Renewable Energy in Bangladesh

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Major Promoters of Renewable Energy Technologies

- Local Government Engineering Department (LGED)
- Rural Electrification Board (REB)
- Bangladesh Power Development Board (BPDB)
- Infrastructure Development Company Ltd. (IDCOL)
- Different NGOs/ MFIs

Sustainable Rural Energy (SRE)

- Overall objectives of the UNDP supported SRE is to explore opportunities for community based renewable energy options for different applications and its multipurpose use in off-grid areas of Bangladesh.

- Component activities of SRE are grouped into three major categories.
  - Demonstration of diversified applications of renewable energy technologies
  - Capacity building through training on renewable energy technologies
  - Development of Renewable Energy Information Network (REIN) in Bangladesh.

Local Government Engineering Department (LGED)

RET Demonstration under Sustainable Rural Energy (SRE)

SL. No	Project Name	Year of Installation	Sites of Installation	System Capacity	Beneficiary
SOLAR ENERGY DEVELOPMENT					
1.	Solar Home Lighting System	1999	Villages of Baliadangi, THAKURGAON DISTRICT	2625 Wp	35 Household
2.	Centralized Solar Electrification (AC) for Growth Centre	1999	Gangutia Bazar, Sailkupa, JHENAIDAH DISTRICT	1800 Wp	50 Shops, 2 small industries and a mosque
3.	Cluster Village Solar Electrification, Sherpur	1999	Nalitabari, SHERPUR DISTRICT	1725 Wp	60 Family (Home less People)
4.	Solar PV System for Goznee Tourist Spot	1999	Jhenaigati, SHERPUR DISTRICT	225 Wp	Tourists
5.	Solar Water Purifier in LGED HQ	1999	LGED HQ, Agargaon, DHAKA DISTRICT	150 Wp	Safe drinking water for LGED officials
6.	Solar Electrification in Rural Clinic	2001	Kamarul, Terokhada, KHULNA DISTRICT	1500 Wp	Rural peoples at Kamarul, Khulna (30000 people)
7.	Solar Electrification at Ambaria UP Complex Bhaban	2001	Khoksha, KUSHTIA DISTRICT	600 Wp	Chairman of UP (Local Governance), Members to facilitate effective and efficient governance at the local level
8.	Solar Home Lighting System for Tribal Community & Bhudda Temple	2001	Digholibag, Rangamati Hill District	1080 Wp	15 Tribal family and a Buddhist Temple
9.	Solar Electrification for IT development	2001	Kutubdia Upazila Engineer's Office, COX'S BAZAR DISTRICT	375 Wp	Upazila Engineer's Office
10.	5 kW Centralized (Largest in Bangladesh) Solar AC System for Fishermen Communities	2002	Jaladaspara , Chakaria COX'S BAZAR DISTRICT	5000 wP	Coastal Fishermen Communities.
	Total			**15,005 Watt**	

Local Government Engineering Department (LGED)

RET Demonstration under Sustainable Rural Energy (SRE)....cont.

SL. No	Project Name	Year of Installation	Sites of Installation	System Capacity	Beneficiary
WIND ENERGY DEVELOPMENT					
11.	Low speed high torque Wind Mill	1999	COX'S BAZAR DISTRICT	15,000 Liters per day at 4m/s wind with starting speed 1.8m/s	Irrigation, Gardening, Fresh water for coastal tourist resorts.
12.	Low speed high torque Wind Mill	1999	Losmonpur Darbar Safir, SHERPUR DISTRICT	-Do-	Irrigation, Gardening, drinking of water for the local people.
13.	Solar-Wind Hybrid system	2000	Kuakata Sea Beach , PATUAKHALI DISTRICT	400 Wp	Tourists (Enhance tourism) .
14.	Wind Energy Resource Mapping (WERM)	-	20 locations of the country	-	
11.	Proposed 10KW Wind-Solar Hybrid System at Saint Martin's Island	-	Saint Martin's Island	10000 wP	Saint Martins Islanders
BIO-ENERGY DEVELOPMENT					
15.	Community Based Biogas plant	1999	Nikli, KISHOREGANJ DISTRICT	-	Community People (around 150 family)
16	Bio-gas Plat for Educational Institute (On going)	2002	Digholia, KHULNA DISTRICT		Students, teachers and local people
17	Installation of 1 Bio Gasifer (Proposed)	-		10 Kw	
15.	Bio Electricity Generation from Poultry Waste	2002	Faridpur Muslim Mission		**Students, teachers**
MICRO HYDRO ENERGY DEVELOPMENT					
18.	Proposed Micro-hydropower Unit	-	Bashkhali, Chittagong	10 Kw	Agricultural Farm
19.	Development of Indigenous Micro hydro Power Unit and Harnessing Small/Micro Potentials in Bangladesh	2002-	Monjoypara , Rangamati Sadar, RANGAMATI DISTRICT	-	

