



Distributed Solar Disruptions required to meet the SDGs: Experience of Bangladesh

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Bangladesh : Energy Situation

At present, more than 160 million people are living in Bangladesh and approaching towards 200 million by 2041.

- By 2021, Bangladesh aims to become a middle income country.
- By 2041, Bangladesh aims to become a developed country.
- Has signed the historic Paris Climate Agreement, which is global response to the threat of climate change by keeping the global temperature rise this century below 1.5 degrees Celsius.
- Bangladesh electricity Power Total Installed Capacity **16,046 MW** (source: Bangladesh Power Development Board)
- Per Capita Electricity Consumption **433 KWH** (2018)
- 10% of total capacity from Renewable Energy by 2020



SUSTAINABLE DEVELOPMENT GOALS

- The SDGs are a comprehensive set of goals and targets that aim to address some of the most pressing social, economic and environmental issues concerning the world today.
- The 17 goals and 169 targets are expected to frame the crucial decisions and policies undertaken by the UN member countries, including Bangladesh, in the years leading to 2030.



Bangladesh successfully achieved most of the Millennium Development Goals (MDGs)

However unlike the MDGs the SDGs call for country led development and Bangladesh has already started implementing actions for its success

To oversee the SDGs Action Plan the Government of Bangladesh (GoB) has set up a special unit, the 'SDGs Implementation and Monitoring Committee', at the Prime Minister's office

Implementing the SDGs will prove to be a costly matter; public funds will not be enough and the role of the private sector and the civil society organizations is crucial for its success



While the goals and targets of the SDGs are all equally important, countries need to prioritize actions based on country-specific needs.

In terms of electricity production the country has made substantial progress in the recent years. Yet pockets of the country, especially remote villages and islands still reside in darkness.

At present the total electricity power generation capacity is 16,046 MW. However, with approximately 433 kWh/capita/year production the country still has one of the modest per capita electricity consumption rates.

Over the past two decades the country has experienced a rapid rise in energy consumption. This trend will intensify further in the coming years. As the country progresses there is also a growing demand for electricity.



Goal 7 connected to multiple SDGs



Present RE Situation in Bangladesh

Sector	Achievement
Solar Home System(SHS)	250 MW (installed over 5 million units)
Roof Top Solar System	30 MW
Solar Irrigation	25 MW
Solar Mini grid	5 MW
Wind	2.9 MW
Biomass & Biogas based Electricity	6.5 MW
Hydro	230 MW
Total	549.4 MW



Wind Energy



Biogas & Biomass based Electricity

Bangladesh Experience

Solar Home System Program: Largest SHS program in the world

Installment based financial Model

Back in 1996, I have introduced an **innovative monthly installment based financial model** at the price of kerosene which has opened the door for Solar Home System (SHS).

By following the path of this financial model, **over 5 million** SHS has been installed all over Bangladesh till now. Around **15% people** of Bangladesh are enjoying modern Electricity from Solar Energy. The monthly installment based financial model was adopted by World Bank later JICA, ADB, KfW, Islamic Development Bank (IDB), UNDP, DFID, GIZ started supporting the Solar Program in Bangladesh.

This financial model with the help of government policy support can be replicated in any developing country where energy demand is high and environment is in threat

In many developing country specially in South East Asian & African countries are replicating this model inspired from Bangladesh.

At the Beginning

50% down payment to install the system and remaining **50%** in **6** monthly installments.

After few years of Experience

25% down payment to install the system and remaining **75%** in **24** monthly installments.

Present Situation

15% down payment to install the system and remaining **85%** in **12/24/36** monthly installments.

Success of Solar Home System in Bangladesh has ignited

- Solar Irrigation Pumps (SIP)
- Solar Street Lights
- Mini & Micro Grids
- Roof Top Solar System
- Solar AC / DC system for Cyclone Centers
- Grid Tied Solar Mega Watt Program
- Solar powered Arsenic water treatment plant



Solar Irrigation: Benefiting Farmers & The Nation

Solar irrigation pumps can potentially replace 1.3 million shallow (diesel operated) pump.

At present 1000 solar irrigation pumps have been installed.

By utilizing these solar run pumps it is possible to generate up to 10,000 MW electricity in the future



Rooftop Solar : Huge Potentials

Roof-top solar power systems in Bangladesh can provide energy for both offices and households.

This comes as an efficient alternative to supplement conventional grid energy and substitute usage of fuel run generators.

It is also one of the solar solutions that does not require land space.



Net Metering Policy is coming up for Solar Rooftop.

Solar Street Light : Growing Fast

100 thousand solar street light has been installed specially in the rural area.

Street light growing very fast and demand also growing.

Its benefiting community villages local markets, Mosques and Temples, Roads and other Public Places.

