

Success Story of Women Empowerment: Solar Irrigation Solution in Bangladesh

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Good to be here:

Women in Bangladesh

- ✓ Ratio of working women is only 26% in Bangladesh
- ✓ Majority of the working women work in NGO sector or teaching sector
- ✓ Very few women work in corporate sector
- ✓ A few companies employs women in challenging sectors
- ✓ Female engineers mostly switch to relatively easier profession due to the unfavorable working environment

Who am I...

- ✓ Me: Chemical Engineer, working in renewable energy sector for last 6 years.
- ✓ Employer: Rahimafrooz renewable energy Ltd.
- ✓ Good to be here: Undertaking the challenging field job, its good to implement some recent vital and 1st of their kinds RET projects that have been recognized as commercial success in the recent years

Rahimafrooz Overview

Rahimafrooz renewable Energy Ltd. (RRE) pioneered solar solution in Bangladesh back in 1985

Pioneer in Renewable Energy Technology in Bangladesh Provides support in powering the lives of over 500,000 households

Provides solar solutions for households, agriculture, healthcare, education, rural streets and marketplaces, as well as government and private institutions

Complete solar system integrator & installer with experience of several centralized projects, office solutions, and home systems

RRE has a backward linkage with Rahimafrooz Accumulators Ltd. – with a solar battery annual production capacity of over 80 million Ah, market leader in solar battery industry

To date, RRE has installed and supplied more than 9.0 MWp of solar energy solutions in Bangladesh

First exporter of solar street light

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My projects

- ✓ Solar Irrigation system:
 - 11.9KWp solar irrigation project in Savar
 - 8.4KWp solar irrigation project in Borguna
 - 600 Wp solar pumps in Naogaon, Dinajpur, Rajshahi, Bagerhat, Chapai Nowabgonj, Rangamati, and a few others
- ✓ Pipeline drinking water solution:
 - benefiting 17,000 households.
- ✓ Solar PV street lights:
 - 200+ solar street lights in Bangladesh, enlightening 27,000 people in coastal belt
 - 70 Street lights in Africa
 - 1500+ more in pipeline to export to Africa
- ✓ Solar powered office solution: Enriching semi urban areas with power for PC, internet, hospital facility, etc.

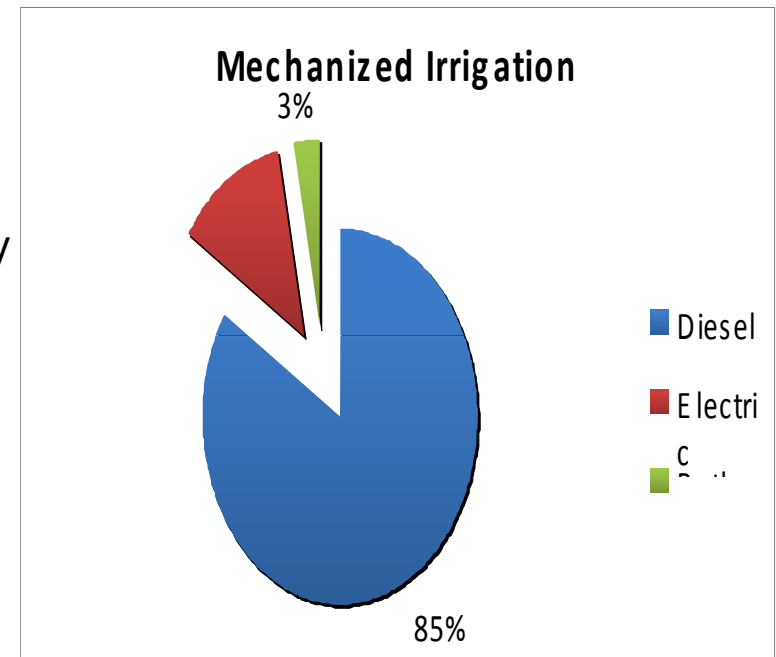
Bangladesh: Agriculture

National Overview:

