

Outcome 1:**Policy and Institutional**

RE Subsidy Policy: RERL actively participated in discussion in revision of the RE Subsidy Policy. RERL also supported AEPC in drafting the revised RE Subsidy Policy document that has been approved by Government of Nepal (GoN) in May 2016.

RE Subsidy Delivery Mechanism: RERL is supporting AEPC to prepare RE Subsidy Delivery Mechanism following the approval of the revised RE Subsidy Policy. The RE Subsidy Delivery Mechanism will be finalized by AEPC and submitted to the government for approval and promulgation in 2016.

Institutional Arrangement in the Federal Structure: RERL is supporting AEPC to prepare a broad concept to decentralize renewable energy promotion activities from central level to provincial, district and village/municipalities levels. The study has been conducted as requested by the Government of Nepal to ministries, departments and agencies to prepare plans to decentralize activities as envisaged by the recently promulgated Constitution of Nepal 2015. The draft document will be discussed within AEPC first and shared with larger stakeholder group before submitting to MoPE.

Training on Large Solar PV Systems: At the request of Department of Electricity Development (DoED), RERL provided a week-long training to 29 engineers, including 2 women. After the training, the DoED engineers expressed that they now understand different aspects of developing large scale solar PV systems for grid interconnection. RERL prepared the training course material and provided the training from 28 June to 3 July. DoED Director General also opined that RERL/AEPC and DoED would work together in future to develop technical specifications for Solar PV systems and grid connection.



Technical Assistance for Procurement of 64 MW grid-connected Solar PV: RERL provided assistance to Nepal Electricity Authority to prepare technical specifications and bid document



for procurement of 64 MW grid-connected solar PV systems to be installed at different locations around the country.

International Apps Challenges 2016: RERL in collaboration with ICIMOD supported Young Innovations to organize “**International Space Apps Challenges 2016**”. The objective of the event was to bring together young and creative minds to find innovative solution to different challenges. Beside 26 global challenges, there were six local challenges that were provided by AEPC/RERL and ICIMOD, which encouraged the students to assist in solving real problems faced in Nepal. Altogether 63 young people including 10 women participated in the challenge and produced 16 innovations. RERL plans to further support 2 innovation related to survey of mini grid (micro hydro and solar) and calculation of area for rooftop solar PV installation in the third quarter.

Outcome 2:

Increase Investment in RE

Establishment of Financial Tools: RERL supported Central Renewable Energy Fund (CREF) to design financial tools to mitigate major risks on project investment for financial institutions and private sector to attract private investment in renewable energy projects. RERL provided financial assistance of USD 200,000 to CREF to establish the mechanisms.

Vendor financing Manual: RERL is collaborating with Clean Start Project of UNCDF to prepare a manual on vendor financing of small scale renewable energy systems like solar home system, solar pumping, biogas, etc.

Interaction with BFIs on Mini Hydro Projects: RERL has been collaborating with SASEC/AEPC to prepare documents of 3 mini hydropower projects to be jointly promoted by the two projects. The detailed feasibility studies of these projects have been shared with the 7 Partner Banks of CREF. AEPC plans to achieve financial closure of these projects in the third quarter.

BFI Juddi Khola visit: RERL organized a field visit to Juddi Khola project site, Bajura for Loan Officer of Civil Bank to assess the local situation for processing loan. Juddhi Khola mini hydro is a 200 kW project located in a remote area in Bajura district. The community requires a loan of about NPR 5 M to complete the project.



Mini Hydro

DFS of Namche Mini Hydro: Draft DFS report of Namche Mini Hydro has been submitted by the consultant. The report will be finalized in July 2016 and shared with the communities in July 2016.

Transmission Line Survey of Giri Khola: RERL carried out detailed feasibility survey of the Transmission Line of the proposed 200 kW Giri Khola MHP, Jumla. The transmission line will evacuate power from the project site to the district headquarters.

Environment Assessment of Phawa Khola & Giri Khola: RERL has hired consultants to carry out Environment Assessment of Phawa Khola and Giri Khola Mini Hydropower projects following the requirements of Asian Development Bank as both of these projects will mobilize financial resources from SASEC.

Energy use patterns of 15 MHPs: RERL carried out analysis of energy consumption patterns of 15 micro hydropower projects. All of these plants have digital energy meters installed under Clean Development Mechanism supported by the World Bank. The energy use patterns are different for different plants. With the use of highly efficient lighting appliances like CFL and LED bulbs, the amount of electricity consumed for lighting has drastically come down in some plants, consequently decreasing the plant load factor.

Case Study of Mini Hydro: RERL is working with Practical Action Consultancy to carry out case studies of several mini hydropower projects in operation. The studies focus on governance systems in place, management arrangement and sustainability issues. The studies will make policy recommendations to the government regarding development of sustainable mini hydropower projects in the country.

