Alternative Energy Promotion Center
वैकल्पिक ऊर्जा प्रवर्धन केन्द्र
Renewable Energy for Rural Livelihood Programme (RERL)
ग्रामीण जीविकोपार्जनको लागि नविकरणीय ऊर्जा कार्यक्रम
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Date: April 27, 2011

To: Mr. Jorn Sorensen
Deputy Country Director/ Programme
UNDP Nepal

Mr. Vijaya P. Singh
ACD
Environment, Energy and Climate Change Unit
UNDP Nepal, Pulchowk

CC: Secretary
Ministry of Environment

Foreign Aid Coordination Division
Ministry of Finance

From: Dr. Narayan Prasad Chaulagain
NPD/ RERL

Sub: **Operational closure of REDP**

We are very proud that the project has been completed successfully and procedure for handover of the assets to RERL has been initiated.

We take this opportunity to thank UNDP for all the support it provided to REDP, which is regarded very highly by both the Government and the people of Nepal.

We look forward for your kind cooperation and continued assistance for successful operation of RERL.

Thank you and warm regards.

Encl:

Copy of project completion report

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Rural Energy Development Programme

(NEP/07/011)

Programme Completion Report

April 2011

Contents

List of Acronyms

ADBN	Agricultural Development Bank of Nepal
ADDCN	Association of District Development Committees of Nepal
AEPC	Alternative Energy Promotion Center
BSP	Biogas Support Program
CBO	Community Based Organization
CDCF	Community Development Carbon Fund
CDM	Clean Development Mechanism
CEF	Community Energy Fund
CM	Community Mobilizer
CO	Community Organization
CRTN	Center for Rural Technology Nepal
DDC	District Development Committee
DDF	District Development Fund
DEEMC	District Energy and Environment Management Committee
DEES	District Energy and Environment Section
DEF	District Energy Fund
DENET	District Energy Network
DPR	Detailed Project Report
DREMC	District Rural Energy Management Committee
EDF	Enterprise Development Fund
ERPA	Emission Reduction Purchase agreement
ESAP	Energy Sector Assistance Program
EU	European Union
FG	Functional Group
FNCCI	Federation of Nepalese Chamber of Commerce and Industry
GoN	Government of Nepal
ICS	Improved Cook Stove
IWMP	Improved Water Mill Project
MDG	Millennium Development Goal
MHFG	Micro Hydro Functional Group
MHS	Micro Hydro System
MoE	Ministry of Environment
MISA	Management Information System Associate

MW	Mega Watt
NaREE	Natural Resources, Energy and Environment
NAVIN	National Association of VDCs in Nepal
NEA	Nepal Electricity Authority
NGO	Non Governmental Organization
NMHDA	Nepal Micro Hydro Development Association
NPC	National Planning Commission
PAC	Project Advisory Committee
PAF	Poverty Alleviation Fund
PEB	Project Executive Board
PMO	Project Management Office
REEDU	Rural Energy and Environment Development Unit
RESC	Rural Energy Services Center
REDP	Rural Energy Development Programme
REP	Renewable Energy Project
RET	Rural Energy Technology
SAPPROS	Support for Poor Producers in Nepal
SO	Support Organization
TRC	Technical Review Committee
UNCCA	Common Country Assessment of the United Nations Agencies
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
VC	Vulnerable Community
VDC	Village Development Committee
TTF	Thematic Trust Fund
WECS	Water and Energy Commission Secretariat
WFP	World Food Programme

Executive Summary

The Rural Energy Development Programme (REDP) operated from 16 August 1996 to 31 March 2011 adopting a holistic approach of development for the promotion of rural energy technology; primarily community managed micro hydro systems in Nepal. Over the period of around 14 years of operation, the programme passed through three phases completing the cycle of pilot operation, expansion, replication, mainstreaming and institutionalization. During the first phase from 1996 to 2003, the programme expanded from initial 5 districts to 10 districts in 1999 and to 15 districts in 2000. In its second phase from 2003 to 2007, the programme worked in 25 districts and in 40 districts in its third phase spanning from 2007 to 2011. From 1 April 2011, the programme has been redesigned as the Renewable Energy for Rural Livelihoods (RERL). The Alternative Energy Promotion Centre (AEPC) of Ministry of Environment (MoEnv) is the implementing agency and the United Nations Development Programme (UNDP) and the World Bank are the two principal donors.

The REDP has made remarkable achievements in terms of (i) substantial physical outputs, outcome and impacts, (ii) pragmatic policy and regulation based on the lesson learned, and (iii) internalization, institutionalization and capacity building at central, district and community levels. Based on the "best practice" lesson learnt in REDP, the Government of Nepal (GoN) formulated and approved the first Rural Energy Policy in 2006. Accordingly, AEPC with the technical and financial support of REDP has been executing its planned activities through the District Energy and Environment Sections/ Units (DEESs/Us) established in all districts of the country within the District Development Committees (DDCs) except in 3 districts of the Kathmandu Valley. Works are underway to establish DEEUs in these remaining DDCs in the current fiscal year 2011/12.

Various studies undertaken by individual consultants, researchers and firms have recorded and documented outcomes and impacts of REDP activities, which have shown to be highly impressive in helping community people and GoN in enhancing rural livelihoods through intervention in supply and consumption of energy. The rural communities of Nepal where REDP worked succeeded in carrying out the programme activities and install and operate their own energy systems. As of 31 March 2011, with the support of REDP, the community people have commissioned a total of 317 community managed micro hydro systems with the total power output 5814 kW benefiting more than 57,749 rural households that were not likely to be connected to the national grid at least in the next five years. Works are underway to complete another 136 MH under RERL by 31 December 2012. Other remarkable achievements made by community people in the programme areas are; 1) 7194 toilet attached biogas plants 2) 3245 Solar home systems, and 3)15076 ICS.

In RERL, that follows the implementation modalities of REDP and aims to complete the on-going micro hydro schemes giving increased focus to the livelihoods. The intended outputs of RERL are: i) lessons and best practices of REDP and other experiences are used for designing a new model and continuous learning in rural energy and poverty alleviation in Nepal; ii) local level has capacity built to increase energy access through community management model iii) local level capacity built to link energy services to poverty alleviation through productive end uses, including for women and socially excluded; iv) Support to Alternative Energy Promotion Center (AEPC) for energy planning in line with the key elements of an operational/functional Rural Energy Policy and local level environment mainstreaming started in 75 districts and national levels; and v) innovative approaches for long-term micro-/mini hydro and RETs sustainability are piloted, including developing micro-hydro projects as a Clean Development Mechanism (CDM) project.

1. Background and Context

Nepal is a landlocked, mountainous country located between the world's most populous countries, China and India, with a total area of 147,181 square kilometers and a population of 29 million. More than 30% of Nepal's population is below the national poverty line, and the country has one of the lowest per capita energy consumption in the world. Nepal's energy consumption pattern is overwhelmingly reliant on traditional sources of energy like fuelwood, agricultural residues and animal waste. Commercial energy covers less than 10% of the total energy use and electricity consumption covers less than 1%. Only about 55% of the population has access to electricity, in rural areas only half the population has access to electricity.

