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Making Research on Climate Change in Bangladesh More Effective

Present Scenario of Solar Powered Irrigation Systems in Bangladesh

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Outline of the presentation

- Introduction
- Carbon emission by irrigation pumps
- Irrigation scenario in Bangladesh
- Target vs Achievements
- Environmental benefits of solar pump
- Price Comaprison of Different types of solar pump
- Pay back time
- Conclusion

Introduction

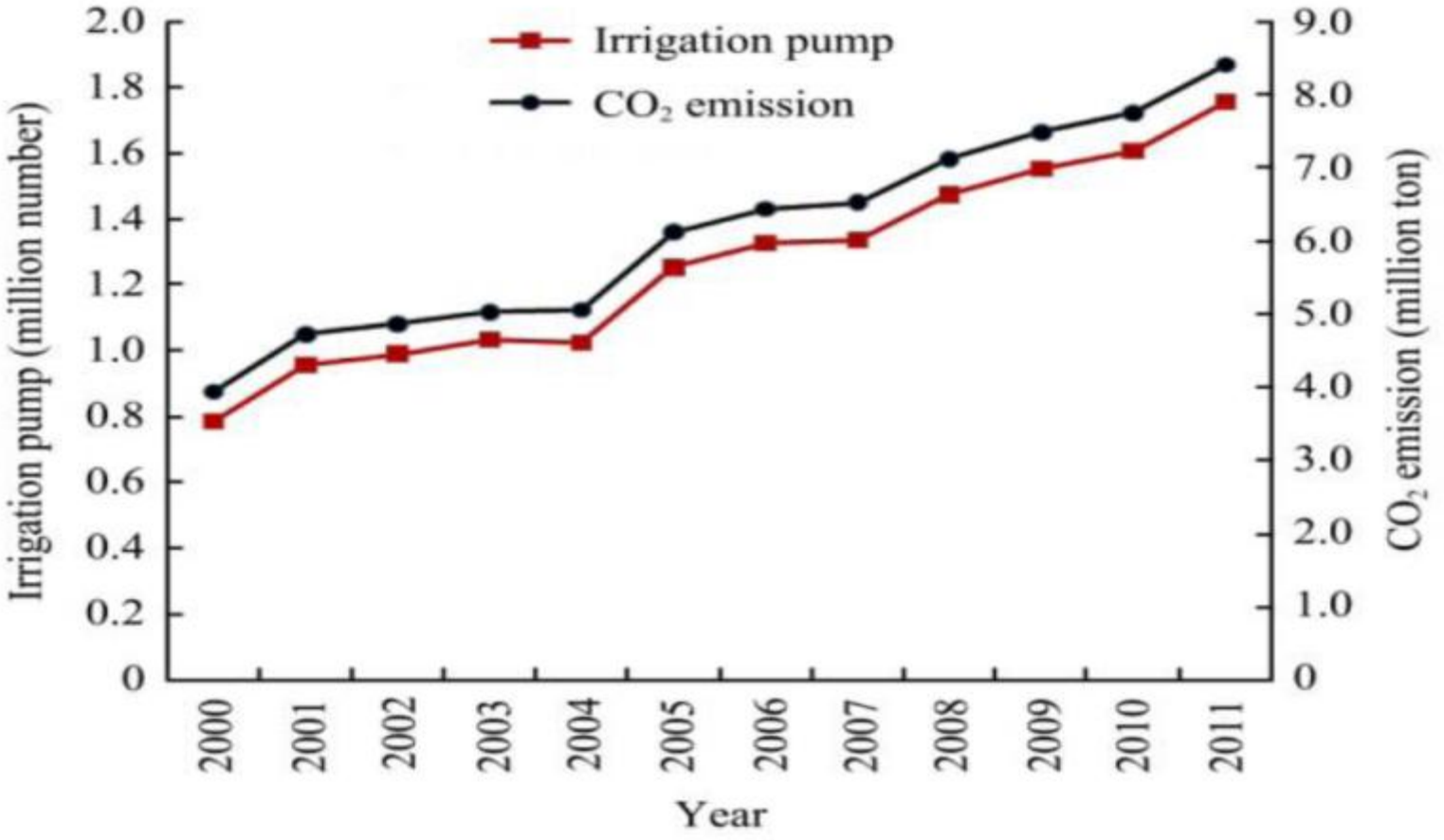
- About 60% of the cropping land require irrigation (AQUASTAT, 2011).
- Almost 1.61 million irrigation pumps, of which 1.34 million are diesel-run and 0.27 million electricity-run.
- Diesel is expensive and difficult to deliver in the remote areas.
- Government is looking for sustainable alternative sources for powering remote areas such as solar powered irrigation pump
- The government provides around Tk 24-26 per litre of diesel as subsidy.

Introduction continue..

- Electrically powered water pumps consume around 1,300MW to irrigate

- During peak growing season, a further 1.3 million diesel-run pumps, using up 900,000 tonnes of fuel, are operated to irrigate the additional 3.4 million hectares of land, (ref. Ministry of power and energy)

Carbon emission by Irrigation Pumps



Ref: Agric Eng Int: CIGR Journal, 14 December, 2014, Vol. 16, No.4
Open access at http://www.cigrjournal.org

Solar Irrigation System in Bangladesh

- The average capacity is 4 kW system.
- Solar irrigation systems are expensive for the farmers compared to traditional system
- At present government gives 40% subsidies and soft loans
- Price is going down day by day and in future it will be viable if the technology is locally developed and managed.

Solar Pump: Target Vs Achievements

- Government has short term target to setup 18,750 solar pumps by 2017.
- Long term plan is to replace all remote diesel powered irrigation pump to solar powered pump .

- Only 350 solar pumps has been installed so far.

Environmental benefits of solar pump

A typical 4kw Solar irrigation system

In its 25-year lifespan,

- can save standard coal 144 tons
- Reduce emission of CO_2 60 tons, SO_2 2.9tons, smoke 2.2 tons, lime ash 37.5 tons.

Price Comparison of Different Types of Solar Pumps

Specification /features	Designed by BUET	Designed by BARI	Designed by Dhaka University	Made in USA	Made in China	Designed by GRENCON
Make and model	BUET	BARI	Dhaka university	Honeywell	Lorentz	GRENCON
Pump type	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Submersible	Centrifugal
Motor type	dc	dc	ac	dc	dc	ac
Average discharge, l/min	56	60	34	100	120	500
Total cost of solar pump, BDT*	1,12,000	1,15,000	1,42,500	2,10,000	3,05,000	2,85,000

* 1 USD = BDT 80

Solar Irrigation pump by GRENCON

3 kw solar array for irrigation system

Solar Irrigation pump by GRENCON

3 kw Solar Irrigation Pump

Non irrigation season: Run a wheat milling huller

Pay back time

- One time investment and very little maintenance is required
- Could be a good solution for irrigation in costal belt & remote village
- Details of the economic analysis not yet done for the payback period but roughly it is 5 to 6 years at this moment

Conclusion

- During off irrigation season the system could be used for other income generation purpose.
- Environment friendly irrigation technology
- Food & energy security
- For clean and sustainable development
- Sustainable green agriculture
- Creating green jobs
- Alleviate energy crisis
- Mitigate climate change

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- Thank you -

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