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Can the Clean Development Mechanism (CDM) deliver?

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ABSTRACT

The paper investigates whether the Clean Development Mechanism (CDM) under the Kyoto Protocol has played a significant role in the development of rural communities, specifically investigating uptake of small-scale renewable energy projects. The investigation involved an assessment of 500 registered small-scale CDM projects under the Kyoto Protocol in terms of their potential impact on the envisaged sustainable development goals for rural communities. Five case studies from the Indian subcontinent were also examined.

The paper concludes that the CDM in its current state and design has typically failed to deliver the promised benefits with regard to development objectives in rural areas. Successful projects were found to have had good community involvement and such projects were typically managed by cooperative ventures rather than money making corporations. The paper puts forward a new framework for the assessment of such benefits in the hope that future projects can be better assessed in this regard. The key problem, however, remains on how to deal with the inherent contradiction between development and sustainability.

1. Introduction

As of the early 21st century, humanity is in the midst of several global environmental problems, primarily centred on anthropogenic climate change, due to the addition of large quantities of uncontrolled CO_2 emissions into the atmosphere. These emissions have resulted from a high dependency on crude oil and other fossil fuels to meet the world's primary energy demands. At the same time, the global energy supply is encountering several challenges in terms of long-term sustainability, in particular, depleting fossil fuel reserves.

The global effort to cut emissions has been hampered by the stark difference in energy consumption between the industrialised and developing countries, wherein the latter have 80% of the world's population but consume only 30% of global commercial energy (IEA, 2006). Several studies (Teske et al., 2007; United Nations Development Programme, 2006) indicate that one of the main barriers confronted by rural communities in the developing world is access to basic, affordable and clean energy services.

Equity issues then suggest that developing countries need to increase energy supply substantially. Climate change, on the other hand, suggests that the world needs to reduce conventional energy use substantially. The only way both can happen is if the developing world and the developed world make a transition quickly to renewable energy. Although there has been a growing recognition for renewable energy solutions worldwide (Lloyd and Forest, 2010), for various reasons, the absolute contribution of such technologies to world energy supply has been very low. One of the prime reasons has been a relatively low level of development of national and international policies to aid the transition—in other words—governmental inaction.

One energy transition policy tool has been to bring developing countries into the Kyoto Protocol, under a flexibility mechanism called "The Clean Development Mechanism" or CDM. This mechanism has been suggested to have the potential to both mitigate global warming and provide renewable energy systems for developing countries (Jotzo, 2004).

Small-scale community based CDM projects, which expand access to energy services through the use of local renewable energy resources, are also thought to have had the potential to contribute to local and national development objectives. These objectives in turn are thought to be a crucial factor in meeting the Millennium Development Goals (MDGs; Brown et al., 2004). It has been thus proposed that the CDM, under the Kyoto Protocol, through its innovative carbon financing mechanism, could play a critical role in making rural community based RE projects sustainable and replicable (Richards, 2003; Jotzo, 2004).

This paper, investigates, whether the Clean Development Mechanism (CDM) has in reality played a significant role in the development of rural communities in developing countries, specifically including uptake of small-scale renewable energy projects. The investigation has been carried out through assessing the registered small-scale CDM

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projects under the Kyoto Protocol in terms of their potential impact on the envisaged sustainable development goals, including access to energy for rural communities.

2. Role of energy in "sustainable" rural development

As discussed by Lloyd and Subbarao (2009), in recent years "sustainable development" has become a buzz word extraordinaire, suggesting that the developed countries can maintain advanced lifestyles and the poor countries can emulate the same through making minor adjustments to appease the environment. The bottom line, however, is that the effect on the environment is underpinned by our resource use per population multiplied by the population. As suggested by the "IPAT" equation (impact = population × affluence × technology), resource use per population is influenced by the levels of both affluence and technology and each of these is underpinned by energy use (Ehrlich and Holdren, 1971). Addressing the inequities between the rich and the poor in terms of consumption/affluence to reduce the total impact on the environment is one of the most important issues to face the world community. This paper will address one side of that issue that is improving the lot of the rural poor. The other side, specifically that of the rich reducing their level of affluence, will be left for another one.