Local Government Engineering Department (LGED)

Development of Solar Energy

- Through Japan International Cooperation Agency (JICA) assisted cyclone shelter project, LGED has established more than 15KW of solar photovoltaic system in several cyclone shelters in coastal districts in Bangladesh.

- The solar installations
  - provide effective utilization during the period of natural disaster;
  - enables the local community to continue adult education at night;
  - transforms this shelter to act as a guide house for the sea vessels and fishermen trawlers to safely reach to the shore.

Sl.	Solar Systems	Capacity (watt)	Location
1.	Solar House Hold System at Coastal Cyclone Shelters	12635	Kuakata in Patuakhali, Noakhali, Cox's Bazar, Madaripur, Kushtia, Kisoregonj, Kutubdia, Chittagonj , Khagrachari Distrct.
2.	Solar Street Lighting at Coastal Cyclone Shelters	2640	Kutubdia & Chokoria of Cox's Bazar and Banskhali & Anwara of Chittagong Distrct.
3.	Solar Battery Charging Station	150	Kazikanda, Patuakhali Distrct
4.	Solar Pumping System	300	Prantik lake, Bandarban Distrct

Development of Bio Energy

- LGED has been involved in dissemination of biogas technology since 1985 and has been able to demonstrate its usefulness at more than thousand sites in different parts of the country.
- Constructed a number of Biogas plants in different districts of Bangladesh.

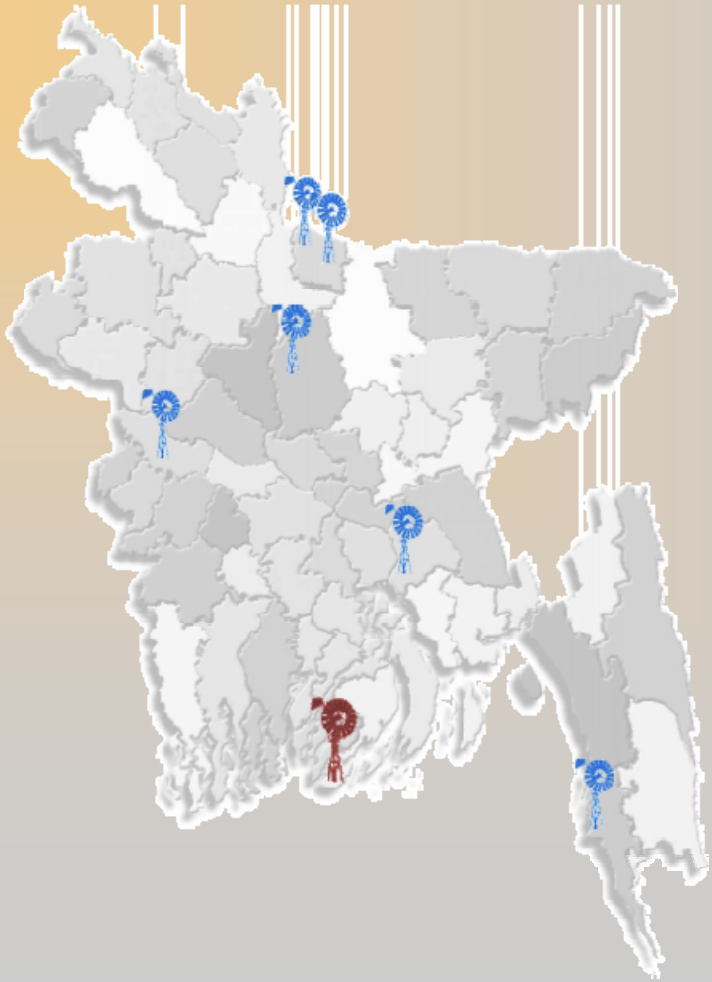
Installation Done by	Raw materials	Type of Design	Daily gas production	No. of plants	Comments
Biogas Project, LGED	Cow dung	Fixed dome:980 nos.	120-150 cft	980	Family Biogas Plant
Biogas Project, LGED	Human excreta	Fixed dome	250 cft	120	Family Biogas Plant
Biogas Project, LGED	Poultry dropping	Fixed Dome	420 cft	20	Family Biogas Plant
Secondary Town Infrastructure Dev. Project	Human excreta	Fixed Dome	250 cft	20	Family Biogas Plant
Sustainable Rural Energy Project	Human excreta	Fixed Dome		2	Community Biogas Plant
		Total		**1142**	