Renewable energy technologies (RETs) have been promoted in Nepal since the early seventies and the success of these initiatives is noteworthy: Around 20 MW of micro hydropower has been developed and about 10% of the population uses renewable energy resources (not including traditional fuels, used by nearly 100% of mountain households and about 77% of hill households for cooking and heating). The total hydro power resource available in the country is estimated at 83,000 MW out of which it is economically feasible to tap about 42,000 MW (UNDP, 2009a). However, so far, only one percent of this has been tapped. This can be attributed to a host of factors. Important ones include (1) lack of coherent sector policies, (2) poor implementation of existing policies and strategies, (3) decade long armed conflict, (4) inefficient resources mobilization and (5) multiplicity of institutions and agencies involved: the Ministry of Energy is responsible for planning and expansion of electricity; the Nepal Electricity Authority (NEA) is responsible for generation, transmission and distribution functions; and the Water and Energy Commission Secretariat (WECS) is responsible for policy backstopping, research studies and dissemination. Presently, the rural energy systems development in Nepal is under the purview of the Ministry of Environment (MoEnv) and renewable energy technologies are implemented through Alternative Energy Promotion Centre (AEPC) that is responsible for policy planning, coordination, monitoring and fund mobilization.

A comprehensive Rural Energy Policy targeting promotion of renewable energy was promulgated by the GoN in 2006, which highlights the role of the private sector in expanding energy solutions and replacing inefficient and unsustainable use of biomass energy with cleaner energy sources, as well as the role of community-managed energy service delivery and the promotion of productive uses of energy for poverty alleviation. The decentralized government machinery, including the District Development Committees (DDCs) and the Village Development Committees (VDCs) play important roles in implement district level rural energy systems development in line with the Local Self Governance Act 1999.

Major ongoing donors funded rural energy programmes/projects are the REDP (UNDP and the World Bank), Energy Sector Assistance Project – ESAP (Denmark and Norway, KfW), Biogas Support Program (SNV and KfW), Renewable Energy Project – REP (EU) and Improved Water Mill Project – IWMP (SNV). Various bilateral and multilateral development partners, such as, Denmark, Norway, Germany, Netherlands, Canada, United Nations Development Programme (UNDP), the World Bank (WB), Asian Development Bank (ADB), European Union (EU) etc. have been active in Nepal in the promotion of RETs.

1.1 Barriers to expanding energy access for the poor

More than 80% of Nepal's population lives in rural areas (UNFPA, 2008), where poverty, remoteness and difficult topography make it difficult to provide access to modern energy services. In rural Nepal, 98% of total energy consumed is obtained from traditional biomass and nearly 91% is consumed for cooking. Surveys show an average of 3-4 hours per day spent by women in fuel collection. Traditional stoves are both inefficient and release smoke in the kitchen with severe health implications related to respiratory and eye ailments from indoor air pollution. Deforestation remains a serious local problem in many mountain and hill areas and only 29% of the country has forest cover, compared to 37% in 1990. Electricity accounts for mere 0.1% of energy consumed in rural areas and less than half the population living in rural areas have access to electricity, compared to 93% living in urban are. Lack of electricity for applications such as drinking water supply, lighting for education, media for information, and refrigeration for health clinics; as well as for productive uses such as water pumping for irrigation (84% of the population depend on agriculture), agro-processing, and income-generating applications, is an obstacle to meeting the Millennium Development Goals (MDGs) (UNDP, 2007).

82% of the total land area of Nepal is mountainous, of which 14% is characterized as remote (Dutta et.al, 2007). The challenges involved in providing access to energy service in the remote, hilly locations are immense, and far more deep-rooted than those in the plains. Some of the challenges faced in expanding energy services in the hilly reaches of Nepal are as follows:

- Poverty and level of development: The first challenge is the pervasive problem of poverty. Enhancing access to energy is an extremely challenging task in Nepal where around one third of the population lives below USD 1 per day threshold. Poverty is widespread across the country and communities with varying degrees of intensity and most severe in remote parts of the high hills.
- Low status of women: The situation is worse for women, who are the lowest in human development and empowerment index. The literacy levels in the hill districts, especially for women are poor (less than 10% in many districts). They also face additional constraints of high workload, near total absence of exposure to the outside world, isolation and poor social infrastructure.
- Inaccessibility: Remoteness and inaccessibility obstructs mobility, leads to higher costs of transportation for developmental interventions, imposes isolation and restricts the scope for higher productivity of resources, which crucially depend upon mobility and external linkages.
- Low demand for electricity: The initial demand for electricity by low-income households in remote areas tends to be small, which has the effect of making the average cost per unit consumed high. As the fixed costs of transmission and distribution depend in part on peak demand (which is during early mornings and evenings), this demand pattern results in still higher costs for poor rural populations. Even when access to electricity is provided, the demand for electricity in remote locations increases, if at all, at a rather slow pace, as the other 'complementary' inputs required to promote economic growth such as roads, access to markets etc. are often missing.
- Limited capacity in rural areas: Nepal has more than 30 years of experience in micro hydro systems development, and today more than 30 micro hydro components manufactures and installers are engaged in the business. These are however

concentrated in and around the capital city of Kathmandu. Only few small manufacturers are operating in other districts. Trained personnel to survey, design, install, operate and manage renewable energy systems are virtually non-existent at the local level.

- Lack of enabling environment/unavailability of coherent policy: Although Nepal has promulgated RE policy in 2006, it still needs further elaboration through acts, by-laws and laws, as well as implementation guidelines. There are several policy duplication in intra-ministerial level i.e. forestry, environment and overlapping role of different departments.

2. Programme Overview

Rural Energy Development Programme (REDP), a joint initiative of the Government of Nepal (GoN) and the UNDP was initiated in August 1996 and completed in March 2011. From April 2011, Renewable Energy for Rural Livelihood, which builds up on the successes and lessons of REDP has been initiated.

The principle objective of REDP III (2007-2012) was to contribute to the process of local capacity development for sustainable, community-managed and equitable rural energy service delivery for poverty alleviation, livelihood promotion and environmental protection. Among other outputs, the project helped develop local level capacities to increase energy access through a community managed model in 40 districts; established linkage between energy services and poverty reduction through productive use of electricity, including for women and socially excluded. Since its inception in 1996, REDP supported the communities of 40 districts to install and operate 317 MHP, generating 5814 kW and benefitting over 320,000 people from 57,749 households. Likewise, during this period individuals were supported to install and operate 7194 toilet-connected biogas plants, 15,076 improved cooking stoves and 3,245 solar home systems benefitting 22,270 households of 40 districts. It also provided support to AEPC to implement key elements of the Rural Energy Policy and to establish District Energy and Environment Sections or Units in 72 out of 75 districts. It also provided inputs towards developing micro-hydro projects as a Clean Development Mechanism (CDM) project.

2.1 Institutional Arrangements

REDP a collaborative programme with multiple partners, working in tandem at various levels, had a strong focus on decentralized project management. The AEPC under the Ministry of Environment (MoEnv) was the government executing agency of REDP. The Programme operated at three levels: (i) community or VDC (Village Development Committee) level, focusing on planning, implementation, operation and maintenance of the community energy systems; (ii) district or DDC (District Development Committee), concentrating on the institutionalization of rural energy system by building institutions, policy and operational frameworks to plan and monitor rural energy development process; and (iii) central level, providing policy supports and coordination based on the lessons learned from decentralized level operations.

At the central level, the project is run by a Project Management Office (PMO). In addition, a Project Advisory Committee (PAC), with representatives from related government ministries, departments, donors, the World Bank (WB) and UNDP, provides overall policy guidance and a Project Executive Board (PEB) makes consensus-based management decisions related to the Programme.

At the District level, District Energy and Environment Section (DEES) is established as a part of the DDC in all 40 districts to carry out district level activities. The DEES is responsible for coordination, planning, local resource mobilization and day-to-day operations including local level capacity development, collaboration among various partners for synergistic impacts, and mobilizing support organizations, financial institutions, and private sector for efficient service delivery. The DEES is supported by the District Energy and Environment Management Committee (DEEMC).

