

Hong Kong Baptist University

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Sustainable Energy and Technological Innovation in China

Title of the Service-learning Project

Desktop research on international case examples of women-led community-based sustainable energy development. (Cases of Tanzania, Nigeria and Taiwan)



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Introduction

With the development of industrialization, social production and high carbon emissions caused by living activities have caused lots of serious environmental problems. At the UN conferences, environmental protection and sustainable energy development are promoted. So, in today's society, the role of renewable energy is becoming increasingly important in both developing and developed countries. Among them, women are indeed playing a particularly significant role in creating sustainable low-carbon communities. It is not only because of human rights and gender equality, but also women are often decision-makers of household energy use in most cases such as the time to turn on some household appliances and the way of cooking. Moreover, women tend to educate children more in families nowadays and it is important to cultivate children's environmentally friendly habits from very young ages. In addition, communities are where individual behavioral changes can achieve collective impacts and women occupy an important position in them. Therefore, in this research report, we choose three typical cases about empowering women for sustainable low-carbon communities around the world, and through some analysis we come to the conclusion.

Case 1 - Community-based & women-led energy initiative in Tanzania

The case of the women-led community based sustainable energy initiative in Tanzania is the 'Rural Women Light up Africa' scheme. The project is launched by UN Women and the Barefoot College. The purpose of the initiative is to train rural women as solar engineers. So, they could promote solar energy and plug the household appliances into solar power, as well as the repair and maintenance

services. The women engineers could receive working allowance so that their effort in promoting solar energy is remarkable. More than that, three villages in southern Tanzania have benefited from these women engineers because they have built up a solar electricity system. The women did not only stay at their village after the graduation of engineer class. It also assists other villages nearby in the establishment of the entire solar electricity system. The universal phase of using solar energy would be the foreseeable future in Tanzania.

Household plan - Cost of equipment and maintenance installments

| Solar package per household | Initial deposit | Monthly installments (for 5 years) |
|---|-----------------------------------|---|
| 20-watt solar panel 12-volt battery Cell phone charger 3 nine-watt lamps | 20000 Shillings (around \$12 USD) | 5000 Shillings (around \$3.08 USD) |

The solar initiative brings tremendous benefits to their communities in Tanzania. Instead of using kerosene, the electricity produced by solar energy would not raise health and safety issues. The change in household energy use would be sustainable and environmentally friendly. Also, the children could study via solar-powered lantern in the evening and nighttime. Apart from that, women inspire their children about the importance of sustainable energy and a low-carbon community, which nurtures a sense of environmental responsibility in their heads. In terms of the community, the initiative improves people’s living quality in the rural village, which gains their acceptance of

the renewable energy project afterwards. Besides, there is a significant and unique meaning of the women-led initiative in Africa where the sense of gender inequality is highly sharpened. The women could be impactful in improving the living quality in the community and also make a contribution to sustainable energy development.

Case 2 - Green energy investment platform-Sunnyfounder (陽光伏特家) in Taiwan

The second case we are going to talk about is Sunnyfounder (陽光伏特家), a women-led, and the first green energy investment platform in Taiwan. Sunnyfounder was founded in 2016, leading by Chen Huiping (陳惠萍), she and her team created the platform because they want to improve citizens' participation in using renewable energy. They realized some energy problems in society. For example, among those solar PV users in Taiwan, 92% of them are enterprises while only 5% are households. The low individual participation is due to the high construction cost, insufficient funds, and lack of maintenance skills. In order to encourage people to participate in generating solar energy, Chen proposed an effective solution—Sunnyfounder.

On the platform, participants are divided into three categories: founders, rooftop providers, and donors. After collecting the idle rooftop from the masses, the professional teams will go for assessments, and coordinate with manufacturers to install solar panels in eligible roof space. After the solar panel construction, the platform will publish the information and solar data of the subscribed panels. It allows the public to participate in solar investment in front of the screen.

Investors can enjoy power rebates by making income from selling the solar electricity back to the power company.