The UNDP (2001) and Sen (1999) suggest that the key factor for any rural development to take place is to create an environment for people to develop their full potential and lead productive and creative lives in accordance with their specific needs and interests. The concept of rural community development as put forth by Asadi-Lari et al. (2005) and Hope (1996) appears to be a process involving a change in the way of living of rural communities. This concept involves a process of social and economic actions for solving community problems utilising the community's capability and resources for their own development. Community development in this case can thus be defined as the support provided at the community or the village level to enable people to work together for better well-being through self-help programmes and techniques for collaborated community action. As inferred by several studies (Markandya and Halsnaes, 2002; Dresner, 2002), a critical evaluation of the key developmental factors for the rural communities (namely social, environmental and economic) can assist in terms of identifying the approaches for assessing the sustainable development of rural communities.

Although energy services (other than food) are not usually considered as a basic human need, they are considered by researchers, policy makers, aid agencies and civil society organisations as a key requirement for moving towards rural development. Several studies (UNDP, 2000; Cavallaro, 2005) have clearly identified the linkages between access to energy services and rural development in terms of economic, social and environmental aspects. The economic benefits of energy access have been shown to play a major role in income generation and livelihood development. The studies (UNDP, 2005; Canadian Environmental Network, 2004; WEC, 1999) have also concluded that access to sustainable and affordable energy is necessary for reducing poverty, malnutrition and hunger, improving health, increasing levels of literacy and education, and significantly improving the lives of women and children in the developing world.

In summary rural development can be facilitated by assisting the rural and marginalised communities in the developing world to become healthy, educated and socially equal. Even though opportunities for income generation can improve the status of these communities, it is evident that energy can play a crucial role in terms of creating positive impacts on education, health and gender equality issues among the rural communities. The key linkages between energy and rural development are shown in Fig. 1.

However, if the technologies adopted to accelerate access to energy have a high environmental impact, then improved access to energy implies an increased impact on the environment. This link means that the entire development process must eventually become unsustainable. It is only when low impact technologies, that is renewable energy technologies, are used that development has a chance of approaching sustainability. Given the current situation in many developing countries it is obvious that there is a need for a major improvement in the quality and quantity of energy services for the rural poor, especially in order to achieve the United Nations Millennium Development Goals (MDGs) by 2015. Accelerating access to modern energy services for the unprivileged, while at the same time protecting the environment, presents major challenges to the concept of sustainability, and there is considerable urgency as 2015 is not far away.

2.1. Rural Sustainable Development through Renewable Energy Clean Development Mechanism (RE CDM) projects

Many research studies (Intergovernmental Panel on Climate Change, 2007; O'Brien and O'Keefe, 2006; Richards, 2003) have

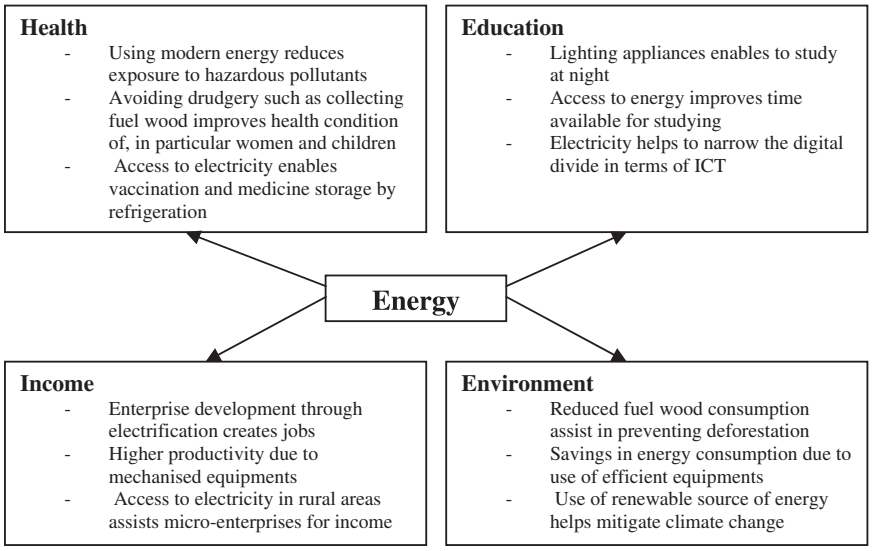

Fig. 1. Linkages between energy and rural development.