Community mobilization, including disseminating project related information, helping communities develop community action plans, accessing resources from various sources and monitoring the local level work, are carried out by Support Organizations (SO). SOs are local non-governmental organizations selected based on explicit criteria including appropriate experience, track record in the project areas, and experience with participatory development approaches including women and excluded groups. Private sector firms as Rural Energy Services Centre (RESC) provide technical support services to the communities for feasibility studies, installation, operation and maintenance of micro-hydro and other rural energy systems. For this, DDC/DEES provide technical training, soft loans and technical backstopping.

At the Community level, Community Organizations (COs) provide an institutional platform for community people to carry out various activities. COs are formed by the community members through community mobilization process. COs are supported to form functional groups (FGs) based on their common interests ranging from income generation FG or forestry FG, to biogas FG or poultry farming FG and so on. Micro Hydro Functional Groups (MHFGs) are formed from among the matured COs for undertaking different activities starting from the identification of a feasible site to the installation and operation of micro hydro plant. Once the community managed system has been running successfully for at least six months, the community groups are encouraged to convert the MHFG into Micro Hydro Cooperatives, which are registered bodies, for ensuring long term sustainability of the system.

Fund Flow Mechanism

In order to encourage local ownership, REDP transfers all grant (subsidy) amounts into a Community Energy Fund or the CEF managed by the community. Each MHFG establishes a CEF to manage (collection and utilization) the funds received for the construction of micro hydro plant in the forms of grant (subsidy), loan, equity and charity as well as the electricity tariffs collected from consumers, both households and enterprises. Project funds for the various activities are channelized through a District Energy Fund (DEF), which operates through the District Development Fund (DDF), an already existing mechanism within the DDCs. The DEF channelizes the fund further to the CEF. REDP's role in project management is limited to facilitation, technical assistance, monitoring and evaluation.

2.2 Programme Funding and project costs

REDP activities are supported through a wide range of partners including the GoN line agencies, UNDP and the World Bank, elected bodies (DDCs and VDCs), Agricultural Development Bank of Nepal (ADBN), community people, donor funded projects and the private sector. Total UNDP contribution for REDP implementation was USD 10.9 million and the World Bank has provided USD 21.3 million to install about 300 micro hydropower plants generating 8.3 MW electricity and benefitting 86,000 households.

In general, the government subsidy / donor grant account approximately 50% of the total micro hydro plant installation cost, DDC and VDC equity investment to 10% and community in-kind (labor and locally available construction materials) contribution to 20%. The rest of 20% of the total cost are mobilized by the community as cash equity and/or bank loan.

Table 1: Year Wise UNDP Fund for REDP

REDP Phase - I		
Year	**US $**	**Remarks**
1996-2001	5,423,215.00	
2002	56,750.00	
Sub-total	**5,479,965.00**	
REDP Phase - II		
2002	107,995.44	As per CDR
2003	222,812.97	
2004	424,868.14	
2005	362,233.56	
2006	506,121.31	
2007	406,285.13	
Sub-total	**2,030,316.55**	
REDP Phase - III		
2007	252,937.56	As per CDR
2008	876,191.28	
2009	1,126,988.47	
2010	957,137.71	
2011	182,831.42	
Sub-total	**3,396,086.44**	
Grand Total	**10,906,367.99**	

3. Implementation Strategy

3.1 Programme Activities

REDP provided support for a number of activities, salient ones being:

- Policy feedback for enabling policy and regulations,
- Institutional development at all levels- community, district and center,
- Capacity development of stakeholders including government agencies, elected bodies, NGOs, private sector, associations, academic institutes and community
- Community mobilization based on participation, transparency, consensus decision making, gender mainstreaming and social inclusion
- Installation, operation and management of micro hydro plants and other RETs
- Livelihoods promotion and environment management
- Research, innovations, documentation and dissemination.

Rural Energy Policy, Nepal

Under a UNDP Thematic Trust Fund (TTF) project, REDP supported the National Planning Commission (NPC) and AEPC in the formulation of the Rural Energy Policy which was approved by the Government in 2006. The policy paper was prepared and discussed extensively with stakeholders at regional consultations in the five development regions of Nepal and more than 450 experts, implementers, academicians and local people actively participated in the process. Development of the Rural Energy Policy took almost four years of continuous efforts, persuasion and untiring follow-up.

The key features of the Rural Energy Policy 2006, which draws heavily from the REDP experience, are:

- A pro-poor focus
- Decentralized planning, institutions and operations
- Focus of holistic development and poverty reduction
- Smart subsidy for targeting poor and vulnerable communities
- Mechanism for the mobilization of internal resources
- Capacity development at all levels
- Multiple uses of energy resources and electricity and R&D for the same
- Mainstreaming gender concerns and vulnerable communities
- Continuing assessment for improvement based on emerging needs of the sector
- Creation of renewable energy fund

REDP took promotion of micro hydro as the entry point for a holistic development of remote, rural communities, through multiple applications such as lighting rural homes, running enterprises / industries including agro processing mills, carpentry, battery chargers, cable TV network, communication center and computer institutes; powering radio, TV and video; operating irrigation pumps; powering refrigerators for storing life

saving medicines and, providing energy for undertaking income generating activities viz. handcrafts, tailoring, sewing, knitting, black-smithy and poultry farming. Other rural energy technologies include toilet attached biogas plants (4-6 m^3) for cooking and lighting, solar home systems (10-30 Wp) for lighting and battery charging and improved cook stoves for cooking.

All REDP activities pivoted around the six basic principles of the REDP community mobilization process, namely organization development, skill enhancement, capital formation, technology promotion, environment management and vulnerable community empowerment.

3.2 Capacity Development

Right from its inception, REDP accorded priority to capacity development at all levels-community, district and center. Capacity development activities include:

Training for individuals selected by the communities on operation and management of micro hydro and other RETs, income generating and environmental related activities, institutional development, book-keeping and decentralized planning. In capacity development, priority is given to women, *dalits*, ethnic groups and poorest of poor. So far, capacities of a total of 47,638 people including, among whom 3,362 are trained in technical aspects of micro hydro plants operation, maintenance and management. Private companies have also been supported to enhance their capacity to supply and install micro hydro and other RET systems and establishment of Rural Energy Service Centers (RESCs) at remote locations.

Workshop seminars, consultative meetings and observation study tours are conducted for staff and other stakeholders such as government officials, high school teachers, and journalists.

On the one hand, sector wide capacity development has resulted in the long term sustainable operation and maintenance of micro hydro systems by trained people and on the other, in an increased demand for micro hydro plants resulting from increased awareness and successful demonstration effects.

In general, the human resources development is referred as the capacity development in the traditional notion. But, the capacity development (CD) is the process and comprised of various functional activities relating to the "software" required to implement the Programme. They include (i) planning, oversight and monitoring, (ii) situational analysis, (iii) stakeholder dialogue, communication, and community mobilization, (iv) setting up and enhancing institutions, (v) training of community members and Programme implementers, (vi) implementation and management, and (vii) advising on policies and regulations.

One of the most important and successful aspects of capacity building of REDP is enhancing the capacity of community to mobilize the resources. Communities are empowered through community mobilization and Human Resource Development activities to seek fund and in-kind commodities from various organizations/agencies such as local government line agencies, other donors funded projects, International NGOs / local NGOs and private channels that included the voluntary contributions of the relatives and household members working abroad.

