

**ISSUES OF GENDER IN PHOTOVOLTAIC INSTALLATIONS FOR HEALTH CLINIC  
ILLUMINATION IN RURAL MALIAN COMMUNITIES**

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**ABSTRACT**

In this project I examine how to successfully implement photovoltaic installation development projects in rural Mali by addressing gender issues. It is imperative to engage women throughout the process because of disparate impacts felt by men and women in the targeted community. This project reveals the importance of understanding local structures, cultures, and society when implementing development project. Research methods include interviews and a case study in the village of Kaara, Region of Sikasso, Mali for illumination of a community health clinic. High rates of infant mortality, maternal mortality, and fertility in Mali present an environment in which healthcare and healthcare infrastructure is greatly needed. Having lighting at the case study clinic has very significant health impacts for women and children in the community, as it provides light for night births. Analyzing the case study led to specific recommendations for ways to set up development projects to include women's concerns and perspectives, as well as men's. Conclusions demonstrate the necessity for an awareness of gender dynamics and special attention to local context and culture when planning and implementing development projects in Mali. Recommendations could be used to effectively and successfully install solar lighting systems in other communities and assist in understanding issues of development projects more broadly.

Keywords: Development, Gender, Mali, Renewable Energy, Health Clinic

## INTRODUCTION

In this paper I discuss how to successfully implement photovoltaic (solar)<sup>1</sup> installation development projects in Mali, West Africa, by addressing gender issues based on my own experiences installing solar panels in rural Mali for illumination of a community health clinic. In development studies and planning it is critical to analyze gender relations, issues of reaching women, and the importance of keeping in mind who will benefit from projects. Philosophies informing the implementation of development projects have shifted over time. The ideology of Gender and Development (GAD) and Women and Development (WAD) served as a theoretical basis for this project (Schroeder, 1999; Piché & Dagenais, 1994). GAD and WAD, arose as a reaction to the Women in Development (WID) theory that began during the 1970's but is still used today. WID, while attempting to incorporate women into a modernization theory model of development, left unquestioned the practices of that very development. During the 1980's, WAD came to the forefront, actively engaging women into development and allowing them to define development agendas. GAD, the most recent theory, allows for a more holistic view of development, incorporating women and men into the picture where one or the other is left out. It is imperative to engage women throughout the development process where they are otherwise absent, in this case for solar panel installations, because of disparate impacts felt by men and women in the targeted community.

Located in the northern Sahel/southern Sahara, Mali is mostly arid and receives a consistent amount of sunlight, making it ideal for solar energy. In urban areas of the country up to 30% of people had access to electricity in 2007. Though for the approximately 60% of the Malian population in rural areas, this figure was less than 7% in the same year (National Directorate of Energy (DNE), 2007). Mali is large in size and diverse in population and local languages. Malian ethnic groups include: Mande 50% (Bambara, Malinke, Soninke), Peul 17%, Voltaic 12%, Songhai 6%, Tuareg and Moor 10% and other 5% (CIA World Factbook, 2006). Mali, a former French colony, is mostly Islamic and has been a secular state since independence in 1960. Although the official language is French, it is mostly spoken by the well educated (and more frequently in rural areas by men).

Malian women face difficult and serious health risks throughout their lives. As in many developing areas of the world, women are responsible for child-rearing and domestic duties such as food

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<sup>1</sup> Solar and photovoltaic are used interchangeably throughout this paper.

preparation, cleaning, drawing water. There is only limited available healthcare, and it is often more limited for Malian women (as is reflected by high rates of maternal mortality and infant mortality). The country is among the poorest in the world (ranked 147 by the United Nation Human Development Index [UNHDI]) and has a very limited healthcare infrastructure (UNHDI, 2006). The average total life expectancy in Mali is 49 years. While the fertility rate is high in Mali, at 7.42 children born per woman (2006 est.), limited healthcare makes childbearing a dangerous reality (CIA World Factbook, 2006). The maternal mortality rate is one of the highest on the continent, estimated at 1,200 deaths per 100,000 births. The infant mortality rate is also quite high, at 219 deaths/1,000 live births estimated in 2004 (Mortality Country Fact Sheet [MCFS], 2006). 73.4% of rural births are not attended by medical supervision or assistance (Core Health Indicators, Mali, 2001). Many other births are in locations without electricity or running water. Lastly, infections and complications during pregnancy and delivery can be caused by the common practice of excision, or female genital mutilation.<sup>2</sup>

