

### Outcome 1:

**NEA and AEPC Coordination:** A coordination meeting between NEA and AEPC was organized on 22 August 2017 to discuss the joint activities spelt out in the MOU signed by the two organizations. Besides, the discussion was followed by following topics:

- Initiation of Power Exchange Agreement (PEA),
- Construction of new Mini Hydro Plants,
- Revision of first edition of Technical Standard of Grid Connection of Micro Hydro Power
- FiT and Net Metering Technical Standard,
- Finalization of Technical Standard for Grid connection of Solar PV,
- Preparation of Municipal Climate and Energy Plan (MCEP) preparation,
- Management of Electricity Infrastructures in Taplejung, and
- Formation of Working Groups/Task Forces.

**Interaction Programme on Enabling Environment for Mini Hydro in Nepal:** RERL in collaboration with Practical Action Consultancy carried out a Case Study on Performance of Mini Hydro in Nepal. United Nations Environmental Programme (UNEP) had provided USD 71,000. AEPC/RERL organized a one-day interaction on 5 July 2017 to share the findings and recommendation of the study and an orientation on sustainable operation and management of the Salleri Chialsa Mini Hydropower Project, Solukhumbu .

The case study looked into;

- Current policy enablers,
- Stakeholders Mapping through Participatory Market System Development (PMSD) Framework,
- Case studied of 6 Mini Hydro and 2 Small Hydro Projects, and
- Household Survey to assess consumer satisfaction

The study also makes different recommends for private sector led development of mini hydro in the country as well as post construction support required for smooth operation of the plants. The study found that the 400kW, Swiss supported, Salleri Chialsa Mini Hydropower Project, Solukhumbu was the best managed project among the studied projects.

The management of the Salleri Chialsa Mini Hydropower Project provided orientation to prospective developers of AEPC supported mini hydro power project on operation and management.



**Renewable Energy in Federal Context:** After the promulgation of the constitution in 2015, RERL has drafted a document highlighting roles and responsibilities of municipalities and provincial and central governments. The document also clearly spells out AEPC's roles and responsibilities in the federal context. The document has been shared with Ministry of Population and Environment (MoPE). This document helps streamline activities at different levels of governance.

**Orientation on Mini Hydro Project Development:** AEPC had called for proposals to supply and install equipment for 2 mini hydropower projects. However, only 2 bids were received for one project and only 1 for the second one. To encourage participation of more vendors, RERL and SASEC organized a 1 day programme in Butwal on 7 July 2017. Information related to AEPC's and ADB's requirements for procurement was provided to the participants. Altogether 13 engineers, technicians and managements personnel from different companies, mainly micro hydro manufacturers and installers, participated in the programme.

**Municipal Energy Plan:** In the new federal system, municipalities have been given the responsibility for development of small hydropower and renewable energy projects. RERL is thus drafting methodology for preparation of Municipal Energy Plan (MEP) based on District Climate and Energy Plan (DCEP) prepared by AEPC and the methodology developed by RERL for District Electrification Master Plan. The MEP preparation starts at the Ward level; it identifies the status of electrification and cooking fuel in use in the ward and the least cost alternative among grid extension, mini/micro hydro, solar PV, biogas and improve cooking stove. Aggregation of Ward level plans will be the basis for the Municipal Energy Plan, which will be GIS based and easy to comprehend.

RERL has shared the methodology with the Renewable Energy for Rural Areas (RERA) project of GIZ. RERA is assisting AEPC to develop frameworks, modalities, guidelines, manuals, etc. for promotion of RE projects in the new federal structure.

