# EVALUATION REPORT

EV550

# GREATER DHAKA POWER TRANSMISSION AND DISTRIBUTION PROJECT PHASES II AND IIA

BY

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## PREFACE

Each year the Overseas Development Administration (ODA) commissions a number of ex post evaluation studies. The purpose of the ODA's evaluation programme is to examine rigorously the implementation and impact of selected projects and to generate the lessons learned from them so that these can be applied to current and future projects.

The ODA's Evaluation Department is independent of ODA's spending divisions and reports direct to the Principal Finance Officer.

Evaluation teams consist of an appropriate blend of specialist skills and are normally made up of a mixture of in-house staff, who are fully conversant with ODA's procedures, and independent external consultants, who bring a fresh perspective to the subject-matter.

This evaluation was carried out by a team, consisting of the following:

Andrew Barnett Consultant Economist (team leader)

David Watson Institutional Specialist Consultant

John Woodhouse Engineering Consultant

John Tyson Sociology Consultant

Simon Henderson Research Assistant

The team was also asked to consider, at the same time, a baseline survey for Phase III of this project. This report, however, deals only with an evaluation of Phases II & IIA.

The team was also assisted by Peter Abelson (an environmental economist) who joined the team for part of its work to develop the Greater Dhaka Power Transmission Project as a case study for an ODA-funded book on the environmental effects of aid projects.

The evaluation involved the following stages:

- initial desk study of all relevant papers;

- consultations with individuals and organisations concerned with the project, including a field mission in June 1992 to collect data and interview those involved;

- preparation of a draft report which was circulated for comment to the individuals and organisations most closely concerned;

- meeting of ODA Projects and Evaluation Committee with Evaluation Department and the lead evaluator to discuss and agree the main conclusions and lessons to be learned from the study on the basis of the draft report;

- agreement with the evaluation team on the final report, which is published together with a summary sheet (EVSUM).

Johnny Morris

Head of Evaluation Department

**ACKNOWLEDGEMENTS**

The Team wishes to acknowledge the patience shown and the information provided in response to many hours of questioning by the Chairmen and staff of Dhaka Biddut Bitaran Kartipakha (DESA) and Bangladesh Biddut Unnayan Board (BPDB).

The Team also wishes to thank the Aid Section of the British High Commission in Dhaka (especially Mr Wayne Evans, and Mrs Maggie Stow), Mr David Simm, Project Manager in Dhaka for Engineering Consultants Ewbank Preece, and Professor Nurul Islam of the Institute of Appropriate Technology at the Bangladesh University of Engineering and Technology. These provided most useful insights into the situation in Bangladesh and gave considerable logistical support to the Team.

The evaluation found that Ewbank Preece Limited, the consultants to the project, carried out their tasks competently, under difficult circumstances, and in accordance with their Terms of Reference. With the benefit of hindsight certain suggestions are made about how the projects might have been changed with the aim of helping to improve future projects. In making these comments, the evaluators do not wish to imply criticism of the various parties involved.

The Government of Bangladesh does not necessarily accept all the findings in this report.

## LIST OF ABBREVIATIONS, ACRONYMS AND TECHNICAL TERMS

AC Alternating current

ADB Asian Development Bank

AMOD Aid Management Office, Dhaka

APPI Action Plan for Performance Improvement

ATP Aid & Trade Provision

BC British Council

BEI British Electricity International

BHC British High Commission

BIDS Bangladesh Institute of Development

Studies

BKTL Blaw Knox Transmission Ltd

BPDB Bangladesh Biddut Unnayan Board

(Bangladesh Power Development Board).

