooperation 2007–2009 (NMFA 2007). The action plan states that the priority areas of development cooperation need to be seen in relation to each other in order to learn from experience and realize synergy effects (NMFA 2007:26). Further, the NMFA wishes to introduce the concept of gender mainstreaming in all their priority areas for development cooperation; 1) Peace building, human rights and humanitarian assistance, 2) Good governance, institution building and the fight against corruption, 3) The environment and sustainable development, 4) Oil and energy and 5) Education and health (the concept of gender mainstreaming will be further discussed in Chapter 2). The NMFA therefore explicitly wishes to support actors, initiatives and processes that strive to promote women's rights, gender equality and fight against all forms for discrimination against women. Women's full and equal rights shall also be emphasized in the dialogue with development partners, including freedom of movement, education and occupational opportunities, housing and other property rights etc. (ibid. 2007:28). The action plan states that energy may have extensive impact on various of these areas within women's rights and welfare, including impacts on work, health and education, and reduced time use for domestic tasks (ibid. 2007:31). The NMFA shall therefore support "*sustainable, safe energy solutions that ease women's burden of work and improve their access to health services and education*" (NMFA 2007:32).

1.3.2 WBREDA and Village Electrification Programs

The West Bengal Renewable Energy Development Agency (WBREDA) does not hold a central place in my analysis of solar efforts and the interplay between actors involved, but has been central to the initial introduction of solar energy efforts in West Bengal and on Sagar, and thus deserves an introduction in this chapter. The agency was founded in 1993, and has a mandate to promote Renewable Energy technologies and create an environment conducive to their commercialization through innovative projects[8]. Their corporate office is situated in Kolkata, but their projects spread out in the whole of the state. West Bengal is now considered one of the leading states in the

[8] WBREDA website March 19 2010 URL-http://www.wbreda.org/

country in terms of renewable energy technologies and -exploitation, and WBREDA has a program to assist other states to reach similar achievements. In addition to the Village Electrification Programs (VEPs), WBREDA has set up an Energy Education Park in Kolkata, and four so-called Aditya Solar Shops in Alipore, Kolkata; Narendrapur, South Paraganas District; Siliguri, Darjeeling District; and Durgapur, Burdwan District. The shops sell and promote solar technology products, and offer people insights into how solar technology may have a range of utility areas. In addition to the four main shops run by WBREDA, there is a number of Rural Adityas run by private entrepreneurs in rural village areas.

WBREDA sets out to aid the State Government, *Panchayats* (local government bodies at village level), Municipal Bodies and NGOs on all matters relating to promotion of alternative energy sources, and has a broad experience in this area. Solar energy is mainly used for the Village Electrification Programs. There has been a significant progress in respect of Village Electrification through Solar Photovoltaic (SPV) route. Around 2000 villages in West Bengal are virtually unreachable by conventional electric line due to prohibitive cost. 400 of these have already been electrified by Solar PV route, and WBREDA is planning along with the Ministry of New and Renewable Energy (MNRE) and GOI to set up about 200 SPV power plants from 25 kW to 100 kW for electrification of the entire Sunderban community.

There are two types of SPV systems for Village electrification; 1) Solar Home Lighting System (HLS) with 40 Wp/50Wp/70Wp SPV Module, and 2) Centralized SPV power plants of capacity 25-50 kW range and setting up of mini-grids in the villages from where people get 'grid quality' electricity[9]. The total Solar PV installed capacity in West Bengal now exceeds 1MW, and includes more than 15 Stand Alone type power plants in the Sunderban area. Micro-level entrepreneurs maintain the Solar Home Lighting Systems, which now are more than 80 000 and growing. Every year, WBREDA adds more than 10 000 solar consumers, with more to come as the supply increases. More than 50 000 Solar PV Home Lighting Systems (HLS) are planned to

[9] WBREDA website March 19 2010 URL-http://www.wbreda.org/, my quotation marks.

be installed in West Bengal within the next five years. These can be designed too meet the higher load demand of users in order to operate several light and fan points etc. Generally, two days backup is provided for SPV HLS, creating a buffer for adverse weather conditions. Finally, WBREDA has installed more than 2000 solar street lights in the state area, including some in the city of Kolkata[10]. Hence, solar technology represents a considerable business for WBREDA and their entrepreneurs, and their motives for contributing to the solar efforts on Sagar may differ from the motives of local agents such as the RKM.

1.3.3 Introducing TERI – The Energy and Resources Institute

At the epicentre of my research, we find TERI, a coordinating agency for a range of other actors involved in a specific area of solar energy efforts which will be discussed in this thesis. TERI describes itself as "(...) *an independent, not-for-profit research institute focused on energy, environment, and sustainable development and devoted to efficient and sustainable use of natural resources.*"[11]. With activities ranging from watershed projects to training programmes, TERI aims to be one of the key actors when it comes to sustainable solutions in modern India. Originating from the concerns of Mr Darbari Seth of Tata Chemicals, who worried about the energy use of his factory in Mithapur, TERI has expanded into a multioperational conglomerate. Among the stakeholders are various regional centres, affiliate institutes in Washington and London and a presence in Tokyo, Kuala Lumpur, Dubai and Malawi, not to mention the numerous international sponsors and partners who contribute to different projects and research, here amongst the Norwegian Ministry of Foreign Affairs (NMFA). The influence and involvement of the NMFA will receive greater attention in the upcoming chapters.

[10] WBREDA website March 19 2010 URL-http://www.wbreda.org/
[11] TERI website September 21 2009 URL-
http://www.teriin.org/index.php?option=com_content&task=view&id=17

TERI's core competence lies in its research capability, combined with efforts of 1) information and communication and 2) outreach. One of the major establishments in this sense is the annual Delhi Sustainable Development Summit (DSDS), assessing the worldwide progress in sustainable development issues and the pursuit of the Millennium Development Goals (MDGs)[12]. The summit attracts leaders from a great range of actors engaged in sustainability, including participants from government, business and industry, bilateral and multilateral organisations, civil society, research and academia. The variety of actors is both an image of and a contribution to the architecture of partnerships and collaborations that are increasingly observed within the field of sustainable development planning. The success of the DSDS has led to the establishment of the World Sustainable Development Forum (WSDF), led by a patronage of select world leaders. Henceforth, the experiences of the DSDS are carried onwards to the corners of the world.

Since its founding in 1974, TERI has completed more than 3500 projects within various fields, seeking to raise awareness, influence policy making and transform people's lives[13]. One of these many projects is the Lighting a Billion Lives (LaBL) campaign. The campaign, described in further detail below, is said to represent TERI's commitment to global sustainable development and creation of innovative solutions. TERI is involved in the Solar Transitions Project, and LaBL is an important practical attempt to improve people's living standards and opportunities through the technology of solar energy. In the next section follows a description of the campaign, the implementation strategy and how it relates to the gender aspect of women's role in the solar efforts on Sagar.

1.3.4 The Lighting a Billion Lives Campaign

> Working under the light of kerosene lamp is time consuming as I have to struggle with every small thing in the dark. I feel I am able to finish my work quickly under the bright light of the solar lanterns and get more time after household work in the evenings.

[12] DSDS website November 18, 2010 URL-http://dsds.teriin.org/2011/
[13] TERI website, March 3 2010 http://www.teriin.org/index.php?option=com_content&task=view&id=17

Sanwari Devi, village resident[14]

Out of the more than 1.6 billion people in the world lacking access to electricity, roughly 25% live in India. This was the backdrop for the initiation of the Lighting a Billion Lives Campaign, which started with a promise of commitment to bring light to one million rural people over four years[15]. The statement was made at the Clinton Global Initiative (CGI) Annual Meeting in 2007, and focused on displacing kerosene and paraffin lanterns with solar lighting devices. Additionally, the goal was to provide livelihood opportunities at the individual and village level. Seeing the massive need and potential to expand, TERI used the 2008 DSDS as a suitable occasion to formally inaugurate the LaBL campaign on February 7, expanding the goal to the ambitious target of reaching one billion people without access to electricity. Through the campaign, TERI means to provide safer and better lighting to a multitude of households, hereby facilitating nightly household chores and children's education, improving illumination and the indoor environment by reducing kerosene and smoke, and increasing livelihood options, with a particular aim to empower women (TERI 2009a:1). The design and delivery model operates on a fee-for-service or rental model, setting up centralised Solar Lantern Charging Stations (SLCS) in different villages. The stations typically consist of 50 solar lanterns which are charged daily by five solar panels and junction boxes, and rented in the afternoon by households and enterprises who use them at night and bring them back for charging and maintenance the following day. The lanterns are continuously developed and customized to meet the needs of the consumers, pushing technology further while keeping focus on bringing the cost down without compromising the reliability and quality of the product (TERI 2009b:6). So how does this relate to the empowerment of women?

According to the brains behind the campaign, the focus on women is double-sided. For one, the campaign provides the possibility of increased living standards for the women

[14] TERI website, October 1 2010
http://labl.teriin.org/index.php?option=com_content&task=view&id=6
[15] LaBL home page, March 4 2010
http://labl.teriin.org/index.php?option=com_content&task=view&id=1

who trade in their old kerosene lamps and substitute them with the solar lanterns in terms of health, time consume and strengthened economic opportunities. The light from the solar lanterns is less straining on the eyes; the indoor climate suffers less from the use of kerosene; the strong light means not having to move the lamp around all the time, which saves time in for instance cooking; and the light allows women to continue their tasks and occupations further into the night, which in turn is thought to lead to economic growth of the household in general, and a greater economic independence of the women in particular[16]. According to this, women benefit socially and economically from the solar lanterns as beneficiaries, or consumers. Secondly, the campaign focuses on the role of women as *entrepreneurs* in the solar context, and expresses an explicit goal of using women as managers of the Solar Lantern Charging Stations (SLCS) (TERI 2009a:1)[17]. Partly, this is due to the perception that women gain social status and independence from increased responsibilities in their communities. This, and the economic growth that may follow the increased livelihood opportunities that derive from the ability to work in the evening hours, are thought to lead in turn to improved gender equality. Moreover, many studies claim that women are more likely to keep their newly acquired knowledge in the community, as opposed to men, who often seek new opportunities in urban areas when they have received training for an entrepreneurial activity (i.e. Potter et. al. 1999:188;Akshay Urja 2007:28). This 'bright lights' syndrome drains the rural areas of competence, while women, being more locked down to their homes due to domestic and family responsibilities, ensure more stability for the local enterprises they set out to manage.

In order to reach these rural women, the campaign relies on its implementation partners, who oversee and coordinate functions at the local level. The implementation partners are typically local NGOs, CBOs, self-help groups or local capacity-building organizations, and serve as the link between the local entrepreneur and TERI[18]. On

[16] LaBL website Decemer 3 2010 URL-
http://labl.teriin.org/index.php?option=com_content&task=view&id=1
[17] TERI website October 1 2010 URL-
http://labl.teriin.org/index.php?option=com_content&task=view&id=2
[18] TERI website October 1 2010 URL-
http://labl.teriin.org/index.php?option=com_content&task=view&id=2

Sagar, these organizations are represented in multitudes, and account for a large part of community activities and services on the small island. One of the organizations which holds a strong presence is the religious movement of the Ramakrishna Mission (RKM). During my fieldwork, I made contact with the head office in Kolkata and was able to visit two of their charging stations on Sagar with a local facilitator and an interpreter. The RKM thus provided me with crucial empirical material, and plays an important part in the analysis of the female participation in the solar efforts on the island.

1.3.5 The RKM in West Bengal

The Ramakrishna Math and Mission consists of 160 branches worldwide. The Ramakrishna Mission Ashrama, Narendrapur is one of these, located in the outskirts of Kolkata and operating in large areas of West Bengal. The structure of the organizational map is pyramidical, and includes a school, a college, a Blind Boys' Academy and various other establishments (RKM 2009). Among these subunits we find the Ramakrishna Mission *Lokasiksha Parishad* (RKMLSP), a unit for integrated rural and urban development. The *Parishad* has two operating areas; 1) Field, and 2) Training. In the field, they work with a number of self-governing cluster level organizations, *Gram Unnyan Kendras*, Youth Clubs and other grassroot level implementing organizations. These are important for the implementation of development programs and -projects, such as RKM's Solar Energy Program and the LaBL campaign. Through this integrated development wing, the *Ashrama* has engaged in rural and urban development programs for four decades, covering all areas from literacy, child and mother care and integrated rural development, to programs on agriculture and allied activities, intensive sanitation programs and a number of other activities. The programs in the field wing are carried out through a democratic and decentralized three tier organizational set-up. The village level youth clubs work as grassroot level implementing agencies. They deal and communicate with a set of cluster organizations which are formed to coordinate and monitor the work that is

performed by the youth clubs. These in turn report to the *Lokasiksha Parishad*, which is the apex body (RKM 2009).

The micro programs implemented through this structure, are either centrally developed or adopted at local level on need based demands and resources. The entire scheme of rural development is based on a set-up of local knowledge and access, not to mention the trust and transparency that is necessarily displayed by the cluster organizations. All these are registered bodies, have their own elected boards of management, and are regularly audited by chartered accountants. The cluster organization is supposed to have a role as a "*friend, philosopher and guide*" to the local community (RKM 2007:14). Sagar Mangal is one of these organizations, situated at Sagar Island at the confluence of Bhaghirati River and the Bay of Bengal. This branch has 12 registered affiliated Village Youth Clubs and 9 Village Clubs as associate members. According to the RKM, people here are enthusiastic and hard working, so any project taken up here is likely to succeed (ibid:14). Within their large range of activities, the Solar Energy Program only constitutes a small, however important piece of the puzzle. It has gradually been included in the RKMLSP action plan due to its multifaceted area of benefits. Aside from the obvious environmental aspects, the idea is that solar energy systems allow basic energy service provision leading to improvements in the quality of life and economic productivity. The Solar Energy Program was launched by RKMLSP, Narendrapur in 1995, and is only growing larger. The involvement in LaBL and the collaboration with TERI is one of the newest additions to the program.

I will return to the different reasons and motivations of the multitude of actors involved in the solar efforts in West Bengal and Sagar, particularly in Chapter 6.

1.4 Outline

The thesis is divided into seven chapters, starting with an introduction of the framework and content of the research. I have started out introducing the location for fieldwork in section 1.1, followed by a section on the main research question. The rest

of this chapter has been dedicated to the key actors involved in the solar energy efforts in West Bengal, India, in particular the agencies of implementation of the LaBL campaign providing light to rural people in the Sunderban area.

Chapter 2, *Drawing on Theory*, introduces the theoretical toolkit that has shaped the analysis of my research. The chapter is divided in four sections, where the first three sections present the three main theoretical tools and ideas that serve to compliment my empirical findings; 1) The Millennium Development Goals, 2) The Rights-Based Approach to sustainable development and 3) Gender issues in the energy context. The chapter ends with a short description of *how* I intend to apply these theoretical tools in the analysis of my empirical findings.

Chapter 3 is the *Methodology* chapter, covering the advantages and limitations of the qualitative method as the preferred research approach. The chapter introduces the Solar Transitions project to which this thesis is a contribution, and explains the choice of qualitative method and the nature of my research. The middle section treats the manner in which data was gathered, and the people involved in my research as intermediaries or informants. The final section is a brief summary of the ethical considerations that need to be acknowledged, and the potential weaknesses of my research.

As I move to Chapter 4, *Women in the Solar Context*, I start presenting the actual research material based on my observations and interviews in the field. Although some of my interviews were carried out in the cities of Delhi and Kolkata, the lion's share of my empirical findings are related to the people of Sagar. The first part of the chapter presents a relatively neutral description of how local people, and women in particular, live their daily lives on the island. Section 4.2 digs deeper into the social areas presented in 4.1, attempting to connect the observed and potential impacts of light and power in relation to cooking, communication, television, education and health and well-being. TI keep an underlying focus on the impacts of the LaBL campaign..

Finally, section 4.3 interprets the views local people on Sagar have on their own life situations and their perspectives of solar energy and the future.

In Chapter 5, the LaBL campaign is investigated further, as I seek to shed light on the *Opportunities and Challenges of Women as Entrepreneurs*. I pay attention to the dual role of women as intended by the campaign, placing emphasis on their positions as managers of the Solar Lantern Charging Stations on the one hand, and on the other as individual entrepreneurs working in the light from the lanterns at night time. I then try to determine some of the social impacts on family economy and the empowerment of women, and explore the potential disadvantages of an apparently beneficial model.

Chapter 6 is the final analytical chapter, in which I strive to identify the importance and perceptions of *Gender, Empowerment and Environmental Concerns in the Different Levels of Implementation*. The chapter systematically interprets the story of LaBL as presented and narrated by representatives from top- to bottom level, from one of the donors, here represented by the Norwegian Ministry of Foreign Affairs, to the Local Clubs and individuals on Sagar Island. I further link my findings and interpretations from Chapter 4 and 5 to the goals and targets presented in the top-level strategies in Chapter 2, pointing out potential correlations in the social impacts of light and power and MDG- and rights-related goals.

In the concluding chapter, I summarize the most important findings and conclusions as presented throughout the thesis. I also point out what I believe to be the most important contributions of the solar energy efforts in the area in a larger context. Most importantly the learning potential for further projects will be emphasized.

II. DRAWING ON THEORY

Doing interdisciplinary research at this level inherently means having to stand on the shoulders of giants. In this chapter I wish to introduce the main bed of theory which constitutes the foundation for my arguments in the analytical chapters. It is my intent

to discuss my empirical findings in light of these theoretical tools, and the following sections will bring food to the table in terms of supporting literature and background information. I have chosen to focus on three concepts within development theory and planning; 1) The United Nations' Millennium Development Goals (MDGs) of 2000; 2) The Rights-Based Approach (RBA) to sustainable development[19]; and 3) Diverse contributions within gender theory, in particular linked to gender and energy. The three are indubitably intertwined, and I will draw on different aspects of them all in my analysis. First, I will give attention to the importance of the MDGs and their possible function and contribution in the context of solar energy efforts. I then move on to a very brief section on The Rights-Based Approach and its relevance to this thesis. Finally, a section on gender theory as linked to energy issues closes this chapter and sets the premises for further interpretation of available data.

2.1 The Millennium Development Goals in the solar context

Every so often the international community creates instruments and strategies that are so powerful that they alter and infiltrate almost any discourse within any organ and society. These tools and ideas can result in or from entire shifts in paradigms, or at least serve as a backdrop for a vast collection of new thoughts, rules and ideas. The Millennium Development Goals of 2000 are seen by many as such a power tool, not least within the development field. The goals are broad enough to include almost every aspect of any given society, and hence may serve as a bedrock for the majority of developmental schemes and strategies of today, implicitly or explicitly. It seems that most development projects and strategies of the past decade in some way or another fit into a framing shape of one or several Millennium Development Goals. A common critique to such a wide conceptual framework, is of course that we risk to be vague and

[19] The concept of *sustainable development* was introduced in the 1987 Brundtland report *Our Common Future*. In Chapter 2 of the document, sustainable development is defined as *"(…) development that meets the needs of the present without compromising the ability of future generations to meet their own needs*" (UN website Nover 28 2010 URL-http://www.un-documents.net/ocf-02.htm). I will not delve into a problematization of the term, but will refer to its meaning in its original broad sense.

fluffy in our strive to cover all areas. The MDGs have been accused of being a plain-vanilla rag-bag of immeasurable utopianisms, based on Western values setting out to improve a non-Western world (Attaran 2005;Amin 2006). All this in mind, I will still argue that in the case of environmentally loaded development planning, especially regarding female involvement, it is hard to deny at least the rhetorical relevance of the MDGs. In numerous documents and writings, both academic and organizational, the MDGs stand out as one of the few theoretical instruments that are explicitly mentioned on several levels of the solar efforts in West Bengal. Although the household informants themselves did not bring up or otherwise seem to be aware of this coherence, the supposed connection between energy, gender issues, education and increased social benefits seems strong enough to follow the trail for theoretic purposes. Scholars McNeill and Bøås have compiled and edited a useful set of articles in their textbook 'Global Institutions and Development - Framing the World?', which has aided me in my perception of how instruments and institutions like the MDGs and the UN have the power to frame and construct realities from macro to micro level. Nustad (2004:42-45) and Crewe and Harrison (1998:157) have also commented on the way development projects and their respective agents manoeuvre within frameworks of constructed realities, for instance by adopting particular aspects of language in order to obtain necessary funding and receive support. I will return to the framing power of the MDGs in later sections, but first, an introduction of their potential relevance in the solar context:

The Millennium Development Goals is a set of eight goals with corresponding targets that were adopted at the UN Millennium Summit of 2000. The goals aim at slashing poverty, hunger, disease, maternal and child deaths and other ills by a 2015 deadline. One might say that all the Millennium Development Goals and targets are in some sense relevant for any such developmental effort as observed in West Bengal and on Sagar. However, I have chosen to focus on a certain few as more important than others in this context.

Goal 1:

Eradicate Extreme Poverty and Hunger

Target 1:

Halve, between 1990 and 2015, the proportion of people whose income is less than $1 a day

Target 2:

Achieve full and productive employment and decent work for all, including women and young people

Keeping a clear focus on entrepreneurship and local enterprising in collaboration with commercial actors as well as NGOs and government, is an obvious attempt to create and sustain local employment and skills. On Sagar, as well as elsewhere in the Sunderbans, there are Youth Clubs involved in training and capacity building. These represent a future oriented vision, securing knowledge and career building education for the younger generations. Simultaneously, TERI claims to have a specific focus on women and female empowerment, a strategy shared by the Norwegian Ministry of Foreign Affairs and its representative Embassies. I will return to and elaborate this topic in the section on women entrepreneurs and female empowerment, in an attempt to determine the actual impact of the intended efforts.

Goal 2:

Achieve Universal Primary Education

Target 1:

Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling

Education is one of the main target areas of the LaBL campaign and the solar programmes in general. There exists a general assumption that access to clean water and electricity is valuable to female school attendance due to the reduction of time consuming activities like collection of firewood and fetching of water (i.e. UNDP 2004:17, Kabeer 2008). The campaign and its implementing agencies focus largely on

the significance of evening light as crucial for students in relation to their homework performance. Solar lanterns provide lighting at night that far exceeds the light of kerosene lamps, granting better reading conditions and less straining of the eyes. Kerosene is also considered a more expensive source of light, therefore limiting the hours of light available at night. Hence, solar lanterns are expected to improve school performance, hereby facilitating educational progression. Empirical findings show that there may be certain discrepancies between stated goals and reality is this case as well, although it is less arguable that the light from solar lanterns is indeed superior to that of kerosene lamps.

