Temilade Agbaje
Institute for Science and Society
University of Nottingham

From User Involvement to User Initiative: The Role of Priority Identification in Facilitating Sustainability of Rural Renewable Energy Projects

Abstract

This paper proposes that the presence or absence of two key elements – user involvement and user initiative - can either promote or hinder renewable energy diffusion. While the concept of user involvement has been presented on many platforms over the years as a key element for successful implementation of development programmes, the various dimensions of involvement necessary to ensure project sustainability have been less often discussed. The role of user involvement in engendering user initiative is even less recognised. The paper explores this cause-and-effect relationship, and highlights the importance of user priority identification in fostering this relationship and ultimately enhancing diffusion.

1.0 Introduction

The concept of user involvement in development programmes is effectively captured by the more widely used term 'participation'. The scope of participation is so broad that it is impossible to encapsulate it within one definitive term (Oakley, 1991). Usually, community participation in a project will involve some combination of the following elements: a focus on making provision for the needs of local people; taking advantage of local people's experience and know-how; allowing local people to donate labour, financial and material resources towards the project (Brown, 1979). Depending on the project and the implementing agency, user involvement may be extended to include aspects of program design, benefits sharing and program evaluation (Cohen and Uphoff, 1980).

Regardless of the form it takes, the central idea underlying and animating participation is *influence*. Through participation, local end users have the opportunity to influence any combination of the key project areas of planning, policy, design, construction, implementation, remuneration and evaluation. Through participation, power is given back to people to claim a stake in the crucial decisions that affect their day-to-day living.

Two sustainable energy projects, one in Nigeria and the other in Kenya, will now be used to illustrate components of user involvement that have been shown to elicit favourable responses and adoption rates in host communities.

Community of Practice: **Energy**
Author: **Temilade Agbaje**
Institution: **University of Nottingham**
Previously published: **No**

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2.0 Case Study 1: The Egaga Stove Project

This improved stove project was preceded by an eighteen-month baseline study carried out from 1997 to mid-1998, during which community surveys were done to ascertain household energy use patterns in Oghara and Benin, two communities in the South-South of Nigeria. During the study, the traditional Egaga was identified as the predominant stove used for cooking in the region. Essentially a locally manufactured metal stand used to support a cooking pot over an open fire, the Egaga stove has been in use in the region for over a hundred years. The bare-bone structure of the Egaga however means that much the fuelwood stacked within its confines is exposed to open air during cooking. Consequently, when the fuel burns, only about 10 percent of the heat energy is directed to the pot above (Kammen, 1995).

Working with Resource Efficient Agricultural Production (REAP) Canada and two local women's groups, the Centre for Household Energy and the Environment (CEHEEN) Nigeria set about the task of developing a more efficient stove for use in both communities. It started by teaming up with the women's groups to identify the preferences of local stove users, most of whom are women. Based on the data collected, three different stove models were developed. One of the designs featured improvements to the Egaga stove, resulting in an upgraded version of the stove that was capable of saving up to 40 percent of the fuelwood used in the traditional model (Obueh, 2008).

Testing of the three stove models in both communities revealed that the improved Egaga was the most widely preferred by the people. The major reason given for its wide acceptance was the familiarity of the technology leading to ease of adaptation. The ensuing pilot activity saw the improved Egaga being disseminated in both communities to 5,222 households, selected on the basis of people's willingness to be involved and the degree of their susceptibility to the harmful effects of indoor air pollution.

3.0 Case Study 2: The Kenyan Biomass Smoke Project

Practical Action, an international non-governmental organisation, worked on a project with fifty households in two Kenyan communities between 1998 and 2001 to develop and implement solutions to pollution problems caused by inefficient use of biomass in their kitchens. Even though the two communities (Kaijado and West Kenya) are both

Kenyan villages, they have different socio-cultural practices and preferences. Consequently, Practical Action worked with them separately to identify the requirements of each community and devise solutions accordingly. Three main interventions were developed: better combustion with improved stoves; smoke extraction through smoke hoods and ventilation through windows and eaves spaces.