Human Resource Development	
Training on Technical Subjects	3,362
Training on Income Generation and Micro enterprise	9,955
Environment Management	2,932
Institution Development	22,795
Orientation/Visit/Consultative etc.	3,693
Others	4,901

3.3 Enterprise development

The Programme emphasized enterprise development, especially energy based and contributing to community development through the Enterprise Development Fund (EDF). Each MHFG is assisted to create an enterprise fund of revolving nature to provide loan to needy villagers at convenient terms. REDP made initial contribution of NPR 10,000 per kW (up to a maximum of NPR 250,000) to each MHFG for creating the fund. Priority is given to poor household to obtain loan to carry out income generating activities / enterprises from the enterprise fund. As of date, REDP has the records of 264 micro enterprises/end-uses established and operated in the Programme areas. The REDP does not record the establishment of end-uses after the withdrawal of the Community Mobilizers (CMs) from the communities.

#	End-uses	Number
1	Cable TV Network	14
2	Agro Processing Mill	92
3	Computer Institute	32
4	Poultry Farming	33
5	Photo Studio	14
6	Oil Expeller	14
7	Battery Charging	7
8	Rural Communication Center	15
9	Refrigerator	2
10	Photo Copy	1
11	Others	3

The above figure do not include the different household/individual level income generating activities undertaken by the members of the Community Organizations (COs) through weekly savings which are also used for providing loans to the members mainly to undertake these activities for earning additional income to meet household expenses and paying electricity bill. They would add up to thousands in number.

One household one enterprise

Working on the motto *one household one enterprise,* REDP aims that every single household covered by the Programme will, as a result of the Programme, have an additional income of at least NPR 25 each month. This will, at the minimum, enable the household to pay the monthly electricity tariff for the minimum connection of 25 watt (sufficient for an incandescent bulb of 25 watt or three CFLs of 8 watt each). The poor households are given priority to get credit from the CO's weekly saving to carry out income generating activities, both on-farm and off-farm. Raising some chickens and selling at least one chicken a month will fetch more than NPR 200 that is far greater than the NPR 25 needed to pay for the electricity services.

3.4 Local Participation and social inclusion

- One of the six basic principles of REDP is the Empowerment of Vulnerable Communities (VCs), which is defined to women, *dalits*, ethnic communities, and poor households. Others are Organization Development, Capital Formation, Skill Enhancement, Technology Promotion and Environment Management.
- It is mandatory to have participation of all (100%) households in the community in Programme activities.
- REDP community mobilization requires one man and one woman from each household to participate in Programme activities starting from the formation of COs separately for male and female members.
- In Programme communities, separate male and female COs are formed, which meet on a weekly basis and are provided targeted capacity development inputs.

Community Organization

		Female	Male	Total
Community Organization (Nos.)		6,723	7,499	14,222
	Ethnic	**Dalit**	**Other**	**Total**
Community Members (Nos.)	118,663	66,115	107,672	292,450
Weekly Saving (Rs.)	28,310,662	13,970,395	22,135,726	64,416,783
Cumulative Investments (Rs.)	54,053,687	26,995,153	39,192,744	120,241,584

- Women are accorded priority in human resources development initiatives.
- Representatives from VCs (as VC focal persons) are included in MHFG at the community level, in DEES at district and at the centre, along with a mechanism to deal with grievances registered at the community level.

Experiences have shown that the transparent and consensus decision making process has helped in ensuring equal and equitable opportunities for all households including the women headed and poor households. The strong social capital built through community mobilization motivates the communities to share and care for all households irrespective of sex, class and creed. All households equally contribute and thus own the micro hydro or energy system and also share the benefits (electricity and tariff revenue) equally.

Some mechanisms that communities have instituted to help poor households to access electricity are:

- If some poor households are not able to contribute cash or raise collateral for a bank loan, they are allowed to contribute in kind and labour.
- In case they are unable to pay the electricity tariff in cash in some months, they are allowed to work in canal cleaning and/or repairing thereby earning wages that are monetized for paying for the monthly electricity tariff.

A recent survey conducted by REDP showed that in REDP supported communities, 100% of the *dalit*, *Janajati* and ethnic/ religious minorities are connected to energy services[1]. In addition, 25% of total energy based enterprises such as agro-processing mill are owned by *dalit*, *janajati* and ethnic minorities, and 41% of these are owned by women entrepreneurs. The outcome of working closely with local communities was also evident during the conflict years when most of the staffs of donor funded projects, government offices, NGOs and banks had to be relocated from villages to the district headquarters and adjoining cities for the security reasons. However, the Community Mobilizers, working for REDP, continued to work at the project sites as they are hired locally, though at a reduced pace.

3.5 Standardization and Quality Management

The REDP has developed over 15 guidelines and manuals on all key areas of Programme implementation such as community mobilization process, micro hydro implementation and environment assessment. These guidelines have been updated / improved regularly based on the feedbacks and evolving needs. These guidelines and manuals have helped in ensuring uniform Programme execution, management, monitoring and evaluation at all levels and quality assurance of micro hydro systems in all aspects. Other measures to ensure quality are as follows:

- Each DEES is staffed by two engineers who are responsible for the technical soundness of the micro hydro systems built by communities. These engineers are responsible for, among others, technical feasibility survey, preparation project design report, providing technical backstopping for the community to seek bids at least from three suppliers, evaluation of bids, supervision of construction and installation, electro mechanical equipments and transmission and distribution lines and power output verification.
- AEPC has pre-qualified 56 manufacturers and suppliers and in order to be eligible for subsidy, communities are required to contract one of these.
- AEPC has appointed pre-qualified consultants and firms for other technical works such as technical feasibility survey and power output verification that is mandatory to be carried by the certified experts for determining the exact plant capacity for calculating the subsidy amount as well as for releasing of the final 10% of the contract amount to the manufacturers/suppliers. DDES is required to seek the services of these pre-qualified consultants and firms if needed.
- The MHFG organizes the Monthly mass meeting that is attended by all CO members. The Chairperson and the Manager make presentation about the works

[1] On an average, these communities are composed of is 40% upper castes, 15% *dalits*, 37% ethnic communities and 8% others.

done (fund mobilized, materials procured and transported to the site, portions of canal constructed, E/M and T/D erected, etc.) that are thoroughly discussed and agreed by all on the consensus basis.

- Upon the commissioning of the micro hydro plant, the MHFG conducts a Public Audit attended by all CO members together with representatives of DDC, DEES, manufacturer/supplier and other invited dignitaries and guest to discuss, dispute and certify the technical aspects and financial expenses incurred.

- REDP has introduced the grievance handling mechanism by appoint focal person in MHFG, SO, DEES and REDP. The process is yet to be improved and streamlined for the perfection.

With the above mentioned measures in place, almost all plants completed since the first one in 1998 are functioning satisfactorily today. There have been occasions when some of these plants (like any other electro-mechanical equipments and civil structures) are damaged and destroyed, but communities have renovated and repaired them in due course of time. In terms of social aspects, now women represent at least 50% in more number of MHFGs.