CA Crown Agents

C&L Coopers & Lybrand (see also the subsequent

grouping CLD)

CEC Commission of the European Communities

CIF Carriage, Insurance, Freight

CLD Cooper, Lybrand, Deloitte (see also the earlier grouping C&L)

DES Dhaka Biddut Bitaran (Dhaka Electrical Supply -BPDB)

DESA Dhaka Biddut Bitaran Kartipakha (Dhaka Electricity Supply Authority)

Distribution system The power system (HV & LV) which provides the final link to the customer

EAD Eastern Asia Department (ODA)

EHV Extra High Voltage ( greater than 22kV)

EDF European Development Fund

EIRR Economic Internal Rate of Return

EPL Ewbank Preece Ltd [post-Jan 1983]

ERD External Resources Division (GoB)

ESD Economic & Social Division (ODA)

E&P Ewbank & Partners [pre-Jan 1983]

FIRR Financial Internal Rate of Return

FY Financial Year

GDPDP Greater Dhaka Power Distribution Project

GEC General Electric Company

GoB Government of Bangladesh

GWh Gigawatt hour

HMG Her Majesty's Government (UK)

HSPE Hawker Siddley Power Engineering

HV High Voltage (Greater than 1 kV but less than 22kV)

IBRD/IDA World Bank

kV kilovolt

kWh kilowatt-hour (active AC power)

LRMC Long Run Marginal Cost

LV Low Voltage (less than 1 kV)

**LIST OF ABBREVIATIONS, ACRONYMS AND TECHNICAL TERMS (CONTINUED)**

MEMR Ministry of Energy and Mineral Resources

MOU Memorandum of Understanding

MPWR&FC Ministry of Power, Water Resources & Flood Control

NEIR NEI Reyrolle (UK)

Network The electrical power system's overhead line and underground cable network

NPV Net Present Value

ODA Overseas Development Administration

O&M Operation & Maintenance

PBS Electricity Consumers' Co-operative, REB system

PCR Project Completion Report (ODA)

PIM Project Identification Mission

Reactive power That vector element of the AC supply which is displaced by 90 degrees from the active power (kWh) vector

REB Rural Electricity Board (of Bangladesh)

SAD Southern Asia Department (ODA)

SEADD South East Asia Development Division (ODA)

TA/TC Technical Assistance/Technical Co-operation

T&D Transmission and Distribution

Tk Taka

ToRs Terms of Reference

UNDP United Nations Development Programme

USAID United States Agency for International

Development

WB World Bank

XLPE cable A solid dielectric, maintenance free,

cable system which can be manufactured

for HV and EHV systems.

## OVERALL CONCLUSION, FINDINGS AND LESSONS LEARNED

## OVERVIEW

### The Projects

1. The projects evaluated are Phases II and IIA of The Greater Dhaka Power Distribution Project (GDPDP). They form part of a five-phase multi-donor programme, costing in total to date approximately £350m, of which ODA has contributed over £100m since 1973 (see table 1.1). The project represents a major investment in the power sector in Bangladesh. The extensive programme of development of the transmission and distribution system under this project is shown in Figures 1-4.

2. The objectives of Phase II were to improve, rehabilitate, strengthen and extend the electrical power system within Greater Dhaka and to cater for the anticipated load growth up to 1987. Total costs were estimated at approximately £60.93 million (in 1984/5 prices) with ADB providing just under half of the total funds, GoB 31% and ODA 23% (£13.82m). Of the ODA funds 16% were for Technical Co-operation, with the balance of capital aid being made up of 6 off-shore turn-key projects and 10 off-shore supply only contracts. The Phase IIA project was proposed in June 1987 to bring forward essential work proposed for the delayed Phase III project. Two locations were identified where there was a particularly urgent requirement for two 132/33 kV substations. Out of a total cost of £10.88m (1986 prices) ODA agreed to provide a £9.79 million grant (90%) including the contractors' local costs. During the period of Phase IIA ODA also provided funds for management consultancy (£0.34m in 1987/88) which was followed by a further grant of £1.97m in 1990.

### The Evaluation

3. The membership of the evaluation team is set out in the Preface to this report. The Study's terms of reference are in the Report's Appendix 1. The Field work for the study was carried out in Dhaka in June and July 1992. Appendix 2 provides the team's itinerary and Appendix 3 a list of the people consulted.

## OVERALL SUCCESS RATING

4. The projects were **partially successful**. The projects were a success in that they provided a substantial physical infra-structure, within a reasonable time and broadly within cost under difficult circumstances. The projects' economic and social impacts are substantial. ODA's increasing emphasis on management and institutional reform of the electricity system was justified, but has, so far, been **less successful.** Judgements on individual aspects of performance are shown in the table at the end of this overview.

