# 5th International convention of Environmental Laureates 2016

**Freiburg, Germany**
**10 - 13 March, 2016**

# Solar Irrigation : New Initiative
## Bangladesh Experience


**Dipal C. Barua**

First Zayed Future Energy Prize Winner
President, South Asia Network for Clean Energy (StANCE)
Ambassador, Zayed Future Energy Prize, Abu Dhabi
Founder & Chairman, Bright Green Energy Foundation (BGEF)
President, Bangladesh Solar & Renewable Energy Association (BSREA)
Advisor, Private Sector Advisory Group (PSAG), Green Climate Fund
Ambassador, Global 100% RE
IPCC: Lead Author (AR 5, Chapter 16)
Councilor, World Future Council (WFC), Hamburg, Germany

# History of Solar Home System in Bangladesh

**In 1996, I have successfully started expanding the renewable energy technology in rural Bangladesh as the Founding Managing Director of Grameen Shakti. First I realized that, if the cost of solar home system (SHS) can be made affordable to the rural people and brought near the price of Kerosene, only then they can become the owner of the SHS.**

1. A monthly installment-based innovative financial model.
2. A strong effective after sales, repair and maintenance network, involving local technicians and especially women technicians / entrepreneurs who repair and assemble solar accessories in their rural communities.
3. It was shown that Solar PV technology can be successfully implemented on a mass scale to provide rural people with environment friendly clean energy, Clean and bright lights.
4. More income with extended working hours and hazard free healthy living.

# Making Solar Home System (SHS) Sustainable

**I have successfully demonstrated that renewable energy is a viable option for the rural people and the myth that this energy technology is too expensive and high-tech for the rural people has been broken. The challenges we initially faced were huge but, I derived and implemented effective integrated market-based strategy that considers the following :**

- Costs should be within reach of the rural people. If the costs are perceived too high and the technology is not cost-effective compared to traditional energy alternatives, the rural people will not be interested.
- Efficient and effective after-sales service should be available so that clients are assured of prompt responses to their problems.
- Quality needs to be ensured to earn the good will and trust of the rural people.
- The technologies should be linked to income generation local market forces should be deployed through capacity through capacity development and local stake hold.

# Installing 7.5 million Solar Home Systems (SHS) in rural areas of Bangladesh by the year 2020.

**Solar Home System (SHS) installation**

## Solar Home System :

Until February 2016: **Over 4 million** Solar Home System (SHS) has been Installed in rural Off-Grid Areas of Bangladesh.

1. It's the fastest expansion of solar energy anywhere in the world.
2. More than 50,000 SHS's are being installed in off-grid areas of Bangladesh every month with almost 20 million rural beneficiary.
3. Rural businesses are booming with the support from Solar energy.
4. Supporting National Grid Power generation capacity.
5. Job opportunity created for both men & women.

# With Solar Power Rural People Can use

Children can Study better by Solar Light

Can use mobile phone charger

Watching solar powered TV

# Bangladesh Energy Sector-at a Glance

- Installed National Capacity: 12071 MW (March 2016)

  Public Sector: 6,440 (53.35%)

  Private Sector: 5,631 (46.65%)

- 63% of Total capacity Generated from Natural Gas

Access to Electricity: 59.6% (December 2015)

# Where we are in Renewable Energy

Hydro Power : 230 MW

Wind Energy: 2 MW

Solar PV: 200 MW

Biogas & Biomass based Electricity: 3MW

# Project under R&D

- Solar Drinking Water Solution for rural schools
- Solar Mega Grid
- Feed in Tariff from Solar & other Renewable energy projects
- Solar charging station for battery operated vehicles
- Water pump & Arsenic filtration  system using solar energy
- Industrial solution with Solar & Renewable Energy (Hybrid system)

# Where we are in Solar PV

- Over 4 million Solar Home System (SHS)
- Over 200 Solar Irrigation Pump (SIP)
- 1 MW of solar hybrid solution
- 20 MW Solar Rooftop Grid Tie installation
- 200+ solar powered BTS
- 200 MW of solar PV installation
- 100,000 + Green jobs
- USD 10 million per year equivalent carbon credit

# Facts for solar irrigation

- **36% of GDP and 64% of employment comes from agriculture**
- **120 million acres of rice field is irrigated by 1.75 Million pumps**
- **1600MW of electricity & 900,000 tons of diesel consumed**
- **Solar irrigation can save up to USD 100 million of government subsidy in diesel**

***BGEF installed Solar Irrigation Pump at Kustia District, Bangladesh***

# Solar Irrigation Pump

- Replacing traditional hazardous diesel pumps with innovative and environment friendly Solar powered pumps.
- Reduce carbon emission and air pollution caused by Diesel run traditional pumps.
- High efficient design and module (Pump, Motor, Controller box and Solar PV) used for optimum output.
- Farmers can get the benefit of irrigation water by only paying **2/3** of the price they are currently pay now.