### Outcome 2:

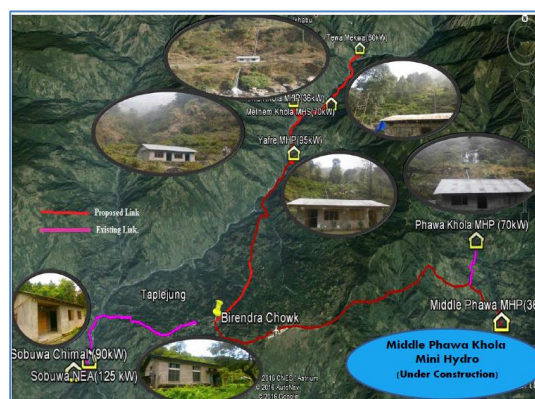
**Financial Closure of Giri Khola:** RERL provided technical assistance through CREF for financial closure of the 200 kW Giri Khola Mini Hydro Project at Jumla. The total cost of the project is over NPR 118 million, out of which NRP 16,34 million will be provided by the Nepal Investment Bank as loan. SASEC/ADB is providing credit and subsidy as per the government rules to complete the project. After the completion of this project it is expected that more than 2200 households and rural enterprises will have access to electricity.



**Status of Mini Hydropower Projects (MHP):**

S. N.	Projects	kW	HHs	District	Status
1	Phawa Khola	500	2093	Taplejung	Bid called for supply & installation of electro-mechanical equipment & civil works
2	Upper Junbeshi	250	615	Solukhumbu	Preparation of Engineering drawings ongoing
3	Lower Bom Khola	282	620	Solukhumbu	Formation of Special Purpose Vehicle (SPV) ongoing
4	Theso Khola	250	NA	Solukhumbu	DFS Ongoing
5	Tara Khola	394	2200	Baglung	Formation of Special Purpose Vehicle (SPV) ongoing.
6	Lung Khola	500	NA	Pyuthan	DFS Completed
7	Lower Lung Khola	NA	NA	Pyuthan	PFS Completed
8	Simrutu Khola	200	1386	Rukum	Civil works under construction Institutional Strengthening of cooperative initiated
9	Giri Khola	200	1840	Jumla	Negotiation with NIBL for credit funding Institutional Strengthening of cooperative ongoing
10	Chuwa Khola	1000	NA	Humla	PFS Completed

**Micro Hydropower Plants Interconnected Mini Grid:** RERL is providing technical assistance to AEPC to install Taplejung Mini Grid Project. The 35 Km long 11kV line for interconnecting 5 mini/micro hydro has already been erected. In this quarter, Bid Notice was published for design, fabrication, supply, installation and testing and commissioning of control and protection equipment. A total of 8 potential bidders were procured the bid document however only one bidder has submitted the bid to undertake the task. The proposal has been evaluated and found the submitted bid is eligible. It is expected that the work shall be completed by December 2017. The Government of Nepal has already allocated NPR 32 M for completion of this task.



**Grid Interconnection of MHP:** On 22 September 2017, the 23 kW Syaurebhumu MHP, Nuwakot was successfully synchronized with the national electricity grid for about 5 hours. It will be formally tested in presence of NEA after Dashain. Syaurebhumu MHP has already signed Power Purchase Agreement with NEA. AEPC provided the financial support for electrical equipment and RERL for civil works required for interconnection of the two systems.



RERL also provided technical assistance for the same. NEA and AEPC had agreed to interconnect MHP less than 100 kW with the national grid in 2015 and the PPA was signed by NEA and Syaurebhumi MHP in 2016. AEPC/RERL is also supporting interconnection of another MHP to the grid in Dhankuta district. As this is the first grid interconnection of a MHP of less than 100 kW, it is hoped that the lessons learnt will be replicated in other areas too. It is estimated that the national electricity grid is within 5 km of about a third of the 2500 MHPs supported by AEPC.