The lack of modern and clean energy in the developing world was identified by the United Nations in 2005 as one of the most important issues that could affect work towards the Millennium Development Goals (MDGs, a set of goals addressing poverty, gender inequality, education, women's and children's health, environmental sustainability and infectious diseases) (Ha & Porcaro, 2005). One Malian case study of an energy project geared towards women, shows that living conditions can be improved and some of the MDGs can be achieved by access to modern, clean energy sources (Ha & Porcaro, 2005). Because of the demonstrated history of inequitable benefits of development projects for women and men, analysis of gender politics in photovoltaic installations is very timely and necessary. To study gender issues associated with photovoltaic installations on rural health clinics, I participated in a case study of an installation in the village of Kaara in the southern region of Sikasso, Mali, for the illumination of the health center and maternity clinic. The involvement of women (as well as men) in the process is essential because their involvement may directly impact the benefit they receive from such projects.

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<sup>2</sup> For more information see the Integrated Regional Information Networks (IRIN), United Nations Office for the Coordination of Humanitarian Affairs (IRINnews.org)

## **METHODS**

For this study, I traveled to the region of Tombouctou in the north, Bamako the capital and largest central city, and the region of Sikasso in the south during the summer of 2006. I traveled with four other research partners: three mixed race/black American men and one Chinese-American woman. In all locations our translators, guides, drivers and co-workers were Malian men.

We visited the Tuareg village of Tirikène, located in the region of Tombouctou, where the leader of our research group had installed solar panels on the mosque two years prior. The village also had two other photovoltaic systems, one for a water pump, and one at the mayor's house. The village, while it had a building designated for use as a health clinic, did not have any equipment or resources for the "clinic". Our efforts at this village became focused on repair of the solar-powered water pump, as it was in disrepair and was a priority for the village upon our arrival.

In the village of Kaara, region of Sikasso, we installed a solar powered lighting system in the maternity ward of the village health clinic (Centre de santé communautaire de Kaara). We worked with a partner from the Mali-Folkecenter (a Malian NGO) who simultaneously expanded, improved and updated the installation on the infirmary of the same health clinic. The installation process took two days. During the installation process, we were able to interview women and men from the village, the midwife for the maternity center, the director and the pharmacist for the clinic. The clinic was very well staffed compared to many rural clinics, which usually have only a midwife or a limitedly trained nurse. Following the installation, I also was given an opportunity to meet with and interview the Women's Association of Kaara, their president, Ténéko Kone, and the midwife, Awa Sangaré. The meeting with the Women's Association involved most of the women in the village, including young and elderly women. At the meeting I was able to ask the women questions on the impact of the solar installation and lighting of the clinic, as well as their activities in development of the village in the past. Concluding the meeting, the women threw a small dance for us in appreciation of the installation. It was a great honor to be granted such a meeting and to be given a dance. This was one of the most valuable and powerful interactions with women during my research, which was especially useful since it was conducted within their own social context.

In addition to those directly associated with or affected by the installations, we interviewed experts on women's issues and solar and renewable energy. Interviewees included: Denis Bilodeau, Team Leader, Communications for Development, United States Agency for International Development, who presented a very comprehensive understanding of development issues in Mali. His expertise lies in the installation of solar panels for powering local radio stations, of which he has done over one hundred. Fadimata Walet Inorène, Coordinatrice Régionale Tombouctou, World Education "Appui à la qualité et à l'équité de l'éducation" Programme d'Appui au Ministère de l'Éducation Nationale, is an expert on women's issues and education in northern Mali. She provided a deep understanding of these issues and of gender relations and politics. Thomas Burrell, Project Director, Mali-Folkcenter, has done over 60 solar installations for various uses. He gave his perspective on installations and their interactions with, and impact on, the targeted communities.