Right at the start of the project, participation was stated as the core objective. Prior to commencement, Practical Action staff met with women's groups in both communities to inform them of the project's aims and objectives. The people were also educated about the risks of traditional biomass smoke, and the benefits they stood to gain from the proposed interventions. Focus group meetings were held to provide a platform for the communities' opinions and needs to be expressed.

Indigenous knowledge was highly valued throughout the project, and the communities' views and opinions were listened to at all stages of the work (Bates et al., 2002). Both men and women participated in technology development and appraisal, deciding on the options that suited them best (Ibid.). For instance, Practical Action had initially considered tackling the issue of smoke extraction by installing chimney stoves. However, consultation with local groups revealed that there was a strong aversion in the community towards chimney stoves due to the colossal failure of a government-implemented chimney stove project years earlier. The idea of smoke hoods, on the other hand, was welcome because a similar project had been successfully implemented in the region previously.

4.0 Two Projects, One Approach

Several characteristics are common to both the Egaga and Kenyan biomass projects:

- Implementing agencies took advantage of existing local structures and knowledge base;
- End users were involved in both decision making and technology development processes;
- Open flow of information between the implementers and host communities increased trust and enhanced the commitment of local people to the projects;
- Educating users on the reasons why they needed to switch made them more receptive to change;

- Participatory methods combined with technical monitoring facilitated the development of solutions that were appropriate to local requirements and that suited users' preferences.

5.0 Beyond Participation

As demonstrated by the case studies described above, participatory approaches have considerable potential to improve the outcome of rural renewable energy projects. Current practice however suggests that in many rural development programmes, participation is stronger in rhetoric than in practical reality; that there is a lot of lip service to the notion of participation but less commitment to the changes in direction and style that would be required to implement it (Oakley, 1991).

One of the "changes in direction" needed, it would appear, involves shifting the onus of participation slightly away from end users and onto implementing agencies. If users are to reap the maximum obtainable rewards from their involvement in rural energy projects, implementing agencies need to redefine their expectations of the participatory process in at least one way. Beyond employing participation as a means of identifying the needs of users, attention should also be paid to using it as a means of identifying the *priorities* of users. Understanding what is most important to end users can make an enormous impact on the outcome of a project, as demonstrated by the following account of Kenya's heterogeneous experiences in disseminating improved stoves in urban and rural areas.

6.0 One Country, Two Stoves

Development of improved cookstoves in Kenya started in the early 1980s, in response to the urban energy crisis. Unable to afford more modern cooking fuels, most urban dwellers were using charcoal stoves, or *jikos*, for cooking. The traditional jiko consumes a lot of charcoal, delivering only 10-20 percent of the heat generated to the pot (Kammen, 1995). As a result urban dwellers frequently spent a significant fraction of their income on the purchase of cooking fuel (Ibid.).

Recognising the need to help people cut down on energy costs, the Ministry of Energy initiated the Kenyan Renewable Energy Development Programme (KREDP) in 1981. The KREDP team worked with local craftsmen and women's groups to develop an improved stove specifically tailored to urban users' requirements. This collaboration resulted in the production of the Kenya Ceramic Jiko (KCJ), a charcoal stove with improved combustion efficiency that enabled users make substantial savings on fuel expense.

The KCJ proved to be an immediate success. Its adoption became so widespread that the KREDP met and exceeded all its targets in record time. The goal of the project was to have at least 20 enterprises manufacturing and selling 5 000 KCJs by 1986. By mid-1986, over 15 enterprises were involved in manufacturing and 125 000 KCJs had been sold (Hyman, 1987). By 1995, with a total of over 780 000 KCJs disseminated (Karekezi et al., 1997), more than half of all urban households in Kenya owned the KCJ, with 20 000 new jikos being sold every month (Kammen, 1995). Though the KCJ has not attained a hundred percent success rate, it is one of the most successful charcoal stove projects in the East African region and indeed in the developing world (Karekezi et al, 1997; Karekezi, 1993).

