

# COMBATING LAND DEGRADATION and DEFORESTATION THROUGH DRE

## BANGLADESH



# COOKING TECHNOLOGIES



# RURAL TECHNOLOGIES



# RETs in Bangladesh

Technology	Installed Capacity
Solar Photovoltaic	1100 kWp, 20,000 SHS
Wind Turbine	20 kW
Wind Pump	8-10
Biogas Plants	20,000 (Operating 10,000)

Source: LGED website



# Climate Change Mitigation Studies

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- I. US Country Study – Bangladesh Report
- II. ALGAS-Bangladesh
- III. TERI-Canada Energy Efficiency Project  
– Bangladesh report
- IV. National Communication




# NATIONAL COMMUNICATION

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- (i) The need to reduce deforestation through the use of DRE technologies, and
- (ii) Distributed small-scale technologies can be cost effective in off-grid areas

# IMPACTS of RURAL ELECTRIFICATION

- I. 93.7 % of the electrified households reported decrease in fuel cost
- II. 78.2 % households reported increase in working hours
- III. 62 % reported increase in household income
- IV. 81 % reported increase in reading habits
- V. 93.7 % reported increase in children study time
- VI. 92 % reported increase in amusement as well as standard of living
- VII. 94.7 % reported improvement in security



Rural communities will face several Climate Change vulnerabilities, of which the following can be considered to be relevant to DRE applications.

- (i) Land degradation from loss of soil organic content, erosion aggravated by deforestation and increased flooding, and decreased rainfall in the dry winter months
- (ii) Food security - decreased crop yield resulting from loss of soil organic content, excessive flooding and increased droughts

## The Four Waste Sector Projects Developed Under an UNDP Project

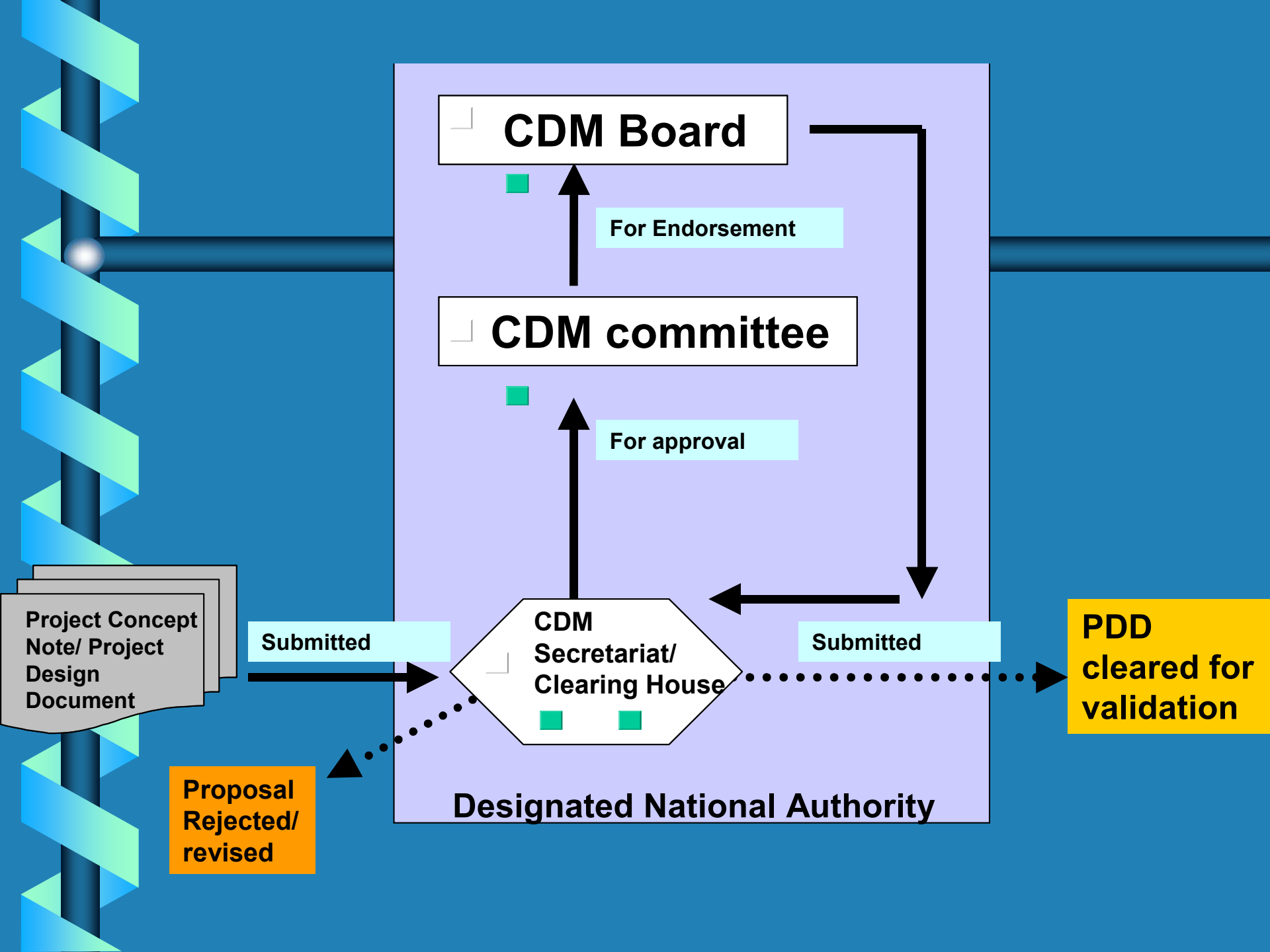
Project	CO <sub>2</sub> eq. Emission Reduction (tons)	Total Investment	Sustainable Development Benefits
M. Landfill	990,000 in 8 years	US\$ 3.5 million	Reduction of odor and fire hazard
R. Landfill	200,000 in 8 years	US\$ 975,000	
Composting - Dhaka (700 t/day)	480,000 in 8 years	US\$ 6.4 million	Reduction of odor, dust and fire hazard. Saving of land. Large number of jobs for women. Very high quality fertilizer (adaptation benefit by enhancing organic content of soils)
Composting - Chittagong (200 t/day)	138,000 in 8 years	US\$ 2.6 million	