My positionality as a white, American, schooled, French and English speaking woman was kept in mind as it is an important factor in research, knowledge collection and production that must be considered in order to fully analyze the experience and project. My personal identity was important when conducting analysis in this new social context. I was operating as a white, western woman—privileged and also isolated because of it. I found, more often than not, that I was treated not as a woman usually is treated, but as an honorary male within Malian society; as an educated American I was accorded the respect usually reserved for men (Schroeder, 1999:xxii). At moments when my womanhood was recognized, I was very obviously separated from Malian women and put in an altogether different Western female category.

The Western female category, from my understanding, defines female in a very separate category from the Malian woman. I am, because of my positionality as a Western woman, unable to claim any personal understanding of the experience of navigating society as a Malian woman. My identity, gender role and status, were particularly important to the research because they shaped my place in the spaces in which I moved and the people with whom I interacted. I was, however, able to gain some access (though limited) to women's spaces that men in my group could not access.

## RESEARCH ANALYSIS

In addition to participation in a solar panel installation in the region of Sikasso, village of Kaara, experts on Malian gender, health and renewable energy issues were interviewed and consulted. Women's differing health issues in the northern and southern regions of the country were also examined. The installation in the village of Kaara at the Centre de Santé Communautaire (CSCOM) health clinic was used as a case study. Having electricity at the clinic has very significant health impacts for women and children in the community as it provides light for night births.

In the installation and interview processes it proved more difficult to speak with, consult, involve and question women than men. While working on a previous installation for water pumping in the village of Tirikène, region of Sikasso, many men from the village crowded around to watch what we were doing. A woman passed by on her way to get water and asked about the water pump. I attempted to communicate with her and tell her that the water pump wasn't working and she should go to the other well in the village that had a hand pump. I was cut off by a man from the village—I am unclear of his relation to her (if any). He spoke to her abruptly in Tamasheq (one of the main languages spoken in the North by Tuareg peoples), then turned to me and told me (in French) that she doesn't speak French and that he informed her the pump wasn't working and to go to the other well. When he spoke to her she continued walking and I was unable to continue trying to speak with her. I realized that I was going to have a difficult time getting access to women and their world.

While conducting the installation in the village of Kaara we were unsure of where to install the light in the delivery room in order to maximize visibility for the midwife during births. I went looking for Awa, the midwife. I found the Chef du Poste (Director of the Clinic) and a Malian NGO worker who were collaborating with us for this installation (both men). When I asked them where to find her, they dismissed the need to consult her and said that she knew nothing about electricity or light installations. I maintained that her opinion would be valuable but they rejected my requests to speak with her. None of the installation participants being medical professionals or trained at midwifery, we felt unqualified to make a decision that would suit her working conditions and the delivery of numerous children. My male colleague went to speak with them and insisted on the importance of her opinion questioning them: "Do you deliver babies?" They finally agreed to send her over and I was able to ask her where to install it. She was surprised at my question and at first did not volunteer an opinion. I explained why I was asking

her where the light should go (though our language communication was difficult since her French was heavily influenced by Bambara and I had a hard time deciphering it). I gave a few suggestions for where to install it, and she said that the wall location (shining down on the birthing table) would be best. I thanked her and she left. Though she seemed surprised to be asked about the location of a light fixture and hesitant to give a decisive answer, because of her experience of child delivery she did have a suggested location for the light.

By recommendation of a USAID project coordinator, I was put in contact with the Coordinator of World Education, Mali. While in the northern region of Tombouctou, I interviewed Fadimata Walet Inorène. A Malian national and female professional, Inorène explained some geographically specific gendered difficulties that face her as an education advocate. She explained much of the situation for young women and the general medical situation of many women in the northern region. Unaware of cultural and gender role differences between the north and the south at this point in my research, I neglected to ask questions that would highlight the impacts these differences would have on solar illumination of health clinics. She explained that women in the Tombouctou region sometimes do not seek medical attention for pregnancies and births because they must ask their husbands' permission to go to a clinic, and are sometimes denied permission. This example of gender politics that has healthcare repercussions is not imitated in the same way in the family structure of southern Sikasso region families, and therefore would have disparate healthcare implications. These differences in healthcare access and infrastructure are similarly reflected in the higher rates of infant mortality found in the northern regions of the country (WHO MCFS, 2006).