Encouraged by the unprecedented success of the KCJ, several enthusiastic donor agencies were eager to replicate the same impressive results in rural Kenya. Unfortunately however, the rural experience of improved stove dissemination proved to be far less spectacular than the urban experience.

The Ministry of Energy and the German Agency for Technical Cooperation (GTZ), working with the *Maendeleo ya Wanawake* (Women in Development) women's group, developed a less expensive variant of the KCJ and named it the *Maendeleo* stove, after the women's group. This early project employed an aid-centred dissemination model, providing subsidies and capital grants to stove users and retailers. At a cost of about US$ 1.50, the Maendeleo was the cheapest available improved stove on the Kenyan market, saving 30-50 percent of the firewood used in traditional stoves (Blum, 1990). A major advantage to the stove was that it could be constructed from sticky soil, stones or any other locally available suitable material. Notwithstanding the enabling conditions however, the Maendeleo failed to achieve widespread dissemination in rural Kenya.

Surmising that the problem was one of technique rather than technology, Practical Action set about developing a commercial model for dissemination of the stoves. The reasoning was that the introduction of a profit incentive into the distribution scheme would increase the value of the Maendeleo as a marketable commodity. Nevertheless, dissemination rates remain comparatively low to date. The Maendeleo has been promoted for nearly twenty years now, but only 4 percent of the Kenyan population currently use them (Ingwe, 2007).

7.0 From Participation to Initiative

It is remarkable that despite the application of similar participatory approaches to implementation of the KCJ and Maendeleo stove projects, the former proved to be sustainable while the latter did not. This comparative shortfall in the performance of the Maendeleo is partly attributable to the failure of implementing agencies to identify the most important considerations to rural users with regard to household energy use. In making implementation decisions, the agencies neglected to take into account the fundamental difference between urban and rural energy use patterns: while urban dwellers have to purchase charcoal, rural dwellers mostly gather fuelwood free of charge. As such rural dwellers have no financial incentive to cut down on energy use.

The rural Maendeleo project was launched along similar lines to the urban KCJ project, on the assumption that energy saving would be a major concern for rural users. However users' circumstances dictated differently, and it was realised after several failed attempts that cost saving actually ranked higher on users' list of priorities. Average rural incomes are low[1], so that even at rock-bottom prices, many users find it challenging to raise the capital needed to acquire a new Maendeleo stove.

In the case of the urban KCJ, reduced charcoal expenditure provided enormous incentive for users to purchase the new energy-efficient stoves, so that even when the government's KREDP project ended, production and distribution of the stoves continued on a commercial scale. This initiative on the part of the users, the ability to make acquisition decisions based on perceived legitimate priorities, is a key factor contributing to the sustainability of energy projects in developing countries. Consequently,

[1] A 1985 survey showed that 37 percent of Western Kenya households had no cash income; 44 percent earned 500 Kshs[1] (or US$ 7.35) per month; 12 percent 501-1000 Kshs (US$ 7.36-14.70) per month; 3 percent 1001-2000 Kshs (US$ 14.71-29.40) per month; 1 percent 2001-3000 Kshs (US$ 29.41-44.11) per month (Overseas Development Institute, 1989).

development agencies need to be more deliberate about identifying the priorities of rural energy users through the participatory implementation methods they employ.

8.0 Conclusion

User involvement in rural renewable energy projects is instrumental to the development of technology that is appropriate for them. However, to achieve sustainable and

widespread diffusion of appropriate technology, user initiative is essential. This is facilitated when implementing agencies make as an important goal of the participation process the identification of users' priorities. It is imperative for implementing agencies to align their priorities with those of local users, or at least to draw a line of best fit which accommodates the most important users' considerations while still meeting their own wider objectives. Until this is done it is unlikely that diffusion of renewable energy technologies in rural areas of developing countries will achieve its maximum potential.

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Institute for Science and Society
University of Nottingham

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