Goal 3:

Promote gender equality and empower women

As mentioned, the gender issue is an inherent factor sought out to be redeemed by the LaBL campaign. In addition to keeping girls from poor, rural areas in school, local women should be granted the possibility to increase their status and secure their financial independence by prioritizing their involvement in solar charging stations and managing and maintenance training. Female consumers are thought to benefit from the lanterns, as they are able to save time on cooking and work on for instance jewellery and beadwork later in the evenings. This in turn may increase their economic sustainability, as they are better fit to create and maintain an income. I have however observed possible strain on double working women and their multiple responsibilities, and the explicit focus on women entrepreneurs does not always translate to reality, as will be discussed.

Goal 7:

Ensure environmental sustainability

Target 1:

Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources

The political will to make sustainability a target area for national politics, and the focus on technology as a key element in terms of climate mitigation and social development has already created a space within which the campaign has found the necessary means to operate. Simultaneously, local demands and efforts tend to drive things further, making NGOs and local government important actors in the push for more stable and available electricity and other benefits. It is hard to determine exactly where the national and international efforts and strategies end and where local influence begins. Solar energy has an indisputable high star in the environmental context, but considering the ongoing move from solar power to coal-based mainland grid connection on Sagar, one might question the true allegiance to the environmental agenda as projected by the national authorities.

Goal 8:

Develop a global partnership for development

Target 1:

Address the special needs of least developed countries, landlocked countries and small island developing states

Target 5:

In cooperation with the private sector, make available benefits of new technologies, especially information and communications

Partnership is undoubtedly the bedrock of the entire effort regarding solar power in West Bengal. The LaBL campaign, the Solar Transitions project, the initial installation of mini-grids on Sagar, have all been founded on strong collaborations between multilateral stakeholders[20]. The Sunderbans being such a geographically unique area, one might compare their situation with that of small island states which are threatened by land erosion, rising sea levels and the exclusion brought by their remoteness. However, the people of Sagar seem to have found a way to convince their

[20] LaBL website December 5 2010 URL- http://labl.teriin.org/index.php?option=com_content&task=view&id=115

representatives to grant them the attention and the possibilities they deserve, such as finally achieving their connection to the mainland grid - a technological leap considered virtually impossible just a decade ago. One of the reasons may be their willingness to pose as subjects for the experimentation with new technologies, along with their high level of education, capability to mobilize and their long experience with various actors from both organizations and commerce.

Involving the private sector in developmental affairs always brings about the chance for scepticism, questioning their true motives and potential ulterior schemes. For TERI, however, the inclusion of commercial actors into the LaBL campaign, has not just been the bread and butter of large parts of the operation. With the crescendo of articles, policies, debates and conventions arguing the need for making clean development commercially attractive, TERI claims to play an important role in building a terrain for business opportunities and economical advantages within the field of solar energy[21]. If the private sector sees the possibility to profit from environmentally friendly strategies, global partners across the world might have their cake and eat it too. However, making commercial actors the glue of an environmental operation may contain the risk of losing them to other projects as soon as something more profitable turns up. This way, the stability of a project or a target area may be threatened by the very wheels that make the engine turn.

This broad sketch of the MDG infiltration of solar related contextual issues serves as a backdrop for further discussion, and will receive more attention in later chapters as I will look back on some of the points made in relation to empirical findings and other data. For the next sections, I wish to turn to the rationale and intentions of The Rights-Based Approach to sustainable development, and establish why I believe it is relevant as a theoretical tool in this context.

[21] [21] TERI website October 1 2010 URL- http://labl.teriin.org/index.php?option=com_content&task=view&id=2

2.2 The Rights-Based Approach

2.2.1 A brief introduction to The Rights-Based Approach

> "The MDGs remain feasible with adequate commitment, resources, policies and effort. A human rights approach to MDG-based strategies has an important added value as it calls for more integral strategies in addressing both immediate and structural problems, putting the rights of people at the centre, and raising the level of accountability of States both at national and international levels."
>
> Navanethem Pillay, United Nations High Commissioner for Human Rights [22]

In the latter half of the last century, the keen observer could see a clear shift in development theories and strategies, from the technological and economic focus of modernization theory (i.e. Hirschman 1958;Myrdal 1958) to the people-centred development that peaked in the 90s. The idea that the reduction of poverty, unemployment and inequality through true fulfilment of human potential and improvements in the quality of life are central to the development process, changed the commonly accepted hegemony of pure economic considerations (Seers 1969 in Potter et al. 1999:33). People went from being passive receivers of development aid or controlled agents within structural adjustment programs (SAPs) to receive focus as individuals whose well-being was a goal in itself, not merely a side effect in the strive for economic growth. These days, the concept of development is broader than ever, exemplified by Chakrabarti and Chakrabarti, who claim that development is *"(...) a socio-economic-technological process having the main objective of raising the standard of living of the people* "(2002). The focus on individual human beings as opposed to the mere economic state of a nation, spurred a growing consensus of the instrumental and intrinsic value of human rights in the development agenda. The Rights-Based Approach (RBA) should not be seen as one, unilinear approach to the same goal with the same means. There is, however, a basic common ground in the thinking of the various movements. The basic elements include an expressed linkage to rights and empowerment, a greater accountability on states and international actors,

[22] UN website December 10 2010
URL- http://www.ohchr.org/EN/Issues/MDG/Pages/Quotes.aspx

stress of the importance of participation and non-discrimination, and a particular attention to vulnerable groups (OHCHR 2004 in Tsikata 2004).

The most groundbreaking aspect of The Rights-Based Approach, was perhaps that it changed the perceptions of the typical donor parties in traditional development aid. Whereas the early conceptions of development portrayed Western development strategies as an altruistic process that sought to *help* the poor and under-developed parts of the world, the RBA placed responsibilities with the development agents, claiming that if someone has a right, someone has a responsibility to fulfil that right (Banik 2008a;Pogge 2008;Sen 1999). In later years, as scholars and scientists placed an increased focus on environmental issues, one observed a new direction of RBA, seeking to illustrate the interdependence between human rights and the environment. Its frontrunners claim that *"(...) national and international governmental and non-governmental institutions dedicated to protecting human rights must recognize the connection and should provide mechanisms to address the human rights implications of environmental problems*" (Earthjustice 2008:6)[23].

The constituents of The Rights-Based Approach are in many ways commensurable with the MDGs. Focus on participation, empowerment and accountability is a red thread in both conceptual toolkits, and development planning shaped within the RBA will often refer to the MDGs and vice versa (Banik 2008b). However, countries focusing greatly on achieving the MDGs by their 2015 deadline, have at times been accused of giving priority to easy quick-wins rather than paying real attention to structural factors. Some even argue that the MDGs are a betrayal of the more

[23] Earthjustice was founded in 1971 as a non-profit public interest law firm, and holds a consultative status with the UN Economic and Social Council. The mandate of the organisation is to enforce and strengthen environmental laws on behalf of hundreds of organisations and communities. For 16 years, Earthjustice has submitted annual reports to the UN, In their 2008 report, Earthjustice points to the increasing international recognition that environmental harms adversely affect indigenous and community rights, and lists a series of examples related to the Right to Life, the Right to Health, the Right to Water, the Right to Work, the Right to Culture, the Right to Development, the Right to Information, the Right to Participate and the Right to Shelter and Housing (Earthjustice 2008:11). The major challenge is of course to prove that there is in fact a direct link between the environmental hazards and degradation and the human and social consequences related to rights.

demanding and nuanced international human rights commitments, trading off the deeper running issues for visible, grand scale quick-fixes – or as labelled by one women's rights advocate: the MDGs - *Major Distracting Gimmicks* (Saith 2006 in Langford 2010:83). Others have praised the MDGs for bridging the gap between human rights and development agendas (Jahan 2003 in Langford 2010:83). In the solar context, it seems to be easier for the top-level actors to refer to the MDGs than to human rights. Perhaps this is partly due to the lack of focus on duty-bearers in the former of the two. The duties and responsibilities emphasized in RBA implicitly steer attention towards the Herculean task at hand and away from self-satisfied pats on the back, while contributions to reach the MDGs to a greater extent are applauded as philanthropic efforts.

In any case, there does in fact exist monitoring organs and consultants working on awareness issues and inclusion of environmental considerations in other areas of operation within the top-level development field. There is no doubt a vast community of environmentalists who see the need to make the connection with the human rights agenda and vice versa. In the case of solar energy in West Bengal, however, this link is made even less explicit than initially assumed. While the social benefits of electricity are emphasized on various levels, the idea of corresponding duties to fulfil these benefits as rights, seems in most cases to have ceded place to the notion of consumer oriented enterprise and local empowerment as a positive side effect. The lack of an explicit human rights agenda, does not however outrule the possibility of human rights related outcome. I have therefore chosen not to leave the initial interest in rights behind completely, although The Rights-Based Approach may have lost its role as the protagonist of this thesis. The notion of rights and duties is far from a homogenic feature in relevant literature. I have primarily found support in the definitions and ideas of Amartya Sen, especially in his writings about instrumental rights and freedoms (Sen 1999). In the next section, I wish to give a brief introduction of Sen's views, before I leave the notion of rights aside for now, and move to a short passage on gender related theory, specifically within the energy field.

2.2.2 Amartya Sen's rights and freedoms

> To ask how things are going and whether they can be improved is a constant and inescapable part of the pursuit of justice.
>
> Amartya Sen (2009:86)

Indian Nobel laureate Amartya Sen is one of our times' most prominent economists and thinkers within the realm of development and justice. His groundbreaking work on bridging the gap between traditional economics and social considerations, has earned him a unique position in both camps of economics and social sciences. Although those who dare to challenge existing truths and perspectives often face immense scrutiny and adverse critique, Sen seemingly manages the balance between disciplines, as well as between academia and accessibility for the common reader.

One of Sen's contributions to the rights-based discourse, is his overview of instrumental rights and freedoms. In five points, he identifies and explains five different categories of rights and freedoms, ranging from political freedom to protective security[24] (Sen 1999:38-40). Sen incorporates human rights aspects with societal responsibilities, and underlines the importance of the *opportunity aspect* versus the *process aspect* of freedom (Sen 1999;Sen 2009). The opportunity aspect refers to what a person is able to achieve, while the process aspect relates to the way in which given target is achieved. In a parallel, Sen also argues the importance of the distinction between '*culmination outcome*' (what a person ends up with) and

[24] Sen's five types of instrumental rights and freedoms, adapted from his 1999 publication *Development as Freedom*:

1) Political freedoms, including civil rights, opportunities to determine governance and political entitlements associated with democracies in the broadest sense
2) Economic facilities, referring to "the opportunities that individuals respectively enjoy to utilize economic resources for the purpose of consumption, or production, or exchange" (Sen 1999:39)
3) Social opportunities, in terms of access to education, health care and other arrangements provided by society.
4) Transparency guarantees, providing trust in social interactions, openness and the right to disclosure, playing an important role in preventing corruption, financial irresponsibility and underhand dealings.
5) Protective security, finally, would be the social safety net that serves to protect the people finding themselves on the verge of vulnerability, ranging from fixed institutional arrangements like unemployment benefits to ad hoc arrangements such as famine relief.

'*comprehensive outcome*' (the *way* the person reaches the culmination situation) (Sen 2009:228-30). The point he wishes to express is that the right to choose to do or not to do something, is an important aspect of individual freedom. This may be seen as a sting in the side to other Asian thinkers and development planners who favour the so-called 'Lee hypothesis' as a superior development model (Sen 1997). The Lee-hypothesis, based on the ideology of former Singapore Prime Minister Lee Kwan Yew, represents the cornerstone of the 'Asian Values'. This view maintains authoritarianism as a valid road to development, as individual freedoms must cede place for the greater good of the community (Potter 2000:376). Sen repudiates this view in many of his writings (1997;1999;2009), and argues that a common good achieved at the expense of individual freedom is an inferior good, due to its 'process aspect'. Similarly, many women have argued in later times that feminism is useless without the right to choose. If women do not have the right to choose to stay home with their children after having been granted the opportunity to work, their actual freedom is weakened, and their individual needs are still undermined. I will not elaborate excessively on the opportunity aspect in this thesis, but I will return to it briefly in my analysis. In particular, I wish to lean on Sen's third type of instrumental rights and freedoms, namely the point on social opportunities. Hereunder, Sen refers to access to education, health care and other arrangements provided by society. These are social aspects explicitly and implicitly linked to the solar efforts in West Bengal and on Sagar, and form an important part of the dynamics and arguments in the ongoing struggle to electrify the island.

In the next section I present some of the current views on gender issues as related to empowerment, energy and the MDGs, before I close this chapter on theory and move on to the methodology of the research.

2.3 Gender and energy

> In addressing the inequality between men and women in the sharing of power and decision-making at all levels, Government and other actors should promote an active and visible policy of mainstreaming a gender perspective in all policies and programmes so

> that before decisions are taken, an analysis is made of the effects on women and men, respectively.
>
> Global strategy for promoting gender equality, Platform for Action at the United Nations Fourth Conference on Women, Beijing 1995, §189[25]

The notion of 'gender' in relation to development was introduced in the mid-70's, and refers to the social roles and interactions of men and women rather than their biological characteristics (Pearson 2000:385;Strulik 2008:352). Gender roles are not transfixed, but rather changeable aspects learned through socialization and institutionalized systems. The analysis of gender relations in preparation or assessment of development strategies, seeks to enhance the focus on women and female participation and empowerment without creating and reaching for a "*unitary category of 'woman' undifferentiated by class, race or nationality*" (Waylen 1993 in Haynes 2002:187). The shift from the Women in Development (WID) movement to the Gender and Development (GAD) approach was founded in an attempt to challenge social norms that imprisoned men and women in static, one-dimensional roles enchained to their biological sex, and rather problematize the way gender relations have an impact on development initiatives and policies (Pearson 2000:390) [26]. Including a gender analysis of the social fabrics of a development context not only places emphasis on female empowerment and participation, but also strives for a holistic image of the contextual process of development, including the significance of gender roles and power relations. There is an increasing urge to place this gender analysis at the heart of any planned action, including legislation, policies and programs in all areas, at all levels, making women's as well as men's concerns and experiences an integral dimension of all political and developmental programs and spheres

[25] UN Womenwatch website November 17 2010
URL- http://www.un.org/womenwatch/osagi/pdf/factsheet1.pdf

[26] The term Women in Development (WID) was created by a Washington-based network of women development professionals who argued against the trickle-down theories, claiming that the modernization approaches to development had different impact on men and women. WID lobbied for the 1973 Peace Amendment to the US Foreign Assistance Act, obliging USA development aid to help "*integrating women into the national economies of foreign countries, thus improving their status and assisting the development effort*" (The Percy Amendment in Pearson 2000:390). The movement was criticized for its limited focus on the *exclusion* of women from the development process, rather than acknowledging the inherent problems of the process itself. The need for a process-oriented analysis in combination with a distinction between biological sex and *gender*, led to the surfacing of the now widespread Gender and Development (GAD) approach (ibid. 2000:390;Merchant 1999:206).

(ECOSOC Agreed Conclusions, 1997/2)[27]. This strategy of *gender mainstreaming* is adopted by the UN as well as various other agencies and organizations, adding a gender component to all planning and execution of development policy and strategy. However, there is a long way from top-level intentions to actual implementation of such strategies, and there has been a call for an increased focus on gender mainstreaming in relation to energy. In the upcoming sections I briefly sketch out some main points on female empowerment, and the mainstreaming of gender in energy contexts.

2.3.1 Mainstreaming gender in energy contexts

Mainstreaming gender does not imply developing separate women's projects or women's components within existing programs and activities. The idea is to make gender perspectives more central to all areas of policy development, research, advocacy, monitoring and implementation and so on. So far, this approach is applied in many of the areas of development and society that are perceived as typically 'female', like projects dealing specifically with women's household activities and education (Crewe and Harrison 1998). However, there has traditionally been a lack of acknowledging the links between these female platforms and the male dominated field of energy. There is currently a call for gender mainstreaming in this machocentric sphere, as the implications for female actors within the sphere are significant (Dutta 2003;Standal 2008;2010).

In 2004 the UNDP published the report 'Gender and Energy for Sustainable Development: A Toolkit and Resource Guide' (UNDP 2004). The main argument of the report is that projects, programmes and policies that explicitly address the gender and energy nexus are more likely to achieve positive results in terms of both the sustainability of energy services and the human development opportunities available to women and men (UNDP 2004:3). Further, the authors do not recommend focusing

[27] UN Womenwatch website November 17 2009:
URL-http://www.un.org/womenwatch/osagi/pdf/ECOSOCAC1997.2.PDF

exclusively on ‘gender and energy’ projects, but rather urge all energy projects to consider the different role of men and women in relation to energy systems in order to avoid ‘gender blindness’ when treating issues of energy production and used patterns. Finally, they establish the need for development efforts overall to consider the role that energy can play in enabling or hindering successful outcomes of development projects (ibid. 2004:3). The UN’s Fourth World Conference on Women held in Beijing in 1995 concluded that women stand at greater risk of higher poverty due to unequal treatment of men and women, leading to fewer options and opportunities for women as a group across the globe (UNDP 2004:16). Access to affordable energy is seen as a necessity for combating poverty, and in order to achieve the MDG goals for reducing absolute poverty, the energy concerns of women need to be addressed through gender sensitive programmes and policies. The report highlights the fact that around 2 billion people today still lack access to electricity. This prompts new efforts in the energy sector, adding the need for installing decentralized small-scale systems in addition to the extension of power grids.

The current view on gender mainstreaming is thus not an attempt to place women on the agenda of development projects and energy efforts, but rather to acknowledge the overall gender dynamics at play in a given context. Focusing on women’s particular needs in an isolated strategy keeps women at the edge of the real field of energy, excluding them from the greater context and limiting their lives and contributions to a gender biased framework of existence. While women in rural areas in developing countries account for the majority of energy acquisition and -management through resources like firewood and cow dung, men still enter the field and dominate the decision-making process when energy has to be bought (Dutta 2003:6). Typical patterns like this need to be considered before embarking on an implementation process without reducing women’s opportunities in the energy field. Gender mainstreaming is a step up the ladder from adding a gender component, and should be employed as a general clarifying analysis that acknowledges the challenges of the contextual reality without limiting the opportunities for either party involved in the efforts.

2.3.2 The assumed benefits of empowerment

The term 'empowerment' has proven difficult to define and translate, but can be described as "*the acquisition of the awareness and skills necessary to take charge of, and to make the most of, one's own life chances*" (Haynes 2002:184-5). Recognizing that most societies are male dominated, the focus on *female* empowerment has become both ends and means in a landslide of strategies and policies. The focus is however shifting away from the idea of empowerment as an end in itself, as it tended to be seen as a 'zero-sum' game in political circles, placing men at the losing end of the field (Kabeer 2001:17). Kabeer links empowerment to *the ability to make choices*, and places the term as inextricably linked to its polarized opposite, *disempowerment*, to be denied choice (Kabeer 2001:18). In this understanding of the term, empowerment inherits a shift from the latter to the former, differentiating 'the powerful' from 'the empowered'. Empowerment thus refers to the ability to make strategic life choices in a context where this opportunity did not previously exist (ibid. 2001:19). This notion of a right to choose is similar to Sen's notion of the opportunity aspect (2009), and may in turn lead to an enhancement of other social opportunities (Sen 1999:39).

Enabling women to take charge in their own lives, increasing their financial independence and social status is thought to have positive effects on society as a whole. Over the years, there has been a general acceptance of the view that investing in women's projects represents a win-win, cost-effective strategy that advances gender equality as well as environmental goals (Crewe and Harrison 1998:35). In the upcoming chapters I focus on the way female empowerment efforts may contribute to reach MDG and rights-related goals and targets on the island of Sagar in West Bengal. TERI uses the language of empowerment in many of their newsletters and reports, and emphasizes the importance of empowering women in order to achieve overall societal benefits.

> It is truly said that an empowered woman is the first and final step towards empowering a community.
>
> TERI 2009a:10

Empowerment efforts are often carried out as projects directly targeted towards women and women's participation, but are increasingly being incorporated as a general approach to all segments and aspects of policy and planning in the shape of gender mainstreaming.

2.3 Applying the theoretical tools in an empirical context

Dealing with such an extensive theoretical framework, it is my goal to let the empirical data guide the material, reaching for the theories of this chapter to support my claims and presumptions. Some theoretical insights will be more explicitly referred to than others, but this chapter provides an overview of the main background material which has guided me in my positioning. Chapter 4 will be almost a pure narration of fieldwork observation and interviews with informants, establishing the contextual grounds for discussion in the further analysis. The MDGs, RBA and gender approaches should be kept in mind as a backdrop throughout the thesis, and more explicit linkages will be made in Chapters 5 and 6. In the upcoming chapter I focus on the methodological approach to the research, closing the chapter with a comment on the limitations and ethical dilemmas I encountered in the field, before moving on to the experiences from Sagar Island, West Bengal.

III. METHODOLOGY

3.1 Qualitative research and data analysis

The theoretical web of rights and development is as vast and intricate as the river delta of West Bengal, where we lay our scene. This study attempts to analyze the empirical findings from the context area in light of relevant theory, covering a range of issues.

The research is a contribution to the Solar Transitions research project coordinated by Norwegian human geographer Kirsten Ulsrud, and aims to analyze a small part of a major assessment being performed in relation to a planned South on South knowledge transfer from India to Kenya[28]. The approach of my research is a bottom-up interdisciplinary field study combined with theoretical studies in the shape of readings and data analysis. The major part of the analysis and discussion will be based on the qualitative research findings from observation and interviews during a four week field work spread out in Delhi, Kolkata and Sagar Island of the Sunderbans in West Bengal. I did interviews with a total of 23 informants, out of whom 9 were women, all of them situated on Sagar (see appendix for full list of informants). I also lean on the findings of the Solar Transitions research group, who visited West Bengal and the Sunderbans in February 2010. The research group performed a survey with 200 respondents from the islands of Sagar and Moushuni, hereby referred to as the Solar Transitions Survey 2010, or just 'the Survey'. The Survey provided me with quantitative data to support the qualitative findings from interviews and conversations, and ensures a broader community voice in the research material. Having a background from anthropology and development studies, these will be the main disciplines shaping my approach, while political science may influence the treatment of policy issues and interstructural relations.