Development of Wind Energy

- Installations of six water pumping windmills and one Wind-Solar Hybrid systems installed at Kuakata sea beach. Table below showing total wind energy installation:

SL. No.	Type of installation	Year of Installation	Capacity	Sites of Installation	Installation done by
1.	Slow speed high torque turbine	1999	0.5 Hp	Begum Hamida Siddique School, Boria, Kushtia District	LGED
2.	Slow speed high torque turbine	1999	0.5 Hp	Cox's Bazar Sea Beach, Cox's Bazar District	SRE
3.	Slow speed high torque turbine	1999	0.5 Hp	Executive Engineer's Office, Tangai District	LGED
4.	Slow speed high torque turbine	1999	0.5 Hp	Gulbahar Ashik Ali College, Kachua, Chandpur District	LGED
5.	Slow speed high torque turbine	1999	0.5 Hp	Bonal para Junior Girl's School, Nalitabari, Sherpur District	LGED
6.	Slow speed high torque turbine	1999	0.5 Hp	Losmanpur pir Shaheb-Bari, Lasmanpur Sherpur District	SRE
7.	Wind-Solar Hybrid System	2000	400 Wp	Kuakata Sea Beach, Patuakhali District	SRE

Location of Windmill Installation



Wind Energy Resource Mapping in Bangladesh

- Long-term systematic wind data is an essential requirement for assessment of any wind energy development project and Bangladesh lacks that wind data.
- Local Government Engineering Department (LGED) and BCAS (Bangladesh Center for Advanced Studies (BCAS) in 1996-97 have carried out two separate studies, each with only one-year observation, jointly.
- These studies mostly concentrated wind observations in the 7 (seven) coastal regions and the reports indicate that the location of Bangladesh fall in a comparatively low wind regime and the annual average wind speed varies between 3.5 to 4.5 m/sec.
- SRE project, in collaboration with BUET and BIT, Chittagong, has taken up a study on titled “Wind Energy Resource Mapping (WERM)”. The study has been designed in a more comprehensive way aiming at systematic observation on wind regime in initially 20 (twenty) different suitable locations including Chittagong Hill Tracts region over a longer period of time.

Wind data for 1 year period

SL	Location	Average Wind Speed (M/S)	Sensor Height (M)	Data Acquisition Period
1	Kuakata	4.54	25	1996-97
2	Kutubdia	4.18	25	1996-97
3(a)	Char Fassion 1	3.28	10	1996-97
3(b)	Char Fassion 2	4.07	25	1996-97
4	Patenga	3.84	25	1996-97
5	Cox's Bazaar	3.34	25	1996-97
6	Noakhalil	2.96	25	1996-97
7	Teknaf	2.96	25	1996-97

Hydro Power Potential in Bangladesh

Medium and Large Hydro Potential :

Karnafuli Project:
At present only 230 MW of hydro power is utilized in Karnafuli Hydro Station, which the only hydro-electric power plant operated by Bangladesh Power Development Board (BPDB). BPDB is considering extension of Karnafuli Hydro Station to add another 100 MW capacity.