Revision of Power Output Verification Guidelines: RERL is supporting AEPC to update POV Guidelines of micro hydropower projects. The updated guidelines also include mini hydropower projects above 100 kW. The guidelines will be finalized and published in the third quarter. Independent POV Inspectors were provided orientation and training on the updated POV Guidelines. RERL also provided technical assistance to AEPC to verify documents submitted by POV Inspectors.



Mini Grid

Taplejung Mini Grid: Contract for construction of 39 KM 11 kV transmission line interconnecting 8 micro hydropower plants and the major load center has been signed by the community. The equipment/goods have already been fabricated or assembled by the contractor and verification has been carried out by RERL/Kabeli Team. Transportation of equipment and materials to the site will be carried out in July and August 2016.

Team of Expert on Mini Grid formed: With RERL's initiative a team of experts with representation from AEPC/RERL, the World Bank, Nepal Electricity Authority, Institute of Engineering, Tribhuvan University and independent experts has been formed to provide technical advice for the control and protection system of the Taplejung Mini Grid. As there is no in-country expertise on fabricating electronic equipment for load sharing among micro hydropower plants in a mini grid, the team will support AEPC to make technical decisions. It is expected that after the completion of the project, capacity of Nepali engineers and fabricators will be enhanced for local fabrication/assembly of all equipment for mini grid projects in future.

Interaction with MCC ON Lukla-Dingboche Mini Grid: RERL prepared the concept paper on Lukla-Dingboche Mini Grid for Millennium Challenge Corporation of the US Government, which is interested to provide technical and financial assistance to develop mini grids in Nepal. The proposed Lukla-Dingboche Mini Grid intends to interconnect all existing micro/mini hydropower plants and major load centers in the Mount Everest Trekking Route to pool electricity to meet the demand during the peak hours. It also envisages development of new mini and micro hydropower projects in the area to meet future demands.

Large Solar PV:

Dhading Solar Project: RERL is implementing Dhading Solar Project funded by Gyeongsangbuk – do Provincial Government of Korea. Under this project, 3 solar PV mini grids, 1 solar water lifting system and an industrial hub has been installed to provide clean energy access to the extremely marginalize Chepang people of Chotesh, Mahadevsthan VDC of Dhading. 48 households located on a hill top are benefitting from the services.

Dubung Business Plan: RERL is supporting the communities of Dubung, Baidi, Tanahun to carry out business opportunity and detailed business plans of micro enterprises operated by the 18 kW Dubung Solar Mini Grid installed with the financial assistance of AEPC and UNESCAP under



the 5P Project. With RERL's support, business plans of 2 larger enterprises and 18 smaller ones have been prepared.

Raksirang Solar Water Supply System: RERL is working with UNESCAP under the 5P Project to carry out DFS of solar PV based water supply systems in Raksirang VDC of Makwanpur district. Most of the inhabitants of the VDC belong to the Chepang community. Integrated water supply and irrigation projects to enhance agricultural productive are planned for the area.

Khotang Solar Mini Grid: RERL assisted DEECCS to carry out business opportunity assessment in the catchment area of the 31kW Halesi Solar Mini Grid, Khotang. The solar mini grid is developed by a SPV owned by the local community and Gham Power Company.

Survey of a 100 kW Solar PV system for grid connection: RERL undertook a DFS of a 100 kW solar PV system for grid connection at Rairang Mini Hydropower Plant site. The DFS showed that grid connection is financially feasible only if the project gets NPR. 10 per kWh @ equity = 5% and grant will be 95%. Result also shows that unit energy cost shall be 16.32 if 30% equity and 70% loan (5% interest rate)

Wind-Solar Hybrid Mini Grid: RERL is working with DDC Makwanpur to establish a cooperative in Bhorleni, Makwanpur to manage the 25 kW wind-solar hybrid system installed with AEPC's support. The cooperative will bring all 140 beneficiary households together to sustainably operate the system. RERL also plans to support the cooperative to install pre-paid energy meter in 2016.

Technical Assistance: RERL supported AEPC/SASEC to procure equipment for 2 solar PV mini grids at Surkhet (8kW) and Achham (30 kW). RERL's assistance was in site identification and preparation of technical specifications.

Vendor Financing: RERL provided grant and a loan guarantee to Sun Farmer to install 5 household sized PVPS in Chitwan under Vendor Financing Mechanism. Sun Farmer has already installed 11 such systems in Chitwan and is planning to expand similar activities in Morang and Jhapa districts too.

Detailed Feasibility Study: RERL carried out DFS of Madi, Chitwan and Telkuwa, Bara Irrigation Projects. RERL is providing technical and financial assistance to establish a SPV to develop Telkuwa Solar Irrigation Project. The SPV will supply water to farmers and help them engage in vegetable production and marketing. RERL is discussing with AEPC to mobilize financial resources to promote Madi Solar Irrigation Project.