The qualitative method has a few obvious strengths and weaknesses that need to be considered. Firstly, in qualitative research, the collecting of data should not be seen as separate from the analyzing of the data. The strength of the method is in the continuous integration of the research question, the data and the data analysis (Morse and Richards 2002). This hermeneutic circle of working with the material has proved

[28] The Solar Transitions project ("Solar power plants for development: Transfer of social and technological innovations from India to Kenya") is a collaboration between the University of Oslo, SUM (Centre for Development and the Environment) and a range of participants from India, Kenya and Austria. The participants derive from different disciplinary and national backgrounds, and will cover a large area of research in relation to Indian experiences with the implementation and social organisation of village solar power plants in villages in the Sunderban Islands in West Bengal. Ranging from technological details to social implications, the research is set to chart the major successes and difficulties regarding the implementation, identifying advantages and obstacles that may facilitate a similar implementation in a Kenyan village as a South on South knowledge transfer.

valuable when delving into such extensive topics as gender and sustainable development efforts. The method allows the data to lead the way as one follows the path of material, and the findings that are analyzed remain specific to the context, while discussed in light of former research. One of the weaknesses of small-scale qualitative research is of course that the lack of sufficient data material may jeopardize the possibility of generalization. My conclusions will at best be indicative, as the findings are too few and superficial to hold water in terms of bombastic statements of proof. However, the qualitative method does provide a deeper dive into the realities of individual informants and allows for unpredicted information to surface (Thagaard 2004). Open-ended interviews and conversations with key actors on both supplying and receiving ends of the energy sector and the LaBL campaign, combined with more structured interviews touching onto important aspects of implementation and social realities, serve to achieve information about both personal perspectives and institutional motivations. Conversely, another weakness of the qualitative approach is the random nature of its implementation. The way a study turns out, is largely shaped by coincidence, persons and interpretation. Access to the right informants is often determined by time, geographical locality and initial contact persons, and perceptions and interpretations may be clouded by some agents' personal interests or lost in translation. In the following section, I present the nature and experiences of gathering data, starting with a description of the people and places that have been relevant to my findings. I end this chapter with an acknowledgement of the limitations and ethical dilemmas that have presented themselves on the way, and how I have and should deal with these to my greatest ability. This way I attempt to minimize the misconceptions and weaknesses that may have arisen during my fieldwork.

3.2 Gathering of data

3.2.1 People and places

Before leaving for India, I spent the first few months of the research on theoretical material in Norway. Through the participants of the Solar Transitions project, I received tips on articles and readings that specifically dealt with the history of solar

energy in West Bengal, some charting the social impacts of the solar efforts on Sagar (i.e. Chakrabarti and Chakrabarti 2002). I also focused on material on The Rights-Based Approach, in particular the workings of Amartya Sen. Simultaneously, I tried to establish contact with informants and facilitators in India, both within project affiliates, such as TERI and RKM representatives, and external sources, through both social and scholarly networks. During this period I planned my interviews and created the interview guide, and prepared the stay in India to my best ability. On arrival in Delhi in late October 2009, the first week was quite slow in terms of getting in touch with informants and organizations, even those who had initially responded to my e-mails. I had made a plan of starting the interviews at top-level, from the capital to the state capital of West Bengal, Kolkata (formerly Calcutta) and further on to the grassroot informants on a specific island in the Sunderbans, namely Sagar. As the Delhi interviews kept me waiting, I finally received word from the Tagore Society for Rural Development, a local organization on Sagar Island. I set off to West Bengal and decided to return to Delhi later in the month for the final interviews. All names have been altered for the anonymity of the informants, except in the cases of people in important positions who gave their consent to be quoted without anonymity. All informants in general were aware of their contribution to the thesis, and all participants with access to the internet were offered to see the extracts in which I refer to the information they have provided.

Sagar quickly stood out as a relevant area in which to perform my fieldwork. There have been conducted several studies on the impact of electricity on the island, giving me access to data and the opportunity to compare my findings with those of previous research (i.e. Chakrabarti et al. 2000). Also, the island turned out to be one of the most geographically accessible of the Sunderbans, and I was able to locate a contact organization (the Tagore Society for Rural Development) through my contacts at the Centre for Science and Environment (CSE) in Delhi before my departure from Norway. Sagar has extensive experience with solar energy and I hoped this would provide me with informants who could enlighten me on the long-term effects of the technology, including the potential downsides or negative impacts, in order to create a

nuanced analysis. The weakness of Sagar as my research field may be that it is not fully representative of the Sunderbans in several manners. For instance, they are soon to be connected to the mainland grid, and the social fabric of society may differ from the other islands in terms of education, communication, NGO presence and so on. I will return to this in later sections. The Tagore Society was a sensible partner for various reasons. First of all, the organization is not a project affiliate. I thought this might make their employers more neutral in their approach and presentation of solar energy impacts on the island. Also, they have a broad experience on various arenas of rural development in the local context. Last, but not least, they early expressed a willingness to participate and aid me during my first visit to the island.

Everything started coming together more when I arrived Kolkata in November. The communication lines seemed more open, and I was able to plan my trips and make arrangements. I was also in touch with the regional offices of the Ramakrishna Mission and the Tagore Society for Rural Development. During my first stay on Sagar, I was welcomed by the staff of Tagore Society and stayed with them in a guest room at their office in Kamalpur. My facilitator and interpreter, Mr. Adeep Guhathakurta, drove me around on a motorcycle for four days, showing me the different power plants and taking me to meet important people. Some limitations did become apparent however, because of the linguistic barrier and the lack of understanding the importance of including female informants. This led to my second trip to Sagar, after having acquired a female interpreter in Kolkata and visited the Ramakrishna Mission to explain my desire to meet with the village women.

The interviews carried out during the fieldwork were a mixture of semi-structured interviews following a pre-designed interview guide, and completely open-ended conversations. I never used a recorder, but found that most of the time I was able to make extensive notes due to the time delay of the questions and answers during the translation of the interpreters. Not relying primarily on transcripts of entire conversations, I may admittedly have omitted small fractions of the conversations and answers to my questions. On the other hand, I always wrote out long field note entries

the same day as doing interviews, and the fact that I did not frame the interviews by turning on and off a button, I was always 'on' in terms of being attentive to the situations I was in and the observations I made. During the first visit on Sagar, I carried out several individual interviews following the interview guide, but had to make some adjustments along the way. I noted that the interviews seemed a bit long – not for the informants themselves, but my interpreter, who eventually tried to take shortcuts by answering my questions himself. His English was quite weak, and sometimes he was not able to convey what I was asking. For instance, he did not understand my question about which part of nature the informant relied on the most. This subsequently emitted the following two questions about what they would do if modern technology threatened this place or activity, and if they would consider paying more for renewable (solar) energy if this could mitigate the threat. I also started to get the feeling that he could have an agenda of his own, trying to portray the answers in a way that would benefit of fit in with the image of the organization he represented. In spite of this, he was extremely helpful, and seemed to take the responsibility of my work and well-being very seriously. Staying in a guest room at the main office of the Tagore Society, I was basically in his hands throughout the stay. The first day I met with the board of the organization and presented my research and my intentions, and the next day we visited several power plants and families with individual solar homes, including the Kamalpur plant (26kW solar and 6 kW wind), Mritunjoy Nagar Solar Plant (25 kW), Kaylapara SPV Power Plant (120 kW), the Natendrapur SPP (25kW) and the wind/solar/diesel/biomass hybrid where I met with the assistant director of WBREDA.

3.2.2 The interviews and the interplay within

I would make attempts to adjust my role as interviewer depending on whom I was talking to. Mr. Guhathakurta brought me to see several men of high status, including two local headmasters, the assistant director of WBREDA and a wealthy man working in the oil industry in the Middle East. In these cases, I would allow the conversation to flow more freely after presenting myself and my field of interest, as they often had a

lot to say about the topic themselves, and offered their opinions. During these interviews I often stumbled across unexpected information about the electricity situation on the island, and the way the local governance operated. In some cases they also agreed to answer the questions of the interview guide, but I would have to cut it short, as Mr. Guhathakurta would get anxious about us wasting too much of these important men's time. I tried asking to see and talk to female informants as well, but the only times this would happen would be when they were the wives or other family members of the men we came to see. Typically, they would welcome us and serve tea and biscuits and make some small talk while we waited for the Alfa Male to arrive, and then they would either retire to a different part of the house or stay in the background without contributing to the conversation.

I myself experienced being given what Standal describes as the role of '*quasi-male'*, a role outside the normal gender hierarchy (Standal 2008:50). Being a Western, educated woman travelling on my own, I did not fit in with the conventional gender roles of the local community. To a certain extent, the situation is beneficial, because I was accepted as an intellectual and a person of 'great knowledge' by the local men, and at the same time I had access to the private sphere of women, being of the same sex. On the other hand, none of the gender groups saw me entirely as one of them, as I am in fact a woman and not a man, but I am not a wife, mother, or in any way bound to the same social reality as any of the local women. I tried to play out this role in a way that would best benefit my research; dressing conservatively, but in Western clothes, demonstrating independence, but humility, and for the most part try to reflect the behaviour of the informants. This could involve ways of eating (hands vs. cutlery), sitting (chairs vs. squatting) and general attitude and body language (confidence vs. submissiveness). This way I tried to facilitate the participation for the informants, making the interview situation a comfortable and less unfamiliar situation.

After having visited Sagar with Mr. Guhathakurta and acknowledged the need for a female interpreter without an agenda of her own, I started searching for someone who might fit the profile in Kolkata. Looking for female associates in the tourist sector as

well as calling upon female students through my former involvement with the international student organization AIESEC[29], I quickly discovered that my mission might prove difficult. Meanwhile, I had befriended a large group of women beggars who spent their days on the street outside my hotel in Kolkata. The two women who initially approached me for food, Farida and Mona, made me into something of a tourist pet, taking me around for food and local chai, and I, hungry for human contact, appreciated their company. It was during these days I realized that Farida, being fluent in English and Bengali as well as Hindi due to her 15 years as a beggar on Sudder Street, the epicenter of tourist activity in Kolkata, might be my best shot at getting a female interpreter unaffiliated with the project and local NGOs. I asked her one afternoon if she would be interested in making the travel to Sagar with me, and the next day she accepted my offer, after having asked her husband for permission. We spent one night together in a Kolkata hotel to make the trip early the following morning, and worked ferociously during the one day we had at disposal in Sagar, before returning to Farida's home at night - a condition her husband had made in order for her to come with me. I then spent the night in their rather spartan house, before returning to Kolkata with Farida the following day. I spent a few more days in Kolkata before returning to Delhi for the final interviews. In between the two trips to Sagar I was able to speak with Mr. Achintya Sett at the Ramakrishna Mission Ashrama in Kolkata, an interview that held many similarities to the description of the interviews with high ranking men on Sagar. The final interviews in Delhi were performed along the same lines, at the workplace of male experts in the field; Mr. Jamal Singh from TERI and Mr. Vivek Kumar, who clarified the position of the Norwegian Ministry of Foreign Aid (NMFA), which is one of the sponsors and partners in the LaBL campaign and TERI collaboration in general (TERI 2009a:10;TERI 2009b:10). I return to the role of the NMFA in Chapter 6.

The circumstances of the second travel to Sagar was an experience in itself, and certainly helped me achieve more relevant information from the women involved in

[29] AIESEC is the world's largest student-run organization, providing a platform for internships in companies and organizations worldwide.
http://www.aiesec.no/index.php?option=com_content&view=article&id=61&Itemid=151

the solar efforts. However, the fieldwork as a whole had some obvious limitations and ethical concerns, which I will point out in the next section.

3.3 Limitations and Ethical dilemmas

As mentioned, my first trip to Sagar made it clear that I would not get access to all the information and informants I would need to get a fuller picture of the general perceptions and experiences of the islanders. Bringing the female interpreter on the second trip helped mitigate this problem, but due to time restrictions (partly caused by an announced upcoming strike in the transport sector that would prevent us from getting home if we stayed longer) we had to do a peer interview in order to talk to more than a couple of women. The interview was based on my interview guide, and although I tried to let the conversation flow freely between the questions, there was a limited degree of open-endedness, and little possibilities of delving into more personal and sensitive issues. In general, I found it hard to access private information about women, narrated by women. More time with a female interpreter would perhaps have provided me more insights through visits in the privacy of their own homes, without male companions or other women present. Standal found evidence of less domestic violence as an indirect implication of light in her study of women solar entrepreneurs in Afghanistan (2008). Such a topic would have been an important contribution to my research, but the lack of privacy and safe surroundings prevented me from introducing sensitive issues of this nature. There were also interviews with higher ranking people present, like a plant operator surveying the interview with a village elder, and RKM representatives and the husband of a female RKM Solar Lantern Charging Station (SLCS) manager hovering over us during the interview. In the latter case, I did not for instance ask questions about her salary compared to her husband's, out of fear of embarrassing either of the two in front of each other and other people.

Further, although I have strived to be neutral in my approach, the down sides of dealing with local organizations is that they often have an agenda of their own, and have the power of framing my visit by choosing what to show me and what and whom

to exclude from my research. Because my field work was so short, it is difficult to determine to what extent this occurred on Sagar. Fortunately, the field notes and working papers, including the Survey from the subsequent visit of the rest of the Solar Transitions research group helped to shed light on some of my unanswered questions. In the next chapter I wish to present an image of my impressions and observations from my fieldwork on Sagar, backed up by observations and the survey performed in February 2010 by the Solar Transitions researchers.

IV. WOMEN IN THE SOLAR CONTEXT – EXPERIENCES FROM SAGAR ISLAND, WEST BENGAL

4.1 Daily life on Sagar Island

Women on the island of Sagar find themselves part of a traditional Indian rural society, which poses some restrictions. These include factors like division of household chores, implicit rules of appropriate behaviour, family obligations and so on, which all shape and colour the lives of these rural women. However, from my observation, women on Sagar do seemingly enjoy a certain amount of liberty and respect. Female school attendance is high, and across the island you will see flocks of young girls in school uniform, chattering merrily as they ride their bicycles to and from their homes. There are special women's clubs, some of which are founded by the government, where women meet and converse and unite in common tasks. And now, there is an explicit attempt to empower women and increase their status and independence further, by granting them facilities for micro-level enterprise, and by involving them as agents in the implementation of the Lighting a Billion Lives campaign.

This chapter focuses on the realities of Sagar women, as narrated by themselves through interviews and conversations with myself and the researchers from the Solar Transitions project. Also, I will draw on my own observations from the field, during my two visits to the island. The first section treats the multifaceted aspects of the lives of these women, ranging from cooking and other chores to what they do for leisure. In

the second half of the chapter I discuss the importance of light and power in correspondence with the aspects from the former sections, and try to determine some of the social impacts on everyday life that may be attributed to the introduction of electricity, in particular electric lighting sources.

4.1.1 Cooking and related tasks

Traditionally, the life of a housewife is quite busy on Sagar, as in the rest of rural India. The day starts at sunrise, setting up the day for the rest of the family, preparing the first meal and attending to domestic animals if the household can afford them. Women are normally in charge of the majority of the household chores, from collecting firewood and water to cooking all meals and bringing the smaller children to school. In addition to firewood, a great share of the cooking depends on cow dung, which needs to be flattened and dried to be used as biofuel. Passing through the villages along Sagar roadsides, you will see groups of women squatting on the ground, pounding on the long rows of dung cakes, flipping them over, helping them dry. The cooking is a long and strenuous process that makes one realize how much freedom really did come with the introduction of kitchen appliances for Western women in the fifties. 92% of the female respondents in the Solar Transitions Survey of February 2010, said to use mud stoves, while a mere 1,5 % uses gas in addition (Solar Transitions Survey 2010:post 19.2, n=187). The making of a meal often takes hours, and the process is almost a fine piece of art, as things are cut, mixed and boiled together in just the right time and order, according to invisible recipes. The vegetables are often grown by the women themselves outside the house, and if the family owns domestic animals, like cows or goats, these are also kept in the immediate vicinity, or even in the kitchen. Most households, if not extremely poor (a category to which none of my informants belong), grow some vegetables for private use. The rest of the ingredients are found at the market, which flourishes at the hour of sunset. The most common goods are foods like rice, dal, fish and vegetables, and of course betel leaves, all of which constitute a major part of the local production and economy (Chakrabarti et al. 2000:12).

There are few signs in my research that indicate that food scarcity is an issue on Sagar (although this may vary according to areas, as I will demonstrate in later sections), and neither is access to water. The island is strewn with artificial ponds that supply the households with water for broad usage. Animals drink from them, adults and children alike bathe there, and women do the washing of clothes and fetch water for other purposes. Many households also use them for farming fish. The ponds are fed by rain water (June-August), and rarely dry up even though they are normally no deeper than 7 feet (Winther 2010a:10). Drinking water however, is mostly fetched from water pumps placed in strategic places in or near the villages. While cooking is often a communal task performed by the female generations of the household together, the fetching of water seems to be primarily the responsibility of daughters and daughters-in-law, the latter of which in general shoulder the largest burden of household chores.

Family relations on Sagar are patrilineal, and women commonly leave their own birthplace and family to go live with the husband and his relatives. Although this might equate to a relatively short geographical distance, the move represents a massive change in the woman's life in terms of her own family ties. Although distances are short, the busy routines of daily life will often prevent them from making the travel to their old homestead. Moreover, their obligations now lie with their mother-in-law rather than their own mother, and they should first see to the needs of the husband's family before thinking of their own. For a mother, the day a daughter-in-law moves in, ultimately represents a relief in tasks and responsibilities, especially related to cleaning and fetching of water and firewood. Firewood is fetched by the women of the household in 89,9% of the cases (Survey 2010:19.3, n=198), and according to my informants it is normally the daughters-in-law who perform this duty, while sometimes getting help from the other women of the family, and in a few cases, the sons. This does not necessarily mean that the daughters-in-law suffer greatly under the performance of these tasks. Neither does it have to mean that young housewives necessarily lead lonely, subdued lives in segregation from their biological families. Firstly, all the women I spoke to explained that both firewood and water pumps were to be found in close distance from their homes. While in some places these tasks are so

time consuming they often lead to high dropout rates in female school attendance, as young female household members are expected to contribute (i.e. Dutta 2003, UNDP 2004:17, Kabeer 2001), this does not seem to be the case among the women in the households I spoke to on Sagar. Water and firewood are readily available, and according to informants, the scarcity of these does not pose a threat to female education. Secondly, these tasks also contain a social aspect. Several informants told me that often there are several daughters-in-law living together under the same roof who will perform their duties together, or women from different households will meet and engage in conversation by the water pumps. It is important to note that this latter piece of information was revealed in an interview with a *man*, but I also observed traffic at the water pumps on more than one occasion, where women were found in conversation. Taking into consideration the fact that they might just be waiting impatiently for their turn, I still note the possibility of a social aspect of the activity of fetching water. A third, and hugely important factor that prevents the isolation and loneliness of women who have left their families behind, is the introduction of cell phones to the society.

4.1.2 Communication

When leaving the main road that is the aorta of transport and commerce on Sagar, the roads turn into paths and the population density diminishes. After following the swirving brick-laid paths and dusty narrow lanes surrounded by damp, green banana trees and sparkling ponds, cover constructions for betel leaf plantations and occasional semi-bare breasted women aloofly covered in wash worn, but colourful saris, it is easy to become romantic and nostalgic, feeling almost caught in a National Geographic photo spread. And then, a cell phone rings.

Cellular phones are becoming increasingly common on Sagar, as in the rest of India. While landline phones have never been widespread in the region due to the same challenges that have delayed the access to electricity in general, cell phones have become an integrated part of life. And with them, people have gained access to

communication lines that were completely out of reach just a decade ago. When asked if they know anyone with a cell phone, all my informants laugh and nod, as if it is the most natural thing in the world. They all have one, as do their neighbours and everyone else they know. It seems it is harder to come across someone who does *not* own a cell phone than someone who does, although the household often share the one phone they own (Survey 2010:17.1vii, n=200). Admittedly, most of my female informants are from the areas around the main road, but even in the more remote villages and habitations, it is common to see both men and women holding their phone in one hand and their work equipment in the other. It seems however, that the way men and women use the phone, may differ slightly. Men at least claim to use the phone partly for business purposes. In this way, the new technology contributes to more stability and predictable outcomes in local commerce, as small enterprises find it easier to gain access to information about market values, availability of goods, fluctuation in prices etc. Although most people on Sagar still do not have internet access, the mobile phone technology has opened up an information technology that undoubtedly increases the coping and management strategies of local businesses (Wilson and Heeks 2000:412-423, UNDP 2004:23). Women on the other hand, report that they use the cell phone mostly for social communication with their friends and family, from communicating with their relatives in other villages and cities to making appointments with friends and communicating daily practicalities with their husbands. *"Normal things",* as they would say with a shrug (interviews 23.11.09).

One woman did explain that they used the phone to look for a job for her son in Namkhana, one of the ports from where the ferries to Sagar leave and dock, but it was unclear whether she made these calls herself, or if anyone else in the family made them (Gopa Chakraborty: interview 23.11.09). I am inclined to lean towards the latter case, due to another remark made by the same woman. At sixty, she is still employed as a cook for a local organization, while her husband is retired (or unemployed). Thus, she is currently the main breadwinner of the family. But when asked who pays the bills, she says that she gives the money to her son, who pays them for her. Surely, this might just be a matter of practical division of responsibilities as she works every day

and her son has the time to perform this task. However, the way she explains it leads me to the interpretation that this is a male responsibility, and it would look bad for the family if she were the one to settle the bills even if she is the one earning the income. This corresponds with Winther's study of Zanzibar, where the wife contributed to the electricity bill after having obtained an electrical stove, but the husband would go to pay the bill in order to keep the image of the male provider publicly intact (Winther 2008).

4.1.3 Television and other leisure activities

When asked about what they do for leisure on their spare time, all of my informants are quick to mention television, and as they do, their eyes almost start shining. In the group interview, the women start chattering and laughing as the topic is mentioned, and the list goes on when they are asked to describe what kind of programs they watch. *"Everything!",* they laugh, and interrupt each other with suggestions and additions to the list. The other women and the male informants also reach a peak of interest for sharing at this point in the interview. It is obvious that this is a topic they are interested in themselves, and it is introduced at a welcome point after a lot of questions of technical and practical nature, about routines and habits that might feel boring to describe in detail. At the top of the list, the women mention Hindi and *Bangla* (Bengali) movies and soap operas, while men reach for the news, but both categories are mentioned by both genders. The National Geographic Channel, Discovery Channel and Cartoon Network are also mentioned more than once, and some mention Delhi news specifically, as well as emergency bulletins and cooking programs.

