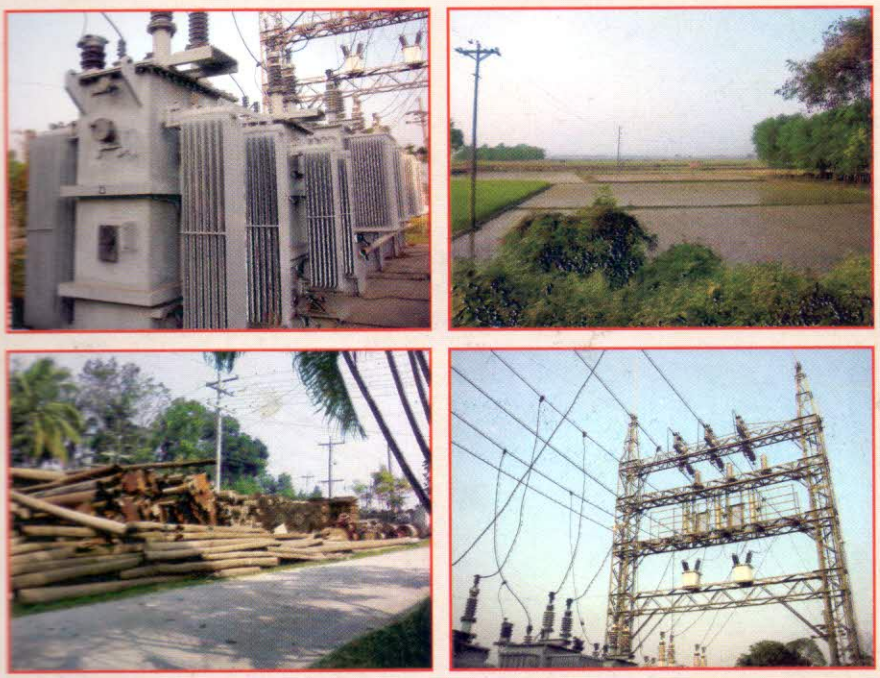
Impact Evaluation Study of the Project "Intensification and Expansion of Distribution System of 18 Palli Bidyut Samitee (PBS), 2nd Phase (Revised)"

Sponsoring Ministry : Ministry of Power, Energy and Mineral Resources



Carried out by

EVALUATION SECTOR

IMPLEMENTATION MONITORING AND EVALUATION DIVISION (IMED)

MINISTRY OF PLANNING

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH

Conducted by

Pathmark Associates Limited

6/A/1, Segunbagicha, Dhaka

June, 2011

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EXECUTIVE SUMMARY

Impact Evaluation Study of the project "Intensification and Expansion of Distribution System of 18 Palli Bidyut Samitee (PBS) - 2nd Phase (Revised)" was carried out to determine the impact of project benefits on the socio-economic situations of consumers in the project areas. According to the Terms of Reference of the study the project had the objectives mentioned below:

The goal and objective of rural electrification is to ensure electricity for rural development as well as to improve the national economy by bringing the entire country under electrification programme in different phases.

According to the revised DPP and the PCR the scope of work was as under:

- Construction of new lines increased to 11961 km.
- Rehabilitation of lines increased to 2239 km.
- Service connection to 511200 consumers.
- Construction of 18 new 33/11 kv substations.
- Augmentation of 5 existing substations.

The assignment on impact evaluation of this project has the objectives as follows:

(i) To review the implementation status of the following major components of the project:

> Status of connection from new distribution lines targeted under the project.
> Status of connection from rehabilitated lines targeted under the project.
> Status of load management of electricity and system loss under the project area.
> Status of connections given to the installed irrigation pumps.
> Status of construction of 33/11 KV new substation and augmented Substation.
> Status of Operation and Maintenance works by the concerned PBSs.

(ii) > To assess the impact of the project activities on expected major outputs as a result of available electricity in rural areas for irrigation, development of industries including the cottage industries, production, employment creation, household uses, health, education, women development and community services etc.
> To assess the sustainability of the project activities.

(iii) > To identify the strengths and weaknesses of the project implementation and suggest measures to overcome the identified weakness.

The Evaluation Study of the Project "Intensification & Expansion of Distribution System of 18 Palli Bidyut Samittee (PBS)-2nd Phase (Revised)" was conducted in all 18 PBS and one district under each PBS. The study area covered upazila selected on two criteria with `good performance' and with "not-so-good performance". From each district one upazila falling under each category was selected. Thus the study area covered 36 upazilas. In selecting the upazilas local PBS offices provided all types of support.