**MAIN FINDINGS**

5. The findings should be seen in the context of those aspects of Bangladesh's economic, political and social situation described throughout the report which make effective development assistance very difficult. Bangladesh is heavily dependent upon external aid. This has led in several areas to policy being driven by donor agencies rather than being fully "owned" by the Government and the local operating bodies; and has contributed to the ability of particular interest groups to resist changes which may affect their narrow interests. The power sector has suffered from the consequences of these features.

6. The technical design was effective within its narrow terms of meeting the load growth in most of the areas covered. The designers used a definition of project beneficiaries which, while conventional at the time, had the effect of excluding from the analysis the needs of the "invisible 40%" of the City who live in slums and who in the future need to be taken into account. With hindsight the technical design may also have lacked sufficient consumer orientation: it could have better met the needs of the operator to reduce non-technical losses and to effectively maintain and manage the system; it may also have better met the needs of medium sized industry by allowing them to be supplied directly by the LV system rather than requiring them to purchase their own transformers and switch gear to connect to the HV system. This different orientation may well have further reduced overall system losses and reduced the total costs to the economy (though not necessarily the utility) of maintaining the distribution system.

7. A striking feature was the limited involvement of local inputs in most aspects of the project. There is always a difficult judgement to be made between the short-term expedient of increasing material and human resources from abroad in order to achieve the successful implementation of the physical infrastructure, and the more difficult longer-term investments required to build up capacities and to use local resources. In the evaluators' opinion more emphasis should have been given to increasing local inputs over time, particularly to increase the numbers of Bangladeshis inside and outside the utilities who would become responsible for managing and maintaining the systems. ODA did attempt and succeed in increasing the engineering consultant's use of local staff in Phase IIA, following a policy that was continued in Phase III.

8. The project had an outstanding economic return. The financial return of the project, however, was very much more doubtful. The utilities' overall financial performance is poor and this has a detrimental effect on the financial viability of the ODA's investments.

9. In the ex post financial analysis, in no year were project revenues expected to be greater than costs. The immediate cause of this financial weakness is the price at which the government allows DESA to buy and sell electricity, and the large level of system losses (in part because of allegedly high levels of theft). But the removal of these causes has so far proved largely intractable as a result of the Government's lack of willingness to address these issues against the background of a difficult political situation and fundamental inadequacies in institutional structure, utility regulation and control, and management.

10. The projects made a decisive contribution to a wide variety of benefits of different social groups. Where these benefits reached disadvantaged groups they were often fortuitous or indirect and had rarely been explicitly so targeted at the project's inception. The most dramatic indirect benefit has been the financial emancipation of thousands of women employed in the mushrooming garment factories in Dhaka. The lives of large numbers of poor people were also significantly improved by the use of very modest amounts of electricity for lighting, fans and (less so) even in cooking. Significantly, many poor tenants were believed to pay more than the tariff rates for their electricity and the alleged theft appeared to be concentrated in higher income groups. Many examples of employment-generating micro-enterprises were also found which depended on electricity.

11. The poverty impacts of the projects have therefore been important and they have had a very positive indirect effect on women.

12. During the course of the projects, it became clear that the viability of the physical assets were threatened by failures in management and human resources elsewhere in the system. At the narrowest level this could be seen as an unrealistic assessment, at appraisal, of the costs involved in providing effective operation and maintenance (O and M) inputs. More generally it is a matter of improved management, institutional reform and human resource development. The projects illustrate ODA's increasing commitment to these concerns, but also the inadequacy of the approaches adopted so far in these projects.

13. A result of ODA's involvement was the supply of British rather than internationally sourced goods and services which have been of high quality, although the utilities believe that they are relatively expensive as a result of tying and the foreign exchange risk of the on-lending terms. The projects also promised, indirectly, a commercial advantage to the UK by allowing British companies to maintain a presence and thereby win multilateral aid projects. UK companies have, however, been unable to win ADB contracts associated with GDPDP, except in the area of consultancy. It is the evaluators' view that UK companies might gain a competitive edge if the tendering process better allowed them to use their experience of the sector to increase the local content of their bids over time.

