

Abstract of Doctoral Thesis

Title : Technological Innovation Systems Building for Diffusion of Solar Energy Technology in Developing Countries: A Multilevel Analysis in Ethiopia

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The global diffusion of renewable energy technologies (RETs) has been sluggish. Wider and faster diffusion of RETs to the un-electrified critical mass of population has been a shared agendum among many actors in developing countries. Due to disparate efforts and myriad challenges, little success of adoption has been registered, and such failures heighten the need for systemic approach. There has been a recent understanding in literature that the development, diffusion and use of new (energy) technology is influenced by the establishment of technological innovation systems (TIS) surrounding the technology in focus. Past studies on TIS were conducted on the development and diffusion of RETs in the context of developed countries. In this thesis work, we empirically investigated how TIS can be built in developing countries for enhanced diffusion and further development of solar photovoltaics (PV) systems. In the study, a case of solar PV systems in Ethiopia and similar cases in the developing world were considered. We explored the diffusion barriers and systemic problems which include lack of integration among solar actors and financial problems facing both sides of the PV supply chain. The historical trend of PV systems in Ethiopia was fully analyzed. Using a proposed theoretical framework of TIS building, the system building practices of Solar Energy Foundation in Ethiopia and Grameen Shakti in Bangladesh were analyzed. We differentiated TIS in the context of technologically advanced countries which emphasize *generating, diffusing* and *using* a new technology (*R&D-based TIS*) with that of TIS in developing countries that (need to) emphasize *introducing, diffusing* and *using* an existing technology and then aiming for building innovative capacity (*diffusion-driven TIS*). We recommended policy intervention in looking for innovation system builders and scaling up innovation system building practices in developing countries so as to address the prevalent energy poverty in a systemic way.