Sangu Project :
This would be a new Project with an annual energy of about 300 GWh per year. For an installed capacity of 140 MW, the annual plant factor is 23%, and it is estimated that the plant would operate in peaking mode. However, this project needs a detailed environmental, social and economic study in the present context.

Matamuhuri Project :
The Matamuhuri development would be a new project of capacity 75 MW and an approximate average annual energy 200 GWh per year.

Hydro Power Potential in Bangladesh

Small Hydro Potential :

BPDB/BWDB Joint Study in the early eighties:

District	Name River/Chara/ Stream	Potential of Electrical Energy in KW
Chittagong	1. Fiaz lake	4
Chittagong	2. Chota Kumira	15
Chittagong	3. Hinguli Chara	12
Chittagong Hill Tracts	4. Sealock	81
Chittagong	5. Lungichara	10
Chittagong	6. Budiachara	10
Sylhet	7. Nikhari Chara	26
Sylhet	8. Madhb Chara1500ft. from fall	78
Sylhet	9. Ranga pani Gung	616
Jamalpur	10. Bhugai-Kongsa at 2 miles U/S. of Nalitabari P.S	69Kw for 10 months 48 Kw for 2 months

District	Name River/Chara/Strea m	Potential of Electrical Energy in KW
Dinajpur	12. Dahuk at Burabari	24
	13. Chawai at U/S. of Chawai L.L.P	32
	14. Talam at U/S. of Talam L.L.P	24
	15. Pathraj at Fulbari	32
	16. Tangon at D/S of Nargun L.L.P	48
	17. Punarbhaba at Singraban	11
Rangpur	18. Buri Khora Chikli at Nizbari	32
	19. Fulkumar at Raiganj Bazar	48

Rural Electrification Board (REB)

- Implementation of SHS installation programme was done by the Rural Electrification Board (REB) in 1997-1999, when 806 consumers of two riverine islands of Narshingdi were connected to solar electricity through generation of 62 KW power.

- REB is an implementing agency under 'Rural Electrification and Renewable Energy Development Project' of the World Bank, under which it installs solar home systems in the remote rural areas of Bangladesh.

Bangladesh Power Development Board (BPDB)

- **Related Renewable Energy Services : Micro Hydro Energy, Solar Energy, Wind Energy**
- **Level of involvement in Renewable Energy Technology (RET) : Implementation, Training & Research.**
- **Experience of RET Installation in Bangladesh : BPDB has plans to implement renewable energy projects of wind, solar and small hydro at remote locations of the country where the electricity grid has not yet reached.**
- **Up to January, 2005 BPDB installed solar household system of total 54Kwp at Juraichari.**
  - Within this program a 10.8Kwp Centralized System installed to provide grid quality of electricity to government office & quarters, Street lihgt(7.20Kwp), hospital, Market places, shops, solar water pumping (AC) for office utility , street lights etc which was previously being powered by diesel generator.
  - Rest on 36 Kwp power installed in individual 300 house holds (75-120Wp of each). Chittagong Hill Tracts Ministry subsidized 25% for HLS. Additionally 5% down payment charged to pay off on a monthly installment 191Tk. for 10 years of period.

IDCOL Solar Program

- Being implemented through 16 Partner Organizations (POs) such as Grameen Shakti, BRAC, Srizony, UBMOUS etc.
- Initial target was to finance 50,000 SHSs by the end of June 2008.
- Target has already been achieved in September 2005, 3 years ahead of schedule and US $ 2.0 million below estimated project cost.
- So far installed 180,000 SHS installed under the program.
- Revised target is financing of 900,000 SHSs by year 2012 with assistance from World Bank, Global Environment Facility, Asian Development Bank, KFW and GTZ.

Thank You