14. The Phase II and IIA projects represented a new phase in ODA's aid relationship as it began to specify and enforce aid conditions in concert with other (but not all) donors. Although there was wide support within Bangladesh (even within the BPDB and DESA) for the new hard line of the donors, there were certain negative consequences: aid conditions were too ambitious and not always demonstrably feasible for the agencies involved; agreements to conditions reached under duress lacked sufficient commitment or understanding by the people required to implement them. The enforcement of conditions therefore subtly shifted responsibility for failures in the power sector from domestic agencies to foreign agencies. Even though reform was essential for the effective utilisation of aid, the effects of sanctions (such as the delay between projects) fell unpredictably and not exclusively (or even at all) on those with power to respond.

15. The increasing complexity of GDPDP, as it evolved, was not matched by the amendment of the project framework or development of the arrangements for monitoring. Monitoring of physical progress, however, was generally good. Monitoring of financial flows (including Taka funds) was hampered by lags in the information system, and lack of clear responsibilities in practice between the supervising consultants and ODA staff in Dhaka, Bangkok, London and East Kilbride. This division of responsibilities, and the increasing complexity of the issues, also hampered the monitoring and enforcement of aid conditions. Joint monitoring with ADB appears to have been effective, but was largely non-existent with GoB.

16. Bangladesh does not appear to have the institutional capacities to review adequately the policies

for the energy sector formulated by external agencies such as the World Bank (including project identification, aid conditions and institutional reform). The risks associated with this practice could be ameliorated by the creation of an independent "power commission" as proposed by a number of independent observers in Bangladesh (see Sobhan 1991).

17. Unless improvements can be made to the institutional performance of the operating agency, including improved systems of operation and maintenance, the durability and sustainability of the project work is seriously in doubt. The returns to additional and effective investment in maintenance and training are likely to be very high indeed. It is unclear whether those few institutional reforms which have occurred are sustainable.

18. ODA's investments in this subsector are likely to have little direct environmental impact. Savings on energy costs, however, through improved distribution will have had an indirect environmental benefit.

**LESSONS LEARNED**

19. Investing in urban electricity Transmission and Distribution systems is potentially of considerable economic value to developing countries. They can even have significant benefits to poor people and disadvantaged groups such as women which may not be appreciated at appraisal and may be enhanced by consideration during design.

20. The observed approaches to building institutional capacity, human resources, and to improving the quantity and quality of local inputs are inadequate. Using aid conditions and management consultants does not ensure success. A largely short-term project approach can lack the necessary strategic vision and commitment to building local capacities. Essential ingredients are likely to include a long-term commitment by both sides to building local capabilities, a step-by-step approach which includes the setting and enforcing of achievable conditions, and a commitment to improving the availability of funds to meet recurrent costs. A long-term relationship with a British utility operator which is committed to institution-building and the transfer of technology is likely to be required. The design of Technical Co-operation for T and D projects should draw on the Principles for New Orientations in Technical Co-operation agreed by the OECD Development Assistance Committee.

21. Current guidelines within ODA for the economic, financial and social appraisal of Transmission and Distribution (T and D) projects are inadequate and require updating, particularly for the determination of user needs, the attribution of benefits, the estimation of indirect and second round effects, the valuation of electricity, the valuation of recurrent costs, the valuation of environmental impacts, and procedures for choosing between investment in T and D relative to investment in other sectors.

22. The forms of, and reasons for, aid conditions should be clear, particularly to a recipient Government and its implementing agencies. They need to be based on a real intention to enforce and be realistically feasible. Certain specific conditions can have unintended harmful consequences. This is particularly so for conditions relating to tariffs, self- financing ratios, the foreign exchange risk of on-lending terms, and the agencies responsible for compliance.

23. The costs to recipients of delays between phases of projects can be significant, and should be considered in project appraisals.

24. Tendering procedures should encourage the development of local capacities to supply goods and services at the required standard and not reinforce the prevailing technological situation.

25. It is important to ensure effective competition for consulting services, even by firms with a long-standing involvement, and to determine whether the cost of management consultants' services is effectively controlled by tendering procedures.

26. There would be considerable advantage to ODA and GoB if evidence were routinely made available to refute the allegations that British goods supplied under tied aid are more expensive than similar goods supplied under international competitive tendering. Value for money checks on tied aid will be more useful if they include comparisons with suppliers outside the UK.