The study is a socio-economic impact study of a technical sector. To ensure that the study adequately covers both technical and socio-economic aspects the study investigators were a combination of Diploma Engineers and persons having degree in Social Science disciplines. The field investigators were imparted practical training by a team consisting of IMED officials and study team members. The investigators conducted in-depth field investigation through interview survey and observation of real situation on-site. Data collection work was properly supervised and guided by supervisors, the consultants and IMED officials.

The study investigation covered both treatment group and control group. In treatment group 612 households and 216 enterprises / organizations and in control group 162 households and 54 enterprises / organizations were surveyed. In addition to these the physical observation covered 805 km of new lines, 8050 poles, and 803 irrigation pumps. In rehabilitated lines 183 km lines were observed physical situation of all 18 new substations and five augmented substations were also observed.

A Focus Group Discussion (FGD) session was conducted in seventeen districts. A local level workshop was conducted in Maulavibazar PBS. These two methods generated qualitative data. Data were processed by using Statistical Package for Social Sciences (SPSS). Based on the result of data processing output tables were generated. The data presented in these tables and those obtained from FGD and local level workshop were analysed to prepare the findings of the study.

The Summary of key findings are mentioned below:

Summary of Key Findings

1. In the treatment group of the 612 heads of households most belonged to the age group of 40 to 49 years. The average age of heads of housed was 42.10 years. Investigation of level of education of these respondents shows that 21.08% were SSC pass and beyond, 8.99% studied up to grade X level, 17.32% had education up to grade VIII level, 21.90% completed primary school education, 22.71% could sign, and 8.01% did not go to school.

2. Among the heads of household 43.47% were farmers, 24.51% were involved in business, 2.78% teachers, 6.2% were engaged in household work, 7.68% were doing private job, 5.39% were in government job, 1.80% were day labourers (Agriculture), 2.12% were day labourers (Non-agriculture).

3. Review of RDPP and PCR confirms that the project increased number of new lines by 10.75%, rehabilitation of existing lines by 24.39% and target customers connection by 78.89%. In the case of line construction achievement was 99.33% and that for new connection was 67.87% of revised target. In reality the new connection was 20.05% higher than originally planned.

4. The review of the report "Report of Follow-up survey of Socio-Economic monitoring & impact Evaluation of Rural Electrification and Renewable Energy program conducted in 2010" gives a clear cut idea that rural electrification has positive contribution towards increasing economic activities in rural areas. The case studies presented in the report make it clear that solar energy is an effective alternative to reduce demand on electricity distributed by REB. This report also corrobates these findings.

5. The rural areas of Bangladesh are changing rapidly in socio-economic activities. More and more "Small Scale Industries", particularly agro-based industries are being developed. Demand for service providers like electricians is also increasing, but their service availability is yet not satisfactory. The study has found that average distance between the service provider (electricians) and service recipient households is 3.98 km.

6. Of the households surveyed 73.69% have TV, 18.46% use fridge and 2.78% use computer. With the trend in spread of Information and Communication Technology (ICT) it is highly likely that there will be an increase in use of computer and televisions.

7. The project has been found to have some strength. The notable strengths are:

   - An effective organization and management structure of PBSs within organization chart of REB to manage operation of development activities centering PBSs.
   - Existence of a comprehensive Palli Bidyut Samity by-laws and integration of the bylaws into REB ordinance. This by-laws provided safeguard in course of project management
   - Achieving the expected level of targets sets in project objectives.

8. Some weaknesses have been identified in the project management and most mentionable of them are:

   - Planned activities were made PBS wise, if they were made upazila wise project planning would have been more grass root oriented.
   - Delay in start of the project
   - Time over-run by 80%
   - Absence of independent Project Director (PO) deprived the project of being managed effectively providing one point service
   - Deficiency in maintenance of sub-stations
   - Transfer of executing head and related officials of PBS during the period of implementation of the project.

9. The project has demonstrated that its benefits are sustainable. There are social indicators such as increase in study hours of students, decrease of sleeping hours of adult people of treatment group at night which means increase in working hours at night, increased production of agricultural crops and employment generation are the elements that demonstrate sustainability of the project.

10. The average time taken between installation of poles and fixing of electric lines was found to be 4.69 months and the mean duration between fixing of electric lines and that of getting service connections by households was found to be 3.55 months.

    The observed poles show that of the pole 27.50% are wooden, 71.17% are concrete and 1.33% are steel poles.

11. The use of bulbs and fans is increasing. On an average a household uses about 4 bulbs and about 2 fans. This use indicates an opportunity for business in electrical goods in rural areas.

12. The beneficiary farmers were found to be aware of the subsidy given by the government on electricity bills, and most of them received the amount of subsidy given.