**Recovery Activity:** Under relief and rehabilitation, RERL supported to install institutional 39 solar systems in schools, health post and public offices in earth quake affected districts. Similarly, RERL is also supporting rehabilitation of 15 MHPs with the total installed capacity of 406 kW. The list of recovery activities carried out by RERL so far is given below in the table:

S.N	Activities	No.	Capacity
1.	Institutional Solar	233	300 Wp each
4.	Mobile Charging Stations	28	40 Wp each
5.	PV Pumping rehabilitated	9	NA
6.	MHP rehabilitated	53	1295.5 kW



Solar Panel house before rehabilitation



Rehabilitated Solar Panel house



Water collection tank before rehabilitation



Rehabilitated water collection tank



**Installation of Solar PV Systems at Snake Bite Treatment Center:** After the successful installation of solar PV backup systems at Snake Bite Treatment Centers at Letang, Morang and Itahari, Sunsari army barracks, RERL supported to install a 1.5kWp solar PV system at the Charali Army Barrack in Jhapa district. The system provides electricity to power the fridge to store anti snake venom vaccines, which has to be stored between 2° and 8°C, fans, lights and nebulizer. RERL has supported 80% of total project cost remaining has been supported by Itahari Municipality for Sunsari and DDC Jhapa for Charali installation. In an average, more than 1500 snake bite cases are treated by the center every year. After knowing the big impact of solar system, AEPC plans to support for PV backup system in 25 Snake Bite Treatment Centers in FY 2074/2075.

**Energy for Education (E4E), Dhanusha:** The E4E concept has been piloted by RERL in two schools of Dhading and Parsa districts. This initiative has provided opportunity to learn subject matters through audio and video interactions. After success of pilot project, RERL decided to carry out this concept in business model. A demand has been received from "Sahid Chandeshwor Lower Secondary School Mithila Bihari Goapalika" of Dhanusha District to support Electricity Supply Systems whereas they would be investing in digital education facilities such as 8 no. of laptops, internet, printer, projector etc. Along with school students, this project aims to provide computer education to local women. Also this project shall provide facility of cyber cafe in rural village. The O&M shall be responsibility of local NGO who is working in modern education sector since longtime. The solar PV has been installed in this quarter whereas the project shall be fully functional by mid of October 2017.

**Solar Mini Grid:** Asian Development Bank (ADB) has agreed to fund upgrading of Bhorleni and Harkapur solar mini grid projects. The AEPC and ADB supported 35kWp Solar Mini Grid System was installed in Harkapur Okhaldhunga and the AEPC supported 25kWp Solar Wind Hybrid Mini Grid System was installed in Bhorleni Makwanpur. Both of these systems are operating well however the demand in the community has increased so much that the systems cannot provide the required amount of electricity. An ADB mission visited the Harkapur site and agreed to support up-gradation. AEPC/RERL is conducting detailed engineering design (DED) for up gradation of both projects.

### Outcome 3:

**Commercial Operation of Micro Hydro:** In order to, disseminate information on the benefits of running 'MHP as an Enterprise', RERL organized orientation in Rolpa, Rukum and Achham districts. As AEPC has been promoting micro hydro in Nepal with Government Subsidy with the 'right to basic lighting' approach, many micro hydropower plants are not optimally utilized. The new 'enterprise based' approach takes a slightly different view and encourages the beneficiaries to make productive uses of electricity so that not only the local people benefit from availability of different services but the MHP itself generates more revenue and will be sustainable.



Key persons involved in management of MHPs, local elected representatives and general people participated in the orientation. The newly elected representative of municipalities took interest in the sustainability of micro hydro and the 'MHP as Enterprise' model and indicated their willingness to work together with AEPC and the beneficiary communities to promote the model. They requested RERL for more information on operation and management of MHPs particularly promotion of productive energy uses. They further requested for AEPC/RERL technical assistance to help them prepare five year energy plans so that they could systematically provide clean energy solutions to the people over the years.

**Training for Women Entrepreneurs:** A five days long training on Entrepreneurship Development was held in Nepalgunj from 11 September to 15 September 2017 for women entrepreneurs from the Mid and Far Western Development Regions. The training aimed to enhance their skills and knowledge on business development and operation, marketing, accounting, gender issues, etc. The participants benefited through both practical and theoretical knowledge. Altogether 29 women from Dailekh, Rukum, Rolpa, Salyan and Jajarkot districts participated in the training.