- 36% of GDP and 64% of its employment comes from agriculture
- Main crop BORO requires maximum water
- Access of electricity is only 35%
- National demand: 5000 MW, National supply: 3500 MW
- Irrigational power supply is only 760MW serving only 13.5% of demand
- Rest 86.5% demand is met by 11.58 Million diesel pumps

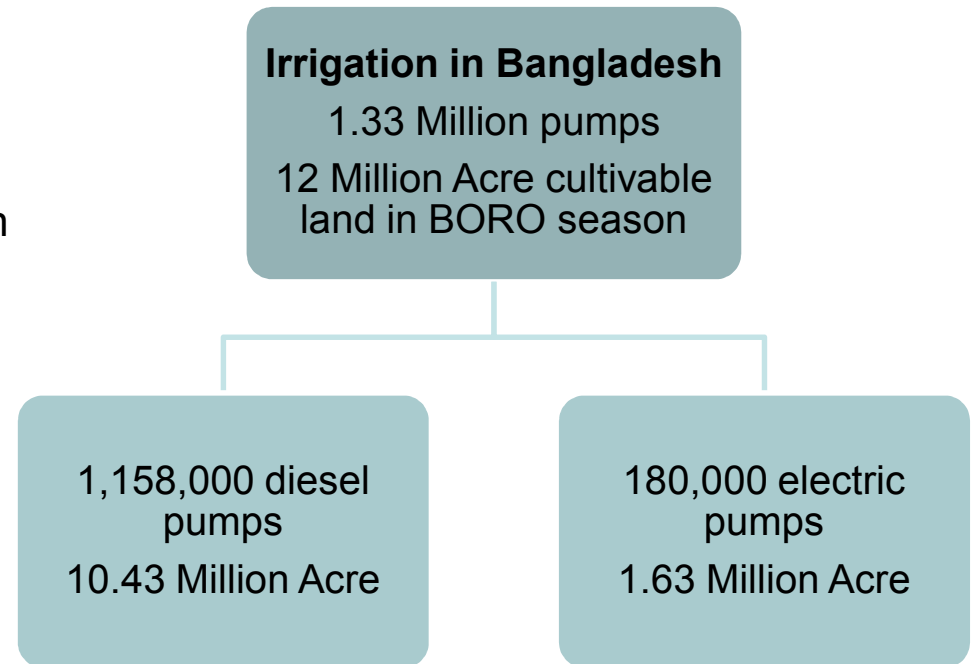
Farmer Situation:

- Farmers rice selling price: BDT 45,700/Hectare
- Rice production cost: BDT 36,518/Hectare
- Irrigation cost (diesel): BDT 16,120/Hectare (44%)

