

TECHNICAL ASSISTANCE COMPLETION REPORT

Division: **Energy Division, East Asia Department**

TA No., Country and Name			Amount Approved: \$500,000	
TA No. 4649-PRC: Alternative Energy Supply for Rural Poor in Remote Areas			Revised Amount: \$500,000	
Executing Agency: Government of Inner Mongolia Autonomous Region		Source of Funding: Poverty Reduction Cooperation Fund	Amount Undisbursed: \$49,175.98	Amount Utilized: \$450,824.02
TA Approval Date: 21 Sep 2005	TA Signing Date: 13 Dec 2005	Fielding of First Consultants: 20 Feb 2006	TA Completion Date Original: 31 Aug 2006	Actual: 31 March 2008
			Account Closing Date Original: 31 Aug 2006	Actual: 31 March 2008

Description: About 70% of the People's Republic of China's (PRC's) 1.3 billion population lives in rural areas, which have experienced rapid development in the last 10 years in parallel with national economic growth. However, providing access to reliable and efficient energy—especially electricity—is a great challenge in remote rural areas. In the rural areas of the northern and western provinces in the PRC, far from the nearest grid, electricity provision through the extension of power grids is an expensive solution. Inner Mongolia Autonomous Region (IMAR), which is one of the 12 western provinces, has abundant conventional energy resources and exports electricity to neighboring provinces. It is also rich in alternative solar and wind energy resources. Due to its unique circumstances—an area of 1.18 million square kilometer with sparsely populated households at an average distance of over 2 kilometers—the Government of IMAR (GIMAR) recognized the techno-economic limitations of grid extension to electrify remote rural households. It used subsidies to promote household level small wind and solar generators for basic electrification (renewable energy [RE] systems) in un-electrified areas. Still, about 70,000 households in 400 villages were un-electrified. The household level RE systems had achieved mixed results and there was a need to strengthen the basic electrification so that it could support further income generation opportunities.

Expected Impact, Outcome and Outputs: The technical assistance (TA) impact was improved economic development and better living standards in remote rural areas of IMAR. The TA outcome was to assist GIMAR in formulating a strategy for expansion of alternative energy-based electrification in remote rural areas. TA outputs were (i) technical assessments of RE systems, (ii) socioeconomic impact assessments, and (iii) strategy for improving decentralized RE system sustainability and further expansion.

Delivery of Inputs and Conduct of Activities: The TA consisted of the following activities: (i) review of the existing GIMAR approach and policies, (ii) shortlist villages and households for socioeconomic impact assessment, (iii) conduct socioeconomic survey of selected areas, (iv) analyze ongoing and completed basic electrification approach, (v) analyze the impact of ongoing subsidy scheme and formulate a financing and institutional mechanism to enhance the sustainability of RE systems, (vi) evaluate and identify an appropriate rural energy business model, (vii) analyze and recommend a strategic approach to expand and intensify alternative energy-based RE systems, (viii) develop a train-the-trainer program to extend maintenance services to remote dispersed households, (ix) identify a package of policy and regulatory initiatives to create enabling conditions for the proposed strategic approach, and (x) dissemination of TA results through workshops and seminars.

An international consulting firm (the consultant) from the United Kingdom (associated with national experts) was engaged in accordance with the ADB's *Guidelines on the Use of Consultants (2007, as amended from time to time)* to implement the TA. The consultants were mobilized in February 2006 with a contract completion date of August 2006. The consultants total input was 34.6 person-months, which was a little higher than the estimated 32 person-months in the TA design. The consulting service was provided in a timely manner to meet the TA implementation needs. The consulting contract completion date was extended to June 2007, an extension of 10 months due to limited field mobility during the harsh winter months to conduct the socioeconomic survey in the remote areas. The final report was submitted in June 2007, which was of good quality and reflected the stakeholders' comments and suggestions. Subsequently, the TA completion date was extended to 31 March 2008 to accommodate the international study tour and its financial closing. All TA activities were completed efficiently utilizing only 90% of the TA amount. Asian Development Bank (ADB) performance was satisfactory and it fielded three missions at the inception, mid-term and the draft final workshop to ensure timely TA implementation. The Executing Agency (EA) performed satisfactorily and provided the required counterpart support and facility during the TA implementation. The performance of consultants was satisfactory but "Not Rated" in the performance evaluation report (PER) as the evaluator wrongly assumed the TA completion date to trigger the PER. In this case, there was a gap of 9 months in the consulting contract completion (June 2007) and the TA closing date (31 March 2008). The PER request that originated in January 2007 based on the original contract completion date in the TA information system (TAIS) elapsed on 2 April 2008 almost immediately after the revised TA completion date.