27. The monitoring and integration of the non-technical aspects of complex projects appear inadequate. The Project Framework could become a more effective component of monitoring if the indicators were more detailed and if objectives and activities were adjusted in the light of experience. The evaluation provides support for the close management of aid by a local office (which has now been established with AMOD).

28. In the design of T and D projects greater emphasis needs to be given to the reduction of non-technical losses, the needs of such customers as small and medium scale industry, and to poor urban dwellers.

29. Project designers would benefit from the evaluation and synthesis of experience of different approaches to improving institutional performance in the power sector through altering institutional structures, the introduction of private capital, improved training and management, the introduction of competition, the contracting out of services (such as bill collection) and the utilisation of existing social groups in the efficient provision of services (such as the co-operatives used in Bangladesh's rural electrification). Although there is advice available on how to introduce institutional reform in a corrupt environment there appears to be insufficient knowledge within ODA (and its consultants) of how to deal with institutional reform where the operating environment is conducive to corrupt practices and where the administrative and legal infrastructure is weak.

EVALUATION SUCCESS RATINGS

The overall measure of success of a project is allocated on a scale from **A*** to **D** according to the following rating system:

A* **highly successful:** objectives completely achieved or exceeded,

very significant overall benefits in relation to costs;

A **successful:** objectives largely achieved,

significant overall benefits in relation to costs;

B **partially successful:** some objectives achieved,

some significant overall benefits in relation to costs;

C **largely unsuccessful:** very limited achievement of objectives,

few significant benefits in relation to costs;

D **unsuccessful:** objectives unrealised,

no significant benefits in relation to costs.

This judgement on the overall success rating is informed by a series of judgements on individual

aspects of performance which are each also awarded ratings, using the underlined sections of the above rating system. This is supplemented by a choice of three ratings for the relative importance of each aspect, which may be **high (H), medium (M) or low (L).** A rating given in **brackets** indicates that no specific objectives were established at appraisal. For this project the ratings were:

| **Project Performance Criteria** | **Rating Phase 2** | **Rating Phase 2A** | **Relative Importance** |
|---|---|---|---|
| Cost Over/run Under run | B | A | HIGH |
| Time over Run/Under run | B | B | MEDIUM |
| Technical success | A | A | HIGH |
| Poverty Impact | (B) | (B) | HIGH |
| Impact upon women | (A*) | (A*) | HIGH |
| Social Impact | (A*) | (A*) | HIGH |
| Cost-effectiveness | A | A | HIGH |
| Financial Rate or Return | D | D | MEDIUM |
| Economic Rate of Return | A* | A* | HIGH |
| Institutional Impact | C | C | HIGH |
| Environmental Impact | (A) | (A) | LOW |
| Financial Sustainability | D | D | HIGH |
| Institutional Sustainability | C | C | HIGH |
| Overall Sustainability | C | C | HIGH |
| Adherence to Project Conditions | D | D | HIGH |
| | | | |
| Overall Success Rating | B | B | |

## 1. INTRODUCTION AND BACKGROUND

## THE EVALUATION

1.1 The membership of the evaluation team is set out in the Preface to this report. The Study's terms of reference are in the Report's Appendix 1. Field work for the study was carried out in Dhaka in June and July 1992. Appendix 2 provides the team's itinerary and Appendix 3 a list of people consulted.

## PROJECT DESCRIPTION

1.2 The ODA has been associated with the Greater Dhaka Power Transmission and Distribution Project (GDPDP) since its inception in 1973 and has contributed over £100m through five Project Phases. The development of the system is shown in Figures 1-4. The programme as a whole represents ODA's largest contribution to the Transmission and Distribution (T&D) Sector (representing over 50% of total expenditure in this sector in 1985, 1986, and 1990). It not only illustrates a shift from more traditional forms of support to power generation but also reflects a more general shift to concerns with financial management and the enforcement of aid conditions associated with institutional development and the whole sector's financial performance. The evaluation covers the Phases II and IIA projects (See Table 1.1).