While in the village of Kaara it became clear that the Women's Association had a very powerful role in the healthcare provided to women and children. The President, who came to the maternity clinic during the installation to thank us for our work, told me of the Women's Association. Later, when given an interview with the Association, I was told about their initiatives in the village. In previous years, they raised money and used it to fix the poorly built maternity ward of the clinic when it was in disrepair, and hired outside instructors to conduct a few weeks long education workshop for the women of the village. These projects demonstrated the power of the Women's Association and their role for women in the community. It was important to discover the existence of this Association in the understanding of gender politics as well as in the understanding of infrastructural support systems for health care.

## CONCLUSIONS

Though specific to Mali, the conclusions from this research will be helpful to any gender aware solar installation projects on rural developing world health centers. Rural Malians often face an array of obstacles to health care access, including: lack of infrastructure for clinics and minimal clinic staffing. While infrastructural upgrades (such as solar installations) to existing health clinic buildings could attract health center staff and would therefore improve healthcare for women, it is risky (from a development project perspective) to install photovoltaic systems in unstaffed clinics because they may continue to go unstaffed and unused—benefiting no one.<sup>3</sup> The experiences of this installation case study, can shed light on gender and political issues of installations not only for the Mali-Folkecenter, but also for other NGO's involved in promoting access to renewable energy sources in rural Malian communities. First, it is important to assess who will benefit from solar installations. In this case, lighting health clinics were beneficial to, and will be utilized by, women in rural Malian communities. It is important to understand differences between Northern and Southern culture, society and gender roles—some things to keep in mind are the nomadic lifestyle of Northern peoples versus the settled lifestyle of Southern peoples. It is also important to consider language barriers and educational differences. Women most commonly and fluently speak indigenous languages—within the communities of this case study fewer women than men spoke French. This is often because young motherhood and marriage removes many women from school at younger ages than young men. It is important to consider, plan for, and remember that it is difficult to find women and solicit their opinions. Existing power structures for women should be used to connect with women and include them in the process of installations. My recommendations include:

(1) Solar installations for lighting health clinics are beneficial to and will be utilized by women in rural Malian communities. Specifically, women will no longer have to use oil lamps to light night procedures and births. The results of such a lighting change are numerous. Women will no longer have to purchase kerosene to keep the lamps lit all night during their labor and delivery. This decreases personal expenses, lowering the cost for women of giving birth and may increase disposable income or income to be invested elsewhere. The installed lighting will also mean that women in labor will not

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<sup>3</sup> This issue affecting clinic utilization requires more thorough research and is a contentious topic within Mali. Some facilities and resources lie unused while other times there are healthcare professionals but no equipment or resources. Electrified health centers may draw and help retain educated health staff because of improved working conditions and quality of life. While this may be true, installing solar powered lighting for health centers without staff in place risks the chance of going unused for the desired purposes.



have to find other women assistants to hold the lamps in appropriate places to allow for the midwife to have adequate visibility. It will also improve the working conditions of the midwife. She will no longer have to work repeatedly in unventilated areas with lamp oil fumes that are harmful to her cardiovascular health. Indeed, this is a health benefit for the mothers and babies as well. They will not have to be exposed to such fumes at a medically vulnerable time either.

(2) Working in Mali it is imperative to understand contextual differences between Northern and Southern culture, society and gender roles. Though there are many similarities and a strong national identity, communities in the northern and southern regions have different characteristics that may affect development projects. In the north of Mali, girls are married as early as 12 or 13 years old, whereas in the south, girls are married more commonly around 17-20 years old (Fadimata Walet Inorène, personal communication, June 2006; Awa Sangaré, personal communication, June 2006). These differences could indicate different conceptions of women and women's rights that might influence resource allocation and development priorities for different communities. Mortality rates for children under the age of five are higher in the northern regions than in the southern regions, which could indicate harsher conditions or less access to healthcare in the north (Mortality Country Fact Sheet [MCFS], 2006). Social norms are also variant because of the traditionally nomadic lifestyles of many northern populations. For example, for many communities in the north, it may be difficult to provide healthcare and healthcare infrastructure to women who are nomadic. Health centers in established villages throughout the north may also serve larger nomadic populations that pass through their villages as well as their own stable community population. All of the above create different circumstances for providing women's healthcare services and resources as well as for various types of development initiatives.