Many researchers consider television an extremely important source of information and training, particularly for women who cannot leave the house freely (UNDP 2004:23). However, it is obvious that television is an immensely important source not only of information, but also of entertainment, and family and friends all join together to watch at night time. When asked who decides what to watch, they all claim that they

decide together (but of course none of my informants are children, who might beg to differ). From my observations of television time, this seems to translate to reality, as it is considered less important *what* to watch than the act of watching in itself. In the situations I observed, the oldest woman in the room would hold the remote control, but the men of the household were rarely present at this point, and may take over when they enter the room. It is common to change the channel during commercial breaks, and they rarely seek to go back to the original show when the break surely must have passed. By then, they will be engaged in the next movie or program, until the next commercial break hits. This form of channel surfing may have something to do with the nature of Hindi and *Bangla* movies, which are traditionally just as much about the outfits, dancing and music, as the story in itself. During my two short stays in India, I have never seen anyone actually finish a movie they started watching on television, although this is of course not a fact founded in actual research. The tendency however, does seem to be a want for immediate glimpses of entertainment, rather than long spanned engagement in one movie or programme. The important thing is the aspect of unwinding, taking in almost whatever the channels will offer. TV time can be seen as a refuge, a breathing space in life, creating a temporary immunity from existing social relations (Rajagopal 2001:5). However, even if they wanted to watch the programmes in a more continuous way, due to the short hours of available electricity, most people cannot always choose what to watch and when to watch it. People with individual solar homes have this liberty to a greater extent than the consumers of mini-grid power, but in general there is an expression of wanting more electricity to be able to watch more freely.

> I go to committees. We talk. No dancing! Haha!
>
> Gopa Chakraborty (60)

When not watching television or performing household chores, some women engage in community activities through local women's clubs. One of the women reported that she was a member of a money collect group, where they all added small sums of money to a common pot, from which they could borrow money for specific needs and

pay it back with low interests. This kind of micro-scale loans from friends and acquaintances reduces the need for banking loans with higher risks which might be difficult to obtain, and was in this case also a social arena for meeting other women. Aside from this, most other leisure activities outside the home seem to be enjoyed primarily by men. Market hours are also time for visiting tea shops, where the men have local *chai* and biscuits while they converse, play cards and socialize with other men. However, the men of Sagar are also quite socially aware, and most of my male informants participated in some kind of community activity on their spare time, through clubs, committees or affiliations with the *Panchayat*.

4.1.4 Education

Education is one of the fields where Sagar jumps off the charts compared to most other communities in the region. Even for West Bengal, a state with a relatively high primary school attendance[30], Sagar is exceptional with its staggering 90,4% literacy, against only 74% in Moushuni, another Sunderban island (Survey 2010:4.1). It is worth noting that the high level of literacy is not only amongst the young generations. All of my informants, up to the age of 72, were literate and had at least some formal schooling. In fact, 35% of the respondents on Sagar have completed secondary school in addition to the 47% who have completed primary school education, against only 14% having completed secondary education on Moushuni (Survey 2010, 4.1 n=194). On Moushuni, 62% of the respondents had only completed primary school, while as much as 24% had no formal education, and none had attended higher education. On Sagar, only 8% had no education, and 7% of the respondents had higher education past secondary schooling. The numbers correspond well with the literacy rates, although the number of people who claim to know how to write (92.6% on Sagar) is slightly higher than those who say they know how to read (Survey 2001:4,4.2, n=194). A possible explanation for this discrepancy is that knowing how to write may be a question of definition, and those who know how to write their names and perhaps a

[30] In 2001 the literacy rate was around 69% in West Bengal, with a school enrolment percentage of 84,6 % in the age group of 6-11 years (Rana et al. 2002:14 in Jha 2003:2839).

few necessary words may consider themselves as capable of writing, but not necessarily of reading. All my informants were crystal clear in their responses that school enrolment is compulsory and a necessity, and two of the most respected men on the island that I interviewed were in fact headmasters. One of them, Mr. Partha Mukherjee, came from a poor background – "*a BPL family*" -, and had been taken in by the Ramakrishna Mission (RKM), who offered him a proper education. For this, he said he was eternally grateful, as he was now a learned and respected man who had the opportunity to offer his own children all of that which he wanted as a child, including the security of a higher education.

> I myself belonged to a BPL family of people who needed benefactors. In our childhood we had to study with kerosene. During extreme heat at night, we had no fans. Now we keep a small fan. We can have a sound sleep. How can we work if we don't sleep? But most people don't have electricity at night. (...) Now I wish to recontribute and encourage the youth. We must speak to them, and mix with people. A teacher is not a preacher, but a helper! (...) I live by the words of Swami Vivekananda of the Ramakrishna Mission: Be good and do good to those who are trying to be good. You see?
>
> Partha Mukherjee, local headmaster, 14.11.09

In addition to the primary and secondary schools on the island, there are a variety of evening classes, often arranged by the Local Clubs. Some of these are extensions of the regular education, offering extra tutoring hours of different subjects to the students who want it or need it. Other forms of evening classes are for adults, where they receive training or information about certain topics. CBOs and NGOs sometimes give classes on issues related to their own efforts, and there are various committees and community meetings, which do not exactly offer education per se, but are just the same arenas for passing information and knowledge through discussion and announcements. Evening classes help raising awareness of relevant issues, in this way possibly contributing to both enlightenment and empowerment.

4.1.5 Health and well-being

> [Health should be defined as] a state of complete physical, mental and social well-being and not just the absence of disease.
>
> The United Nations World Health Organization (WHO)[31]

All my informants state that they see a doctor when they get sick, but they do not all refer to Western medicine[32]. My female informants from the group interview agree that if they get sick, they first see a '*personal doctor'*, and only if their health does not improve, they go to the hospital (interview 23.11.09). According to interviews conducted by the Solar Transitions research group, many say that with electricity, more people will go to the health centres (Winther 2010d:16). At the moment, the health centres are normally closed during the night, and only open 2-3 days a week, and problems that cannot wait have to be attended to either by private doctors or at the hospital. There are two kinds of doctors; the general physicians of the Western type, who provide tablets and pharmaceuticals, and the homeopath doctors, who are cheaper (Winther 2010c:13). In addition to the Western type and the homeopathy, there is a third kind of medicine used for particular problems, referred to as *oja* practice. This category refers to more traditional activities with aspects of 'magic', and is related to rituals like lighting of incense and the exorcism of ghosts. Typical *oja* cases are snake bites, fertility issues ("*if there is no baby*") and other "*ladies' problems*" (Winther 2010c:19).

The informants mentioned only one health centre which was connected to a solar mini-grid, but not with a 24-hour connection. Some expressed concern about the lack of medical personnel, and it is an overall problem that the health services are not provided with adequate equipment. Electrifying the health centres could contribute to more complete services, such as fridges for storing medicines, sterilizing equipment and longer opening hours, preventing the need for long travels outside the island in order to get treatment. Increased electrification may also impact people's health in

[31] WHO website October 30 2010 URL- http://www.who.int/bulletin/bulletin_board/83/ustun11051/en/

[32] Western medicine is here used in contrast to homeopath or local medicine, and refers to chemically produced pharmaceuticals and formally trained medical staff.

other ways, such as improving visibility at night and facilitate mobility. During the daytime, women seemingly move around freely in their immediate surroundings. Many young girls ride bikes to and from school, and women are often seen on the backs of motorcycles, balancing elegantly and seemingly effortlessly, even when their hands are full and a child or two are placed on their laps. At night, street lights have improved at least the theoretical opportunity for the mobility of women in particular, which will be discussed further on in the chapter.

The 2010 survey and the information from my informants indicate that the people of Sagar are unusually well educated, community oriented and ambitious regarding the future. And now, the future seems brighter than ever, in the literal understanding. An increasing amount of people has access to safe, high quality electric lighting, and people express their unanimous content with the development. Their only hope is that they will have unlimited access to light and power sooner rather than later, as the social impacts of these are considered almost exclusively positive. I will now identify some of the ways the above mentioned social arenas correspond with the introduction of electrical power, focusing on light in particular.

4.2 The importance of light and power

The population of Sagar welcomes the efforts to increase electrical supply with open arms. According to former director of WBREDA, now director of the Board of WBREDA, Mr. Gon Chaudhuri, people in the Sunderbans were initially sceptic towards solar energy (Gon Chaudhuri: interview 14.02.10). The common view was that it could not possibly work, but the *Panchayat* decided to allocate land for two power plants anyway, as they were starved for electrical power. When they saw that the solar photovoltaic power plants (SPVPP) did in fact function according to the promises of WBREDA and Mr. Chaudhuri, demands started coming in from all corners of the Sunderbans. According to Mr. Chaudhuri, they started to see him "*as a god*", and after this it was easy to gain their confidence and introduce new energy efforts to supply larger parts of the population (Gon Chaudhuri: interview 14.02.10).

Most of my informants expressed that their lives have improved greatly over the last decade or so, after receiving solar power. Some note that they used to be poorer, but the explicit correlation between solar energy and economic growth is not apparent in all cases. The most common explanation as to why their lives have improved is that they now have light, fans and television, which they did not have before. These are the three most common electrical appliances that are made available with the three or five point power supply from the mini-grids or solar homes. The notion of an improved quality of life seems to be uncontested, and my analysis acknowledges that the people on the island are in unison when it comes to their views on this matter. Their only complaint is that the power they receive is not sufficient to meet their wants and needs, and they are all pressing for 24-hour connection. In the upcoming sections I will present some of the factors that are specifically affected by the access to light and power.

4.2.1 Traditional cooking and new responsibilities

Many women on Sagar do most of their cooking outside (TERI staff: interview 02.10) but this does not apply to all women, all the time. I have observed cooking both outside and inside the kitchen, and assume that the practices vary according to habits, and not the least, facilities. In the majority of the households that were interviewed by the Solar Transitions researchers, the men had decided where to install the electric light, and the kitchen is not always a prioritized area (TERI staff: interview 02.10) Some women try to finish all their cooking outside during daylight hours, while others have to struggle in the kitchen with kerosene lamps. The kerosene lamps are not only more dangerous in terms of unsecured fire, but have also proved to have negative health impacts, like eye damage and respiratory problems (i.e. Chakrabarti and Chakrabarti 2002:41, TERI 2009a:3) Households that have electric lighting in the kitchen area, claim that the women can save up to half an hour on every meal due to the improved quality of light, as they are able to perform the tasks of cooking faster, and they do not have to move the light around all the time (Winther 2010c:19-21). For

this purpose, the solar lanterns may be an optimal solution. When mini-grid power only offers three points for light, fan and television, the men do not always choose to put the one light in the kitchen. But with the solar lantern, women can bypass the power from the grid supply, and control the use of light on their own premises. Hanging the light from the roof provides light approximately of the same quality as the grid power, and they are also able to control the intensity of the light and hereby increase the hours of light if they reduce the intensity. Finally, the expenditures on the solar lanterns rarely exceed the expenditures on kerosene, and so the lanterns represent a significantly more viable option for the future. However, there are some factors that perhaps should be taken into consideration.

> About 1.3 million people – mostly women and children – die prematurely every year because of exposure to indoor air pollution from biomass.
>
> OECD/IEA 2007:419

Cooking indoors with firewood can lead to a variety of health problems, like respiratory diseases and eye problems, and may even have fatal consequences (UNDP 2004:17). While some women have started using gas for cooking, none of the women I spoke to had tried an electrical stove, and none expressed a particular wish to do so. They claim that the food tastes better with firewood, and this is the only time my female interpreter actually meddles in and joins the conversation offering her own view, agreeing with the women that this is in fact so. In Winther's study, the Zanzibari men in particular also expressed their preference for food cooked with firewood, because the food was cooked slowly, whereas the electrical stoves are harder to regulate (Winther 2008:190,197,205). Nothing thus implies that a shift to electrical cooking is going to happen in the near future, and former development projects involving the introduction of 'modern' stoves have shown that the adoption of such a profound change in domestic practises do not occur easily (Crewe and Harrison 1998). This could essentially mean that a lot of firewood and biofuel cooking could be moved inside as there is no longer a struggle to finish the cooking before dusk. This would eliminate some of the improvements in the indoor climate due to reduction in kerosene usage. In a worst-case scenario, this move could eradicate the positive health impacts

of switching to electricity when it comes to respiratory conditions and clean indoor air. This aspect will have to be investigated further to discover if these gloom premonitions hold any truth, and what measures could be taken to avoid such a scenario. What can be considered a fair assumption is that the introduction of electricity has and will continue to reduce the consumption of kerosene, but not of firewood or biofuel.

When it comes to access to clean water, many places in the Sunderbans may benefit greatly from electrically run water pumps and water distillation plants, such as Moushuni Island east of Sagar. On Sagar however, hand driven water pumps have been available for decades, and the impact of electricity on water access is therefore non-existing or indirect and hard to determine. The market area on the other hand, is certainly booming after sunset, and has extended its hours after the introduction of electricity. This relieves some of the time pressure on women, who no longer have to race against the clock to finish all their chores during daylight hours. It also holds an advantage in terms of food conservation, as most foodstuffs will expire faster when subjected to strong sunlight over several hours. Being able to display and sell the goods after dark, less food is lost to heat degradation, which may also have positive economic implications. However, the main market areas and clusters of shops on Sagar are still almost exclusively run on diesel generators, and have not yet incorporated solar energy as a dependable source of power (Guhathakurta: interview 15.11.09) – and now with the arrival of mainland grid power in the near future, it is hard to imagine that they ever will.

4.2.2 Higher technological demands in a globalized world

> Oooooh! You G-mail – me G-mail!
>
> Adeep Guhathakurta 15.11.09

While cell phones have become an integrated part of society, the Internet still represents a world of mystique for most people on Sagar. Many of my informants

claimed never to have heard about it (Although I cannot outrule that there may have occurred a loss in translation, I did attempt to explain the concept in fuller sentences), and almost no one had ever tried it. The assumption of the Internet being an unfamiliar technology was backed up by the Solar Transitions Survey, where 72,5% of the respondents reported not to have heard about it (Survey 2010:24.13, n=200). I was told by Mr. Partha Mukherjee that there was a secondary school in the area that had a connection (but was not able to confirm this by visiting the school), and some of the high ranking men expressed some interest in increasing internet access on the island, but as per November 2009, internet skills were almost non-existing. However, as people are adapting to all the newly available technology, they are demonstrating an increasing interest in what else the world has to offer. This means that few villages want to make do with the few hours of solar power under the understanding that "*something is better than nothing*", as they would back in 1996 (Chaudhuri: interview 14.02.10). Technological awareness and curiosity is increasing, and people express a wish and willingness for taking part in the outside world – hence the joy and excitement of my male interpreter when he saw some of the e-mails I had printed out. With an ecstatic expression he hurried into his office and pulled out a pile of papers, among which was a printed invitation to a seminar, with the Gmail logo in the upper left corner. This common feature tied us together in a way that included him in my technological world of gadgets and chargers, which I sometimes felt the need to understate during my stay.

The charging of cell phones is also an aspect that needs to be considered by electricity suppliers to a completely different degree than a decade ago. Now, everyone relies on their phones, and need access to charging power on a regular basis. Some shopkeepers with electrical supply have added cell phone charging to their line of business, and this way add to their income (Winther 2010c:17;33). For the future, people would like to ensure that they have an extra point for this purpose without 'stealing' power from the other appliances, and in the technological development of solar equipment, cell phone charging is receiving more attention as a basic need.

4.2.3 Television – a bridge across societies

> People are influenced on how to dress, how to behave, how to live, from TV. We also get an idea of how much the country has developed. In the villages, they live in quite a backward way. We would eat rotis on the floor, or on the charpoy. But TV tells us what to do and when.
>
> Amar Singh, airport worker, quoted in Rajagopal 2001:127

Although television hopefully does not possess an absolute power to mainstream and shape society in this hierarchical way, there is no point in negating its strong presence and powerful role in the world in general, and Sagar alike. And in a small, remote place like Sagar, where the tide and geographical circumstances until fairly recently made any mainland contact quite difficult, the introduction of television changes life drastically. The TV becomes a 'window to the world', which offers a stream of mesmerizing images of the unknown, making the strange familiar and the familiar exotic. Family and friends can enjoy each other's company in a sort of separate togetherness that does not demand much of anyone. Television brings them together in an effortless way, and it also brings them closer to the outside world in a dual way; 1) through the images that reach them inside their own homes, and 2) through the shared stream of communication with other viewers, engendering a shared sense of intimacy across social boundaries (Rajagopal 2001:5). Many people report that they have fewer fights with their family members, because the television offers a distraction to their quarrels and indifferences. Standal found indications of less domestic violence after the introduction of electricity, both because the women were able to perform their duties faster and better, and due to the distractional value of television (Standal 2008).

The assistant director of WBREDA, Mr. Sushanta Biswas, even claims that the suicide rates have gone down as a direct result from the introduction of television (Biswas: interview 13.11.10). I have no research to back up this bombastic statement, but at least his explanation fits in with the way suicides are normally treated in Indian press. Suicides are often mentioned in small notices in the newspapers, along with what seems like extremely simplified reasons for committing them. On November 17 2009 the Telegraph actually reported a suicide spurred by a bad haircut (The Telegraph,

Kolkata edition 17.11.09)! Whether suicides are in fact committed on different grounds than we are used to in Western societies, or if the public is guilty of overlooking the deep desperation behind choosing such extreme measures is not a topic I can afford to delve into. It is suffice to note that television is perceived as more than just a source of entertainment, and the social impacts of its presence is acknowledged on many levels. Previous studies conclude that TV habits are becoming part of women's ways of constructing their modern identities, and impressions brought by watching news, series and movies might actually promote gender equality (Shaw 1994, Winther 2008:206). There is a correlation between television and education, and TV is potentially contributing to the promotion of women's rights in the sense that their access to resources of information is crucial for female empowerment (Standal 2008:72, 82).

Through television, the people of Sagar have become more aware of their possibilities and opportunities. This also includes their attitudes towards electricity. Although few may be aware of their right to electricity through the Electricity Act of 2003[33], they know that people elsewhere have 24-hour access, and ask, why should not they? (Chaudhuri: interview 14.02.10). As time passes, people start to adapt to the commodities of technology, and WBREDA is currently experiencing difficulties meeting the demands of the consumers, and not the least, the would-be consumers. Moreover, people are no longer just asking for light – they want fans and television as well, and they need charging possibilities for their cell phones. These are still needs that can be met to a great extent by solar energy, but as the mainland grid power access approaches and more technology is made available, it is probable that solar alone will not be considered a desired option on Sagar in the years to come.

[33] The Electricity Act of 2003 extended the focus on rural electrification, including a National Policy for rural areas emphasizing the importance and need for stand alone systems based on renewable and non-conventional energy sources. (Ministry of Power, Government of India website, November 15 2010)
http://www.powermin.nic.in/acts_notification/electricity_act2003/preliminary.htm

4.2.4 Light for enlightenment

> We are giving literacy to the village
>
> Sushanta Biswas, Assistant Director of WBREDA 13.11.09

Of all the arguments in favour of electricity and the solar lanterns, the 'study light argument' is the most reoccurring. TERI, WBREDA, RKM and many consumers refer to the importance of light when it comes to the study hours of children (i.e. TERI newsletter:2;Renewable Energy/Akshay Urja 2007:29) With proper electrical lighting, children have significantly improved opportunities to do their homework at night without straining the eyes in kerosene light or having to make do without light altogether. According to another survey, children on Sagar now get an average of an additional 2.25 hours per day for study (Chakrabarti and Chakrabarti 2002:40). It is argued that improving the conditions for studying in turn leads to improved results in school, and the quality of the education all across the line. Interestingly, however, when I asked my informants when and where the children of the household did their homework, the answer was never inside, at night! Most claimed that they finished their homework right after school, often outside, meaning that there would be no need for a solar lantern or electricity as such for this purpose. I also noted that one of the few informants who did not reach for this bullet phrase about study light, was one of the headmasters, who claimed that electricity had had very little impact on his school, as the power supply was not available during school hours (Sabir Bose: interview 13.11.09). A third notion that came to mind, was the fact that many households only have one room in addition to the kitchen and sometimes very small bedroom, and during these so-called study hours, this room will be occupied by friends and family members watching television. In households where they are free to regulate the use of electricity, such as SHS or mini-grid consumers, they often turn off the lights or reduce the hours at night in order to save power for the TV. This way, the access to electricity could in fact contribute to the disruption of study hours rather than facilitating them[34].

[34] This coincides with findings from Kenya, where power for television is favoured over study light (Jacobson 2006:147).

In this sense, the solar lanterns could prove a better and more viable option as a source for study light than installed electrical lighting run by points.

On a first glance, it could seem that the 'study light argument' does not hold water in the real world, although it is a nice thought that solar energy efforts should improve the education of local children. There are however a few factors that prevent me from writing off the importance of light in this context. First of all, my informants are mostly from areas near the main road, representing the 'urban' population of the island, if one might call it that. Subsequently, their children normally live in the near proximity of the school, and hence arrive at their homes soon after the school day ends. This might not be the case for the 'rural' children, who could face a longer travel and arrive closer to dark. For these children, the lantern will be significantly more useful. Secondly, it is fair to assume that the older children of secondary school have longer days and do their homework at a later hour. Teenage girls also have household responsibilities to tend to after school, which could mean they will have to postpone the study hours until night time. Thirdly, one may reach for the argument of Amartya Sen concerning the *opportunity aspect* (Sen 2009:228-30). Even if the children do not make use of their opportunity to study at night, the lantern offers them the possibility to choose to do so. If a solar lantern is available, the reason for not studying at night will not be due to the lack of sufficient light. If a change in the daily schedule should prevent them from finishing their work during daylight hours, the lantern provides an adaptation capability that ensures their opportunity to finish it all the same. This way, the *comprehensive outcome* of having access to the lantern is a value in itself. Finally, I did observe a small boy at the RKM charging station who picked up two lanterns right after school. According to the SLCS manager, he comes every day directly after class, taking one lantern for himself and one for his mother to use in the kitchen (Tanay Satra: interview 23.11.09). Although the charging stations did not rent out all their lanterns on a daily basis in November 2009, the demand was increasing, and the significance of the lanterns was on the rise. According to TERI and RKM sources, several evening classes are also starting to rely on the lanterns. Although they do not

fit exactly into the ‘study light argument’, there is definitely a value to be found in well lit classrooms for night time education and training.