Source: Waste Concern (2003)

# SSN CDM PROJECTS

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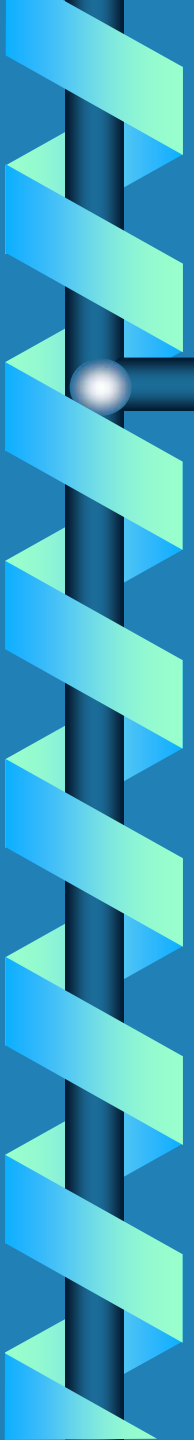
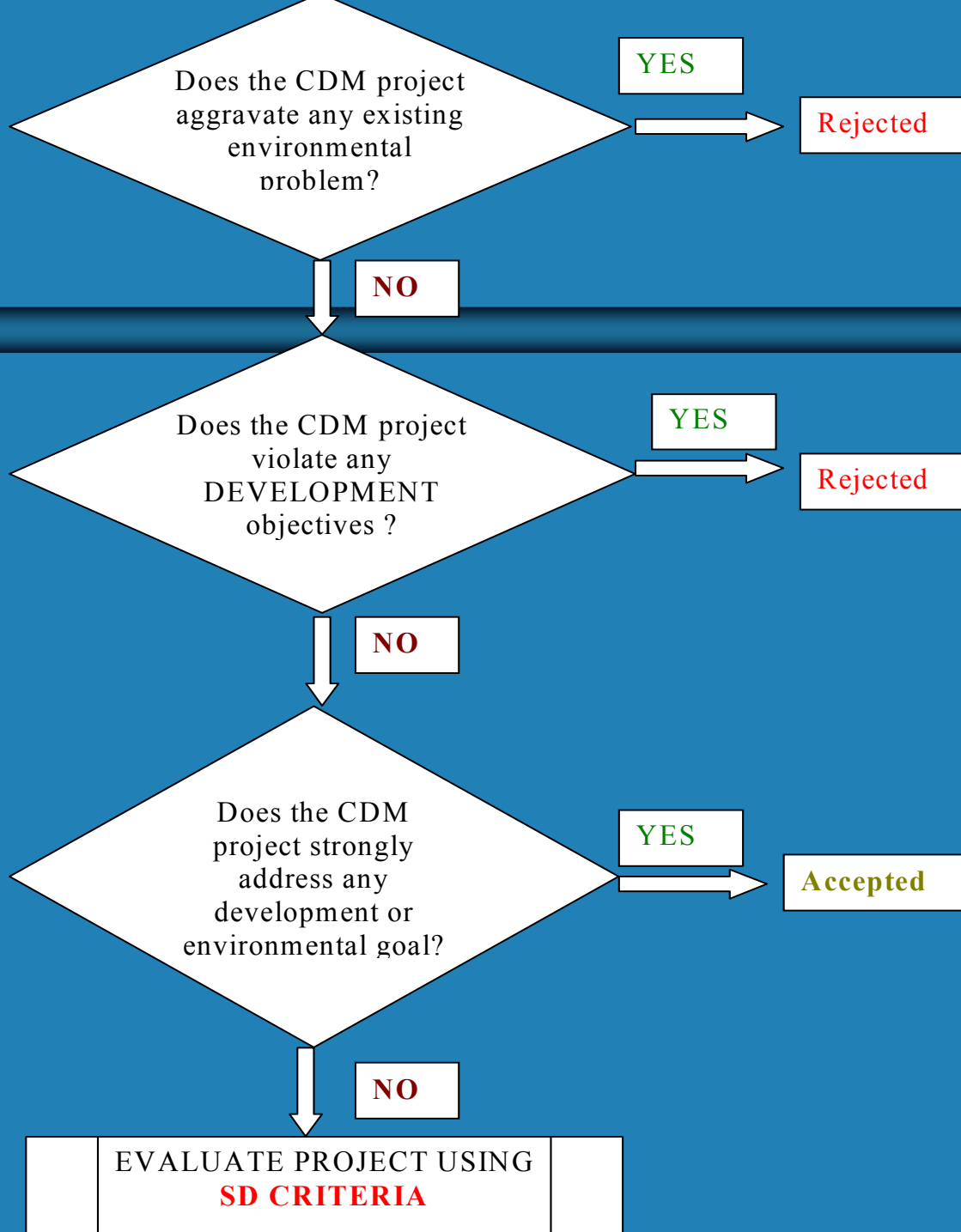
- I. 12-seater electric vehicles to replace 14-seater gasoline vehicles
- II. SHSs in rural off-grid areas
- II. Efficient lighting in rural areas (using CFL)