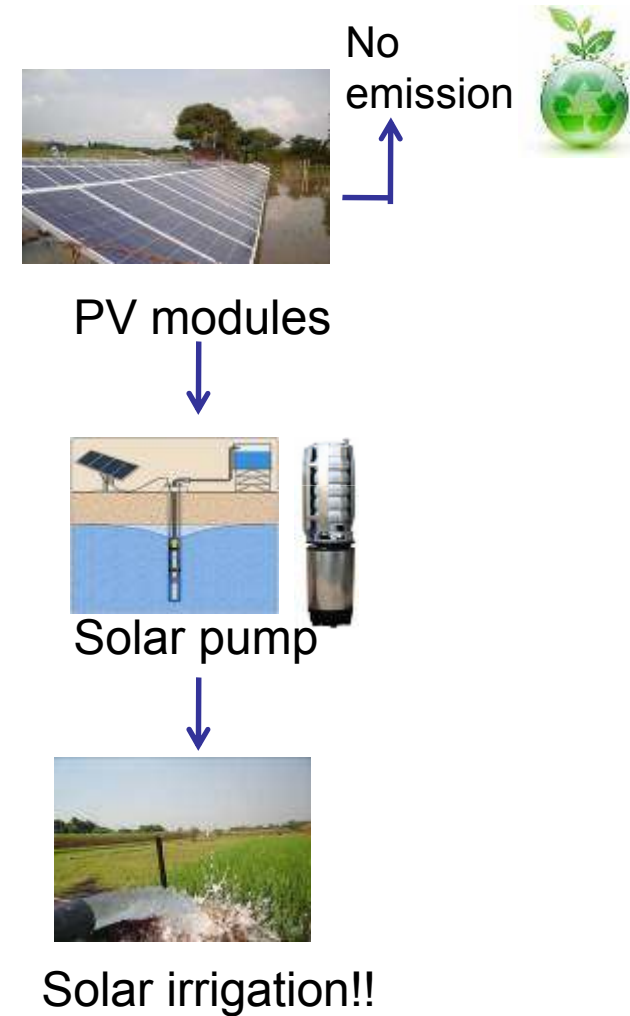
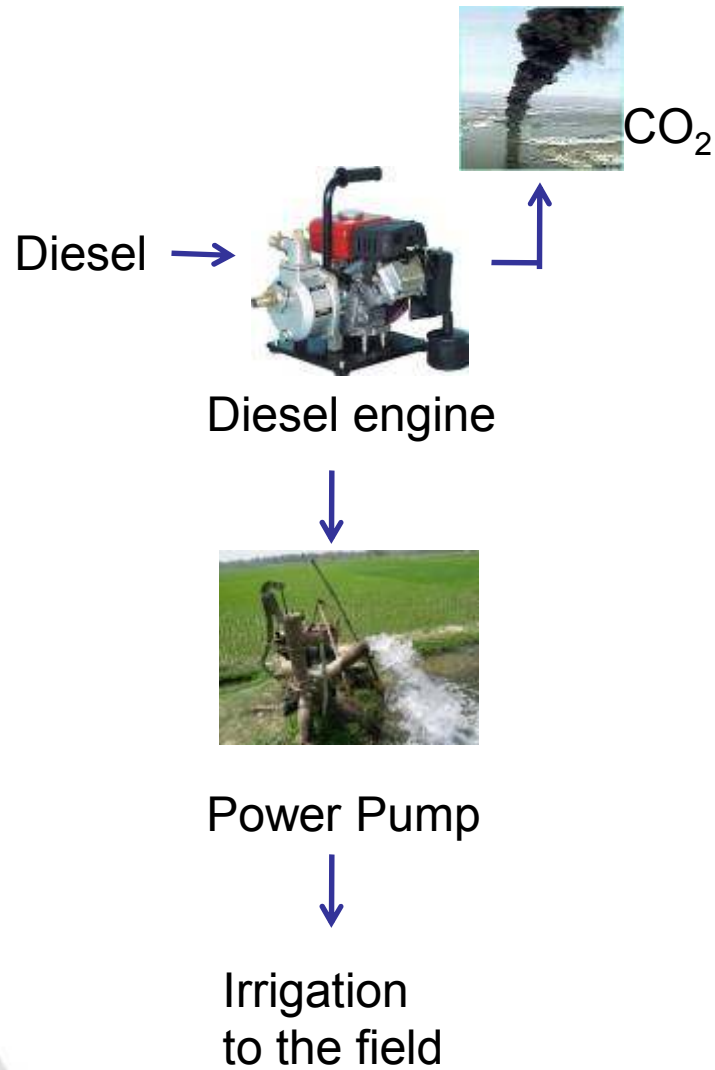


Issues with irrigation:

- Seasonal crisis and price volatility of diesel are common hazards that are associated with diesel pump based irrigation in Bangladesh
- It also involves carrying hassle of diesel, periodic and sudden maintenance and servicing issues with the engine, dry run (in case of shallow engines), futility of engine life, etc.
- Diesel pumps require 80 crore liters of diesel in BORO season.
- Govt. provides around BDT 5,400 Million yearly cash subsidy on
- Currently irrigation cost comprises 44% of production cost!!!
- Diesel price has gone 40% higher in last 3 years!
- So its time for a suitable alternative



Introduction to Solar Irrigation



Success Story:1

Introduction to Solar irrigation in Bangladesh

- Project description: 1st solar irrigation project installed for a tribal community headed by Bichitra Tirki at Chapai Nawabgonj in 2007
- Beneficiaries: 11 Families started drip irrigation in 7 Acre land
- Production: Tomato, Cauliflower, Chilly, Lady finger, Jute, pumpkin, etc
- Community enhanced income: BDT 105,000/Year
- Dissemination: A few other replications took place in the same year in Gazipur, Bagerhat, etc.



