Chapter 10
Diffusion of Renewable Energy Technologies in Rural Communities: Exploratory Study of Development Partnerships in Cajamarca, Peru

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EXECUTIVE SUMMARY

Worldwide, over 1.3 billion people lack access to energy. Lack of electricity undermines the provision of basic social services, including education and health, and impedes development of income generating opportunities. Renewable energy technologies provide a viable option to rural electrification and are increasingly recognized for their contribution to rural development, energy security, and climate change mitigation. International non-governmental organizations (NGOs), working in partnerships with local actors, play an important role in the diffusion of renewable energy technologies in developing countries. Based on the exploratory case study of the international NGO Practical Action, this chapter explores the nature and effectiveness of development partnerships for the provision of sustainable energy services in remote off-grid rural communities in Cajamarca, Peru. It emphasizes the importance of building effective partnerships with communities and local government; facilitating community participation and ownership; building capacities for sustainable provision of energy services; and providing affordable and appropriate technological solutions that meet people's needs.

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ORGANIZATIONAL BACKGROUND

Access to energy is central to sustainable development and poverty alleviation (Modi, McDade, Lallement & Saghir, 2006). Energy access is linked to all three pillars of sustainable development[1]: economic growth, social equity and environmental protection, as defined by the World Commission on Environment and Development in its Brundtland report in 1987 (Oyedepo, 2012). Sustainable energy services can significantly improve human, economic, social and environmental conditions in developing countries (Kaygusuz, 2012) and are essential in meeting all Millennium Development Goals (MDGs) (Sanchez, 2010). Over the last few years, energy access for the poor has become one of the top items on the development agenda in the international arena. The UN General Assembly declared 2012 the International Year of Sustainable Energy for All to raise awareness and promote action around increasing access to energy, energy efficiency, and renewable energy with a global goal of achieving universal access to energy by 2030. Furthermore, a growing number of international, regional, national and local organizations are engaging with this issue via research activities, policy and advocacy and development activities on ground.

Decentralized renewable energy[2] technologies are increasingly acknowledged to be the most affordable and most sustainable solutions for rural communities in much of the developing world (REN21, 2011). The Renewables 2011 Global Status Report by the Renewable Energy Policy Network for the 21st Century indicates that a growing number of solar home systems, wind turbines, micro-hydro, biomass systems and other renewable energy solutions are powering homes, schools, community centres, health clinics and health posts, agriculture and small business in off-grid areas in developing countries. It estimates that hundreds of millions of rural households enjoy the economic, social and environmental benefits of renewable energy, with a few million households relying on solar photovoltaic (PV) technology, over 44 million using biogas for lighting and/or cooking, and more than 166 million using more efficient biomass cook stoves.

However, 2.7 billion of the world population still rely on traditional biomass energy sources and over 1.3 billion do not have access to electricity (IEA, 2011). Using inefficient biomass fuels pose harmful impacts on human health, in particular, among women and children, and on the environment. Lack of electricity undermines the provision of basic social services, including education and health, and impedes development of income generating opportunities. It is clear that without access to affordable and sustainable energy services, the attainment of economic and social development goals in developing countries is doubtful (Modi et al., 2006). It is predicted that without a change of course, by 2030, 900 million people will con-