4. Impacts

4.1 Achievements

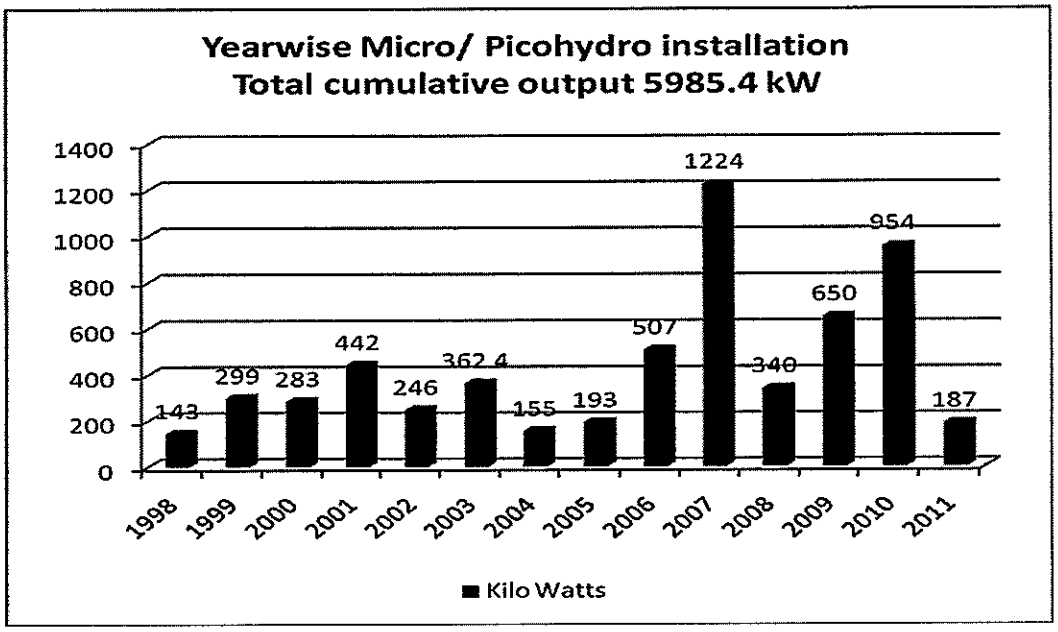
As of March 2011, a total of 292,450 people from households have benefited from REDP activities, of which 60,994 households have already accessed electricity services. Of the total households, around 80% are from the vulnerable groups. With the programme support and guidance, all beneficiary households of micro hydro plants are mobilized for social capital building, income generating activities and environment improvement by planting trees and fruit saplings, cleaning in and around households and constructing/improving infrastructures such as ponds, taps, trail and roads.

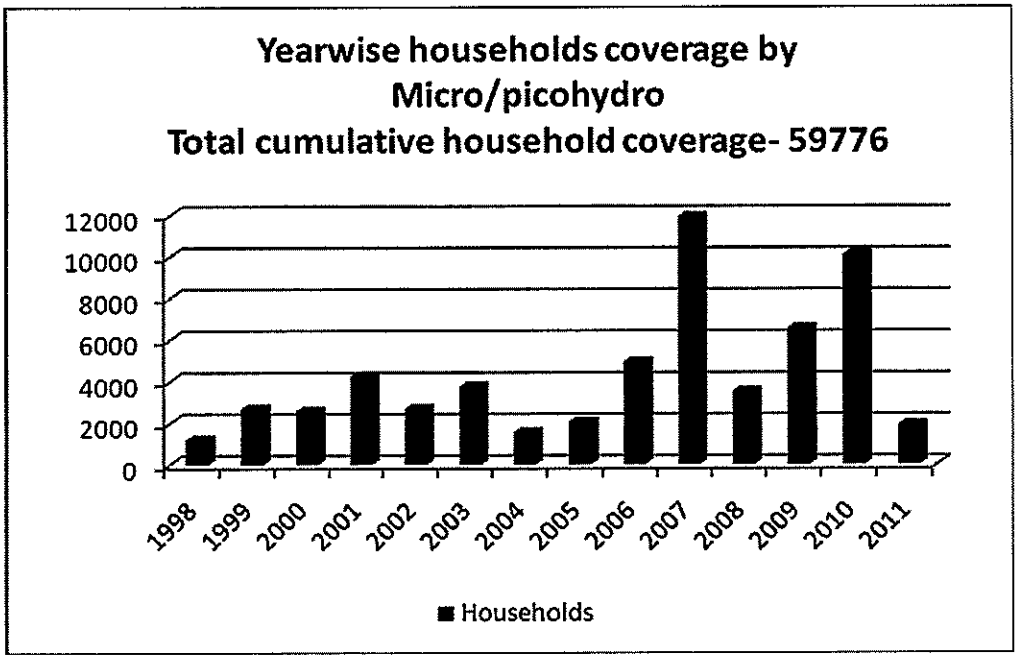
Table below high lights the major achievements of REDP.

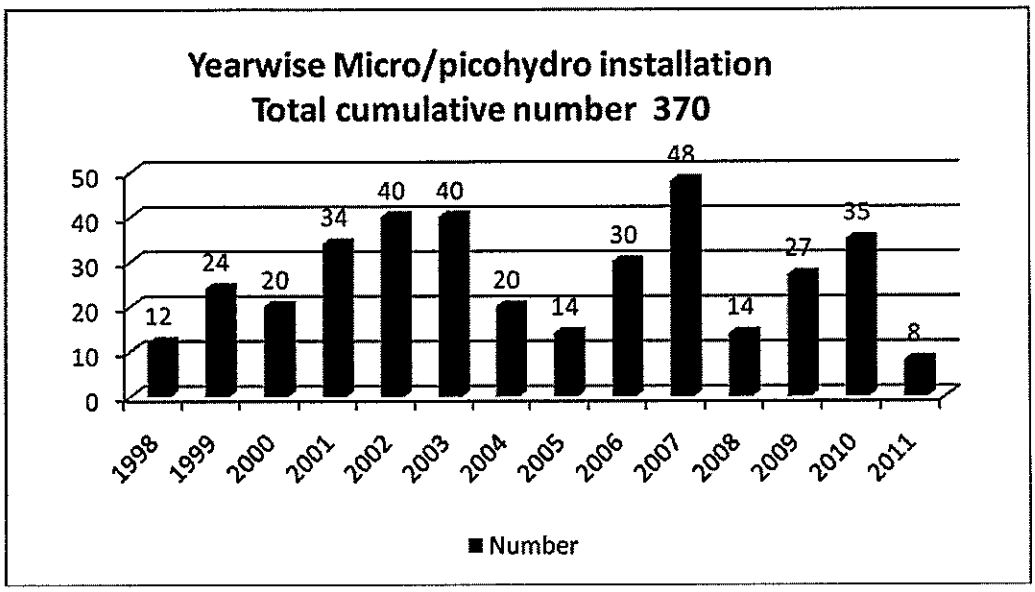
Major Achievements of REDP (August, 1996-March 2011)

Particulars	Total
Rural Energy Systems	
Micro Hydro	317 (5814.2 kW, 57,749 HHs)
Peltric set	53 (171.2kW, 2027 HHs)
Toilet Attached Bio-gas Plant	7,194
Solar Home Systems	3,245
Improved Cooking Stoves	15,076
Environment Initiatives	
Nursery Establishment	195
Community Managed Forests	415
Plantation	3,724,849

Toilet Construction	31,706
Environment Classes/Campaigns	2739
Trail Road Construction	636.66
Tap / Pond Construction	440







- Increased capacity of stakeholders through (i) Strengthening of local (district) level NGOs as Support Organizations; (ii) Promotion of local electromechanical/grill workshops as Rural Energy Service Centers (RESCs) for technical support; (iii) Strengthening of local government bodies (DDCs and VDCs) for undertaking decentralized rural energy planning, programming and monitoring and evaluation, and (iv) capacity development of local community to plan, implement and manage rural energy systems, and more importantly, to 'envision' a process of sustainable development for themselves V) upgraded capacity of private sector to deliver RET systems
- Enhancement of rural livelihoods through (i) Increased income from off-farm and on-farm activities, (ii) End use promotion of energy produced from micro hydro and other renewable energy systems; and (iii) Increased capital from savings and credit operations of the COs.
- Improved quality of life with access to electricity through (i) Improved health due to reduction in drudgery, labour and smoke inhalation, and improved sanitation; better education of children due to the availability of brighter light at night (extension of study hours); (ii) Increased awareness among the rural people about global activities via telecommunications and computers and resultant reduction in the feeling of 'isolation'; (iii) Establishment of infrastructure like electricity, schooling, potable drinking water and micro-enterprises.; and (iv) Improved environment in and around homes and communities.

