GREEN ENERGY PROGRAMME UNDER SUSTAINABLE RURAL ENERGY

Local Government Engineering Department (LGED), through Sustainable Rural Energy (SRE) project has been conceived within the overall framework of UNDP financed Sustainable Environment Management Programme (SEMP), targeting the objective to explore opportunities for community based renewable energy (RE) options for different application and their use. Activities under SRE encompass demonstration of RE installation, capacity building through training and establish a renewable energy information network. In the contest of natural resource endowment and livelihood of the rural people, SRE has limited its activities within four renewable energy options and these are Solar, Wind, Biomass and Micro-hydro.

DIVERSIFIED APPLICATIONS OF SOLAR PV TECHNOLOGY

Rural electrification is one of the priorities in development policy, particularly in developing nations in the world. PV technology is one of the least expensive and environmental friendly options as compared to grid extension or use of diesel generator. SRE project has explored a number of PV applications considering socio-economic condition, availability of resources, technological options and dissemination possibilities.

Solar home Lighting system: With a view to demonstrate the impact of PV technology on the quality of rural livelihood and also to asses the viability of the technology in the remote rural areas, SRE has installed 35 PV systems each having capacity of 75Wp in off-grid areas under Thakurgaon district. Each household has been benefited from lighting rooms and watching TV. The installations have improved the quality of rural lives and generated enthusiasm and hope among the rural mass.

PV Technology for Landless Poor: Govt. of Bangladesh has taken

number of rehabilitation programme for the landless poor providing durable shelter in a cluster manner and productive employment and there by reducing the pressure of urban migration. SRE project has joined hands with the on-going initiatives of the Govt. by installing Solar PV systems in the cluster village of 60 landless households with a view to assess the possibilities of this technology to be maintained in a remote place by the landless group and thereby improve their quality.

Tourist resort: As a part of dissemination of renewable energy technology SRE has taken a twin effort in Goznee, a reputed tourist resort under Sherpur district, firstly, to demonstrate the potential of the solar PV to provide tourists comfort and the other is the underground tunnel LED decoration to attract tourists.

Rural Market Electrification: Some selected rural markets, popularly

called growth centres are considered as nuclei of rural economic growth. Only daytime marketing system has a negative impact to the daily laborers and farmers who have to sacrifice a certain portion of their working hours for shopping or marketing their product. A multi user system with a micro-power station and a micro-grid concept has been implemented at Gangutia growth centre in Jhenidah district. This system consists of a standard AC single phase grid that distributes electricity from a micro power plant of 1.8 kWp capacity solar power to 50 shopkeepers. Market committee takes care of the system's operation and maintenance task.

Rural Community Clinic PV electrification: Delivering an adequate level of health care services in remote regions present many

challenges. One of those challenges is to provide the facilities of reliable source of electricity. SRE has taken initiative and selected Kamarul Community health clinic under Terokhada Upazila in Khulna district to deploy PV technology to facilitate better medical health care to the off-grid locality. Under this initiative a 1.5 kWp PV system has been installed to provide electricity to OT lamps for medical surgery and refrigerator for vaccine, blood etc. preservation in addition to other medical equipments. Moreover, clinic lightings, fans and a TV facility have also been incorporated considering patients' comfort. Operation and maintenance of this system is being done by the clinic authority.

Union Paraishad complex under solar power: With the epoch making step of decentralization, Union parishads are gaining importance in the process of development and better governance. It has been decided to provide necessary infrastructure including computer to the UP to facilitate effective and efficient governance at the local level. SRE has extended its solar dissemination and demonstration programme to this level and has set up a 600 Wp solar PV installation in Ambaria UP complex. Under this programme, the two-storied UP Headquarter including conference room has come under solar electrification in addition with a computer and a TV for information and entertainment.

PV in tribal community development: With a view to promote environment friendly technology in a ecologically sensitive area like Chittagong Hill Tracts (CHT), SRE has made solar PV installation in a tribal communities of 15 tribal families in an isolated island on the Kaptai Lake in Rangamati district including the Community Temple.

PV technology in IT development: To develop an Information Technology (IT) culture and related infrastructure in renewable way in remote off-grid areas, SRE has taken a Solar Photovoltaic programme at Kutubdia Upazila Engineer's office to run Computer and printer by solar power.

Micro-grid for fisherman community: Sariakhali Jaldaspara is a sea-shore remote and off-grid area located in Fariakhali union under Chakaria upazila in Cox's Bazar district. The locality is based on around 70 families. Fishing is the main financial activity in this area. Taking advantage of the inclusion of this area under UNDP-FAO-GOB programme for fishermen community, SRE has taken initiative to install a 5kW PV system which would be distributed to the users through a micro grid, thereby creating synergy between different governments programmes.