Outcome 3:

Productive Energy Use:

Business Management Training for Women: RERL organized “Business Management Training to Women Entrepreneurs” from 11 to 15 June 2016 at Nepalgunj. The main objective of the training was to impart knowledge on business management particularly on entrepreneurship, book keeping and marketing of their businesses. Altogether, 23 women from the Mid Western Region participated.

Innovation: RERL supported three innovative projects that help fuel switching from firewood to electricity. RERL helped to locally design and fabricate an electric lokta bark boiler and install it at a Nepali paper factory in Ghandruk, Kaski. After comments from the Ghandruk entrepreneur, RERL further modified the design and fabricated a prototype and tested it. Based on the new design a lokta bark boiler was fabricated and installed in Ramechhap district by a local entrepreneur with financial assistance from Rapid Enterprise and Livelihoods Recovery Project (RELRP).

Similarly, RERL is supporting to design and fabricate a nettle leaves dryer (Sisno dryer). The dryer has been fabricated and transported to Baglung. The Sisno dryer will be managed by the Nisi Sisno Powder Udhog owned by 15 women entrepreneurs. The enterprise will be providing employment opportunity for 15 ultra poor women during collection time.

Stakeholder consultation on Himalaya Nettle (Allo) boiler: In order to exchange knowledge on technology transfer in Allo (Himalayan Nettle) Value Chain, RERL and AEPC jointly organized “Stakeholder Consultation Workshop”. The Allo entrepreneurs, Traders and Value Chain Experts participated in the workshop. In the workshop, an entrepreneur from Sankhuwasabha shared his experiences on difficulties on allo boiling and requested for an electric boiler to help reduce fuelwood consumption and increase boiling efficiency. RERL plans to test the Lokta Boiler it has helped develop to boil allo.

Business Proposals of 45 MSME prepared: RERL provided technical assistance to PEUC/AEPC to prepare 45 business proposals for small enterprises powered by MHPs. The business plans have been submitted to AEPC for government subsidy.

MHP as an Enterprise: RERL is supporting beneficiaries of the 83kW Darna MHP, Achham, far-western Nepal to run their MHP as an enterprise by selling surplus power to 500 HHs from neighboring Kalagaun VDC. With RERL support a cooperative has been formed in Darna VDC



and another cooperative in Kalagaun is being formed. The people of the two VDCs have signed a Power Purchase Agreement to export 25 kW from Darna to Kalagaun. The people of Kalagaun have mobilized equity and grant from WISIONS, Germany and Kalagaun VDC to construct 11kV transmission line and distribution line.

Similarly, to promote MHP as enterprise in other areas, RERL carried out a quick assessment of 30 MHPs to understand the attitude of the beneficiary communities towards leasing out their MHPs to private entrepreneurs for operation and management. Before doing the assessment a 2 days' orientation on MHP as an enterprise model was conducted in all MHPs. However, it was found that in almost all MHPs the sense of ownership is so strong that beneficiaries are extremely reluctant to lease out their properties to private parties. On the other hand, they all agree to operate and manage their MHPs through cooperatives. RERL thus plans to support communities in 14 earthquake affected districts to establish cooperatives to run MHPs as enterprises.

UNDP CD's field visit: MHP & Solar PVPS: UNDP Country Director Mr. Renaud Meyer visited

a micro hydropower plant in Kavre district and a solar PV pumping system (PVPS) in Ramechhap district. Mr. Meyer along with AEPC ED Mr. Ram P. Dhital, UNDP PA Ms. Anupa Lamichhane and UNDP Communication Officer Mr. Kamal Sigdel visited the 12 kW Daunne Khola MHP located at Pinthali, Mangaltar. Mr. Satish Gautam, NPM/RERL provided details on the project to the visiting team, which interacted with the beneficiary



communities, both men and women on benefits of REDP/RERL supported activities. The team also observed the micro hydro powered agro-processing mills and biogas plants.

The UNDP team visited an AEPC supported PVPS project in Belghari of Ramechhap district. The PVPS project is providing access to clean drinking water to over 100 households. During his interaction with the beneficiaries, Mr. Meyer asked the why the PVPS was only providing water for drinking and not irrigation. The people responded that the cost of larger project integrating both irrigation and drinking water is high and they are not able to pay for it. Mr. Meyer instructed RERL to prepare a proposal for a new PVPS project for supplying irrigation water for GEF Small Grant Fund.



Relief and Rehabilitation:

Installation of Solar Systems in public institutions: Based on the demand collection from earthquake affected districts, RERL provided financial and technical assistance to install solar systems in 48 public institutions such as local governmental bodies, health posts and schools. In the mean time, RERL also received demand for solar mini grid, solar pumping systems, and institutional solar PV systems from different communities.

Rehabilitation of MHPs: With the technical and financial assistance of RERL, beneficiary communities initiated rehabilitation work in 54 MHPs in earthquake affected districts, of which, 20 have been complete and 29 are ongoing.