Its Specially benefiting Social Security , Women Safety and improvement of Law & Order Situation.



Solar Telecom Tower

Solar Power also can provide energy for Telecom Towers in both Off Grid and On Grid areas in all over Bangladesh.

Around 1933 (*source: SREDA*) Telecom Towers are operated by Solar Energy now. This becomes an alternative of conventional grid energy so far for this sector.

It can be easily installed at the rooftop of the Control Room and does not require extra land space .



Solar Mini- Grid : In Island & Remote Areas

Mini Grid creates sustainable power supply in remote areas and islands. It has successfully created access to low- emission electricity for almost 5000 rural households in Bangladesh

It also help income generation and economic activities.

Already 25 Mini grid has completed and 50 Mini grid under process for Implementation.



Utility Scale Solar

Utility Scale Solar is coming up. Recently 3 MW Utility Scale Solar power electricity has been connected to the National Grid Line.

Around 800 MW Solar Power Plants has been approved by The Government to be connected to the National Grid Line.

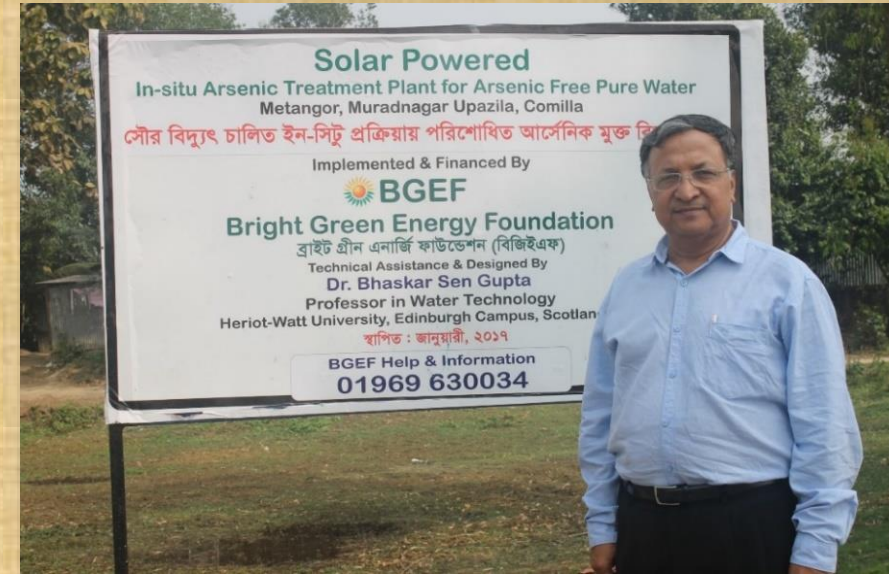


First Solar Powered Arsenic Treatment Plant

In Bangladesh over 20 million people are directly affected by arsenic.

This was the first time In-Situ technology is blended with the solar energy. This pilot plant is now producing 4,000 -8000 liters of arsenic free drinking safe and clean water for the local community and school children.

At present, over 200 students and their teachers of the school and 1,200 villagers are drinking arsenic free water from this pilot plant. From the successful outcome of this pilot plant, BGEF is planning to install 2,500 more plants of the same type if the funding support is ensured. It is estimated that over 3 million people could be directly benefited from these plants.



Arsenic Treatment Plant Operation Process (SAR)

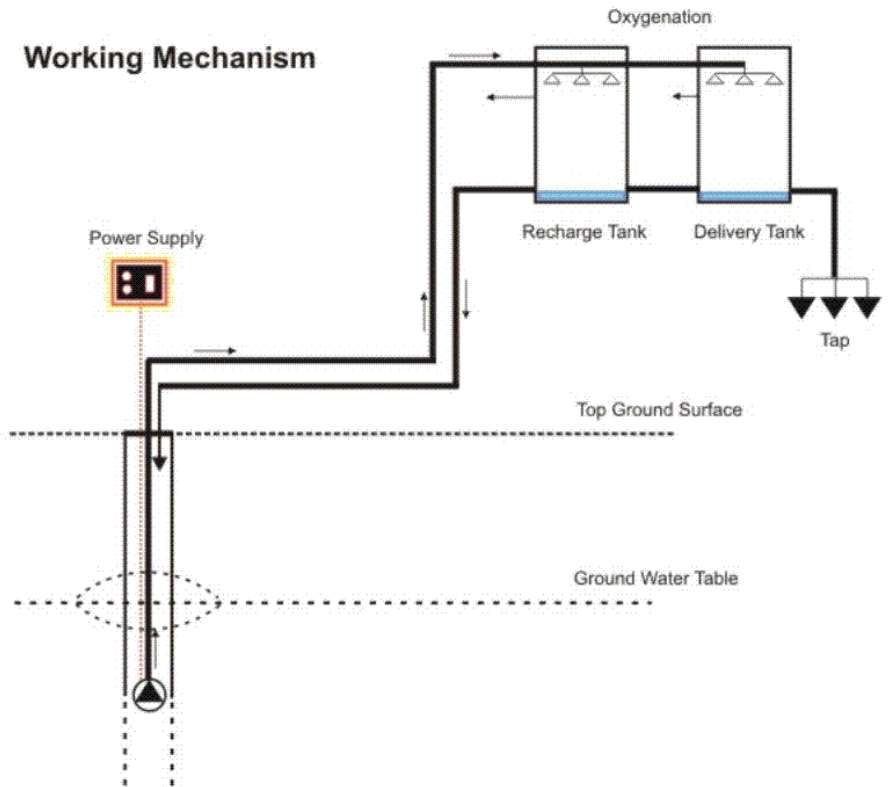
Ground Water is pumped up by a submersible pump.

