African Electrification Initiative
Practitioner Workshop

Rural Electrification
Bangladesh Experience

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Rural Electrification Program in Bangladesh
BANGLADESH

PEOPLES REPUBLIC OF BANGLADESH

Total Area: 147570 Sq. Km

Population: 140.6 million (2006)

Population Density: 953/Km²

GDP per capita: 554 (current US$)

GDP growth: 6.21%

Per Capita Income: 599 US$

District: 64

Upazilla: 460

Total Number of Village: 84,320

80% of the total population living in rural area

82% of the total rural area is covered by the ACRE program
Power Sector At A Glance

As on June, 2008

- Present Installed Capacity
  - Private Sector: 1700 MW
  - Public Sector: 3606 MW
- Generation Capability (Including IPP): 4130 MW
- Peak Demand: 4800 MW
- Total Transmission Lines (230 & 132 KV): 7848 Ckt. KM
- Grid sub-station Capacity
  - 230/132 kV: 12 Nos. 5850 MVA
  - 132/33 kV: 71 Nos. 7526 MVA
  - Distribution Line (Total): 256143 Km
  - Total Consumers: 10.80 million (on-grid), 0.36 million (off-grid)
- Access to Electricity of Population: 39%
- Per Capita Generation: 175 kWh
- Per Capita consumption: 145 kWh
- PDB Generation cost: 3.079 US cent.
- Average selling price of all utilities: 5.295 US cent
- Average selling price of PBSs: 4.920 US cent
EMERGENCE OF REB

In 1977 the NRECA & the Commonwealth Associates Inc. competed feasibility study on REP. The study report recommended:

- Bangladesh should begin ACRE program under the framework of a perspective plan.
- Each RE Project area should form a Palli Bidyut Samity (PBS), based on the principles of consumer’s co-operative.
- A central agency of GOB be there to organize, finance, administer, and monitor the activities of the PBSs.

GOB accepted recommend and established REB through P.O. 1977 with the following target:

- Establishment of Palli Bidyut Samity (PBS) based on the principles of Consumer’s Co-operative of USA Model.
FUNCTIONS OF REB

Measures for effective use of electricity. Surveys and feasibility studies and prepare schemes. Project proposals to the Govt. for approval and execute the projects.

Electricity generation, transmission, and distribution system in rural and semi urban areas of Bangladesh.

Organization & formation of PBS. Nominate Directors for the first PBS Board.

Lending fund to PBS. Build distribution network & all infrastructures & hand over those to PBS. Set standards for all activities, materials and construction methods.

Integration of distribution systems of others and arrange for rehabilitation.

By-laws, Policy instructions for PBSs, their registration with REB.
FUNCTIONS OF REB

Recommend the electricity tariff on behalf of PBSs to BERC.
Appoint officers and engage consultants, advisors, auditors and contractors.
Construction of distribution network under ADP Funding.
Technical assistance for O & M activities of the PBSs.
Assist PBSs in its tariff fixation study.
Assist PBS in selection of officers.
Provide training for PBS employees & officers.
Set annual targets in key performance areas of the PBSs.
Monitor PBS activity for achieving Financial Sustainability through Reduction of System Loss, Improve Collection and Controlling expenses.
REB BOARD

CHAIRMAN

Member Engineering

Member PBS & Training

Member Finance

Member Admin

Part time Members
1. BPDB
2. BADC
3. BRDB
4. BSCIC
PBS means Rural Electric Society.
Each PBS has separate entity registered with REB.
PBS is basically a electric supply utility Cooperative.
Present numbers of consumer of PBSs varies from 35 to 270 thousand.
PBS runs under co-operative principle.
PBS BOARD OF DIRECTORS

- Board comprises of a maximum of 15 Members - each representing an Elaka of the PBS.
- Office bearer of Political Parties, Public/Local Bodies can’t be a Board Director.
- Board Directors are elected directly by the consumer members.
- Tenure is 3 years - rotating elections to maintain continuity.
  - Elections conducted by REB designated Election Commission
  - One member one vote
- Women’s participation in PBS management ensured through nomination of Lady Directors Max. 3 in a PBS– they also can be elected as Directors
- Board meeting is held monthly – Takes decisions and sets policy.
- General Meeting of Members held annually and Board reports to members on Board accountability
FUNCTIONS OF PBS

- Purchase & sale of electricity.
- Sub-station & line maintenance.
- Consumer complaint handling.
- Line extension / Consumer connection.
- Motivate people for safe use of electricity.
- Tariff setting in consultation with REB.

- PBSs purchase power in bulk at 33 kv mainly from BPDB, some PBSS purchase power from SIPP synchronized with BPDB system at 33 kv.
ACHIEVEMENT (April, 2009)

- No. of PBSs: 70
- Upazillas Covered: 433 out of 482
- No. of Electrified Village: 47,084 out of 84,320
- Line Constructed: 2,18,357 KM.
- Line Energized: 2,15,300 KM.
- Integration of PDB/DESA lines: 29,494 KM
- Total Consumer: 75,79,505 Nos.
  - Domestic: 64,51,189 Nos.
  - Commercial: 7,60,933 Nos.
  - Industry: 1,23,899 Nos.
  - Irrigation: 2,30,353 Nos.
  - Others: 13,133 Nos.
- Average Bill Collection: 99.59 %
- System Loss:
  - Sub-station: 11.60 %
  - Grid Meter: 14.97 %
- Month Outstanding: 1.86
- Peak Demand: 2311 MW
- Installed Total Capacity of SIPP on BOO basis is 193 MW in Eight PBSs.