Success Story 2: Adaptation in Rice Irrigation: 30 Acre Rice irrigation by solar pump

- Project Description:
Demonstration of solar irrigation pump for rice irrigation
- Location: Savar, Dhaka
- Installation date: September 2009
- Area coverage: 30 Acres rice field
- Beneficiary: 22 Farmers
- Motor capacity: 10HP
- Daily water discharge: 500CBM
- Mode of payment: Fixed yearly water rental for 3 crops
- Outcome: Evolution of commercial model for replication

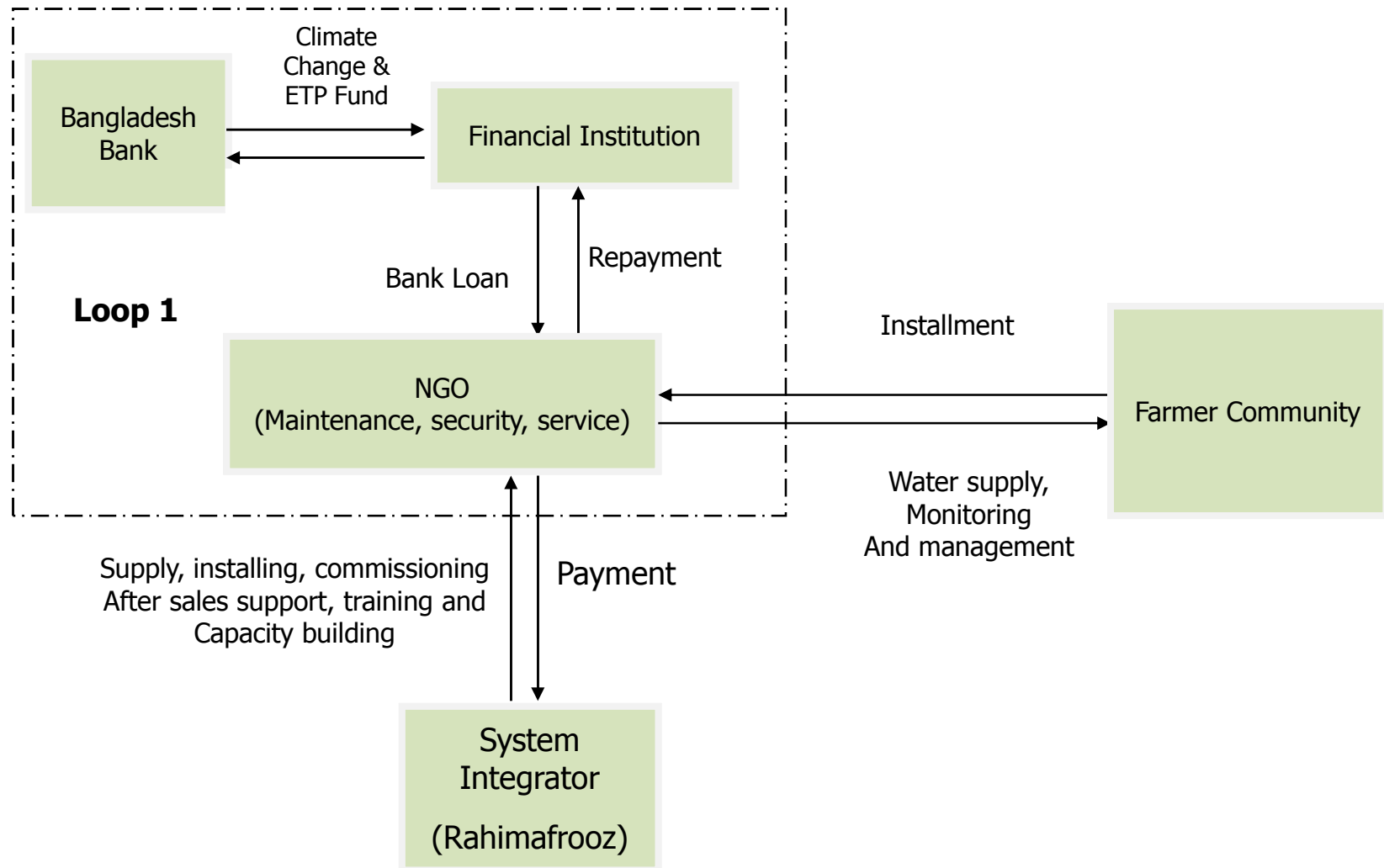


Success Story 3: Commercial replication of solar irrigation in 40 Acres rice field

- Project description: Transformation of 40 Acres crop from single crop to 3 crops by ensuring uninterrupted irrigation by SPV pump
- Location: Fultola Kumrakhali, Borguna
- Implementer: Resource development foundation (RDF)
- Installed capacity: 8.4KWp
- Water source: Open canal
- Area Coverage: 40 Acres (Minimum)
- Beneficiary: 42 Farmer group
- Mode of finance: Single digit bank loan given to the farmer community through NGO for installment collection
- Pay back period: 10 Years
- Farmers direct benefit:
 - Productivity enhancement
 - Food security
 - Employment generation and poverty alleviation
 - Ownership transfer
- NGO benefit: Service charge



Business Model of commercial dissemination



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Business Model: Additional benefits to the community

- Cost Optimization
- Steady Expenditure over 20 years
- Green solution providing better environment
- Hazard minimization
- Ground water conservation
- Noise pollution minimization
- Extension of yearly productive time



Changing livelihoods in Barguna

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RAHIMAFROOZ
Enriching Lives with Your Trust

Ongoing Project: Pipeline drinking water distribution by solar pumping in Coastal Bangladesh

- The project will cover seven locations in Southern Bangladesh
- The drinking water will be distributed to outlet/points in schools, hospitals, cyclone shelters and community places, using solar PV water pumping technology in sweet water sources
- The total beneficiary from the project will be: 87,000 persons (approx.)