This water is oxygenated by showerheads & stored in Recharge & Delivery tanks. No chemical oxidants used.

The oxygenated water from Recharge tank is recharged back into the aquifer to create an oxidation zone.

The oxidation zone supports growth of microbes that oxidizes As(III) to As(V) & also oxidizes Fe(II) , thus preparing underground adsorption bed for As(V) .

This treatment, when carried out for a few weeks, produces arsenic & iron free drinking water as per WHO guidelines.



Community Based Solar Potentials for Bangladesh

The Community based solar programme also has a very significant impact on the country. There are 124,948 primary schools and using the rooftop can produce over 1250 MW electricity. There are about 67,000 secondary school buildings and 30,000 college and university buildings which can be used to generate over 970 MW electricity.

About 53,000 madrasahs are there in Bangladesh and by using their rooftops it is possible to produce over 265 MW electricity. Using 300,000 mosques, temples and other religious buildings, it is possible to produce over 750 MW electricity.

Both the sides of the Bridges and Public road sides can be used for producing electricity from the Solar Energy.



Potentials for Floating Solar

Floating Solar is another Potentials for Bangladesh specially using lot of water bodies all over the country such as Rivers, Lakes, Canals, Haors, Beels, Big Ponds and several water bodies which can be use for producing electricity. For Example, Kaptai Lake Appears to be good site for Floating Solar and The Countries Largest Irrigation Project, The Teesta Barrage Project is another suitable location for Floating Solar.

Bangladesh is a land scarcity country, so we need to utilise the unused water bodies for producing electricity through Solar Energy.



Solarising Secondary Towns : Creating Climate Resilient and Migrant Friendly Towns & Cities

Dhaka's growing population (over 18 million) problem hence brings us to the strategy of identifying about few secondary towns away from the coast such as **Pabna, Bogra, Jessore, Natore, Mymensingh, Comilla, Faridpur, Sylhet, Noapara, Dinajpur** and others which could be the best option now to attract and absorb about a million migrants each.



Solarising Secondary Towns : Creating Climate Resilient and Migrant Friendly Towns & Cities

These towns would be made into “Climate resilient and migrant-friendly” towns through investing in both their physical and human infrastructure.

These towns can be designed with the **Special Solar rooftop systems** and **Solar Street Lights**, **Solar Irrigation**, **Solar Pumping**, **Green Building**, **100% RE**, **Human Resource development and Training Centre**, creating **Eco-village** in the neighbourhood of towns, **Modernizing and Diversifying Agriculture**, use of **Energy Efficient Technology**, **Developing Energy Efficient Cooling Storage**,



Solarising Secondary Towns : Creating Climate Resilient and Migrant Friendly Towns & Cities

Electric Vehicle, Development of Public Transport run through electricity and RE, Low Carbon Technology, Green Garments Factory, LED Light Factory, Rain-water Harvesting, Waste to Energy , Bio-gas and organic fertilizer, Wind energy, Floating Solar in Different water bodies Rivers, Lakes, Haors, Ponds and Irrigation Project such as Teesta Barrage.



Context of SDG village with 100% RE

Identified around 1,034 villages (*source: SREDA*) in remote areas where grid electricity cannot be reached.

- **Only Renewable Energy can be the best possible solution for those villages.**
- **Experience & the expertise from the last 2 decade in the Solar & Renewable energy can help us to energise those villages.**



School children studying better under Solar clean Light

Bio-Gas Plants & Improved Cook Stoves



Bio Gas Plant



Improve Cook Stove (ICS)

House hold based and Poultry & Dairy Farm based Bio-Gas Plant are growing gradually.

Improved Cook Stoves is also growing specially in Rural Areas.

Other Renewable Achievements



Battery operated Easy Bikes in Bangladesh.



Wind Turbine Power Plant in Bangladesh.



hydroelectric power plant in Bangladesh



Thank You for your Kind Attention