4.2 Impacts on MDGs

REDP was conceived as a 'rural energy' and 'holistic development' project in 1996. Its contribution to holistic development of the rural communities is immense. This has been documented in a number of publications on the project. In 2005, an in- depth study was conducted by the Winrock International to assess the contribution of Programme activities towards MDGs. This was done through a comparative analysis of changes before and after REDP intervention. Changes in MDGs changes were computed by analyzing the two sets of data collected from 1,503 households of the 20 selected communities; the first set of comprehensive household level baseline data collected by

REDP at the beginning of the project and the second set of follow-up household level data collected from the same households (Winrock International, 2008).

MDG 1: Eradicate extreme poverty and hunger

- Between 1996 and 2005, there has been a 52% growth in household income in REDP communities, compared to the national average household income growth of 46% for the same period. Average household annual income increased from NPR 48,000 to NPR 73,000.
- Percentage of households below NPR 50,000 annual income decreased from 59% to 54%, and those below NPR 10,000 annual income reduced from 15% to 12%. Households with annual income over NPR 100,000 have increased considerably from 9% to 24%.
- A recent survey undertaken by REDP showed that kerosene savings between 80-96%, and reduction of diesel by 23% were observed in all households. Similarly, the expenditure on batteries was seen to be reduced by 15% to 30% (Winrock International, 2008).
- On an average about 3 people got direct employment opportunity because of installation of one micro hydro power plant (average size 25 kW) (Pokharel, 2006).

MDG 2: Achieve universal primary education

- Total number of illiterate people decreased from 37% in 1996 to 25% in 2005. Over 93% of children in 2005 have acquired primary education. For the same period, children of age group between 6 to 14 years without primary level education dropped from 25% to 7%.
- The educational status of girls has improved. The ratio of boys and girls enrolment in school changed from 1.20 in 1996, to 1.13 in 2005.

MDG 3: Promote gender equality and empower women

- There is a reduction in hours expended on fuel wood collection and agro processing for both men and women. On an average, time saving is estimated as 3 hours daily.
- Over the years, men's participation has improved in households chores like cleaning, agro-processing and cooking, reflecting changing gender relations within households.
- Social involvement of both men and women significantly increased (almost doubled). In women COs, women are the chairpersons and managers. In some MHFGs, women have been working as the chairpersons and also as managers.
- Women involvement in small scale and cottage enterprises has increased. The number of such enterprises increased from 400 in 1996 to 700 in 2005.

MDG 4: Reduce child mortality/ MDG 5: Improve maternal health/ MDG 6: Combat HIV/AIDS, malaria and other diseases

- The average annual child mortality rate decreased to 5.3 from 9.4. Similarly, annual maternal mortality rates decreased from 5.3 to 4.3. This is resulted from the substantial reduction of indoor smoke inhalation due to the displacement/reduction of fuel wood for cooking by biogas plant/ICS as well as displacement of kerosene for lighting by electricity generated from the micro hydro plant.
- The number of households having toilets increased from 42% in 1996 to 70% in 2005.
- Households with access to tap water increased from 58% in 1996 to 82% in 2005 whereas the national statistics show an average increase from 32% to 42%.

- Average walking distance to fetch clean drinking water has reduced from about 400 meters to 175 meters.

MDG 7: Ensure environmental sustainability

- Average monthly demand of kerosene decreased from 3 to 1.4 liters per household, thereby saving around 29,000 liters of kerosene per year (from just the 1,503 surveyed households). Monthly demand of batteries per household has also decreased.
- Firewood consumption has reduced considerably. Monthly demand for firewood in 1996 was approximately 10 Bharis (1 Bhari ~ 35 Kg); the number in 2005 was less than 7 Bharis per month.
- Community people, both men and women have experienced more greenery in their surroundings. The adverse environmental impact of micro hydro plant due to the smaller and simpler civil structures is negligible as compared to that of large hydro power plant with large civil structures.

MDG 8: Develop a global partnership for development

- The REDP has demonstrated a workable public-private–partnership model for renewable energy systems development, especially micro hydro, enhancing partnership between local communities, private sector and public sector along with other government line agencies, development bank and local NGOs. The community managed micro hydro is funded and owned by private (individual members of MHFG) and public sector (DDCs and VDCs). The private sector (RESC) and civil society (NGOs) are services providers.
- The Rural Energy Policy 2006 and the district level rural energy policy of all 40 District Development Councils have institutionalized this partnership model.
- The REDP is entrusted to implement the Khimti Neighborhood Development (KiND), the first public –private partnership project of GoN, UNDP and Himal Power Limited.
- REDP staff has provided technical assistance to various UNDP country offices and other international agencies for promoting micro hydro plants for holistic development and rural livelihoods. The REDP approach and modality has been replicated or studied by UNDP offices from Afghanistan, Timor Leste, Cambodia and Tajikistan thereby promoting the South-South Cooperation.
- Created strong social capital for caring and sharing among all households based on participation, inclusion, transparency & consensus decision making.
- The REDP has collaborated with the World Food Programme (WFP) for constructing a total of 237 Institutional improved Cooking Stoves (IICSs) in 237 primary schools of seven (7) Far Western and Mid Western Development regions. The main purpose of these ICSs is to help rural schools to reduce the fuel wood consumption in cooking snacks from the raw materials provided by the WFP for feeding the students.

4.3 Expansion of Renewable Energy Businesses

The private sector (individual consultant and firm/company) is involved in the provision of technical services to the community for the survey, fabrication, installation, repair and maintenance of renewable energy systems that include MHP, SHS, biogas and ICS. In addition to micro hydro plants, the REDP support has further accelerated the installation of SHS, toilet attached biogas and ICSs thereby generating expanded business opportunities for the existing firms as well as attracting additional business firms due to increased demand. In addition, private sector workshops are promoted as Rural Energy Services Center (RESC) in each Programme district. Over the years, the number of the pre-qualified consultants and firms has been steadily rising. In 1996, there were less than 15 consultants and firms, now they have increased to more than 100.

4.4 Internalization/ Institutionalization of REDP modalities

Gradually but steadily, several of the REDP's good practices and modalities have been internalized and institutionalized by AEPC / GoN in the dissemination of renewable energy in Nepal. The creation of District Energy and Environment Sections / Units (DEESs/ DEEUs) in seventy two DDCs itself testifies the internalization of REDP approach and practices by the Government of Nepal.