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Technical Viability: Choice of technology

- Selection of right technology is very important
- Solar pumps must be sized for the specific location of use, considering local solar irradiance
- Efficiency improvement optimizes system cost
- Seasonal variance needs to be incorporated for the success of the project
- Wiring and equipment loss can affect desired delivery
- Supply side efficiency improvement is equally necessary
- Required technical support and after sales service can be key to continuous , efficient operation
- Experience and expertise of service provider ensures implementation of feasible model.

Choice of technology and technical partnership

- Submersible pumps are *more efficient(90%+)* than surface types due to the suctional head loss of surface pumps
- *MPPT controller* increases system performance by 20%
- *Sun-tracker* enhances flow by 20%
- High efficiency crystalline panels ensure high efficiency and long life
- *System sizing software* helps choosing optimum pump size for efficiency optimization
- System sizing software helps choosing *optimum panel size* for *cost optimization*
- System sizing software also determines possible *seasonal variance* water output for proactive planning
- Improved water supply method through *buried pipe/brick drains* increases area coverage and reduces percolation loss.
- On time service and technical know-how ensures uninterrupted output
- *RAHIMAFROOZ RENEWABLE ENERGY LTD.* proposes one stop solution for selection and implementation of the right technology

Future Scopes:

- Replication of similar projects in agrigane countries
- Key to the replication is to create a success story
- Another key component is enabling feasible environment through right policy framework
- Role of the system integrator is to design and implement the right solution , which is one of the crucial success factors
- I will be happy to be of any service regarding replication of similar success stories across the borders

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Thank You



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