4.2.5 Energy for health and security

So far the health clinics have not been among the primary beneficiaries of solar energy, although there is a theoretical market for improving health services through the introduction of electricity. Cooling systems may contribute greatly to the conservation of medicines, and lighting facilitates operation and management in the night time. However, there are few traces of solar driven fridges or coolers anywhere on the island, perhaps due to the low availability of hours and the instability of the service. In fact, not one of the 200 respondents of the Solar Transitions Survey reported to have a fridge (Survey 2010:17.1viii, n=200). This is a possible area that could undergo change when mainland grid power is introduced, or even as solar electricity becomes more widespread and developed elsewhere in the Sunderbans. For the moment, the few health clinics with access to electricity run on diesel generators, as they rely on 24-hour connection.

The wife of an *oja* doctor states in an interview that electrical lighting is helpful when people come to see her husband in the middle of the night for help with their problems (Winther 2010c:19). Not only is the quality of the light better, but it is superior to kerosene especially in the hot season, when the wind circulation makes the kerosene lamps difficult to use. In this way the use of solar lanterns facilitates the traditional work of ‘magic’ medicine, making traditional and modern tools and activities meet and benefit from each other[35]. If the *oja* doctors benefit from the electrical light, it is fair to assume that other kinds of doctors who receive house calls are also likely to benefit from the switch to solar lanterns or other electrified lighting sources. This of course includes the health clinics as well, but the fact that they are only open 2-3 days

[35] The terms ‘traditional’ and ‘modern’ refer to the time span the tools and activities have been available and considered an integrated part of society, and do not imply a ranking.

a week could indicate that there is a lack of financial means and infrastructure to run them full time.

Specific Human Development Index (HDI) numbers or other statistics that show measurable improvement in health on Sagar are hard to come across, even for limited fields such as primary and maternal health. One survey that was carried out on Sagar and described by Chakrabarti and Chakrabarti in an article written in 2000 and published in 2002, states that 21 per cent of the sample households reported that their family members suffered from eye problems due to kerosene usage, and there is a probability the shift to solar lantern would reduce these numbers (2002:41). A more extensive study on the direct and indirect health impacts of light and power would be a great contribution to the research on electricity on Sagar and the correlation between energy access and MDG goals and targets. In section 4.1.5 we saw the potential for positive health impacts due to street lights. This was confirmed by more than one of my informants. The increased security experienced by the population on Sagar after the introduction of street lights hold both social and health related aspects.

> Now, people sit under the street light, play cards and socialize. With the light, there is less anti-social behaviour. If there was light everywhere, it would change people's behaviour. You see, this is simple people. They work, and rest. Literacy is about 90% - if they can, people will work more!
>
> Partha Mukherjee, local headmaster, Sagar, 13.11.09

The solar powered street lights that now light up the roads in many villages make night time travel a safer practice. All the women I spoke to, claimed that they feel safer moving around after dark now that the street lights are in place, and several informants of both gender expressed a wish for even more street lights. I am not aware of any crime rates from Sagar or whether criminality has diminished since the introduction of street lights, but the sense of increased safety and less shady behaviour seems to be shared by the majority of the people I talked to. Mr. Partha Mukherjee stated that women feel safer and more protected against rapes (interview 14.11.09). The increased mobility of women is a clear improvement in Sagar women's opportunity aspects, and

represents a noticeable freedom and promotion of rights, even if this was not necessarily the primary aim of the installations. Several studies emphasize the importance of women's mobility as a prerequisite for their freedom, and the example from Sagar falls in line with these (Chakrabarti and Chakrabarti 2000:41, UNDP 2004:17, Standal 2008:75-6). Not only do the lights improve the sense of security in terms of human dangers, but they also protect against animals. Mr. Biswas of WBREDA also claimed that there had been a reduction in snakebites on the island after the introduction of street lights, an explanation that is easier to accept unquestioned than the link between television and suicide rates (Biswas: interview 13.11.09). The mortality rate due to snake bites is considerably high on Sagar, but proper lighting can prevent these accidents. Visitors to the island are encouraged to always apply snake repellent and use mosquito nets when going to sleep, and the solar lantern could be an important tool for checking the beds and corners of the room, among guests as well as the local population[36]. The only hospital on Sagar that treats snake bites is the Sagar Gramin Hospital. Local people however, seem to prefer the *oja* remedies. *Oja* is used for protection against the ghosts that are thought to inhabit the island (Winther 2010c:19). This could indicate that the snakes are in fact associated with ghosts, and light becomes a way to fight evil powers. In a similar way, a study by Standal from rural areas of Afghanistan showed that people in the areas she visited related to the danger of wolves in an almost mythical manner (2008:78). Standal found few actual signs that the wolves represented a substantial danger, and argued that the references to the wolves might in fact refer to ghosts and spirits more the animals themselves. On Sagar, the snakes do represent a real danger, but also contain an element of the world of darkness – symbolically as well as literally. The street lights, dubbed *security lights* in both Afghanistan and Zanzibar (Standal 2008:78, Winther 2008:136-8), inherits a potential of remedying so-called 'traditional' fears and threats with 'modern' means. Similarly, the solar lanterns can be carried as a torch along the roads, and provide a sense of safety in and around the house at night. Light, in this

[36]Bengal Spider website November 11 2010 http://www.bengalspider.com/resources/2474-Sagardwip-Beach-Tourist-Spot-Bengal-Sagar.aspx, Department of Sunderban Affairs November 22 2010 http://www.sadepartmentwb.org/Tourism.htm

way, increases the opportunity for mobility and well-being, and protects against dangers on Sagar of various kind.

4.3 Views on life and opportunities now and in the future

4.3.1 'The good life' and material goods

The women I met on Sagar in general did not express the need for great material goods. When I asked what they need in order to live a good life, the answer was almost always that they *have* a good life - their family is well, their children are healthy, education is available and there is enough food. There is the possibility that it would be considered greedy or ungrateful not to give this answer, but the reply corresponds with my all over impression of the islanders. However, according to the survey, 66,7% of those who answered the question, said that farming does not produce enough food, and only 8,9% of the respondents would sell any of the food they produced (ST Survey 2010:10.9, n=153). The question of food scarcity could prove to be more nuanced than portrayed in the positive outlook transmitted by the qualitative interviews. Also, in my interviews, the men are quicker to mention the need for better infrastructure, more electricity and better health support. Women often join the men in the urge for more electricity when the topic is more explicitly introduced, but do not immediately express the need as a prerequisite for a good life. What did surprise me a little was the fact that almost all my informants, men and women alike, stated that the most beautiful place on the island was the capital, Gangasagar. Some of the men mentioned the temple that is there, which is a site for pilgrims and considered very holy, but the women agreed that it was the best place because they could "*get everything [they] need there*" (interview 23.11.09)[37]. On an island filled with such natural beauty and impressive landscape, it is interesting to note that the capital should overshadow all this and be considered most beautiful. Of course it is common to

[37] Douglas Torgerson (1999) has written about the human/nature relationship and the value and perception of *space* and *place* in different cultural contexts, and notes that the ideas of indigenous values as portrayed by Green politics do not always correspond with the way 'traditional' cultures relate to *place* and the prospect of modernity.

become blinded by the normality of everyday sights, but the answers also indicate a positive attitude towards modernity and material goods.

The survey reflects the urge for practical, material goods when the respondents are asked what is the most important thing they need in order to live a good life (27.2, unsorted material, n=200). The absolute majority of the respondents list electricity, health services, roads, stronger riverbanks and food, while only a few suggest answers like unity, cooperation and discipline. The survey does not show the gender of the respondents in this table, but I find it interesting that the Solar Transitions team should get such straight to the point, material wants for answers, while my informants seemed to portray satisfaction with life as it is. There are several plausible explanations, one being that a team of experienced international researchers may have an air of authority that could make the respondents feel like they could be of real assistance in helping them achieve their desires. Another possibility is the difference in data collected through qualitative and quantitative studies. A large survey with numbered questions and a rigid set-up may produce more mechanic answers from the respondents than an informal setting where the conversation runs more freely. Admittedly, my interviews with the women were not as open-ended as I could have hoped for, but the flow of the conversation was still kept to a certain degree. I do however have to consider the fact that in most cases other people were present during the interviews, and so the lack of material goods or wanting more things in life might have been difficult to express for the women in question.

4.3.2 Local conceptions about solar and the future

> Consumers are not interested in energy per se, but rather the services it delivers.
>
> Wilhite: lecture 28.08.08

There are some discrepancies in the conclusions about the common view of solar energy versus diesel, and people's allegiance to one or the other. While some studies claim that people are willing to pay more for an environmentally friendly power source (Chakrabarti and Chakrabarti 2000:41), most explanations for energy choices

are founded on financial concerns. People who have received subsidized solar energy explain its superiority over diesel by the lower costs, while people who rely on diesel claim that they cannot switch to solar energy because it is too expensive. There is little that indicates that people choose solar over diesel due to environmental concerns, and many households do not rely on one energy source alone. The husband of the female SLCS manager in fact sells diesel for a living, and while they have an individual solar system installed at the house, they also rely on fossil fuels, in addition to the two solar lanterns she brings home every night (Ajanta Sen: interview 22.11.09). The general opinion seems to be that the need for energy supersedes the need for *clean* energy, and exposed to the opportunity of a coal-based 24-hour connection, no one will be likely to choose solar energy out of environmental concerns. When my informants express that they have got "*better lives with solar*", my impression is that they are in fact saying that they have got better lives with *electricity*, no matter where it comes from.

The solar lantern could however stand at greater chance to survive if and when the mainland grid-connection arrives, due to its relatively low cost and high mobility. The lantern can be moved around outside as well as inside, and its use can coincide with whichever other electrical appliance that might occupy the power source. The lantern does not stand at risk of power cuts, and would supply the household with light even in case of grid-connection problems due to maintenance issues or weather conditions. Similarly, the solar street lights have the advantage of functioning off-grid, providing the possibility of light in areas that will never reach grid-connection due to low demographic numbers or remoteness. The sustainability of solar energy for lighting options may thus be more viable than the use of solar for other energy needs in the event of grid-connection or other energy options with increased supply. This is more likely to be of importance for the future consumers than the environmental advantage over kerosene, although the people of Sagar are not entirely oblivious to environmental concerns.

> In school, we heard the story about a little Dutch boy, Hans, who discovered a hole in the dam and sat down and held it with his hands to keep the dam from bursting. Hans is our hero, a global hero. He tried to save his country with the little means that he had, as must we. Climate change cannot be stopped, but we must prevent it as best we can.
>
> Partha Mukherjee, local headmaster, Sagar Island, 14.11.09

The questions about abstract concepts like climate change and global warming posed the most difficulty in the interview situation, as my interpreters struggled with the meaning of the words. Often, I would get answers like "*the cold season is better*" before I was able to convey the question in a more specific manner. According to Mr. Partha Mukherjee, many people are aware of the concept of climate change, but they do not fear it because they feel that their gods will assist them. This claim was neither supported nor denied by the other informants, but few people seem to be significantly worried about climate change issues of the global scale.

The issues of land erosion and health problems are more graspable, and environmental awareness schemes stand at greater possibility to succeed if they focus on the direct local impacts of climate change and the possible mitigation of these. The rising sea level in the river delta has caused several small islands in the area to disappear completely, as the river widens and swallows great pieces of soil (Gopinath 2009). There are local efforts to mitigate the land erosion by the plantation of mangroves in the exposed coastal areas (Gopinath 2009:559). The *Panchayat* on Sagar pays for local climate mitigation in the shape of mangrove plantation. The deep and infiltrated roots of the tree allegedly bind the soil together and protect the shoreline against the erosion. Mr. Guhathakurta brought me to see both the plantations and the *Panchayat* office where people came in to deliver their slips and receive money for their efforts on November 15 2009. The fact that they are paid, might question the real drive behind the efforts of the mangrove planters, but if everyone is not immediately concerned about the effects of climate change, at least some people are. Mr. Mukherjee has bought a piece of land outside Kolkata where he plans to live with his family when he gets older. The purchase was mainly an investment in the future of his children, because he fears the erosion and rising sea level may have made the island

uninhabitable by the time they get old (interview 14.11.09). No one else expressed this degree of concern for the future, in spite of the acknowledgement of the erosion problem by the local *Panchayat*. An elderly man did however claim that there is a shift in the weather patterns in the area. There is lack of rain in due time, and the temperatures get higher in the dry season. Both the elder man and Mr. Mukherjee men also mentioned the cyclone *Aila* as an example of climatic threats. They feared that more cyclones and extreme weather conditions would occur more often in the years to come, which will be a disaster for crops and plantations (Jaydeeb Jana: interview 13.11.09; Partha Mukherjee: interview 14.11.09).

People receive information about climate change and global warming through the news on television and in newspapers, but do not seem particularly worried about the impacts. Perhaps this is due to the clean, rural surroundings, where industry and pollution seem like aspects of a different world. However, the Sunderbans constitute a high-risk area in terms of their geographic locality. Not only have large areas of land been swallowed due to the rising sea level, but the river delta also becomes increasingly shallow as its arms widen and spread out. Investigations have shown that people become climate refugees, having to move from their land due to erosion, and as the rivers run shallower, it is harder to manoeuvre by boat, making commercial and private fishing more difficult[38]. The correlation of the phenomena is however seldom recognized by the local population, at least not to an extent that makes them call for immediate measures. When people opt for solar energy sources, their decision is based on more quotidian concerns, like monthly expenses and availability.

4.4 Chapter conclusion

There is no doubt that life has changed on Sagar after the introduction of electricity. It is important to note that in some cases, the electricity that is available is not powered by solar energy, but rather diesel generations, wind parks, the hybrid plant etc. In the

[38] CSE website December 5 2010. URL- http://www.cseindia.org/node/640

case of my informants, my questions were specifically directed towards solar energy, but in some of the overall observations regarding social impacts of light and electricity it is not always possible to exclude the presence of other energy sources completely.

One aspect that is becoming clear in my research is that people are almost exclusively happy with the changes brought by the solar energy efforts, except the instability and low availability of the power. Most people are to a certain extent aware of the environmental advantages of solar energy, but at this point they are driven by cost and access, and a 24-hour connection will be favoured over an environmentally friendly connection. Television and modern communication influence the islanders and their outlook on life, and as the awareness of opportunities increases, so do the demands for more and more stable power. Even though men make most of the decisions regarding grid or mini-grid power, the solar lanterns present women with an independent lighting option, not confined to the placements of points inside the house. The next chapter deals with female involvement in the solar efforts in a more specific manner, as I investigate how women take part as active agents in the LaBL campaign and solar related enterprise.

V. OPPORTUNITIES AND CHALLENGES FOR WOMEN AS ENTREPRENEURS

5.1 Women's role in the LaBL campaign

In Chapter 4 I sought to identify some of the ways the introduction of electricity, and particularly electrical lighting sources can potentially change women's lives. In this chapter I deal with women's role more specifically in one of the efforts that involves them in a very explicit way. The Lighting a Billion Lives (LaBL) Campaign aims to address women in a dual way; 1) as subjects and beneficiaries of a targeted action, and 2) as active agents and participants in the implementation of this action plan (TERI 2009a:1). However, also as beneficiaries, women have been assigned an important role as agents and contributors, as part of the intended outcome is to increase the number of female entrepreneurs and enable women's commercial activities after daylight hours.

This chapter presents an outline of the presumed advantages of female entrepreneurship and the characteristics of female enterprise on Sagar, both directly and indirectly linked to the LaBL campaign.

The notion of women as more attractive local entrepreneurs due to their proneness to reinvest in areas benefiting the family and community, has gained terrain over the last few years (Potter et al. 1999:188, Akshay Urja 2007:28). The 2006 Nobel Peace Award to Muhammad Yusuf and Grameen Bank rewarded the investment in micro-credit loans for women, leading to increased female entrepreneurship in the South and subsequently, female empowerment[39]. TERI have founded their flagship campaign on these same principles, creating a system intended to enhance female involvement at implementation level as well as inspiring female business efforts to strengthen their financial independence and overall economic growth (TERI).

In this chapter I focus on two types of female entrepreneurship; 1) The Solar Lantern Charging Station (SLCS) management, and 2) The individual enterprises that have surged with the introduction of electrical evening light. The latter of the two is a group that has existed longer than the LaBL campaign, but that is expected to grow as the campaign spreads out and the advantages of the lanterns become more widely known and accepted. The data on the SLCS managers is primarily derived from TERI information material, an interview with Mr. Achintya Sett of the Ramakrishna Mission Headquarters in Narendrapur, Kolkata and two interviews with a female station manager, carried out in November and February, by myself and the Solar Transitions team respectively.

[39] It is impossible to mention the micro-credit strategy of Grameen Bank without mentioning the landslide of criticism the institution has received just in the last few weeks. A Norwegian television documentary showed a range of critique worthy practices, from dubious transfers of aid money to sky high interests that drive people into never-ending debt (Brennpunkt 29.11.10). However, the accusations of malpractice were not new to everyone, as the set-up has been criticized for years by a host of researchers who do not believe in the micro-credit model as an ideal solution for development (i.e. Goetz and Gupta 1996 in Pearson 2000:397). But criticism aside, it is an undeniable fact that the micro-credit strategy has been a widely accepted model that has influenced other strategies and policies during the last decade.

5.1.1 Women as solar entrepreneurs

> [My job consists of cleaning the lanterns and registering and charging customers. I take a lantern to the house myself every day, but we also have solar powered electricity at the house between 17.30 and 21.30. (…) Life is better now than it used to be, because we used to be poor, and now I feel more safe, secure. But it is quite hard work. I am also a housewife, and my baby is only 14 months. (…) I used to live near Gangasagar, but I came here for marriage. Now this is my home.]
>
> Ajanta Sen, SLCS Manager, 23.11.09

The primary reason for lifting up women as independent economic agents in the South was the extensive evidence that their income is almost exclusively fuelled into household needs, while men tend to spend a considerable part of their income on personal spending (Elson 1995 in Pearson 2000:395). These findings spurred the notion of '*smart economics*', correlating female empowerment with higher GDP and family living standard (Standal 2010:5)[40]. Using this as a backdrop for planning and implementation, TERI set out to incorporate women on all levels of the LaBL campaign. Their goal is to send local women for training to become technical managers of the Solar Lantern Charging Stations, in order to supply them with the knowledge and competence they need to run the stations[41]. The fee-for-service model is designed to inspire the station managers to actively seek customers, as they receive 1,5 of the 5 Indian rupees (INR) that it costs to rent a lantern for the night. Hence, the more consumers, the more income for the station manager. The work otherwise consists of cleaning the lanterns after use, making sure they are charged during the day, and keeping track of the customers and making sure they deliver the lanterns on time. The station managers employed through the RKM have applied for the position through a Local Club, which collaborates with the RKM, who again acts on behalf of TERI. This way, TERI uses a model relying on local (wo)manpower to run, implement and monitor the practical aspects of the LaBL campaign. In Afghanistan, the Norwegian Church Aid (NCA) has implemented a similar model, sending women for

[40] World Bank Site Resources December 5 2010.
URL- http://siteresources.worldbank.org/INTGENDER/Resources/GAPNov2.pdf

[41] TERI also sends men for training, but in this context I will focus solely on the female participants.

six months training in India to become 'Barefoot Solar Engineers' (BSEs)[42]. According to a study carried out by Standal in 2008, the training and employment has led to women's increased influence and status in their local village, and contributed to their self-esteem and empowerment (Standal 2008). The idea of using women as solar engineers envisions a female stronghold in the otherwise 'male' field of energy (Crewe and Harrison 1998:92), that normalizes female involvement in energy choices and promotes her to an 'expert status' in a future oriented field of desired appliances and social benefits.

5.1.2 Night time enterprise in solar light

The second type of female entrepreneurship is found in the increased business opportunities that arise when women are able to work at night. Many people on Sagar refer to the beadwork, stitching and weaving that women are now able to perform in the electric light, and that contributes to the financial income of the family. According to some, this female driven economic growth leads to a higher demand for electricity that is no longer out of reach for the consumers. When the first solar plant was installed on the island, few had the means to pay for more than the allocated hours of electricity, if even that. Fifteen years later, the islanders have climbed on the economic ladder, and have increased their purchasing power notably (Chaudhuri: interview 14.02.10). An important aspect of the possibilities for economic growth is of course the fact that Sagar is less isolated than the majority of the Sunderbans, especially in terms of the amount of visitors passing through due to the holy town of Gangasagar, which is a pilgrimage site. The pilgrims represent a customer base outside the local community, and as they flow through the island on a daily basis, the opportunities for selling gifts and souvenirs are nearly endless.

[42] The Barefoot Approach was initiated by the NCA in 2005 and aims to electrify remote rural communities through solar energy. One male and one female member of the community, often a married couple or otherwise related, are chosen to go to the Barefoot College in Tilonia, India for a six month training to become Barefoot Solar Engineers (BSEs). The inclusion of women is considered important for many of the same reasons stated by TERI (Standal 2008:40).

The evening light thus enables a drastic change in women's business opportunities, and women's contribution to the household economy is a social opportunity available even to households that are not connected to the generators or mini-grids. Theoretically, this means that even families that cannot afford the monthly payments of grid electricity, or who live off the grid-connected areas, have achieved more equal opportunities to improve their life situation on the island. There is still insufficient data on the specific correlations of electricity, female driven economic growth and the direct social benefits, but there are some indications that allow for a brief analysis.

5.2 Social impacts on and of female entrepreneurship on Sagar

The clear, overall opinion on Sagar is that life has improved since the introduction of electricity. "*We used to be poor*", is a common answer, and people with access to grid power or individual solar homes express their enjoyment of their light, fans and televisions. The exact reasons for the economic growth are harder to determine, but studies imply that the women's contributions have been important (i.e. Chakrabarti et al. 2000). Solar electricity for lighting has seemingly opened up a new world of social opportunities, whether powered by panels, points or lanterns. But what have been the impacts on the women themselves? Is the introduction of solar electricity really just the sunny story that is being conveyed through websites and pamphlets?