National CDM authorities look at SD criteria predominantly from the following three angles:

- I. Address some significant environmental problem
- II. Jobs and poverty alleviation
- II. Advance some stated development goals



# BIOGAS ELECTRICITY GENERATION FROM POULTRY WASTE

The untreated disposal of poultry waste is an environmental hazard and increases soil degradation because it encourages the growth of pathogens.

Converting to biogas creates a large GHG benefit (from grid displacement and methane emission reduction) and produces high quality fertilizer, which is in short supply in Bangladesh.

The IPCC TAR reveals that in most of Tropical Asia, Climate Change will adversely affect fish resources. The switch to poultry from fish is an adaptation strategy because the fish population is declining due to ecological stresses that can be expected to worsen under Climate Change.

# BENEFITS of POULTRY WASTE BIOGAS PROJECT

Therefore the need for poultry-based protein will increase as a result of Climate Change. The poultry industry in Bangladesh has no system to dispose off the poultry waste and in most large farms this is becoming a major concern. The present disposal method is either open dumping in a pit or dumping in ponds as fish feed. This waste to energy DRE project therefore increases rural livelihood opportunities and increases adaptive capacity by allowing poultry farms to become environmentally sound and financially better off.

**The Avoided Methane Emission calculation for the project is given below:**

CO<sub>2</sub> eq. methane emission factor = 0.24 kg CO<sub>2</sub> eq./kg of droppings

Waste per bird = 115 kg per year

CO<sub>2</sub> emission per year for 5000 birds =

$$5000 \times 115 \text{ kg/yr} \times 0.24 \text{ kg/kg} \times 1 \text{ ton} / 1000 \text{ kg} = 138 \text{ ton CO}_2 \text{ eq.}$$

CH<sub>4</sub> emission avoided in 5 years by one unit =  $138 \times 0.50 \times 5 = 345 \text{ ton CO}_2 \text{ eq.}$

There are more than 2000 farms in the country that has at least 5000 birds. If this project can be replicated in even 400 farms, the CO<sub>2</sub> savings would be 138000 tons, which is a good size small-scale CDM project.





# ROADSIDE PLANTATION

- Roadside plantation, which started in the early nineties, is an important component of Social Forestry Project.
- The objectives of the project are to utilize available resources, establish the rights and access of the poor to those resources, share the income generated out of the project with the poor and improve the rural ecology through forestation.
- The plantation consists of mainly firewood and timber trees.
- The roadside trees are pruned twice a year and the branches are used for firewood.
- Every morning village women sweep the roads to collect leaves and twigs that are used as cooking fuel.

# MANAGEMENT STRUCTURE

The project involves a total of 5,095 beneficiaries, of which 2873 are female (55%)

The beneficiaries have been divided into 251 Primary Groups

The criteria for becoming a Primary Group member are:

- age should be between 18 and 52 years
- monthly family income should be less than Taka 2500
- land ownership of the family should be less than 0.5 acre (1 acre = 0.405 hectare)
- highest education level completed should be less than Grade 12

# CLIMATE CHANGE RELATIONSHIP

This is not a sequestration project but a bioenergy project based on avoided deforestation.

The GHG reduction results from the fact that fuelwood and fodder requirements are being met from a managed source rather than an unmanaged one.

The project's GHG reduction can be increased if deforestation is reduced even further by coupling an improved cookstove program so that the harvested biomass was used at higher efficiency.

Roadside plantations are reversing the deforestation process being experienced in the western zone of the country.



# DRE PROSPECTS IN BANGLADESH

- (i) Improved biomass cookstoves – arrest deforestation and soil degradation
- (ii) Biogas plants – increase adaptive capacity through increased livelihood and arrest soil degradation
- (iii) Household waste composting – arrest land degradation
- (iv) Solar/wind groundwater pumping – alleviate drought effects
- (v) Efficiency improvement in parboiling – increase adaptive capacity through increased livelihood and arrest deforestation and land degradation by saving biomass fuel