

Ladakh Ecological Development Group (LEDeG)

The following text is based on an update report provided by LEDeG in spring 2008.

LEDeG in 2008

Today LEDeG has more than 52 fulltime employees reporting to a Working Committee of eight members. This committee is responsible for the decision making and governance of LEDeG's projects. It is elected by a general body comprising of 100 members.

LEDeG Programmes

1. Appropriate Technology

Since its inception in 1983, LEDeG has been working towards introduction of appropriate and renewable energies technologies in Ladakh. These technologies have huge potential in improving the living conditions of people. The most prominent among them are micro hydroelectric power unit, hydraulic ram pump, improved watermill, solar photovoltaic, passive solar architecture, solar cookers etc.

Micro Hydroelectric Power Unit (MHPU)

LEDeG in cooperation with Dan Church Aid (DCA), Denmark and Bremen Overseas Research and Development Association (BORDA), Germany have installed more than 56 MHPUs in the remote villages of Ladakh since 1989.

Hydraulic Ram Pump (HydRam)

With cooperation of BORDA, LEDeG has implemented 63 hydraulic ram pump projects in Ladakh from 1993 till date.

Solar Photovoltaic (SPV)

The 250 KVA Diesel Generator at Tangtse in Durbuk block of Leh district supplied electricity to three villages for domestic lighting. The diesel generator besides polluting the otherwise pristine and highly fragile environment consumes an average of 48,200 litres annually. In collaboration with India Canada

Environment Facility (ICEF), Ministry of New and Renewable Energy (MNRE), Ladakh Autonomous Hill Development Council (LAHDC) and people of Durbuk block, LEDeG has installed a 4X25kWp solar photovoltaic power plant at Tangtse, which completely replaced the existing Diesel Generator set. The solar photovoltaic plant is now managed by the local people through a cooperative society known as Renewable Energy Development Cooperative Limited or REDCO.

Villages in Ladakh are isolated, houses are scattered, resources are inadequate and options for electrification are limited. SPV home lighting systems ameliorate the situation considerably. LEDeG installed smaller SPV power plants of 1kW or more at Lingshed School and LEDeG's offices at Karzoo and Ribook Centre. Till date we have distributed over 1015 solar home-lighting systems and 1420 solar lanterns in Ladakh under the MNRE's programme.

Other solar technologies include:

- a) Solar Fruit Dryers
- b) Solar parabolic cookers (SK-10, SK-14 and Scheffler)
- c) Solar water heaters (evacuated type)

Passive Solar Architecture

With the temperature dropping down to -40 Degree Celsius, room heating primarily in the evening and early morning is not a choice but a matter of survival. The conventional methods of room heating is the use of kitchen stove and Chullah (stove) fuelled with dung, wood and kerosene. LEDeG has been trying to address the problem of space heating through use of solar energy. Trombe wall technology is an extremely simple technology built on the principle of passive solar gain and minimization of heat loss through various design and insulation techniques. In 1984, in collaboration with Ladakh project, LEDeG installed 75 solar retrofitted houses. Trombe house can reduce reliance on heating fuels by about two-third, besides reducing indoor air pollution and health hazards. Under the project titled 'Integrated Development of Durbuk Block Using Renewable Energy Resources', LEDeG retrofitted 135 houses with Trombe wall in Durbuk block of Leh district.

Improved Water Mill

The improvement of traditional water mill is done by improving various components of the traditional mill but the most significant is the replacement of

wooden runner with hydraulically better-shaped metallic runner having cup shaped blades. This increases its operational efficiency as well as making it more useful with additional machines for hulling, electricity generation etc. Hydropower, in the form of traditional (wooden blades) low power output water mill (*Rantak*), has been in use in Ladakh for centuries for grinding purposes.

2. Micro Enterprise

In the last few years, there has been a paradigm shift in LEDeG's approach towards micro hydroelectric power unit. Now the purpose of installing MHPU is not only electrification but also the setting up of small village based micro enterprises. In the remote villages of Ladakh, agriculture and other land based activities are the main source of livelihood. The power generated by MPHU is being used for operating end-user machines or secondary devices like flour mill, oil expeller, wood turning lathe, multipurpose carpentry machine, community water heater, butter churner, spinning machine etc.

3. Watershed

In the early eighties, watershed development was a program of the Central Government aimed at treating waste and degraded land. Then the program was characterized by a top-down approach, with least participation of local communities. In 1987, the objective of the program was revised and broadened with the improvement of the socio-economic conditions of people inhabiting the program areas. LEDeG's association with the government in the implementation of Watershed Development programmes dates back to 1993. Our programme area includes 12 villages of Nyoma block in Leh district. The main objective of the program was to ensure holistic development of people and natural resources in the watershed belt.

4. Handicraft

Traditionally, handicraft and agriculture have been the main stay of the Ladakhi economy. By formation of Self Help Groups, LEDeG promotes art, culture and tradition of Ladakh and in a way improves the livelihood of the people by generating more cash income through sales of handicraft products, for which LEDeG has a shop in Leh. We provide refresher courses on spinning, knitting, weaving, tailoring, wood carving, fruit processing, natural dyeing and embroidery. When the Self Help Groups become fully functional, the programme helps them to build a work shed so that the production of crafts can proceed on a sustainable basis thereby enabling the members to generate income. LEDeG will continue

marketing their products until they become self-reliant and independent, in Leh or other urban centres.