Evaluation of Outputs and Achievement of Outcome: The TA achieved its outputs and its quality was satisfactory. The technical assessment of existing RE systems was comprehensive. The methodology adopted for technical assessment was consistent with the international good practices and incorporated the feedback received during the socioeconomic survey. The socioeconomic impact survey included different (i) geographically representative parts of IMAR, (ii) level of electrification—both electrified and un-electrified areas, and (iii) type of installations—household- and community-based. Altogether, 404 households distributed across 13 villages were surveyed comprising 193 households without electricity and 211 households with RE systems. The dispersed households location with large distances posed logistic and resource challenges, which were overcome through an innovative approach to engage post graduate local university students for carrying out the survey during summer months. This was the first-of-its kind independent field survey of beneficiaries of ongoing and planned schemes of GIMAR, which has provided a useful feedback for the expansion and intensification of electrification of rural households. The technical and socioeconomic assessment and the GIMAR commitment to achieve 100% electrification by 2012 formed the basis for formulating a strategy for expansion of the decentralized RE system. The TA recommended (i) to have a more targeted financing approach—cash/credit/fee-for-service from higher to lower income levels, respectively—rather than a uniform subsidy approach, to reach the poor un-electrified remote households; (ii) improvement in the quality of components, installation and maintenance through more rigorous component standards and promoting rural energy service company approach; and (iii) appropriate RE system configuration to meet the expectation of the consumers, their willingness-to-pay and affordability. Consistent with the recommendations, the consultant proposed an investment plan and policy recommendations for electrification of about 200 households in five un-electrified villages that were surveyed during the TA implementation.

The consultants carried out their tasks to the satisfaction of the EA and ADB and were consistent with the terms of reference. Additional local level training programs and dissemination workshops were carried out to (i) enhance the sustainability of existing installations, and (ii) seek stakeholders views on strategy formulation. A cross section of GIMAR administration officials at village, city and provincial levels were consulted. An international study tour was also held to provide first-hand experience and knowledge on the practical implementation of alternative energy policies in European countries where these technologies are more advanced. The TA assisted in analyzing and recommending a practical strategy to enhance the sustainability of the existing RE installations.

Overall Assessment and Rating

The TA was assessed as highly successful, as it also included the pre-feasibility assessment to electrify 200 households in five villages. The TA implementation took longer, which was primarily due to an expanded socioeconomic survey scope, which was accommodated on the request from the EA and key stakeholders. The expanded scope enhanced the attainment of TA objectives and ensured high ownership from the EA. It was relevant in addressing the urgent need to review the ongoing and planned household electrification programs to improve their sustainability and expand electrification. The TA recommendations were formulated through extensive consultations with key stakeholders; this participatory approach improved the quality and practicability of TA recommendations. The TA implementation was efficient; it was completed within the allocated budget and within a reasonable time. Due to strong support from the EA, the TA is sustainable.

Major Lessons

The socioeconomic field survey and extensive stakeholder consultations were key inputs in formulating the strategy which also ensured good ownership by all stakeholders. Similar practical field work is recommended for supplementing the desk evaluation for future interventions. Being a stand-alone TA, the implementation of TA recommendations could not be included. Financing of follow on activities from the Poverty Reduction Cooperation Fund was not possible as it was discontinued in 2007. A follow through approach in similar TA is required to ensure TA outcome and impact. Though it did not affect the TA implementation, there is a need to strengthen timely filling and updating of TA administration data sources (PER, TAIS etc) for ensuring consistency.

Recommendations and Follow-Up Actions

The TA outcome and its impact will be monitored through ongoing and planned energy sector interventions in IMAR, where ADB is supporting environmental improvement projects.

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