5.2.1 Family economy and expenditures

Through the LaBL campaign, women are given the opportunity to apply for work that may contribute to their increased social status and financial independence. But there is a lack of research on the actual circumstances of female economy. The woman mentioned in Chapter IV gave money for the bills for her son. It is still unclear whether the newly acquired income of women remains with them as their personal money, or if it is passed on to the male heads of household for them to decide and distribute where it should be spent. The idea that women reinvest in the family is just

half the equation if there is no certainty that the money is theirs to invest. According to the Solar Transitions survey, men account for 92.8% of house owners, and in the cases where women reported to own, they were more often than not widows (4.4%) (Survey 2010:15.4, n=200). The same question arises in the case of individual enterprise like jewellery, beadwork and other handicrafts. Although there are signs that indicate the impact on economic growth on the islands, the impact on the women's personal economy is still a grey area. Some authors have argued that in the case of South Asia, there is little evidence that giving credit to women diminishes intrahousehold gender conflict or leads to women's increased autonomy over economic activities (Goetz and Gupta 1996 in Pearson 2000:397). Their research indicates that the majority of the credit ends up in activities controlled by male household members, and all that women are left with is the social and moral responsibility of repayment. The outcome might be different in the case of personal income versus micro-credit loans, but the gender dynamics of a society is rarely changed by the flick of a strategic policy wand. If the money is in fact fuelled directly into the family economy run by men, the money may well contribute to improved living standards for the women, but not necessarily on their terms. We have seen that men for the most part decide where to install the points and lights when the house is electrified, and it is likely to assume that men control the majority of other expenditures as well. Expenditures that do not directly benefit the male parts of the household might stand at risk to be deprioritized. There are also some slight indications of men earning more than women for the same work, as the numbers show for betel vine cultivation (men reported to earn an average of 2575 INR per month, against 2166.67 INR for women). Of course, this may be coincidental or depend on external reasons like geographical area or local prices, but it is worth noting that men in general possess more money (Survey 2010:13.1, n=198/200 (cross-tabulation)). Also, women's work still tends to be unpaid or poorly paid, while men report higher earnings through activities such as husking business, poultry farming, rice business and rickshaw driving. This places the respondents of the survey at a 2115.38 INR average monthly salary for men, against 1500 INR for women.

The new livelihood opportunities constitute one side of the coin that contributes to economic growth. The other potentially important aspect is the savings made from converting the energy use from kerosene and diesel to solar power[43]. Most of my informants claim that they prefer solar over fossil fuels because it is less expensive. It is difficult to determine the actual cost of diesel and kerosene versus solar electricity because of the variety in subsidy schemes and fluctuating prices. A pattern that repeats itself in several villages is that a ration of kerosene (numbers ranging from 2-7 litres depending on the size of the household) is subsidized at about 9-12 INR per litre. The additional kerosene is bought on 'the black market', at prices from 25-40 INR per litre (Winther 2010a:4;7;Winther 2010c:15;34). Several households who receive two litres on the ration state that they spend four litres every month, meaning that the government ration only covers about half of the amount they use. Kerosene is also considered expensive, meaning that the amount spent is probably considerably lower than the amount they would like to spend for sufficient lighting. A rough estimate using the median numbers from these data, shows that a household receiving 5 subsidized litres at 10,5 INR per litre are likely to spend up to 212,5 INR per month (assuming a kerosene price of 32 INR on the black market). In comparison, the solar lanterns provided by TERI represent a cost of 5 INR per night, adding up to 160 INR per month (30 days). However, the cost of the solar lanterns is the same no matter the size of the household, or doubled if the family needs more than one lantern. The financial savings following a shift from kerosene to solar light is therefore not necessarily substantial, but the quality of the light and the hours of light provided by the solar lantern far exceed the kerosene lamps. Finally, previous studies show that several households report the scarcity of kerosene as a contributing reason for adopting solar energy (Chakrabarti and Chakrabarti 2000:39). Replacing kerosene lighting with the solar lantern removes the insecurity of whether light will be available at any needed time, as long as the demand does not exceed the number of lanterns in the local SLCS.

[43] The Afghan informants in the BSE study reported financial savings of this nature, contributing to growth in the family economy (Standal 2008:62).

5.2.2 Time use and double working women

During my short meetings with them, it was rare to hear the women on Sagar complain about anything, which may of course be the way they were brought up according to their culture and tradition. However, the one aspect that they expressed some frustration about, directly and indirectly, was their lack of time. The female SLCS manager employed by the RKM expressed that her job was very hard work because she was also a housewife and daughter-in-law with a 14 month old baby, which made it hard to fulfil all her duties during the day (Ajanta Sen: interview 23.11.09). In comparison, the male SLCS manager thought the work was easy, compared to his last job (Tanay Satra: interview 23.11.09). It could be that women are not used to having a job outside the home and the transition is difficult, but it is an undeniable fact that men have a greater amount of liberty after they finish their work hours, while women often have duties and obligations well into the night time. There has been a debate about the time constraints of working women in the Norwegian media over the last few years, describing the difficulties in making time for everything in a busy schedule (‘*tidsklemma’*, or 'the family trap'). The women on Sagar may move in a slower tempo as they go about their tasks, but the amount of responsibilities they carry would make the debates soar in a different cultural context. It is claimed that women cooking in the light of the solar lanterns or other electrified light can save up to 1,5 hours daily (Chakrabarti et al. 2000:8;Winther 2010c:19-20). This is a positive impact on women’s daily schedule, but there is still the question of how this surplus time is used. A World Bank report from 2008 states that although electrification of rural households leads to time savings in regular household duties, the total work burden of women is often increased (IEG/WBG 2008:45-6). Either the household chores are shifted to the evening hours, making room for other work activities during the day, or the extended hours of light are used for home businesses. The report also notes that in most places, the hours spent on watching television exceed the amount of time saved in household activities using electrical light. Both men and women on Sagar estimate that they stay up an additional 1-2 hours every day due to the availability of light (Survey 2010:23.17,23.18, n=194/150). Finally, the availability of television is actually thought

to decrease the study hours of children, although the TV may also provide educational benefits (IEG/WBG 2008:46).

It seems that the tendency is that electricity prolongs the day in terms of waking hours, adding to both working hours and leisure time, especially in the form of television. But although some men also work during the night time, for instance with betel leaves, shops or tea stalls, my observation is that men seem to gain more time for leisure, while women gain more time for work. During the market hours, men are to be found socializing in the tea stalls, while women are either shopping for their families or selling their goods. Men also seem to be more active in the local clubs than do women, who have a more limited social circle. The analysis is weakened by that fact that I have no access to material that proves that the majority of Sagar women spend their evenings working. According to the Solar Transitions Survey, most women spend their evenings cooking and aiding their children with their homework. 99,5% of the respondents said they cooked food after sunset seven days a week (Survey 2010:23.9, n=198), and only 9,4%, male and female combined, claimed to use any of their electrical equipment to earn an income (2010:23.2, n=138)! However, the respondents of the survey are not necessarily representative for everyone living on Sagar, as there are many rural informants and also informants from the island of Moushuni. Moreover, the survey mainly addresses consumers of mini-grid connection, and does not consider the solar lanterns in any extensive way. Thus, the numbers might look very different if the questions were addressed solely to consumers who rent their lanterns at a charging station, maybe for a specific purpose. Of course, there is also a possibility that women do not go to social arenas like the tea stalls due to cultural restrictions, and they might be home relaxing in front of the TV while their husbands and sons are out running the family business. But the fact that women's home businesses and strengthened economy is mentioned repeatedly by such a multitude of sources, both oral and written, does however lead me to believe that there must be some truth to the claim, which in turn points to a probability of double working women among this segment.

5.2.3 Empower or manpower?

> An apparent consensus may in fact be just the expression of a dominant view.
>
> Crewe and Harrison 1998:162

A final question that arises concerning the nature of female entrepreneurship under LaBL, is the role the women fill in relation to TERI. Firstly, I was a little surprised to hear that only 2 of the 16 Solar Lantern Charging Stations run by the RKM on Sagar have female station managers (Dahr, interview 20.11.09). According to the RKM, it is because women do not apply for the jobs, not because they do not get them. Women feel like they are not capable, or they realize the double strain they will be under if they take on the responsibilities of a paid day job in addition to their domestic responsibilities. Another issue is the fact that the women (and men) TERI have trained as SLCS managers on Sagar, have not received an extensive training like the Afghan Barefoot Engineers (Standal 2008), but only went for a one day training course on the island itself. According to TERI staff, this is because the women do not have the time to actively market the product and obtain more customers, and also they do not feel confident enough as technical experts (Winther 2010a:9). They now get an introductory course to provide them with just enough knowledge to run the station in a satisfactory way. Although it may be true that the women on Sagar are not immediately comfortable with a role as technical experts, it is hard to avoid all critique and ignore the fact that 1) TERI conveniently saves substantial sums of money on the cutbacks in the extensive training, and 2) Local Clubs tend to be dominated by men, preventing women from participating on an equal level from the beginning of the implementation process. This means that the implementation organ at the level right above individual agents is not a gender-neutral field where women have equal opportunities to influence and contribute.

The act of leaving the country for six months and receiving an education about locally unknown technical equipment, and going for a day's training at the local clubhouse is incomparable. Whereas the Afghan women BSEs experienced that they were seen differently by the community because of their new expertise, the women solar

entrepreneurs on Sagar are performing simple tasks like cleaning the lanterns and filling out receipts for customers. Albeit a straining job and an unusual position for a woman traditionally, it seems a lot to expect the same core shaking social change in the outlook on women. Also, the lack of knowledge about the technical aspects of the stations makes the women depend on outside experts if anything happens. The fact that the female station managers are in a position to earn a living might empower them economically, but the model does not automatically empower them in the comprehensive manner that is needed in order to reach gender equality as projected by the MDGs (Dahlerup 2006 in Jones et al. 2010:116). The situation also indicates that the women who participate in the campaign do not feel a sense of ownership, and are not comfortable with the model of implementation as it was initially intended. There seems to be a lack of female voice and agency on the grassroot level that effectively prevent the female entrepreneurs from operating the stations fully and participating in the campaign on their own terms[44]. Participatory approaches often tend to overlook questions of conflict and power within the communities they seek to address (Crewe and Harrison 1998:162). While marginalized groups may be present during initial discussions, the groups of women, land-less or lower-castes may not necessarily have the same opportunities to express themselves and be heard by others. In the case of women as solar entrepreneurs on Sagar, one may wonder how important it was considered by TERI to empower the women at this first line of implementation, or if the first priority is simply to get manpower for the charging stations.

Gon Chaudhuri has claimed that the lack of local manpower is the reason for why around 60% of the renewable energy device systems in India are not functional today (interview 14.02.10). This seems almost incredible in a country that gives home to more than 1 billion inhabitants. However, the lack of manpower in the renewable energy sector appears to be real, and it is hard to attack TERI for their failed attempt to put women at the forefront of their campaign to light up the lives of the rural population. Still, the implementation of the LaBL campaign on Sagar stands out as a

[44] Jones et al. emphasize the importance of promoting women's ability to articulate their views in a meaningful way (voice) and to "*become the agents of their own empowerment*" (agency) in order to prevent women's interests and status from remaining invisible and inferior (2010:116).

sadly typical example of development efforts that fail to incorporate the participation and empowerment of its beneficiaries at an early stage, even when that is exactly what they have set out to do. Fortunately, there seems to be a more apparent success in the impact of the lanterns among the local consumers, as the numbers of customers are steadily increasing. In this way, the campaign is well on its way to reach its explicit goal of providing light to the population deprived of electricity, and subsequently improving the lives of the energy poor.

5.3 Chapter conclusion

The increased involvement of women in local enterprise has contributed to economic growth and higher purchasing power on Sagar. Due to this financial expansion, the inhabitants are now in a position to demand more electrical power that they can actually afford. Women thus play an important part in the process of electrifying the island, but it is still unclear to which extent they participate on their own terms. The time saved on household chores and the extended hours of the day apparently add to women's total workload, in a way that prevents the surplus time saved from leading to more time to rest. In the case of home businesses, women are to larger degree masters of their own time, while the model for women as solar entrepreneurs through LaBL may entail time constraints that put a lot of pressure on double working women.

TERI's campaign is ambitious in its goals, and the organization is eager to show rapid results. The fact that they rely on many external agencies for funding, probably increases the need for quick, measurable progress in the field. Teaming up with local NGOs and CBOs is a way to ensure faster implementation, and also fills the part of local participation. However, as demonstrated in this chapter, the participation is not necessarily deep and real, and the reason for operation through these organizations seem to be more about manpower and access than the inclusion of local knowledge.

VI. GENDER, EMPOWERMENT AND ENVIRONMENTAL CONCERNS IN DIFFERENT LEVELS OF IMPLEMENTATION

6.1 One campaign, many stories

Many of the top-level ideas about women and entrepreneurship that were presented in Chapter 2 have been integrated in the planning and implementation of the LaBL campaign and the general rationale for developing alternative energy options on Sagar. TERI may be seen as one of the protagonists in this process, as they launched the campaign and continue to gather forces towards reaching their goal of providing light to a billion people. However, TERI depends on a range of partners and donors for the funding of the LaBL campaign, one of them being the Norwegian Ministry of Foreign Affairs (NMFA), through the Royal Norwegian Embassy (RNE) in New Delhi (TERI 2009a:3,10;2009b:10). This chapter explores the interaction between the various actors and agencies that are involved in the implementation of the campaign, and their premises and motivations for taking part in the process that brings light to people's lives.

An issue that receives my attention in this chapter is the way the story of the campaign and its impacts are portrayed and perceived by the actors at different levels, from donor agencies providing financial support, through TERI and their implementation agencies at local level to the individuals that the campaign aims to reach as beneficiaries or entrepreneurs. In an interview with an RNE expert on solar energy, Mr. Vivek Kumar, I received insights on the Norwegian motivations and priorities as one of the top-level agents that ultimately hold power over the implementation of the LaBL campaign. Further, Mr. Jamal Singh of TERI contributed to add insights to the vision and status of the campaign from TERI's own perspective. Mr. Achintya Sett and Sagar-based staff members from the Ramakrishna Mission elaborated on the story of LaBL as seen and told by the RKM, and finally the people of Sagar were represented by a selection of informants that told their story through a range of interviews and conversations. This chapter interprets their stories in light of my own observations and theoretical material, and points to the linkages as well as differences in the stories that are told. The tendency that arises through the interviews and

conversations indicates that some of the original ideas and motivations that drove TERI in their launch of the campaign have held a varying degree of interest in the different levels of implementation. While the donor agencies, here represented by the RNE, have applauded the gender aspect of the implementation model and the environmental benefits of solar powered lanterns, the local people on Sagar seem less concerned with these abstract concepts and more interested in solar lanterns as a step on their way to a fully electrified life. I approach this topic from the top-down, starting with an introduction of the Norwegian rationale for involvement as described by Mr. Vivek Kumar. This, and the following sections keep an underlying focus on the different agents' perceptions of gender, empowerment and environmental concerns, and end with the voices of local people of Sagar, as narrated by my informants and interpreted in light of supporting literature.

6.1.1 Donor agencies and their motives and influence – the Norwegian Ministry of Foreign Affairs and the Royal Norwegian Embassy in New Delhi

The Norwegian Ministry of Foreign Affairs (NMFA) and its Royal Norwegian Embassy (RNE) in New Delhi state that advocacy and gender shall be cross-cutting thematic areas in all projects that fall in under the Indo-Norwegian Cooperation on Environment, Renewable Energy and Climate Change[45]. The empowerment of women is stated as an important factor of other solar energy projects supported by the NMFA, through increased social activity, strengthening economic activities and of course, providing study light for children[46]. Kumar confirms that these benefits are part of the reason they wish to contribute to the LaBL campaign as well, through donations to TERI (Kumar: interview 30.11.10).All projects that depend on external funding, also depend to a certain degree on the satisfaction of the donors and their acceptance of the

[45] Norwegian embassy in India website December 3 2010 http://www.norwayemb.org.in/PageFiles/232769/RNE_brochure_final2.pdf

[46] Norwegian embassy in India website December 3 2010 http://www.norwayemb.org.in/News_and_events/Climate-and-Environment/Indo-Norwegian-Cooperation/Electrifying-villages-in-and-improving-livelihood-of-women/

way the project is run[47]. Section 2.1 mentions that when the strategies and wishes of the donor agency are already known, projects are sometimes planned and shaped within this framework. Sometimes the implementation of these top-level strategies proves difficult due to local practices or the lack of real participation.

Kumar informs me that LaBL is only a small component of the collaboration with TERI. The Norwegian Embassy has been working with TERI since 2004 on research activity on different aspects of climate change and the environmental sector, covering 13-14 activities as part of the framework. The Embassy found the campaign to be a good initiative, because it links with the Government of Norway's wish to support development in developing countries as well as including and considering climate issues. LaBL offers activities relating to energy efficiency, renewable energy climate modelling, South on South cooperation and technological transfer. There is also a focus on what part the business sector may play, making the campaign interesting for commercial actors as well.

When the Embassy approves a project it involves a scanning, an assessment of which aspects the project takes in (Kumar: interview 30.11.09). When considering the LaBL campaign, their conclusion was that it covers several of the priority areas of the Embassy, and entails many obvious benefits deriving from the access to solar lanterns. First of all, Kumar mentions the opportunity it provides children in school, enabling them to read and study at night. The Embassy also emphasizes the opportunities for women artisans to continue their work into the evening, which is very difficult without proper lighting. The access to light may also contribute to prosperity in other, smaller

[47] Following the end of the SAPs of the 1980s, Western countries began to demand political conditionalities of 'good governance' from the aid recipient countries in the 1990s (Haynes 2002:21). Conditioning aid is a well-known strategy within development policy, but as more and more aid is channelled through multinational organizations and species of NGOs rather than bilateral state-to-state aid, donor conditionality also changes. In many cases, the donor agency finds a project or an organization that fits the profile for what they want to support, and then all monitoring and implementation is left to the receiving organization, which only has to report the progress to the donors on a regular basis. This is a typical strategy of many large corporations who want to demonstrate goodwill and corporate social responsibility (CSR) by supporting a charitable project. Other donor agencies are more meticulous in their choice of recipient organizations, but the implementation is still left to the project managers without excessive donor involvement.

cottage industries. All in all, the use of solar lanterns are thought to have direct economic implications for the families involved, leading to better lives with more technological commodities, such as televisions. Kumar recognizes the educational value of television, and the possible large-scale benefits that derive from people's access to TV: *"People with access to TV's often have a better grasp of what is happening in the world, and a socially conscious citizen is often a more environmentally aware citizen."* (Kumar: interview 30.11.09).

People's rights to better lifestyles and livelihoods are taken into consideration when the Embassy participates in or contributes to a project, and development projects should not have negative impacts on the environment. Climate issues are important and according to Kumar, awareness is increasing among stakeholders. Rather than emphasizing conflicting interests, the different sectors should be feeding each other, acknowledging the different platforms involved. International networks are also considered important in the sense that they may bring in new models and state of the art technology.

The Millennium Development Goals and Clean Development Mechanisms (CDMs) are seen by the Embassy as driving forces steering the country towards human and social development, but when employing these international mechanisms, working with local CBOs and NGOs is considered paramount to success (Kumar: interview 30.11.10). International and national actors are alien to the communities, so the projects have to rely on local actors as intermediaries. This line of thinking was represented by many development scholars in the 1980's, introducing ideas about national ("indigenous") organizations providing vertical mediating links between local groups and Northern/Western experts and representatives of power (Carroll 1992:2). Kumar continues that the project implementation has to be a conservative process, in close collaboration with the organizations from the local communities. TERI has to monitor the outcomes through the stages, and continuously hold meetings with implementing organizations to ensure that the project is moving towards its goal. Local organizations vary, and may have different levels of influence and importance.

In the LaBL program, they do not have direct influence as a voice at the national level, but the Embassy claims they will still be heard through TERI..

Through TERI and the LaBL campaign, the NMFA has found an apparently tailored project that fits in with various aspects of the Norwegian India Strategy[48]. The state of Norway wishes to *"(...) strengthen, intensify and further develop a mutually beneficial cooperation with India in areas that are important for Norwegian interests (...)*" (NMFA 2009:15). The NMFA also has an explicit agenda to promote gender equality as an integral part of its overall engagement. Providing funds to the LaBL campaign which covers many of the areas considered important to the NMFA, the Embassy is able to check off a range of priority fields on their agenda. For the NMFA, the success story of the rural women contributing to economic growth and being empowered in the process, is a story worth hearing and supporting (i.e. TERI 2009:1). Hence, I conclude that it is very important for TERI to translate the results of their implementation efforts into presentations and reports that fit in with the discourse of their donors. The NMFA's challenge is to keep up with the development of the campaign and make sure that the monitoring and reports are of high standards and paint a true picture of the situation. Donor agencies that contribute to development projects have a responsibility to investigate the story they are told, to avoid the funding of failing projects or resting on their laurels thinking that they are improving a field where nothing is done. This way, they must seek to avoid the scenario described below by the Washington-based

[48] The main objectives of the India strategy are to:

> 1. strengthen bilateral and multilateral cooperation on international political issues of major importance to Norway;
> 2. strengthen cooperation on climate, environmental and energy issues, including the dialogue on climate policy issues and the development of a clean energy partnership;
> 3. further develop our cooperation on economic issues, promote Norwegian business interests, foster closer economic ties and encourage greater investment in India; and
> 4. further develop our cooperation on societal issues. Cooperation on research and higher education is to be strengthened and, together with cultural cooperation, support efforts within the other priority areas in the strategy.
>
> (NMFA 2009:16)

researcher David Roodman, letting the *idea* of potential benefits weigh more than measurable and transparent results.

> We decide who to give money to based on who tells the best story that makes us feel good about where our money is going. We usually don't give our money to the people who have the best scientific evidence that it actually works.
>
> David Roodman, Senior Fellow, Centre for Global Development, Washington DC
> Brennpunkt, NRK1, 29.11.10

These insights into the background and motives for the involvement of the NMFA in the LaBL campaign show the importance of scrutinizing the story that is told by implementing agencies. It is time to move one step down the ladder to the story transmitted by TERI, the engineers behind the campaign, and comment on their relationship with their implementation partners.

6.1.2 TERI's dual burden - responsibilities upwards and downwards

TERI has set out to reach an immense goal in their launch of the LaBL campaign, and has to secure and maintain a steady increase in the amount of beneficiaries receiving light from the solar lanterns. The implementation of the campaign should be in contractual agreement with the donors who are financing the various efforts and programs, and who expect certain issues to receive priority and attention. Measureable results and documented progress is necessary in order to satisfy the expectations of the financial partners. Further, TERI is in constant collaboration with regional and local partners who aid them in the practical aspects of the implementation, in this study represented by the Ramakrishna Mission (RKM). This vertical line of collaboration demands different input by TERI in their relationship with the partners upwards and downwards in the implementation system, which also affects the way they present their story.