5. Agriculture in Ladakh

LEDeG is actively engaged in the introduction and diversification of agriculture in remote villages of Leh and Kargil district. In the relatively developed areas of Ladakh, LEDeG is engaged in value addition programs like production of jam and juice (apricot, seabuckthorn), jelly, drying vegetable for winter consumption, improved packaging etc. While in the remote areas, LEDeG's focus is on the diversification of production base through introduction of improved seed, training on vegetable production for self consumption, awareness programs about seed, pesticides, fertilizer and organic farming etc. With the financial assistance from Groupe Energies Renouveable, Environment et Solidarites (GERES), LEDeG constructed about 167 green houses in various parts of Ladakh – Zanskar, Kargil, Changthang and Khaltse over the last few years.

Recent projects of LEDeG: -

“INTEGRATED DEVELOPMENT OF DURBUK BLOCK USING RENEWABLE ENERGY RESOURCES”

Year: 2003 - 2007

Funding Agencies:

- a) India Canada Environment Facility, New Delhi
- b) Ministry of New and Renewable Energy, Government of India, New Delhi
- c) Ladakh Autonomous Hill Development Council, Leh

Physical achievements:

- a) Installation of 100kWp solar photovoltaic power plant at Tangtse
- b) Retrofitting of 135 using passive solar architecture or Trombe-wall technology
- c) Distribution of 300 solar dish cookers (SK-14)
- d) Distribution of 500 solar box cookers
- e) Distribution of 630 improved smokeless Chullah (stove)
- f) Installation of five solar submersible pumps & five solar surface pumps
- g) Up-gradation and solarization of 10 Community Health Centres
- h) Establishment of ten eco-tourism units at tourists places

- i) Formation and promotion of 12 women Self Help Groups for handicraft development

"INCOME GENERATION ACTIVITIES FOR THE RURAL POPULATION OF WESTERN HIMALAYAS"

Year: 2005-2008

Funding Agencies:

- a) European Commission (EC)
- b) Fondation Ensemble, France

Project Partners:

- a) Groupe Energies Renouveable, Environment et Solidarites (GERES), France
- b) Bremen Overseas Research and Development Association (BORDA), Germany
- c) Ladakh Environment and Health Organisation (LEHO), Leh
- d) Leh Nutrition Project (LNP), Leh
- e) SKARCHEN, Leh
- f) Spiti Trans-Himalayan Action Group (STAG), Spiti

Physical achievements:

- a) Installation of 10 Micro Hydroelectric Power Units (MHPUs):
 - **Changthang:** Tiri Phu (2006) –5kW
 - **Nubra:** Digar (2006) –10kW
 - **Khaltse:** Fanjila (2005) –5kW, Mangu (2006) –10kW, Domkhar (2006) –5kW, Hinju (2007) –5kW
 - **Kargil** – Purkitchey (2005) -10kW, Pangbar (2005) –5kW, Shargundy (2005) –15kW
 - **Zanskar** – Pidmo (2006) –5kW
- b) Installation of End-user Machines or Secondary Devices:
 - **Domkhar:** oil expeller, nut cracker, flour mill, butter churner
 - **Fanjila:** multi-purpose carpentry machine
 - **Tiri Phu:** Flour mill
 - **Mangu:** Flour mill, butter churner
 - **Pangbar:** Flour mill
- c) Construction of 167 improved green houses
- d) Construction of 17 solar lambing sheds

- e) Construction of seven solar poultry farms
- f) Formation of 10 Self Help Groups in preservation and development of Ladakhi handicrafts
- g) LEDeG has set-up three Fruit Processing Units at Ribook Centre and Lehdo and Chamshen villages. The FP units at Lehdo and Chamshen are managed by the women Self Help Groups.

“BASIC NEEDS SERVICES: DECENTRALISED WATER AND ENERGY SUPPLY”

Year: 2005 – 2008

Funding Agencies:

- a) German Ministry for Economy Cooperation and Development (BMZ), Germany
- b) Bremen Overseas Research and Development Association (BORDA), Germany

Physical achievements:

- a) Installation of 10 Hydraulic Ram Pumps (HydRams)
- b) Eco-sanitation promotion through introduction of eco-pan toilets

“PILOT PROJECT FOR IMPROVEMENT OF LIVING CONDITIONS OF RESIDENTS OF STRUCTURALLY DISADVANTAGED AREAS OF LADAKH THROUGH DEVELOPMENT OF VILLAGE-BASED MICRO-ENTERPRISES”

Year: 2006 – 2007

Funding agency:

- a) Sir Ratan Tata Trust (SRTT), Mumbai

Physical achievements:

- a) Production and sales of vegetable seeds- organically produced
- b) Training on organic farming to local farmers
- c) Organic certification is under way; expert from IMO, Bangalore visited LEDeG recently and follow-ups are taken up by our staffs.

Other achievements in year 2007:

- a) Installation of a solar Scheffler cooker at Skidmang Nunnery with financial support from Julay Ladakh, an NGO based in Tokyo, Japan;
- b) Installation of a 1kW solar photovoltaic power plant at a government middle school in Lingshed with financial support from Enlighten Child Foundation, U.S.A.