Specifically the following REDP modalities have been adopted by AEPC to be applied for all donor funded projects, irrespective of their own implementation procedures:

- Technical Review Committee (TRC): REDP requirement that all Details Project Reports (DPRs) for renewable energy systems, especially micro hydro plants need to be approved by the TRC, before subsidies / grant is released to the MHFG. The approval of DPR is done on the basis of technical, financial, social, and environmental viabilities. The TRC is an independent committee composed of representatives of AEPC/GoN, REDP, ADBL and NMHDA. In 2003, the AEPC made the approval of TRC mandatory for all micro hydro plants for provision of subsidy from the REF.
- The EDF modality is facilitating a number of on-farm and off-farm income generating activities and micro enterprises. The AEPC/GoN has adopted the EDF in the subsidy policy, starting from 2009-10 in order to ensure sustainability of micro hydro plants. Accordingly, in addition to the subsidy based on the power output, each micro hydro plant is provided additional amount of NPR 10,000/kW up to the maximum of NPR 250,000 for the EDF that provides loan at liberal terms and conditions to prospective entrepreneurs to establish rural enterprises who are required to pay for the loan and interest in installments. Realizing the strength of social mobilization to promote the RET systems in Nepal, ESAP/AEPC has also incorporated the social mobilization component.

5. Programme Sustainability

5.1 Productive Use of Energy

The sustainability of a micro hydro system depends, among others, on the availability of funds sufficient to meet recurring expenses for operation, repair maintenance, community activities and cash dividends to promoters/ investors (individual households, DDC and VDC). As discussed in section 2.1, REDP has supported MHFGs to establish

and operate the Community Energy Fund (CEF) for this purpose. The CEF's main revenue sources are the household tariff and commercial application of electricity for micro enterprises. While the household tariff rates are difficult to raise once fixed, because of the generation limit as well as the income levels of the households, the revenue from commercial application can, in principle, be increased utilizing the electricity during daytime. The constraint faced is the lack of / limited infrastructure and services to start income generating activities and micro enterprises in rural areas. In order to deal with these issues, REDP adopted two approaches. First, through its motto of one household one enterprise, supported through saving and credit operation of COs, skill enhancement training and operationalization of the enterprise fund. It is seen that once poor households start income generating activities (and are able to pay the electricity bill), they work hard to earn more by expanding activities or switching to more profitable ventures. Secondly, the Programme proactively provides information, enterprise development training and exposure visits for potential entrepreneurs to encourage establishing electricity based micro enterprises. In some instances, assistance is provided to link rural producers with city- based markets.

The promotion of income generating activities and the micro enterprises in REDP supported micro hydro plant sites are showing good results. In general, given the increased public awareness and the expansion of rural infrastructure, enterprise development is easier now. The positive impact from the income generating activities undertaken in all communities include (1) regular payment of electricity , (2) increased intake of foods and vegetables, (3) enhanced cleanliness and /or attendance of school going children, (4) renovation of houses, (5) increased number of consumer stores/kiosks (6) increased demand for electricity for household appliances.

However, it is clear that support for income generating activities and efforts to link them to markets needs to be further intensified. Given its limited resources, REDP has been linking up with development partners and other programs such as Poverty Alleviation Fund (PAF) and UNDP funded Micro Enterprise Development Programme.

The REDP Plus model: Developing a consolidated livelihoods package

REDP has initiated three innovative livelihoods initiatives in three micro hydro sites at varied stages of development.

- Package A at Mangpang Khola MHS, Budathum VDC, Dhading: The MHS has been commissioned recently and end use promotion activities have been initiated only recently. The main focus of this package is to promote energy based enterprises by encouraging women, *dalits*, ethnic and poorer households to access the EDF being provided to the MHFG.
- Package B at Girindi Khola MHS, Dagatundada VDC, Baglung: The MHFG here is mature enough for legalization, and the main focus here is to provide energy inputs into existing local resource-based enterprises such as stone crushing factory and a beaten rice- processing unit.
- Package C at Chauri Khola Micro Hydro Cooperative, Pokharichari VDC, Kavre: The MHFG has already been registered as a cooperative. The main focus here is to facilitate the cooperative to diversify its activities and services, leading towards the sustainability of both MH and Cooperative.

Once developed, this livelihoods package will be implemented in new micro hydro sites in an integrated manner from the very beginning, in order to get benefits of both electricity and economic growth together simultaneously. This will be a key component of REDP Plus Model that will ensure optimum end-use promotion, diversified businesses development and long-term organizational sustainability.

5.2 Strengthening institutions as an exit strategy

Some of the notable achievements made in the institutionalization / internalization of REDP activities are as follows:

- Community level: REDP supported institutional development of COs and FGs. The REDP pulls out its supports from a community after the successful operation and management of micro hydro systems, which normally is after a year of completion and operation of the renewable energy systems. Experiences have shown that the strong social capital and consensus decision making process practiced by community people based on participation and transparency have helped to sustain FGs, especially MHFG or Micro Hydro Cooperatives with an operational CEF manned by trained operator and manager.
- District level: REDP has supported DDCs to create and strengthen DEESs for decentralized planning and management of rural energy systems development. These DEESs have been operational with DECs, DREMCs and DEFs under DDCs in 40 districts. Based on the demonstrated successes in participatory and transparent planning and management of community managed renewable energy systems, more and more DDCs have started owning the DEESs by assigning them additional functions as such appraisal, financial and supervision of the rural electrification through the extension of national grid especially for micro hydro. DDCs in Dhading, Tanahun and Dadeldhura have allocated, from their own resources, funds to promote other RETs in non-REDP-VDCs.
- Central level: The Rural Energy Policy 2006 was formulated based on REDP's best practice lesson learned. Presently, REDP is supporting AEPC implementing the Rural Energy Policy in all 75 districts. The GoN (through MoE) has already endorsed the DEESs as district level entities for implementing its energy and environmental activities.
- The table below depicts the strategic shifts of responsibilities that are brought about with the implementation of the REDP.

Table 5.1: Strategic shift of responsibilities (UNDP, 2009b)

	Responsibilities prior to REDP	**Responsibilities after REDP**
Central Government	Policy formulation and implementation	Policy formulation
Local Government (district level)	No role for local government authorities in decentralized energy planning and promotion	Planning and provision of energy services at district and village levels
Communities	No community Involvement	Operation and management of energy systems done through community organizations
NGOs	Not active in energy services development through community mobilization	Community mobilization on contract with the district committee as social organization
Private Sector	Only few companies active, mainly involved in manufacturing and installations in urban area (Kathmandu and other large cities)	Technical services provided through private sector organizations in rural areas for survey, installation, operation, repair and maintenance

5.3 Functional Collaboration with Partners

In order to ensure sustainability of its activities, REDP forged collaboration with other renewable energy programmes and projects such as ESAP, BSP, REP, IWMP. REDP also co-ordinated to complement rural energy activities as necessary with the Poverty Alleviation Fund (PAF), Centre for Rural Technology/Nepal (CRT/N) and other International NGOs. Key areas of memorandum of understanding signed with PAF include strengthening linkage for livelihood promotion for the poor, strengthening community organizations to become sustainable and pro-poor, ensuring preparation of community action plans (CAP) through participatory process, cost-sharing in micro-hydro projects in the form of community equity funds for the poor, enhancing end-use applications for the benefit of the poor, and strengthening capacity of the DDC for managing energy information, joint monitoring and promotion of renewable energy technologies for the poor. Other partner on social mobilization and livelihoods promotion is the Support for Poor Producers in Nepal (SAPPROS).

5.4 Accessing CDM funds

REDP has been playing an important role by assisting AEPC for a first micro hydro based Clean Development Mechanism (CDM) project in Nepal. AEPC/GoN (Project Entity) has already signed the Emission Reduction Purchase Agreement (ERPA) of micro-hydro CDM project on June 30, 2007 with CDCF/WB (Trustee). The unit price for each CER is agreed at USD 10.25/t CO_2 for total target of emission reductions of 191,000 t CO_2e with possibility of addition, at least, 100,000 CER by reviewing in 2012. The project will increase electricity access for people in rural areas with installation of 15,000 kW by 2011 from micro hydro systems with the generating capacity varying from 5 to 500 kW each. Of the total, REDP supported micro hydro systems will contribute to 5814 kW.