### Outcome 4:

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**Orientation on Financial Administration and Monitoring System (FAMOS):** RERL provided orientation to UNDP Country Office staff on FAMOS. The FAMOS software was developed by UNDP Nepal. The main purpose of the software is to store and track financial transactions of all UNDP projects and generate reports as required by UNDP.

**Utility Scale Solar PV Project Design Guideline:** A joint task force team of Ministry of Energy (MoEn), Department of Electricity Development (DoED), Nepal Electricity Authority (NEA) and AEPC/RERL has prepared Terms of Reference (ToR) to prepare "Utility Scale Solar PV Project Design Guideline". This will be the national guidelines for all the stakeholders working in utility scale solar PV projects.

**Flood Relief/Rehab Assessment for RE:** RERL coordinated with stakeholders to prepare a proposal for GoN and Development Partners to support RE technologies under relief and rehabilitation for victims of recent floods. RERL presented the proposal to the Renewable Energy Confederation (RECoN) on 15 August 2017.

**Preparation of Project Operation Manual (POM):** RERL is supporting AEPC to access credit/grant under the World Bank's private sector led energy access project in Nepal. RERL support has been in identification of potential sites and preparation of Project Operation Manual (POM).

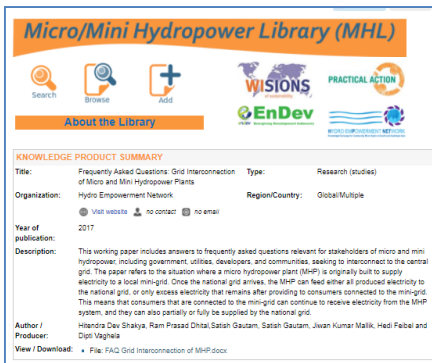


**Telkuwa Solar Irrigation Project:** Minister of Population and Environment Honorable Mithila Chaudhary visited RERL supported 4kW Solar PV Pumping System at Telkuwa Bara on 30 August 2017. After observation of the system and interaction with local farmers, Honorable Minister expressed that the integrated projects that have not only solar pumping for irrigation but also support for modern farming needs to be replicate throughout the country.



Minister visits Telkuwa PVPS Project

**Knowledge Product:** RERL provided inputs on two knowledge products on grid interconnection of micro and mini hydro hosted by Energypedia, online knowledge platform. Energypedia is a wiki-based platform for collaborative knowledge exchange on renewable energy and energy efficiency topics in developing countries. RERL's inputs were for;

A screenshot of the Micro/Mini Hydropower Library (MHL) interface. It shows a search bar, navigation buttons (Search, Browse, Add), and logos for WISONS, EnDev, and Practical Action. Below is a 'KNOWLEDGE PRODUCT SUMMARY' for 'Frequently Asked Questions: Grid Interconnection of Micro and Mini Hydropower Plants'. The summary includes details on the organization (Hydro Empowerment Network), region (Global/Multiple), year (2017), and a description of the working paper's content.

- i) Frequently Asked Questions (FAQs) and,
- ii) Development of Grid Connection Policy for Micro/Mini Hydro Plants in Nepal.

The links for the knowledge products:

[https://energypedia.info/wiki/Frequently\\_Asked\\_Questions:\\_Grid\\_Interconnection\\_of\\_Micro\\_and\\_Mini\\_Hydropower\\_Plants](https://energypedia.info/wiki/Frequently_Asked_Questions:_Grid_Interconnection_of_Micro_and_Mini_Hydropower_Plants)

[https://energypedia.info/wiki/Development\\_of\\_Grid\\_Connection\\_Policy\\_for\\_Micro/Mini\\_Hydro\\_Plants\\_in\\_Nepal](https://energypedia.info/wiki/Development_of_Grid_Connection_Policy_for_Micro/Mini_Hydro_Plants_in_Nepal)

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