Apart from operating the investment platform, Sunnyfounder aims to achieve green energy sharing by providing care to the disadvantaged groups. Chen and her team understand that the caring power of a traditional one-off sponsorship may not last long. Therefore, Sunnyfounder uses an innovative green energy public welfare model to offer long-term and stable “sponsorship” to the society in need. They build solar plants for the disadvantaged units and social welfare groups. The green energy revenue generated by the solar power plants will be fed back to the disadvantaged groups, providing continuous, stable and predictable resources. The mission of Sunnyfounder is to ensure everyone has access to affordable, reliable and sustainable modern energy. They take action to help reduce poverty, reduce inequality, and improve well-being by promoting sustainable development with green energy.

Case 3 - Solar Sister in Nigeria

The third case study is a nonprofit women-driven organization in Nigeria, named Solar Sister. It was first established in 2009 by an energy economist, Neha Misra. Then it started operation in Nigeria in 2014. In Nigeria, more than 600 million people are living without electricity. Also, more than 700 million people are still using flammable and polluting cooking fuel like kerosene. Therefore, Solar Sister aims to improve this situation and by empowering women in energy projects.

There are two main goals of the Solar Sister. Firstly, Solar Sister aims to solve the energy poverty problem and switch the energy habit in Nigeria. By providing recruits, training, and support, local

women learn how to set up a business selling clean energy products and sell them in their communities. It helps promote the replacement of the kerosene lamp with solar light, which can reduce carbon emission. Also, there will be less smoke produced during cooking which is beneficial to health. According to independent research (Solar Sister, 2018), over 55,000 metric tons of CO₂e emission was avoided, and nearly 250,000 kerosene lamps were replaced by solar light. It shows that it can help the building up of low-carbon communities in Nigeria.

Secondly, Solar Sister wants to address women's empowerment in less developed countries. Women in Nigeria have a low independent economic capacity. Also, they are low-skilled with low education levels. However, by providing training and opportunities to learn how to run a clean energy business, they are able to learn new skills and earn money from selling products. It shows that it can improve women's independent economic capacity and gain confidence from their husbands and the communities. Besides, not only these women who participate in Solar Sister can benefit themselves, but they are also influencing other women in the communities to use clean energy products and set up clean energy businesses. It shows that by expanding the Solar Sister network, there will be much more women in Nigeria to be beneficial and improve their livelihood. Also, it is a good way to build sustainable low-carbon communities in Nigeria.

Comparative analysis

In summary, these three regions-located women-led low-carbon energy transition programs present different characteristics:

Challenges of energy poverty exist in both developed and developing countries, but generally speaking, less developed regions like Tanzania, Nigeria more likely to emphasize energy accessibility, which aims at ensuring people who are living without electricity access to reliable energy, as well as using modern household appliances to replace the high-polluted cooking fuel like kerosene. Well-developed regions like Taiwan focus more on affordability to address the high construction costs of renewable energy. Besides, these three projects were initiated by different subjects. The Taiwan and Nigeria project were founded by individual female leaders, whereas the 'Rural Women Light up Africa' scheme in Tanzania was launched by International NGO and college. It thus to some extent leads to the way of promoting solar energy in communities is slightly distinct. Unlike the projects in Taiwan and Nigeria, which focus on providing training and opportunities to learn how to run a clean energy business. Women in Tanzania could receive the working allowance from the program.

Although the above three cases show different features in terms of focuses, initiators, and methods on promoting community-based renewable energy. There are some common features could also be summarized as follow:

First, all of these programs provide training support for women to improve their skills. For example, the Tanzania project aims at training rural women so as to enable them not only to be able to use modern household appliances but also could repair these types of equipment. Similarly, the Nigeria program provides training skills on how to set up a business selling clean energy products for local women.

Second, all of the three cases indicate that the influence of female-led renewable energy projects goes beyond the local community. Women play an important role in renewable energy development by influencing women in other communities to use clean energy products.

Third, other positive impacts of woman-led renewable energy projects have also been highlighted in these case studies, such as mitigating gender inequality, alleviating energy poverty, improving people's living quality, as well reducing health and safety risks. Furthermore, women are the key actors in educating the next generation to nurture a sense of environmental responsibility.

Conclusion

Overall, the above case studies manifest that women play an important role in promoting renewable energy. Their behavior could not only influence the current energy use to achieve collective impacts, which is crucial on mitigating gender inequality, alleviating energy poverty, improving living quality, reducing health risks. More importantly, they are an important actor for a promising sustainable future since they are nurturing their children who are the future leaders and entrepreneurs.

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