6. Lessons and good practices in expansion of energy services for the poor

The REDP experience encompasses all three dimensions of expansion, namely, scaling up, replicating and mainstreaming. During its first phase (1996- 2003), with support from UNDP and the GoN, the Programme started from a pilot in five districts and was scaled up to 15 districts. During the next phase (2003-2007), World Bank joined the Programme, and it was replicated to 25 districts resulting in increased coverage and an increased number of beneficiaries. The focus of the third phase (2007- 2011) was on mainstreaming by incorporating full- or sub-components of a Programme into the national or local development priorities. Both external and internal factors have contributed towards the up-scaling, replication and mainstreaming of REDP activities.

The available literatures and website have revealed that there are many projects and programmes that are either in formulation and/or implementation phases in many countries exactly similar to REDP's good practice. Some do acknowledgements and many do not. Nevertheless, there are UNDP funded projects/programmes that are formulated taking into consideration of REDP lesson learned in Timor-Leste, Afghanistan and Bhutan.

6.1 Explicit policy commitment to renewable energy

The Government of Nepal has accorded priority to the promotion and dissemination of RETs in its five year development plans and annual programmes since the eighties. For a Programme like REDP, Nepal's past experience with micro hydro and other RETs and the existence of a private sector capable of manufacturing, installing and carrying out

repair and maintenance of MHS, was helpful. The original REDP document was formulated based on the long experiences of GoN and UNDP with micro hydro promotion, decentralized governance and energy-environment-poverty nexus.

Since the Rural Energy Policy 2006 was formulated based on demonstrated success of REDP, influencing policy makers to agree on the document was relatively easier, even though the process was disrupted because of the changes in government and/or bureaucracy during 2004-2006. Getting the policy approved and adopted was attributed to the unstinted support of the government line agency, AEPC and the donor, UNDP, and the strong commitment of REDP team.

6.2 Synchronization with existing decentralized governance system

When REDP was designed and launched, Nepal already had a development strategy that emphasized decentralization and community mobilization based on participation, equality and equity. REDP's emphasis on recentralized governance is well in line with the government's focus, and the Programme took advantage of the enabling environment that the country and the energy sector provided in the Nineties. The Eighth Five Year Plan (1992–1997) provided an opening for the involvement of NGOs in the delivery of services to local communities. Further, the Electricity Act (1992) created an environment conducive to community and private-sector participation in hydropower development through de-licensing of up to 1,000 kW capacity. The 10th Plan adopted a number of strategies with regard to decentralization, which are key principles of REDP as well. These are: autonomy to the local bodies for performing duties of the local self Governance Act, 1999; enhancing the institutional capacity of local bodies for enabling them to deliver services to the people, and enabling them to function responsibly; enhancing the people's participation in the local development process extensively; and making local bodies capable of mobilizing internal and external resources.

All these provided REDP an institutional framework to set up the required institutions at all levels – at centre for policy, guidance, resource mobilization, monitoring and evaluation, at district for planning and management, linkages, capacity development and technical support services, and at community for construction, operation and management, repair and maintenance and fund management.

6.3 Community led micro hydro development

REDP's community mobilization not only recognizes the importance of people's participation but puts the people in the driving seat. The project does not build micro hydro or any other systems and hand them over to the community upon completion, but motivates people and develops their capacity to plan, implement and operate micro hydro plants. As such, there is no need for a handing over process. Devolution of power is achieved as the Programme provides all applicable grant (subsidy) amounts into the CEF account managed by communities. In general, REDP's roles are limited to the facilitation, technical assistance, monitoring and evaluation. This role division was instituted strategically right from the beginning of Programme. The REDP team believes that the approach of putting communities at centre-stage works universally and is applicable to all development sectors.

6.4 Developing national capacities

The REDP/UNDP assisted the GoN to formulate and promulgate its first ever Rural Energy Policy, which adopted several good practices and lessons learned in the

implementation of REDP. In line with its exit strategy, activities are also underway to transfer skills and knowledge of REDP to AEPC and elected bodies through capacity development, trained human resources, operational regulations, guidelines and manuals on various aspects of micro hydro systems. The Programme has also supported the private sector and local NGOs to provide technical, social and managerial support services.

6.5 Widespread information dissemination

Right from the very beginning, REDP proactively disseminated information about the project at all levels, including community-based, elected bodies, civil society organizations, private sector, donors and government. Among the main promoters of REDP have been the Chairpersons of DDCs of districts with REDP projects. Partners helped in the documentation and dissemination in the forms of assessment reports, newsletters, students' thesis, and case studies and national and international recognitions and awards.

Association of District Development Committees of Nepal (ADDCN) and National Association of VDCs in Nepal (NAVIN) are two important partners of REDP that are playing important roles in policy advocacy, lobbying and capacity development of their members, namely DDCs and VDCs thorough the creation and operation of Natural Resources, Energy and Environment (NaREE) and Rural Energy and Environment Development Unit (REEDU). With the support of REDP, the ADDCN in collaboration with concerned ministries, associations and projects organized a "National Conference on Rural Energy" that concluded with a 13 Points Kathmandu Declaration. As an outcome, ADDCN and Federation of Nepalese Chamber of Commerce and Industry (FNCCI), the umbrella organization of Nepalese business houses signed a MoU to work jointly for the promotion of rural energy systems following the public-private models.

7. Issue need to be addresses in REDP plus

a) Facilitate to formulate policy/laws/by-laws and implementation modality to connect small scale renewable energy systems to grid.

b) Replicating REDP's community mobilization in other renewable energy programmes/projects through AEPC.

c) Enhancing manufacturing capacity of RET system manufacturers and installers for the capacity of more than 100kW and up to 1000 kW as envisaged by Rural Energy Policy 2006.

d) Developing the capacity of DEEU created in 32 districts by AEPC/MOE with the support from REDP/UNDP

e) Focused program on productive use of electricity to promote rural livelihood through electricity based micro enterprises.

8. Conclusions

The renewable energy systems promoted by REDP, especially micro hydro systems provide access to energy services for communities, who might have had to wait for years to get electricity from the national grid, if ever. Through its focus on productive uses of electricity, income generation and enterprise development, REDP helped the communities living in poverty to overcome two of the pervasive problems that keep them

in poverty - their low productivity and their limited range of productive options. In this respect, REDP has gone beyond most traditional village level micro hydro promotion programmes, which restrict themselves to providing household lighting, and not really utilize energy as a 'service' that works for the communities, helping them to generate incomes and move out of poverty. Similarly, at a higher level, by providing inputs in areas of community mobilization, women's empowerment and inclusion of the disadvantaged sections of the community, REDP unleashed social transformation, which is critically lacking in many rural communities. By doing so, REDP reached segments of the population that most development efforts had bypassed in the past.

9. Way Forward

In fourteen and a half years since its inception in 1996 to completion in 2011, REDP has been the flagship program of the Government of Nepal and UNDP in the rural energy sector. It innovated many things and demonstrated that with proper support the communities of rural Nepal are able to plan, implement, operate and manage renewable energy systems for improving their livelihoods. To institutionalize the achievements of REDP, both the government and development partners have agreed to initiate the Renewable Energy for Rural Livelihood programme, which will focus on supporting the communities not only to install and operate energy systems but also to make productive use of energy to improve their livelihoods by establishing and operating electricity based micro enterprises that will create employment within the rural communities and also provide essential services.

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