WIND ENERGY DEVELOPMENT

Harvesting Energy from wind needs reliable information of wind characteristics and for this, systematic analysis of long-term wind data is extremely important. In most places, around 3.5m/sec wind speed has been recorded by Meteorological Department which is not suitable for wind power trapping. Currently, lack of appropriate wind speed has limited large-scale programme for harvesting wind energy on commercial basis. In this connection, SRE has conducted a joint study programme with BUET and BIT Chittagong titled WERM, (**Wind Energy Resources Mapping**) targeting wind mapping at twenty different locations in the country at different height.

Meanwhile, SRE has designed a windmill at a low speed regime (2m/sec) for water pumping. Two demonstration plants have been installed at two locations in Sherpur and Cox's Bazar district. Moreover, a 400 W wind turbine, hybrid with a 150 Wp solar PV, has been installed at Kuakata. However, wind mill and small wind turbine hold potential for demonstrating the technology as well as raising awareness of the people about the prospect and benefit of use of wind energy in Bangladesh.

SMALL HYDRO POSSIBILITIES IN BANGLADESH

Several attempts have been made in the past to find out the potential of Small and Micro-Hydro power unit in Bangladesh which believed to be more environment or ecologically friendly in comparison to large hydro with dams. At present identified potential small and Micro-Hydro sites are listed below:

SL	Distctrict	Expected Power Generation (Kw)	Potential Sites
1	Bandarban	25	Liragaon
2	Bandarban	20	Bangchari
3	Bandarban	15	Monjoypara
4	Bandarban	30	Cang-oo-para
5	Chittagong	81	Sealock
6	Chittagong	10	Bamer Chara
7	Chittagong	12	Hinguli Chara
8	Chittagong	10	Lungi Chara
9	Chittagong	10	Budia Chara
10	Chittagong	15	Chota Kumira
11	Chittagong	4	Faiz lake
12	Dinajpur	32	Pathraj
13	Dinajpur	11	Punarbhaba
14	Dinajpur	32	Chawai
15	Dinajpur	24	Talma
16	Khagrachari	3	Nunchari Tholi Para
17	Kurigram	48	Fulkumar
18	Moulavibazar	78	Madhab Chara
19	Panchagarh	24	Dahuk
20	Rangamati	30	Thun Khrue Chara Mukh
21	Rangamati	20	Kamal chari
22	Rangpur	32	Buri Khora Chikli
23	Sherpur	35	Marisi
24	Sylhet	26	Nikhari Chara

However the first Micro-hydro power unit at Monjoypara on Hanra Khal of Bandarban District is installed by Mr. Aung Thui Khain, a tribal of Marma community. The present output of this unit is 10 Kw. He has used low cost indigenous appropriate technology. It has been understood that such Micro Hydro unit could be the most feasible and cost effective solution for electricity production in the off-grid Chittagong Hill Tracts region. The whole CHT region are criss-crossed by numerous "Chara" that hold the potentials for harvesting hydro electricity for socio-economic upliftment of local tribal community. It may be mentioned that LGED has already established GIS(Geographic Information System) setup in these hill Districts and this technology will be useful for identification of potential chara. LGED has also came forward to provide assistance to Aung Thui Khoiyan initiatives. Moreover installation of 15Kw Micro-Hydro unit at Bamerchara in Chittagong District is under consideration of Sustainable Rural Energy (SRE)Project.

BIOMASS TECHNOLOGY PROMOTION

SRE project encompasses biogas technology not only as an alternate source of energy but also as a means for better health and sanitation for rural poor. In order to support LGED's movement on biogas technology, SRE project has implemented two community based biogas plants. The first one has been installed at Talihati union under Nikli Upazila in Kishoregonj district targeting a total of 150 families and the other is under construction at Senhati Zakaria madrasa under Digholia upazila in Khulna district for nearly 400 orphans. These demonstration plants would benefit the community in many ways: providing energy for cooking and thereby saving fuel wood, ensuring better health and sanitation of the community and also producing good quality pathogen free fertilizer for agriculture use. From the community, a beneficiary committee has been formed and this community is entrusted with the responsibility of proper operation and maintenance of the system. Beside that, SRE has planned to analyze the option of Bio-gasifier technology in this country. A 5kW Bio-gasifier demonstration plant is under planning

RENEWABLE ENERGY INFORMATION NETWORK (REIN)

LGED has developed a Renewable Energy Information Network (REIN) with a comprehensive scope for developing an information platform for renewable energy utilizing modern technologies with long-term perspective. This network will be designed and tailored to facilitate the energy planners, project developers, researchers and all relevant organizations in developing renewable energy projects and promotion of renewable energy utilization in Bangladesh. SRE has taken an initiative to design and host a website (http://www.lged.org/sre) on renewable energy development.

TRAINING FOR CAPACITY BUILDING AND TECHNOLOGY TRANSFER

As a part of capacity building SRE provides training on renewable energy technology to LGED personnel. Meanwhile, SRE has conducted a number of training programs at Assistant Engineer level. Moreover, 30 LGED engineers from different areas have given extensive TOT training targeting that they will train Community Organizers, SAEs and Mechanical Foremen at grass root level.

Please visit our web site at ; http://sre.lged.gov.bd

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