

Executive Summary

The energy paradigm is shifting from fossil fuels to renewable energy as the depletion of fossil fuels is threatening energy security of many nations today. As the global warming caused by burning fossil fuels has become a major concern for humans, international societies are putting more efforts to reduce greenhouse gas emission. Under the post-Kyoto system, developing countries are highly likely to share the obligation to reduce greenhouse gas emission according to the Durban outcome. Renewable energy development will become a major issue of concern for all countries in the future.

The share of renewable energy projects in the total development assistance is growing and is believed to be so for Korea International Cooperation Agency (KOICA). The goal of this research project is to provide KOICA with a basis for a successful delivery of renewable energy projects. The objectives of this research is to ① build a strong foundation to deliver renewable energy ODA projects of KOICA more effectively by providing information on renewable energy potentials and the social system in the region, ② establish methods for an effective implementation of renewable energy projects by developing project evaluation guidelines and studying past renewable energy projects cases, and ③ encourage Korean public and private sectors to explore overseas renewable energy markets and lead the East Asian region to make actions for mitigating the effects of global warming.

The scope of this research is ① research on renewable energy potentials and the social systems in major East Asian countries, ② case studies on renewable energy projects funded by development agencies, ③ study on the methods for successful implementations of renewable energy projects, and ④ development

of pre-assessment and post evaluation guidelines for renewable energy projects. The subject countries for the research are Vietnam, Cambodia and Sri Lanka. The major methodologies to develop the pre-assessment guidelines and post-evaluation guidelines were re-categorizing and reorganizing KOICA's existing evaluation criteria as well as complementing the evaluation details.

All three major East Asian countries, Vietnam, Cambodia and Sri Lanka have abundance renewable potentials in hydro, wind, biomass and solar energy. The potentials of wind, biomass and solar energy are high in Vietnam and Sri Lanka. Cambodia possesses high energy potentials in solar and hydro as well as biomass. All three nations have poor policy supports for renewable energy development. In case of Cambodia, it is urgent to expand the grid infrastructure and improve national electrification as the power sector of the country is largely underdeveloped.

The case studies on renewable energy projects were conducted on 2 solar PV projects implemented by KOICA as East Asia Climate Partnership (EACP), and 2 projects funded by other international agencies – the biodigester program in Vietnam funded by SNV and the wind farm project by World Bank– in the three major countries. The methodologies for conducting the case study are site visits, interviews with the relevant stakeholders and collection of the project documents. The biodigester program implemented in Vietnam was largely considered as successful, meeting the regional households' energy needs with an abundant regional energy source. The stand alone solar PV project in Cambodia has a significant meaning of providing energy to the poor, but not without a concern over the government's and the people's capacity to manage the project properly after implementation. The performance of the wind farm project in Sri Lanka was slightly unsatisfactory but the facilities have been well maintained at the time of the visit by the research team. The grid-connected solar PV project in Sri Lanka has been well managed until recently,

but because of one of the inverters broken, there was a significant loss in the power production when Ecosian visited the site.

The major study methodologies applied to develop the methods for a successful implementation of renewable energy projects are analyses of the renewable energy potentials and the lessons from the case studies in the three countries. It is feasible to introduce pellet making machines and technology in Vietnam as the abundant biomass in the country were abandoned without being utilized for energy sources. Community biodigester project to provide basic energy to people is feasible for Cambodia who suffers from a lack of energy. Wind energy is abundant while the electrification rate is low in Northern Sri Lanka, thus it is feasible to implement a wind farm project to provide electricity to the Northern people.

Ecosian research team developed the pre-assessment guidelines by reorganizing and complementing the existing KOICA's pre-feasibility guidelines. It is essential to conduct a detailed feasibility study based on a systemized data collection methodology in order to plan a project properly. We also developed post-evaluation guidelines based on the existing KOICA's feasibility study framework. The renewable energy project evaluation criteria of other international development agencies were analyzed and reflected. Pre-assessment and post-evaluation guidelines were developed accordingly with the KOICA's pre-assessment and post-evaluation processes to maximize the practicality of the guidelines.

Recommendations for KOICA in implementing renewable energy projects are elaborated in the end of this report. We recommend KOICA allocate a greater budget on capacity building for projects in Cambodia, because of the government's low project management skills and the poor education level of the people. New renewable energy technology should be smoothly transferred to Vietnam as a good pool of electricity experts and a few power generator manufacturing

facilities exist. It is recommended KOICA follow the local power regulations and guidelines in Sri Lanka. It should be easily achievable for KOICA to meet the goals of renewable energy projects – economic development and greenhouse gas reduction – if KOICA reflects on the local conditions when planning a project, systemizes the pre-assessment and post-evaluation of a project, and establishes concrete post-project management methods.