An important channel for transmitting the story of LaBL is the *Solar Quarterly*, India's first comprehensive quarterly magazine dedicated to solar PV and thermal technologies, launched by TERI in July 2008. In the first issue, the LaBL campaign is

described as an initiative which "*aim[s to] give a better life to people in Indian villages, both through lighting and lighting-induced entrepreneurship opportunities.*"[49]. The entry emphasized the health, environment and safety risks that could be mitigated by the shift from kerosene and biofuel to solar lanterns, but did not mention women or empowerment specifically. However, in January 2009, TERI introduced another quarterly publication specifically for LaBL, the *Journey towards a Billion* newsletter, where the model of empowerment and economic growth through women solar power entrepreneurs was presented already on page 1 (TERI 2009a:1). The dual purpose of the model was to *"[create] sustainable sales and service networks in villages (...) and empowering women by giving them economic freedom*"(ibid. 2009a:1) An apparent function of the newsletter is to portray all the sunny stories of successful implementation of the campaign, along with personal narrations from beneficiaries who have experienced improved living standards after receiving and using the solar lantern. "*The campaign has provided an opportunity for me to earn income*", says one young housewife turned entrepreneur (TERI 2009a:8). She continues: "*I am planning to expand the work. It is benefiting the villagers and I can earn some money as well*".

In the same issue, we find the story of Ghoti Devi, a woman entrepreneur managing a LaBL charging station in Rajasthan, presented as the proud 'LaBL Champion of the quarter'. Devi attended a technical management and training programme called 'Creating LaBL Entrepreneurship' that was organized in her village under the campaign with the support of the Norwegian Ministry of Foreign Affairs (TERI 2009a:10). For TERI, it is crucial to transmit the images of the success stories of LaBL both to their financial and material donors as well as potential new external partners. The story that is presented is partly focusing on the economic aspects as seen above, and partly on the social opportunities and benefits in terms of for instance health, safety and education. The newsletter ends with a set of 'Words of Inspiration', featuring quotes ranging from the First Vice-President of the Government of Spain

[49] Solar Quarterly [online] December 7 2010
URL- http://bookstore.teriin.org/docs/newsletters/Sample%20copy-%20July%202008.pdf

giving her honoured support, to a Rajasthani school teacher and LaBL lantern user explaining the benefits of using the lantern:

> I can collect milk in the morning and sell it by morning itself. My one-year-old can go and switch the lantern on herself. I have no fear as there is no danger of shock or fire. It is also easy now to spot snakes and *bichoos* and kill them.
>
> Mamta (TERI 2009a:11, original emphasis)

The specific stories and anecdotes from the grassroot level provide TERI with empirical evidence for their show-and-tell for their donors and partners, current and potential. It is also a channel for local voices to express their ability and content, focusing on the value of participation and empowerment. The advantage to this presentation is not only the concrete examples of how success can be achieved, but it also underlines the *agency* of women in the process. This may contribute to the visibility of women's status and participation, and may inspire and enable more women to steer towards their own empowerment (Jones et al. 2010:116). Conversely, the newsletter is constructed as a *positive* mirror of the solar reality, and will not serve as a channel for the grassroot voices of critique. The relationship between TERI and RKM is based on more than visual examples of success, and was portrayed as slightly problematic in my meetings with RKM staff. Whereas the story that is transmitted to the donor-level needs to be based on successes and efforts underlining the gender field and environmental benefits, the communication with RKM is more focused on the need for expansion and local manpower.

6.1.3 RKM – intermediaries between a rock and a hard place

While WBREDA primarily collaborates with the *Panchayats* for implementation of energy efforts, TERI operates through non-political bodies like the Ramakrishna Mission (RKM), who in part rely on interest and participation of Local Clubs[50]. At this

[50] The activities of TERI are extensive and multifaceted, and I am not aware of all their operations in every shape and form. I hereby refer to their strategy in this specific context, as it has been portrayed in this research. TERI might also operate through political bodies in other contexts, but my focus has been on their relationship with the RKM in Kolkata, and their branch on Sagar.

level, RKM functions as an intermediary organ between the driving forces behind the LaBL campaign and the local organizations and individuals who ultimately put the planning in effect. The workings of the RKM were described in further detail in section 1.3.5 in Chapter 1. This section focuses on the challenges the organization faces as the primary link between the local beneficiaries and individual implementers of the LaBL campaign on the one hand, and TERI on the other. For the RKM, the LaBL campaign only constitutes a small fraction of their programme, but the prestige and pressure involved is substantial (RKM staff: interview 20.11.09). The most pressing issue is TERI's wish to expand the campaign, adding pressure on RKM officials to train more staff and set up more Solar Lantern Charging Stations (SLCS). But while the investment costs for such an expansion will be covered by TERI and their donors, the responsibility for the care of the materials lies with RKM. The organization is therefore hesitant to initiate more projects and stations, as the financial risk in case of degradation or loss of material is a liability for the stability of the organization. Another issue is the question of manpower. While TERI seems eager to state a point about female empowerment and the participation of local women to their donors and financial partners, the question of manpower, as was discussed in section 5.2.3, holds more power over the implementation process at the level of RKM. As long as women show little initial interest in the position as station managers, RKM will settle for male employees. It seems more important to cover the positions rapidly than to spend a lot of time and resources on the involvement of women.

It is important for RKM to run a broad operation contributing to *pallimangal*, the Bengali expression for rural welfare[51]. RKM has contributed greatly to education in the geographic region, a statement which was confirmed in section 4.1.4 by the local headmaster who received his education through the RKM (interview 14.11.09). The RKM has also been involved in strengthening the sanitation systems on the island, perhaps one of the reasons Sagar appears unusually clean and well-kept, especially in

[51] RKM Kamarpukur website, December 7 2010
URL- http://www.rkmkamarpukur.org/Ramkrishna%20Mission%20-Rural%20Development.aspx

an Indian context[52]. Being chosen as the primary organization for facilitating the implementation of the LaBL campaign in the Sunderban area added on to their already wide range of activities, and contributed to their efforts within the field of environmental mitigation as well as facilitating economic productivity in the area (RKM 2007:14). As mentioned in section 1.3.4, Sagar is considered a place where the efforts for rural welfare are most likely to succeed. Mr. Achintya Sett of the Ramakrishna Mission Ashrama Narendrapur Office in Kolkata confirms that Sagar holds a very particular position in the Sunderban area, and even claims that *"You can't feel the real Sunderban if you go to Sagar"* (interview 21.11.09). But in spite of TERI's focus on local participation with a particular strive to include women, RKM is finding it difficult to translate the strategy from theory to practice. In the next section I present some of the factors I believe to be contributing to the challenges observed by the RKM in relation to local participation, of women in particular.

6.1.4 Local participation – the final rung of the ladder

> [T]he ways in which participants are constructed by others – and perceive themselves to be constructed – within any given space for participation means that they are never neutrally positioned players.
>
> Hickey and Mohan 2004:84

My observations of the level of participation by the local population on Sagar show both positive and negative signs. In the general development discourse, the consensus on local participation influencing the outcome of any development related variable, not just poverty, is growing, and participation by women in particular, is often considered a prerequisite for successful implementation of any given strategy or project (Thomas 2000:34). Today, much of the grounds for participation are laid through the involvement of local organizations. Many of my informants, both male and female, had close ties with at least one organization in their local community, especially with the 'Clubs'. The Clubs exist in a variety of different natures, and are sometimes more

[52] On November 21 2009, Jairam Ramesh, the Environment and Forests Minister of India dryly commented in the Telegraph that "*If there was a Nobel Prize for dirt and filth, India would get it, no doubt*" (page 1)

like local management groups. They are often linked to other umbrella organizations and bodies operating above their own level, like the RKM and TERI. Further, the Local Club seems to be an organizational body that operates somewhere in between the realm of the typical NGO and political organizations, whose presence influences daily life and operations in a significant way. The Club is for many people the nearest body for organized participation, and represents the final rung of the ladder in many outreach programs initiated outside the community.

> *Kaja*: What does the local club do?
> *Gopa Chakraborty* (60): Many things. They are like mediators when people fight.
> *Kaja*: Is there a lot of fighting?
> *Gopa Chakraborty*: No, no!
>
> (interview 23.11.09)

When asked who is responsible for their well-being and who helps them in times of need, my informants would often answer "*the Club*", either right before or right after "*my family*". The Clubs perform community-oriented activities, such as plantation work, organizing evening classes, intermediating conflicts and putting together social events like book fairs and meetings. The Clubs seem to hold a more familiar position than the more formally structured organizations, and consist of local people only. This proximity increases the faith people have in the Clubs as reliable supporting agents, but one may question the part they play in micro-political relations. If the Clubs are significant for solving conflict, providing jobs and influencing other organizations, either as intermediaries or implementers of projects, this could indicate that those who have the time and opportunity to participate in Club meetings and activities may be favoured over those who do not when goods or jobs are to be distributed. When agents further from the grassroot level leave implementation and distribution of employment and assets to local management without interference, this may promote participation, but could possibly entail favouring or nepotism.

In Chapter 5 we saw that TERI's reasons for not sending the women solar entrepreneurs for technical training may be founded in statements about their lack of

interest expressed by male dominated local groups. If the Club, which provides the job opportunity, to begin with is a male biased arena, it might be hard for women to express their capability and desire to take on the technical challenges of solar engineering. As observed in this chapter, leaving implementation fully to local agents involves giving up a certain amount of control in favour of local management and decision-making. In a sense, this may be a step towards real local participation, but the project to be implemented stands at risk to lose some of the aspects that were considered vital at the top-level planning, in this case the inclusion of women participants. TERI and the Local Club operate within two different frameworks of realities, which are not always commensurable. For local people on Sagar, the primary focus above and beyond all other considerations seems to be on the need for more and more stable electricity. As demonstrated in Chapter 4, my informants are quick to list the social benefits deriving from a 24-hour connection, but seem less concerned with the way electricity is obtained.

It seems that after their initial hesitation towards solar energy (Chaudhuri: interview 14.02.10), the people of Sagar have adopted this attitude towards almost any effort that may contribute to more electrical power. The island is now strewn with power plants of different shapes and forms, and the inhabitants' willingness to play the part as Guinea Pigs for energy experiments is physically established in the rows of solar panels, windmills and criss-cross of cables that now define Sagar. The strong desire for more electricity makes the population of Sagar an easy target for energy experimentation, a playground for companies and organizations that wish to introduce their newest ideas and projects in a friendly and receptive environment. Sushanta Biswas of WBREDA refers to the hybrid plant as a "demonstration project", leaving little doubt that Sagar plays an important part in the test-driving of renewable energy sources (interview 13.11.09). The fact that the initial request for energy was voiced through the *Panchayat* by the local population is of course an important factor for the implementation of these projects (Akshay Urja 2007:30). The people of Sagar are not a passive group of people subdued by the predators of top-level planning who only care about their own agenda. The main reason for the goodwill displayed by the islanders is

their contentment with the energy they receive from the new energy sources, and the lower dependence on diesel generators and kerosene lamps. Further, the lack of correlated focus in all levels of the implementation of the LaBL campaign, does not necessarily mean that the original intentions never correspond with the outcomes. The final section of this chapter treats some of the reported social impacts of light and power on Sagar, and how they may be connected to MDG- and rights-related goals and targets.

6.2 Reaching the goals – does light and power make a difference?

This section primarily discusses my findings as presented in Chapters 4 and 5 in light of theoretical input from Chapter 2. We have just observed that the language of rights, empowerment and gender mainstreaming is not explicitly attributed throughout all the levels of implementation, but I also implied that there may still be correlations in the intentions and outcome. While previous sections point out many of the challenges and discrepancies in the implementation process, this section focuses more on the signs of improvements in areas that are directly or indirectly connected with rights, gender and the MDGs. I start with a short section on whether electricity can be treated as a human right, before I address the social benefits that have arisen or improved following the introduction of light and power.

6.2.1 Electricity as a right?

The question of whether electricity should be considered a right or merely a benefit often arises when investigating the social implications of life with or without access to power. One may argue that electricity is established within the framework of human rights as an implicit attribute of other rights, such as non-discrimination or sustainable development, and explicitly in the context of eliminating discrimination against women (Tully 2006). Further, the access to electricity is a core component in the combat for eliminating energy poverty for all, and rural women in particular. One of the main objectives of the Electricity Act of 2003 is to ensure supply of electricity to

all areas, and also address consumer protection against failure to meet the standards of performance (Thakur et al. 2004:1). Yet still, the goal is miles from being reached, and an overwhelming few express the view of access to electricity being a right rather than a benefit one wishes to achieve and maintain.

> Of course [electricity] should be a right. But in this country, with so many people... It is so extensive. There are mountains, islands, places are remote. How can we reach them all? It is impossible. It is a task that would take more money than we could ever spend.
>
> RKM staff: interview 20.11.09

Electricity as a human right may be a concept that is difficult to work into a practical reality. Electricity *for* human rights however, is a significantly more surmountable notion. As concluded in earlier chapters, the lack of an explicit human rights agenda in a development context does not necessarily rule out the possibility of human rights related outcome. In the case of the LaBL campaign and other solar energy efforts for electricity on Sagar, there are some tendencies that imply that electricity and light could form part of an important contribution for reaching MDG and human rights goals and targets.

6.2.2 Identified social benefits corresponding with rights and MDGs

> What's in a name? that which we call a rose
> By any other name would smell as sweet
>
> William Shakespeare (Romeo and Juliet, 1600)

Without falling into Shakespearian romanticism, I have observed some correlations between top-level goals and targets and social impacts of light and power at grassroot level on Sagar in spite of the lack of corresponding language. This section identifies some of the areas of improvement in opportunities and living standards that could be directly linked to the intentions of the Rights-Based Approach and the MDGs. This way I seek to exemplify some of the assumptions that are made in the top-level recommendations for strategies, and contribute to the evidence that there are linkages

between theory and practice. To pursue the analysis in section 6.1, I discuss the findings as related to gender, empowerment and environmental concerns.

Although female participation has not been emphasized in a substantial way at the grassroot level, there are a few areas where women report that their lives have improved. First of all, Chapter 4 showed a significant change in the time use of women for domestic tasks performed with electrical light or the solar lantern, particularly in relation to cooking. Some of this excess time may be channeled into evening businesses, but television account for a great deal of the new daily activities (see section 4.2.3). The prolonged days resulting from the access to light and power contributes to ensuring Article 24 of the Universal Declaration of Human Rights, stating that everyone has the right to rest and leisure[53]. The access to information and communication lines through TV, radios and not the least, cell phones, is an opportunity aspect (i.e. Sen 2009) which grants women a greater possibility to socialize and maintain their relationship with family in other areas. The women of my group interview all agreed that their lives were better than before because *"(...) we didn't have solar. Now we have TV and phones*" (interview 23.11.09). Another aspect enhancing the freedom of women is the increased opportunity for mobility after sunset, as seen in section 4.2.5. The women I spoke to said they felt safer at night with access to good quality lighting, and expressed a wish for more street lights. Amartya Sen argues that freedom is not only defined by the access to certain benefits, but also the *absence* of *unfreedoms* (Sen 1999). The absence of nightly dangers, both human and others (such as snakebites) thus represents an enhancement of women's freedom. The livelihood opportunities in the shape of home businesses is a potential contribution to gender equality as women gain access to employment that generates income, in line with MDG Goal 1, Target 2 (see section 2.1). However, the lack of evidence of women controlling and distributing their own income, refrains me from placing a lot of emphasis on this final matter.

[53] UN website December 8 2010
URL- http://www.un.org/en/documents/udhr/#atop

The immediate impacts on women's empowerment have been harder to determine in my research. However, the apparent consensus on the importance light has for school children is an indication of the potential long-term benefits in education (as seen in section 4.2.4). 58% of the respondents in the Solar Transitions Survey claim that the children study when the lights are on (N/A=33%) (Survey 2010:23.7). This number will most likely increase if more people have access to solar lanterns. Only 38.2% report that they watch TV when the lights are on (2010:23.6.4), which could indicate two things: either the respondents do not own a television or have immediate access to it, or they turn off the lights in order to save power when they watch TV (or a combination of the two). Section 4.2.4 implied that television stand at risk of 'stealing' electricity used for study light for the children of the household, and the solar lanterns could have a mitigating effect. The improved opportunities for studying at night, in addition to the increased mobility for female students after sunset thus correspond with the MDG goal number 2, of achieving universal education for all (section 2.1) and Article 26 of the UN Declaration for Human Rights, ensuring the right to education for all[54]. Moreover, the increased social opportunity for education is highly likely to lead to other social benefits regarding health, employment and economic growth, in line with Sen's instrumental rights and freedoms (Sen 1999:38-40). The tendencies on Sagar show signs of following this pattern, and may thus increase the possibilities for female empowerment in a long-term perspective.

A final note on the environmental benefits of solar lanterns and other solar energy efforts is in order, although the immediate effects of these are harder still to determine. However, there is no doubt that the solar lanterns and other electrical lighting sources are reducing the need for kerosene and diesel used for lighting purposes (see section 5.2.1). Also, if Mr. Kumar of the Royal Norwegian Embassy is correct in his assumptions, people will become more environmentally aware in the years to come due to the information they now have access to through television (see section 6.1.1). If internet is introduced on the island in the near future, the impacts of the closing information gap may be even more extensive. In any case, the reduction in emissions

[54] UN website December 8 2010 URL- http://www.un.org/en/documents/udhr/#atop

on Sagar alone may not have any significant effects on a global scale, but Sagar and LaBL serve as an example of efficient small-scale climate mitigation. This in turn may be followed elsewhere in the world, contributing to reaching MDG goal number 7: to ensure environmental sustainability.

6.3 Chapter conclusion

The implementation of solar efforts on Sagar depends on a variety of actors and agencies, but while local and female participation is high on the agenda of TERI and their donor agencies, there are some apparent weaknesses in the implementation scheme, particularly regarding the role of women. The Local Club is an important body of influence and administration, but may sometimes prevent female participation or underestimate the ability of local women. Because the Clubs advise and provide the RKM and TERI with manpower and local management, they have the power to decide who receives training and employment. In Chapter 5, I showed that according to TERI, women express concern about their time use and being technical experts, and SLCS station managers now only receive one day's training before entering their new role as solar entrepreneurs. With the lack of technical expertise and confidence-building management training, women are not empowered in the way the LaBL campaign intended, and the gender aspect of the effort has become vague and barely visible. This represents one of the challenges for projects that are mapped out, planned and funded at a level that is almost completely absent at the level of implementation. The Norwegian Ministry of Foreign Affairs is one of the donor agencies that enable the survival of the LaBL campaign, but while financial support is provided, it is hard to monitor the implementation at grassroot level all over India. This way, some of the targets of the strategy may be weakened on the way from theory to practice.

However, there are signs of solar lanterns and other solar efforts leading to positive social impacts in line with MDG and rights-related goals and targets on Sagar. The long-term impacts will be interesting to follow, and if the language and discourse of top-level planning and strategies were appropriated by all the levels in the

implementation process, it might contribute to even more measureable results in line with the original intentions.

VII. LOOKING TO THE FUTURE – FINAL CONCLUDING REMARKS

This concluding chapter has two aims. Firstly, I wish to connect the dots and emphasize my most important findings and conclusions throughout the research. Secondly, these findings may serve as grounds for some careful recommendations for future projects and the ongoing efforts in the Sunderbans.

7.1 Summary of approach and important findings

The need for research and experimentation within the field of renewable energy has been the backdrop for a wide range of solar energy efforts in the Sunderban Area in West Bengal, India. My research discusses the impacts on women involved in solar energy efforts on Sagar Island, the largest of the islands in the Sunderbans. The research is a contribution to the research project Solar Transitions, which seeks to assess the implementation of solar energy in the area in order to learn from the Indian experiences and facilitate a similar implementation in a rural area in Kenya (see section 3.1). My particular emphasis has been on the empowerment and social opportunities of women through the process, and their level of participation and acquired benefits. The solar efforts are channelled through levels of agencies, and my goal has been to clarify the goals and targets of the various actors along the way, especially in relation to gender issues and empowerment through the Millennium Development Goals and the notion of rights. In particular, I have discussed the implementation of the Lighting a Billion Lives campaign, a TERI initiative that aims to provide rural poor with electrified lighting through solar lanterns. The campaign targets women in particular, seeking to provide them with means for empowerment through its fee-for-service model that enables employment for women solar entrepreneurs as well as providing light for home businesses. The lanterns offer

possibilities for light into the evening hours, allowing children to study at night and women to add to their working hours. However, there are some weaknesses in the implementation process that could prevent women from benefiting in the substantial way the model intends. I sought out to answer some of the questions I believed to be crucial for the assessment of the implementation process, and founded the research in the question:

To what extent are women empowered and enlightened by solar energy efforts in West Bengal in their dual role as beneficiaries and entrepreneurs?

The key actors and efforts in the target area were presented in Chapter 1, and the reader was introduced to the historical and political backdrop for the area in which I performed my research. Chapter 2 was dedicated to the theoretical material that has supported the interpretation of my findings, and revolved around the importance and potential of three influential contemporanean tools and strategies; 1) The United Nations Millennium Developments Goals, 2) The Rights-Based Approach to sustainable development and 3) The mainstreaming of gender and empowerment in energy contexts. This chapter was followed by a chapter on methodological approach, describing the processes of fieldwork and interviews and the challenges which arose on the way.

In Chapter 4 the empirical material of the context was presented in two sections. The first section gave a general description of the daily life on Sagar Island as observed by myself and the Solar Transitions research group, through interviews and interaction with local people. The second part of the chapter attempted to identify some of the impacts the introduction of light and power has had on the different aspects presented in 4.1. There were indications of time savings in the cooking process when using electrical light or a solar lantern, and the introduction of cell phones has opened new doors for communication of both private and commercial nature. So far, my findings implied that men use the phones for business purposes more often than women do, while women on the other hand are able to stay in touch with their families after leaving home for marriage, preventing isolation and feelings of loss. Television has

had an enormous impact of people's social lives, and was emphasized by my informants as one of the most important benefits of obtaining electricity. Many previous studies imply that television contributes to the empowerment of women due to its provision of information and its cultural power, but my research in this area is not sufficient in order to draw such a conclusion in the context of Sagar. The importance of light for study purposes and educational value is a reoccurring topic, and although I found some irregularities in the study habits of children, it seems safe to conclude that light is considered a crucial asset for children and youth in school by the majority of my informants at both local and top-level. The field of health and health services is an area that has yet not undergone substantial changes after the introduction of light and power, except in terms of security and mobility. This is considered particularly beneficial for women, who are now able to move more freely after sunset.