(3) To effectively and considerately incorporate women into the installation process, language barriers, educational differences and lifestyles of women in the community must be considered. Indigenous languages are most commonly spoken in rural areas. In rural areas, fewer women speak French than men because women are often obligated to leave school at an earlier age. Young motherhood and marriage removes many women from school well before lycée (secondary school). This disparity makes the presence of a translator who speaks the indigenous languages even more important to working with women. Male translators who speak the indigenous languages are readily available throughout the country. However, working with a male translator may taint or alter the interviews and responses with

women. It may also limit the topics appropriate to discuss and the interview spaces themselves. Throughout the country, but more strikingly in rural areas, finding women from whom to solicit opinions is difficult and requires intent. Therefore, structural planning decisions must be made in advance to accommodate the added intent of including women in research and installations.

(4) Models of participatory research should be used from the beginning of development projects in order to include all members of the community and create reciprocal relationships between participants. Participatory research is used to create a reciprocal relationship between all participants in the research. Participants include the researchers or aid workers. Thus, they are located in the equation as participants and not as observers or as actors upon the community. Under this model, my research team and myself would be brought in as resources in the process of the installation. For the case study in Kaara, models of participatory research were not used by the local NGO from the beginning when they first began contact with the village. If participatory research had indeed been used, women would have been more accessible as they would already be involved in the installation process and not need to be pulled in upon our arrival. Attempting a participatory research model means remaining cognizant of status, power, gender and societal and cultural positionality in the research process. When planning this research, I had hoped to use models of participatory research in knowledge production and collection, but since all actors did not use this model from the start of the project, it was not a true participatory research project (Elabor-Idemudia, 2004). I believe my research would have been made more effective if a participatory model were used.

(5) While most public space in Mali is male dominated, Women's Associations are self-organized and a traditionally accepted forum in which women are able to enter the public arena. Consequently, Women's Associations are a valuable resource for communication with women in the public sphere. Using the existing social structures for women's empowerment makes integrating women into the installation process easier and more "normal" within the societal context. The Kaara Women's Association demonstrated their power in the public arena in the meeting they held with us and the dance performed for us. Performance and dance is a means of power demonstration and negotiation that is often used by Malian Women's Associations (Modic, 1994). The Women's Association in Kaara also had a very powerful role in the healthcare provided to the women and children in the village. They raised money and used it to fix the poorly built maternity ward of the clinic when it was in disrepair.

Elderly male authority in rural Malian villages is often most recognized (as is shown by greeting the chief or mayor and male elders of the village upon arrival). Female authority within villages, nonetheless, is present and powerful. Still, the male and female spheres of power are separate, perform different duties, and may often not be equally visible to development workers. While the public space most accessible to Western aid workers and researchers is male dominated, Women's Associations demonstrate their public influence in action, art and community and therefore may act as a recognized power structure to work with and through.

### **SUCESSES AND AFTERLIFE**

The project was very successful in creating connections and relationships that will make it possible to carry on further research and to continue collecting data to support desired and projected results of solar installations for health center illumination. Projected and desired results include lowering the Maternal Mortality Rate (MMR), lowering the Infant Mortality Rate (IMR) and alleviating income burdens on new mothers by eliminating the necessity to purchase kerosene for lamplight during night births and emergencies. Although further data is yet to be collected, I revisited Kaara in 2007 and found the solar panels in good, working condition. Women testified to the impact lighting had made for the births of their children. The Woman's Association expanded their activities—including a savings account for micro-loans to members and a community garden—and their village influence. This project has allowed for research to be done that could assist in the effective and successful installations of solar lighting systems in other communities. Future work includes establishing a network of female translators and working with Women's Associations as agents of development in communities.

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