* 85% Country's total dist. lines.
** 70% Country's total consumers.
Standardizations

a. Construction Design Standardized
b. Construction Method Standardized
c. Construction Material Standardized
d. Standardization - Key to success
YEAR WISE VILLAGE ELECTRIFICATION

Financial Year

(No. of Village Electrified)
CATEGORİELY WİSE POWER CONSUMPTION (MWH)

(FY 2007-2008)

- Domestic: 49.40%
- Irrigation: 32.59%
- Commercial: 7.81%
- Industry: 10.03%
- Others: 0.18%
FINANCING OF REB

- Grants made by the Government
- Loans obtained from the Government
- Grants and loans obtained from any source outside Bangladesh with the sanction of the Government
- 1% service charge obtained from PBSs.
FINANCING OF REB

- Signing Loan Agreement with GOB.
- Funding from GOB to REB
  - Local Currency
  - Foreign Currency
- Uniform On-Lending Term (U.O.L.T)
- GOB portion as Grant.
- Foreign Fund as Loan.
- Re-Payment of Loan
  - Total Period of 33 years including 8 years of Grace Period.
  - Rate of Interest: 2%
FINANCING OF THE PBSs

- Registered with REB.
- Legal Entity.
- Loan Contract with REB.
- Initial Infra-structure development & energization takes 2 to 3 years.
- Operating Cash Loan of 9 to 10 Millions Taka during this period.
- Rest of the loan given in kind.
- Subsidy to the PBSs from GOB against operational deficit.
RATE STRUCTURE OF THE PBSs

- PBS & REB Board approve Tariff Structure of the PBSs.

- Factors considered for Tariff Structure
  - Cost of Service
  - Cost of Power Purchase
  - O & M Expense
  - Depreciation & Interest Expense
FINANCIAL VIABILITY
(With BST of 01-01-2004)

• Out of 67 PBSs, 54 have crossed the subsidy/grace period and DSL has been due.
• 17 PBS have reached Break-Even Point.
• These are Industrial consumer based PBSs.
• The more industrial Consumers, the earlier financial viability.

(Textile, Ceramic, Pharma, Steel, Cold Storage, Garments, Agro, Poultry, Fisheries, Cottage & etc. are main industries)
GOB SUBSIDY

Due to insufficient

- Number of Consumers per K.M.
- KWH consumption per K.M.
- Consumer mix
- Low Tariff rate
- Remoteness and Backwardness of the service area

GOB Subsidy in following Forms

- Subsidy in Financing
- Subsidy in Cash: On Operating loss (Difference between Operating Expense and Operating Revenue) during initial 5/6 years from Commercial Operation of the PBSs
- Lower BST
KEY FACTORS RELATED TO SUCCESS (CONT’D.)

• Decisions based on Policies & Procedures
• Revenue Criteria for Line Extensions
• **Management Audit:**
  • Management Audit held bi-annually in the presence of Chief Executive along with high officials of REB.
  • Performance Target Agreement between REB & PBS.
• System Loss Reduction Initiatives.
• MIS report and 550 form.
• PBS Instruction Series.
• **One Point Service to attend the Consumers.**
REB negotiates Performance Targeting for the PBSs:

- **GOAL**
  - Improve performance of each PBS.
  - Improve quality of Service.
  - Ensure accountability.
  - Provide future guidance.

- **PTA OPERATIONAL PLAN**
  - Grouping on Equity and Age.
  - Targets on Key areas.
  - Key targets: System loss and Accounts Receivable.

- **Evaluation:**
  - Bonus/ Penalty.
SUCCESS OF RE PROGRAM IN BANGLADESH

- Low System Loss
- Revenue collection - approx (98%)
- A/C receivable 1.81 months (standard level - 2 eq. months)
- Reliability of service
- Accountability & Transparency
- Line construction = 42 KM / day
- Village Electrified = 5 villages / day
- Consumer Connected = 2000 consumer / day

- Introduced a new management & accounts practices, new standard of construction and distribution engineering and above all a model of a decentralized electrical distribution systems in Bangladesh.

- Increase GDP, Food Security.
OFF- GRID
Renewable Energy
Rural Electrification Board

- GOB aims at providing electricity to entire rural population by 2020.
- Connecting more than 700,000 consumers every year, it would take more than 20 years to provide access to all.

- To achieve the target a two track approach is required:
  
  (i) expand the electricity distribution grid and
  
  (ii) support renewable energy options to provide electricity in areas not reached by the grid by making solar home systems (SHS) available to households through PBSs

SOLAR HOME SYSTEM PROGRAM

- A total of 13,000 SHS has been installed
- Training of personnel
- Installation guideline
- Billing and bill collection procedures
- Monitoring
OFF-GRID

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THANK YOU