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Remote Village Electrification Plan through Renewable Energy in the Islands of Indian Sundarbans

Electrification plan for over 50,000 households

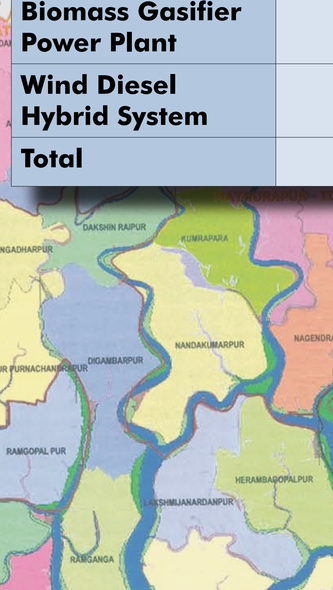
Sundarbans region, in India and Bangladesh, is known for large mangrove forest and Royal Bengal Tigers. It has over 100 deltaic islands in Indian portion out of which people live in 54 islands. There is no conventional electricity in the islands. West Bengal Renewable Energy Development Agency (WBREDA) has taken several initiatives to electrify the region. **So far over 40950 households are using electricity from renewable energy (RE) resources.** However, more than 100000 households in 20 islands spread over 131 remote villages within Indian portion do not have access to electricity at present. WBREDA, with The Energy and Resources Institute (TERI), has prepared a Master Plan for Electrification for these off grid islands.

Proposed New Measures

- 35 mini grid hybrid power plants and 38934 Solar Home Systems
- Coverage of entire 131 unelectrified villages in 20 islands
- Total 1.59 MW_p SPV + 1.12 MW_e Biomass + 20 kW Wind from new plants
- Serving 11275 domestic households + 3200 commercial shops from the hybrid plants
- Over 572878 people will get access to electricity

Distributed Generation by Renewable Energies

The approach was adapted through a combination of field survey (demand, locations for new plants, willingness etc.) and secondary data (RE resources, experience from existing plants etc.) sets. Solar and biomass resources are adequate in the region. Distributed generation through RE route found out to be the suitable solution. The Plan proposed total 35 power stations. Configurations of plant elements were suggested by using optimisation tool HOMER. All proposed plants would be hybrid types with SPV, Biomass and Wind with battery banks depending on the locations. Total 1.59 MW_p SPV capacity was proposed while biomass gasification and wind were about 1.12 MW_e and 20 kW. Total 11275 households plus 3200 commercial shops would get electricity from these. The scattered households would be provided with 38934 Solar Home Systems (SHS) of 37 W_p capacity.



EXISTING RE PROJECTS	Number	Aggregate Capacity	Benefited Households	Population Covered
Solar Power Plant	13	707 kW_p	3,450	18,400
Solar Home Lighting System	35,000	74 W_p to 35 W_p per system	35,000	200,000
Biomass Gasifier Power Plant	2	1,000 kW_e	1,500	9,000
Wind Diesel Hybrid System	1	510 kW	1,000	5,000
Total			**40,950**	**232,400**

In total,131 villages were proposed to be covered with total estimated expenditure of about Indian Rupees 1316 million. The tariff values for each plant were proposed and verified with willingness of the consumers to pay for the service. Involvement of the local people in the village electricity cooperative (VEC) would ensure the sustainability of the projects.