**Water Discharge by a Solar Irrigation Pump installed in Kustia by BGEF**

# Potential of SIP in Bangladesh

The country has about **1.71 million irrigation pumps**, of which 83% run on diesel. The remaining 17% are electricity-operated. During the peak irrigation period 2500 MW of power demand is solely required for running the electric pumps.

The diesel-run irrigation pumps consume more than half a million tons of diesel each year.

There is a potential to install over 300,000 Solar Irrigation Pump in Bangladesh

# Initial Challenges faced for SIP :

- Lack of awareness among the farmers:
  - Cost of water from Solar Irrigation Pumps
  - Environmental damage caused by Diesel Run pumps
  - Year round Efficiency about Solar Irrigation Pumps
- To identify the proper SIP site which would benefit both Sponsors and Farmers.
- Lack of skilled labor and pump operator.
- Lack of awareness about the benefit of SIP in local administration in rural level.
- Lack of online Banking facilities (Mobile Banking) in rural areas of the country to collect online payments directly from SIP beneficiaries.

# To make SIP sustainable in Bangladesh:

- To show the financial benefits to farmers (savings)
- To provide the Information required for SIP to Local Admiration for support and co-operation.
- Environmental Benefits
- Technical skill development and create awareness among farmers for Crop Patterns
- Provide agricultural support for better cultivation and more productions
- Ensure better income generation for farmers
- Arranging regular meeting and workshop with farmers

# BGEF

## Bright Green Energy Foundation

With the vision of **Mr. Dipal C. Barua**, Founder and Chairman, BGEF was founded in **January 2010** to face the energy crisis of Bangladesh with clean, environment friendly efficient renewable energy sources.

# BGEF

Bright Green Energy Foundation

# My Experience with SIP

BGEF has started SIP installation

**July 2015**

**9 SIP Successfully Installed**

**14 SIP are under construction**

**9 SIP new irrigation sites are selected for March 2016**

# BGEF Solar Irrigation Pump at Poradaho, Kushtia

# Installing of SIP

Pipe boring process

Interacting with farmers

Solar PV installed for irrigation pump

Inspecting water reservoir tank

# Solar Irrigation Pump:

## Kushtia, Bangladesh as visited by Mr. Dipal Chandra Barua in October 2015

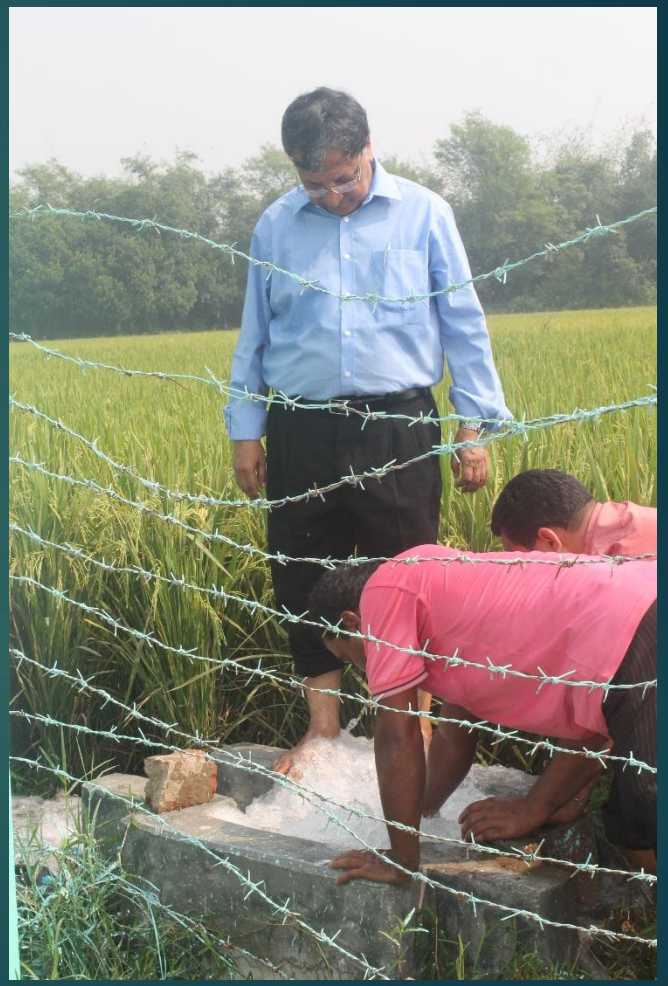
Meeting with farmers

Solar PV for Irrigation pump

Pump room

# Mr. Dipal C. Barua is encouraging farmers to move forward with SIP for AMON season

# Pump Inspection



# First-Ever Zayed Future Energy Prize

HH Sheikh Mohammed bin Zayed, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, presents the first Zayed Future Energy Prize to Dipal Chandra Barua, in honour of innovation and commitment in alternative energy, at the Abu Dhabi National Exhibition Centre, January 19, 2009.

Thank you
for your Kind Attention