Chapter 5 addressed the opportunities and challenges for women as solar entrepreneurs, as station managers of LaBL charging stations, or as beneficiaries of the lanterns, using the light for enterprising activities in the evenings. The involvement of women as both beneficiaries and entrepreneurs is thought to increase their status and lead to empowerment, but there are some obstacles that challenge the implementation model. Firstly, many women continue to experience a heavy work load after prolonging the day with electrical light, and the burden of business activities are only added to the responsibilities of domestic chores. There were also few indications of proof that women's personal economy is strengthened by their adding to the family income, although there are signs of female businesses contributing to an overall economic growth on the island (Chakrabarti et al. 2000).

In Chapter 6 I returned to the means and motivations of the actors at the different levels of the LaBL campaign, and pointed to the varying importance of gender, empowerment and environmental issues as they are perceived by the respective parties involved. I paid particular attention to the notion of participation, and took notice of the way the issue of women's voice and agency is downplayed the further down the ladder we move from top-level planning and strategies to implementation at grassroot

level. Finally, I concluded with a section on the potential coherence between light- and power-induced social benefits and the MDG and rights-related goals and targets that were introduced in Chapter 2. I hereby concluded that light and power may in fact contribute to certain improvements when it comes to reaching these goals, but that incorporating the language of rights and responsibilities all the way through the implementation process and not just at the top-level, might lead to even more substantial benefits.

The remains of this chapter have a future-oriented aspect, as I summarize important contributions of the solar efforts on Sagar and discuss the learning potential for future projects.

7.2 Contributions of the solar efforts

People on Sagar have benefited from the solar efforts, and the access to the limited electricity has probably served as a steppingstone in their struggle to get on-grid. In the lines of Sen (2009), the culmination outcome for the population will probably be considered successful in their own view, although the environmental aspect of the operation has suffered a significant blow if there is a complete shift from renewable energies to coal-based grid-connection on the island. However, it is unlikely that the entire population on Sagar will gain access to the mainland grid-connection for a long time to come, due to both household finances and the necessary investments for building an island grid that will reach all. The probability of coal-based mainland grid connection evaporating all solar energy efforts in the area is not likely. But even if this were to happen, the solar experiments will have made two very important contributions;

First of all, Sagar's unique social and geographical situation grants possibilities that are still out of reach for the majority of the Sunderban islands. The experiences with the technology and implementation will provide the remaining islands that are yet to be electrified with valuable information and learning which will hopefully facilitate an

even more successful implementation in these areas. Additionally, solar efforts are not only a relevant technological approach in the Sunderbans, they offer possibilities anywhere in the world with the right climatic settings. Not only will other areas in India be able to draw on the experiences from Sagar, the identification of benefits and disadvantages in the technology can be useful in a global context. The Solar Transitions project affiliates are obvious partners in this context, as they seek to remedy the difficulties and learn from the successes before assisting in a knowledge transfer from India to Kenya. The technology might still lack the strength to provide stand-alone connection that can supply all the necessary institutions and appliances of a society, but there are still masses of people who feel like the people of Sagar did in the 90s; *something is better than nothing* (Chaudhuri: interview 14.02.10). And while they will gain from the small-scale supply of light and power, the solar technology might still be developed into a more sustainable energy source in terms of the financial aspects and the capacity of supply.

The second important contribution is the impact on women's social opportunities, especially regarding education and livelihood options. Although the ambition of making women solar entrepreneurs has not been entirely fulfilled on Sagar, there are strong indications of women benefiting from the economic growth brought by their home businesses that have surged after getting the additional hours of light. Even if there are uncertainties about whether they control their own income, the surplus finances are at least to a certain degree spent on home commodities and helpful appliances. Also, a general economic growth on the island may raise the standards of public arenas, like health and infrastructure. Sagar shows signs of being a society founded on solidarity and community awareness. People have shown great ability to mobilize and adapt in order to improve their own lives. There are good reasons to believe that the financial surplus of the economy will be at least partly fuelled into public benefits that serve the greater population, rather than contributing to inequality and social differences. Better roads and increasing numbers of street lights contribute to the mobility of women, thus increasing their personal freedom. The opportunities for empowerment can still be strengthened, but some women seem to have

experienced a change in status and position due to their newly acquired independence and/or responsibilities.

Although the MDGs and the concept of rights are rarely mentioned at the grassroot level of implementation of solar efforts on Sagar, there are signs of at least partly reaching some of the goals and targets set in international and national documents and strategies. The availability of solar powered electricity has facilitated and improved a variety of social opportunities for women, such as better study conditions, increased mobility, greater livelihood opportunities and communication benefits. The environmental aspect is not often referred to in a global format, but improved indoor climate and health benefits are mentioned on occasion. The environmental investment and its macro-scale effects, limiting CO^2 emissions and mitigating global warming is a long-term investment that should not be omitted from the assessment of solar efforts. The externality costs of generation of energy that has negative impact on human health and habitat are often not considered part of the equation when consumers negotiate their choice of energy source (Chakrabarti et al. 2002:10). However, people on Sagar are to a certain extent aware of the problems of climate change and the advantages of solar energy, although they relate to the issue in different ways.

From what I have observed during the writing of this thesis, solar energy is still not considered a viable stand-alone energy option, but efforts like the LaBL campaign show signs of great potential when it comes to improving the opportunities of people who are far from achieving main grid-connection. The study also shows that when people gain access to certain electrical appliances, they start wanting more electricity. Hence, solar lanterns and other solar energy efforts may serve as a steppingstone in the process of providing electricity for all. The impacts of the solar lanterns also show that a small difference in the daily lives of people in terms of access to light may in fact contribute to significant changes in an *opportunity aspect* (Sen 2009). Although there will always be discrepancies between theory and practice, my conclusion is that the introduction of light and power has in fact contributed to enlightenment and empowerment on the small island of Sagar. If the challenges and obstacles as well as

the successes of the implementation processes described here are taken into consideration, a knowledge transfer based on these experiences might serve as a guideline for similar projects – and ultimately contribute to enlightenment and empowerment for people across the globe.

List of informants and facilitators

Name	Position	Place	Date
Banerjee, Gautam*	Project coordinator for Sagar with Tagore Society for Rural Development	Travel from Kolkata to Sagar	12.11.2009
Basak, Indra (23)*	Housewife	Sagar	23.11.2009
Biswas, Ashis	Tagore Society for Rural Development	E-mail and telephone correspondance	13.10.09-05.12.09
Biswas, Sushanta	Assistant Director of WBREDA	Sagar	13.11.2009
Bose, Sabir*	Local headmaster	Sagar	13.11.2009
Chakraborty, Gopa (60)*	Cook	Sagar	23.11.2009
Chatterjee, Nalini (30)*	Housewife	Sagar	23.11.2009
Chaudhuri, Gon*	Former director of WBREDA	Kolkata	14.02.10
Das, Jayashri (21)*	Housewife	Sagar	23.11.2009
Das, Sailendra*	Ramakrishna Mission Staff	Sagar	23.11.2009
DasGupta, Makhan*	Operator of SPV Power Plant	Sagar	13.11.2009
Dutta, Mahendra*	Operator of SPV Power Plant	Sagar	13.11.2009
Farida	Female interpreter	Kolkata, Sagar	10.11.09-25.11.09
Guhathakurta, Adeep*	Tagore Society Staff/Male interpreter	Sagar	12.11-09-23.11.09
Jana, Jaydeeb (56)*	Villager	Koylapare, Sagar	13.11.2009
Kumar, Vivek	Expert on solar collaboration, The Royal Norwegian Embassy	The Royal Norwegian Embassy, New Delhi	30.11.2009
Kumarmana, Mala (24)*	Housewife	Sagar	23.11.2009
Mukerji, Nirupama (34)*	Housewife	Sagar	23.11.2009
Mukherjee, Partha*	Local headmaster	Sagar	14.11.2009
Satra, Tanay (45)*	Male SLCS Manager	Sagar	23.11.2009
Sen, Ajanta (22)*	Female SLCS Manager	Sagar	23.11.2009
Sen, Vijaya (72)*	Housewife	Sagar	23.11.2009
Sett, Achintya*	Ramakrishna Mission Official	Ramakrishna Mission Ashrama, Narendrapur, Kolkata	23.11.2009
Singh, Jamail	Research Associate for Decentralized Energy Solutions, LaBL, TERI	TERI headquarters, New Delhi	01.12.2009
TERI staff*	TERI staff	New Delhi, Kolkata, Sagar	February 2010
			*Names have been changed
			**Interviews by the Solar Transitions Research Group

List of Acronyms

BSEs	Barefoot Solar Engineers
CBO	Community Based Organization
CDMs	Clean Development Mechanisms
CGI	Clinton Global Initiative
CSE	Centre for Science and Environment
DSDS	Delhi Sustainable Development Summit
GAD	Gender and Development
GOI	Government of India
GOWB	Government of West Bengal
HDI	Human Development Index
HLS	Home Lighting System
IEA	International Energy Agency
INR	Indian rupees
LaBL	Lighting a Billion Lives (campaign)
MDGs	Millennium Development Goals
MNRE	Ministry of New and Renewable Energy
NGO	Non-Governmental Organization
NMFA	Norwegian Ministry of Foreign Affairs
OECD	Organization for Economic Cooperation and Development
RBA	Rights-Based Approach
RKM	Ramakrishna Mission
RKMLSP	Ramakrishna Mission Lokasiksha Parishad
RNE	Royal Norwegian Embassy
SAPs	Structural Adjustment Programs
SHS	Solar Home System
SLCS	Solar Lantern Charging Stations
SPV	Solar Photovoltaic
SPVPPs	Solar Photovoltaic power plants
TERI	The Energy and Resources Institute
UNDP	United Nations Development Program
VEPs	Village Electrification Programs
WBREDA	West Bengal Renewable Energy Development Agency
WHO	World Health Organization
WID	Women in Development
WSDS	World Sustainable Development Forum

List of references

Akshay Urja (2007): "WBREDA Stepping Forward" in Akshay Urja/Renewable Energy January-February 2007. Volume 3. Issue 1. Pages 10-36

Amin, Samir (2006): "The Millennium Development Goals: A Critique from the South" in *Monthly Review*. Volume 57, Number 10

Attaran A. (2005): "An Immeasurable Crisis? A Criticism of the Millennium Development Goals and Why They Cannot Be Measured." *PLoS Med* 2(10): 318.doi:10.1371/journal.pmed.0020318

Banik, Dan (2008a): *Rights and Legal Empowerment in Eradicating Poverty*. Farnham, England: Ashgate Publishing.

Banik, Dan (2008b): *How can democracy and human rights ensure freedom from hunger?* Norwegian interests and foreign policy goals in a changing world, Ministry of Foreign Affairs, September 2008 [online] September 16 2010 URL-
http://www.sum.uio.no/research/poverty/tfessd/Publications/MFA_Norway_Dan_Banik_2008.pdf

Bøås, Morten and Desmond McNeill (Eds.) (2004): *Global Institutions and Development: Framing the World?* London: Routledge.

Carroll, Thomas F. (1992): *Intermediary NGOs: The Supporting Link in Grassroots Development*. Kumarian Press, Inc. Connecticut, USA

Chakrabarti, Snigdha, Subhendu Chakrabarti, Amita Majumder, Robin Mukherjee (2000): "A Study on the Impact of the Use of Electricity on Socio-economic Activities and Environmental Awareness of the Inhabitants of Sagar Dweep, an Island in West Bengal, India". *Economic Research Unit, Indian Statistical Institute,* 203 B. T. Road, Kolkata 700, 108, india

Chakrabarti, Snigdha and Subhendu Chakrabarti (2002): "Rural electrification programme with solar energy in remote region – a case study in an island" *Energy Policy* 30 (2002) 33-42. Elsevier Science Ltd.

Chaudhuri, S.P. Gon (Ed.) (2007): *Renewable Energy in the Sundarbans*. New Delhi: TERI Press.

Crewe, Emma and Elizabeth Harrison (1998): *Whose Development? An Ethnography of Aid.* London: ZedBooks Ltd.

Dugard, Jackie (2008): Power to the People? A Rights-Based Analysis of South Africa's Electricity Services. [online] URL-
http://wits.academia.edu/JackieDugard/Papers/85982/Power_to_the_People_A_rights-based_analysis_of_South_Africas_electricity_policy_framework

Dutta, Soma (2003): "Mainstreaming Gender in Energy Policies" for *UNESCAP Project on Capacity Building on integration of Energy and Rural Development Planning.* Draft for circulation. UNPD, June 2004 [online] URL-
http://www.unescap.org/esd/energy/cap_building/integration/egm/documents/Soma_D_paper.pdf

Earthjustice (2008): Earthjustice Environmental Rights Report 2008. [online] URL- http://www.earthjustice.org/sites/default/files/library/reports/2008-environmental-rights-report.pdf

Eckholm, Erik (1975): *The Other Energy Crisis: Fuelwood*. Washington D.C.: Worldwatch Institute

ECOSOC Agreed Conclusions, 1997/2 [online] November 11 2010 URL- http://www.unhcr.org/cgi-bin/texis/vtx/refworld/rwmain?docid=4652c9fc2&page=search

Gopinath, Girish (2009): "Critical coastal issues of Sagar Island, east coast of India." *Environ Monit Assess* 160:555–561

Haynes, Jeff (2002): *Politics in the Developing World. A Concise Introduction*. Malden, USA: Blackwell Publishing. Reprinted 2005

Hewitt, Tom (2000): "Half a Century of Development" in Allen, Tim and Alan Thomas (eds.) *Poverty and Development into the 21st Century*. Oxford: Oxford University Press. Reprinted 2003

Hickey, Samuel and Giles Mohan (2004): *Participation: From Tyranny to Transformation?: Exploring New Approaches to Participation in Development*. London: Zed Books Ltd.

Hirschman, Albert O. (1958): *The Strategy of Economic Development*. New Haven: Yale University Press

IEA/WBG (2008): "The Welfare Impact of Rural Electrification: A Reassessment of the Costs and Benefits. An IEG Impact Evaluatiuon." Washington DC: The World Bank Group. 141 [online] October 21 2010 URL- http://lnweb90.worldbank.org/oed/oeddoclib.nsf/DocUNIDViewForJavaSearch/EDCCC33082FF8BEE852574EF006E5539/$file/rural_elec_full_eval.pdf

Jacobson, Arne (2006): "Connective Power: Solar Electrification and Social Change in Kenya" *World Development*, Vol. 35, No. 1, pp. 144-162, 2007. Elsevier Ltd. [online] December 3 2010 URL- http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VC6-4MD9KGH

Jah, Jyotsna (2003): "Primary Schools in West Bengal." *Economic and Political Weekly*. July 5 2003. pp. 2839.2840

Jones, Nicola, Rebecca Holmes and Jessica Espey (2010): "Progressing Gender Equality Post 2015: Harnessing the Multiplier Effects of Existing Achievements" *IDS Bulletin*: *The MDGs and Beyond.* Volume 41. Number 1. January 2010

Kabeer, N. (2001): "Reflections on the Measurement of Women's Empowerment. *Discussing Women's Empowerment. Theory and Practice.* Sida studies no. 3. Stockholm: Novum Grafiska AS. pp. 17-58

Korten, D. (1990): *Getting to the Twenty-First Century: Voluntary Action and the Global Agenda*. West Hartford CT: Kumarian Press.

Langford, Malcolm (2010) "A Poverty of Rights: Six Ways to Fix the MDGs." *IDS Bulletin* Volume 41 Number 1 January 2010. pp. 83-91

Merchant, Carolyn (1999): "Partnership Ethics and Cultural Discourse" in Fischer, Frank and Maarten A. Hajer (Eds.).*Living with Nature: Environmental Politics as Cultural Discourse*. Oxford: Oxford University Press. Reprinted 2005

Ministry of New and Renewable Energy (MNRE): Renewable "Energy in India: Progress, Vision and Strategy." *India Environmental Portal* [online] December 5 2010. URL- http://www.indiaenvironmentportal.org.in/files/mnre-paper-direc2010-25102010.pdf

Morse, Janice M. and Lyn Richards (2002): *Readme First for a User's Guide to Qualitative Methods*. Thousand Oaks, California: Sage Publications

Myrdal, Gunnar (1957) *Rich lands and poor: The road to world prosperity*. New York: Harper

Nelson, Paul J. (2007) "Human Rights, the Millennium Development Goals, and the Future of Development Cooperation." *World Development* Volume 35, Issue 12, December 2007. pp. 2041-2055

NMFA (2007): Action Plan for Women's Rights and Gender Equality in Development Cooperation 2007–2009. [online] URL- http://www.regjeringen.no/upload/UD/Vedlegg/Utvikling/ActionPlanwomensRights.pdf

NMFA (2009): *Opportunities in Development: The Norwegian Strategy to India.* New Delhi.

Nustad, Knut (2004): *Gavens Mak:Norsk Utviklingshjelp som Formynderskap.* Oslo: Pax Forlag

OECD/IEA (2007): International Energy Agency: "World Energy Outlook 2006". Paris [online] October 28 2010. URL- http://www.iea.org/textbase/nppdf/free/2006/weo2006.pdf

Pearson, Ruth (2000): "Rethinking gender matters in development" in Allen, Tim and Alan Thomas (Eds.) *Poverty and Development into the 21st Century*. Oxford: Oxford University Press. Reprinted 2003.

Pogge, Thomas (2008) *World Poverty and Human Rights: Cosmopolitan Responsibilities and Reforms*. Cambridge: Polity Press. Second Edition

Potter, R., T. Binns, J. Elliot and D. Smith (1999): *Geographies of Development*. Essex: Pearson Education Limited.
RKM (2007): *Ramakrishna Mission Ashrama Narendrapur Annual Report 06-07*. Kolkata

RKM (2009): "Solar Energy Programme", undated document November 2009, Kolkata

Rajagopal, Arvind (2001): Politics after Television. Hindu Nationalism and the Reshaping of the Public in India. Cambridge: Cambridge University Press.

Razavi, Shahrashoub and Carol Miller (1995): "From WID to GAD: Conceptual Shifts in the Women and Development Discourse". United Nations Research Institute for Social Development. United Nations Development Programme. [online] October 20 2010. URL-

http://www.unrisd.org/unrisd/website/document.nsf/0/d9c3fca78d3db32e80256b67005b6ab5/$FILE/opb1.pdf

Sen, Amartya (1997): "Human Rights and Asian Values." New York: Carnegie Council on Ethics and International Affairs. [online] October 7 2010. URL-http://www.carnegiecouncil.org/resources/publications/morgenthau/254.html/_res/id=sa_File1/254_sen.pdf

Sen, Amartya (1999): *Development as Freedom.* New York: Anchor Books. A Division of Random House, Inc.

Sen, Amartya (2009): *The Idea of Justice*. London: Allen Lane. An imprint of Penguin Books Ltd.

Shaw, Susan M. (1994): "Gender, Leisure, and Constraint: Towards a Framework for the Analysis of Women's Leisure." Journal of Leisure Research, Vol. 26, 1994 [online] URL-http://www.questia.com/googleScholar.qst;jsessionid=17A11A301B2E3AB437CDE3DED6D816E3.inst1_3a?docId=5000198251

Standal, Karina (2008): Giving Light and Hope in Rural Afghanistan. The impact of Norwegian Church Aid's Barefoot Approach on Women Beneficiaries. Master thesis. University of Oslo, Centre for Development and the Environment (SUM).

Standal, Karina (2010): "Lighting the Path towards Gender Equality: Training Women as Solar Engineers in Afghanistan" in E-Net No. 2 2010. [online] September 16 2010. URL- http://www.sum.uio.no/pdf/publications/articles-bookchapters/karina-standal-gender.pdf

Strulik, Stefanie (2008): "Engendering Local Democracy Research" in Gellner, David N. and Krishna Hachhethu (Eds.). *Local Democracy in South Asia: Microprocesses of Democratization in Nepal and its Neighbours.* New Delhi: Sage Publications India Pvt Ltd.

TERI (2009a): *Journey Towards a Billion*, Volume 1, Issue 1, January 2009.

TERI (2009b): *Journey Towards a Billion*, Volume 1, Issue 3, July 2009

Thagaard, Tove (2004): *Systematikk og innlevelse. En innføring i kvalitativ metode.* Bergen: Fagbokforlaget

Thomas, Alan (2000): "Meanings and Views of Development" in Allen, Tim and Alan Thomas (Eds.) *Poverty and Development into the 21st Century*. Oxford: Oxford University Press. Reprinted 2003.

Torgerson, Douglas (1999): "Images of Place in Green Politics: The Cultural Mirror of Indigenous Traditions" in Fischer, Frank and Maarten A. Hajer (Eds.). *Living with Nature: Environmental Politics as Cultural Discourse.* Oxford University Press, Oxford. Reprinted 2005

Tsikata, Dzodzi (2004) "The Rights-Based Approach to Development: Potential for Change or More of the Same?" *IDS Bulletin* Volume 35, Issue 4, October 2004. pp 130–133

UNDP (December 2004): "Gender and Energy for Sustainable Development: A Toolkit and

Resource Guide". *Bureau for Development Policy. Energy and Environment Group*. New York [online]. –URL http://www.undp.org/energy/genenergykit/genderengtoolkit.pdf

Wilhite, Hal (2008): "Debates in the Social Sciences." [lecture] 28.08.08. University of Oslo, Centre for Development and the Environment

Wilson, Gordon and Richard Heeks. 2000. "Ch. 18. Technology, Poverty and Development" in Allen, Tim and Alan Thomas (Eds.) Poverty and Development in the 21st Century. Oxford: Oxford University Press

Winther, Tanja (2008): The Impact of Electricity: Development, Desires and Dilemmas. United States: Berghahn Books.

Winther, Tanja (2010a). First visit to Sagar and Moushuni. Unpublished field notes

Winther, Tanja (2010b) Second visit to Sagar and Moushuni. Unpublished field notes

Winther, Tanja (2010c) Third visit to Sagar and Moushuni. Unpublished field notes

Index