13. The study reveals that beneficiaries suffer worst due to crisis of electricity supply during summer season both during day and night. Use of alternative sources of energy particularly solar energy came up as a strong suggestion to reduce sufferings during summer.

14. The control group mentioned that they experience the following problems at household level due to non-availability of electricity.

    - Studies of children at night suffer for lack of electricity
    - It is difficult to move at night
    - Lack of security
    - Frequent happening of theft and dacoity
    - Cannot watch on TV the educational and entertainment programs
    - Cannot use electrical appliances like fridge, TV
    - Too much cost of buying kerosene
    - Cannot charge mobile phones
    - Cannot take serious patients to either doctor or hospital at night

15. The areas that do not have electricity suffer from problems of various types. Some are like those of households, others are different than those of households. These are:

    - Irrigation cannot be easily done
    - Cost of irrigation is high
    - It is difficult to move at night.
    - There are frequent theft and dacoity
    - Social functions cannot be organized in the area
    - Shop close early in the evening.
    - People cannot get the benefit of modern life because they cannot use TV, fridge
    - People in the area need to move to other places for charging mobile phones
    - The area has remained underdeveloped
    - Cannot take serious patients to either doctor or hospital at night.

16. In the treatment area primary level students on an average study for 2.85 hours and secondary and higher level students study 3.65 hours. Study hours at night increased by 1.07 hours for primary school students compared to 1.69 hours by secondary level students.

17. In the control households primary school level children can study only for 1.96 hours at night and secondary and higher level students can study for only 2.46 hours at night. This is almost the same as found in the `before' situation of treatment household students.

18. The study has found out that most adult people go to sleep at 8-45 pm in the control area which means they can do little work at night. In the case of treatment group the adult members sleep at night on average for 6.89 hours and this means they can work more at night than adult people living in the areas without electricity.

19. Observation of irrigation pumps has given rise to an optimistic finding about operational ability of pumps. Of the pumps 94.77% were found to be in operating condition.

20. Voltage fluctuation has been cited as a serious problem by users of electricity in irrigations pumps.

21. The sample PBSs gave data on system loss and the average system loss was computed as 12.71%. This is close to the figures given in REB MIS Reports. According to the field data the system loss before the project was 16.42%.

Major Recommendations

Based on the findings a number of recommendations are made. The major recommendations are:

1. The project experienced a time over run of 80%, and 10.93% of foreign exchange remained unutilized. Due to delay in handing over of PDB lines to REB a development partner suspended disbursement of substantial amount of foreign currency. This resulted in delay of procurement of materials and ultimate result was time overrun. The PDB can be given the responsibility to concentrate on generation of electricity. Distribution of electricity can be entrusted to REB and similar organizations.

2. The review of RDPP shows that the breakdown of project activities was done PBS-wise. This does not help in soft-path to energy management through effective decentralization at least relating to assessment of needs. It is recommended that the need for various physical facilities under future projects be planned according to the selected upazilas under PBSs. This will help the disadvantaged areas from the risk of being deprived from electricity services.

3. Absence of independent Project Director (PD) deprived the project of being managed effectively providing one point service management facilities. It is recommended that the future development projects in REB are managed through an independent Project Management Unit (PMU) with a fulltime Project Director and adequate manpower strength.

4. The long "lead time" at different stages of project implementation, if reduced can assist in better utilization of fund and better quality of work. It is recommended that, in such projects, in future careful consideration should be given to avoid delay in start of work and expedite the procurement process.

5. The life and work pattern of electricity consumers is changing rapidly. The demand for electricity should be determined based on the pattern of uses at house and other consumer units.

6. Electricity influences the activities both at households and workplaces. It has an impact of empowerment of women. In future project formulation due attention should be given in implementation on empowerment of women through such projects.

7. Number of electricity consumers will continue to increase. There should be alternative system of bill collection so that people do not have to go to distant places and wait for long time in queue. To lessen sufferings of consumers in paying bill the use of mobile phone facilitated bill payment system can be introduced. This payment system can be secured by the guarantee of mobile phone company. REB should regularly monitor the system of payment.

8. It has been found that if in the control areas electricity were available there could be more small scale industries developed. Gradually more and more rural areas particularly the disadvantaged areas with potentials for economic activities should be brought under electricity supply. In such areas subsidy on electricity bills for use in economic activities can be given through REB.

9. The security of substations is very important for uninterrupted supply of electricity. Automatic alarm system can be introduced to ensure security of substations. As realistic measure complain centres of PBSs can be established besides the substations.

10. The use of renewable sources of energy particularly solar energy can be made widespread to make electricity generation, distribution and consumption sustainable with reduction of peak hours load demand.