1.3 In early 1976 an agreement was reached between the Governments of the UK and Bangladesh to implement GDPDP Phase I. ODA provided £29.5 million (35% grant, 65% variant 1 loan). The project's objectives were to cater for the anticipated increase in power requirements up to 1982 and to improve management, operation and maintenance (O&M) and systems efficiency. It consisted of three major turnkey contracts and eleven supply-only contracts to install two bulk supply substations; to complete the 132 Kv grid round Dhaka; to construct five new 33/11 Kv substations; to expand two 132/33 Kv and 15 33/11 Kv substations; and to supply 33 Kv and 11 Kv conductors and cables. The project was designed and supervised by Ewbank Preece, Power and Water (from 1983 known as Ewbank Preece Ltd - EPL).

1.4 Phase IA, costing £10.6 million on grant terms, was agreed in May 1982 and its objectives were to enable all the work planned in 1974/75 to be completed (including the rehabilitation of the distribution system in Old Dhaka), and to cater for those variations in demand which had occurred since the original development plan. The phase consisted of nine supply-only contracts. In November 1981 ODA agreed to a waiver of competition for the Phase IA consultancy and EPL's services were retained.

**Table 1.1 Actual Phases of Greater Dhaka**

**Power Distribution Project**

**(from Exchange of Letters to actual completion date)**

| | Phase I | Phase IA | Phase II | Phase IIA | Phase III |
|---|---|---|---|---|---|
| 1976 | March | | | | |
| 1977 | | | | | |
| 1978 | | | | | |
| 1979 | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 1980 | | | | | |
| 1981 | | | | | |
| 1982 | | May | | | |
| 1983 | May | | | | |
| 1984 | | | November | | |
| 1985 | | | | | |
| 1986 | | December | | | |
| 1987 | | | | November | |
| 1988 | | | | | |
| 1989 | | | December | | December |
| 1990 | | | | | |
| 1991 | | | | April | |
| 1992 | | | | | |
| 1993 | | | | | |
| 1994 | | | | | |
| 1995 | | | | | December |
| Planned ODA Contribution Current Prices | £29.5m | £10.6m | £13.82m | £9.79m | £56.0m |

1.5 The Phase II objectives were to improve, rehabilitate, strengthen and extend the electrical power system within Greater Dhaka and to cater for the anticipated load growth up to 1987. A secure system was expected to lead to increased industrial productivity, more effective control of power losses and an improved load factor. Total off-shore cost was estimated at approximately £60.93 million (in 1984/5 prices), ADB providing just under half the total funds, GoB 31% and ODA 23%).

**Table 1.2 Phase II Project Costs**

| Source | Off-Shore Costs | | Local Costs | |
|---|---|---|---|---|
| | 1984/85 Prices | Cash Prices | 1984/85 Prices | Cash Prices |
| ADB | £27/013m | £29.060m | £1.350m | £1.660m |
| GoB | - | - | £18.746m | £23.11m |
| ODA | £13.82m | £15.82m | - | - |
| Total | £40.832m | £44.883m | £20.096m | £24.756m |

1.6 In current prices ODA's contribution was to be made up of £15.82 million including £2.5 million technical co-operation (for the project consultancy by EPL); funds were in the form of a grant to the Government. ADB provided its funds to GoB as part of its 6th Power Sector Loan, at 0% interest, subject to 1% pa service charge. ODA and ADB funds were both to be on-lent to BPDB at 10.5% pa with a five year grace period.

1.7 The project ultimately included six off-shore turnkey contracts, ten off-shore supply-only contracts, and a number of local "erection only" contracts. ODA financed the 132 Kv Substations, 132 Kv underground cable and miscellaneous vehicles and boats. Details of ODA and ADB off-shore contracts are in Table 2 of Annex E. Work was planned to start in May 1984 with completion of physical works planned for July 1989.

1.8 As part of its consultancy input to Phase II, ODA funded a design study for Phase III for the period up to 1992. Provision was also made to assist in the implementation of the recommendations of a Management Study that EPL had completed in 1983 under Phase IA. Both ODA and ADB agreed that, as a condition of project approval, action should be taken by GoB to implement these recommendations by the end of December 1984.

1.9 The Phase IIA project was proposed in June 1987 to bring forward essential work proposed for the Phase III project. ODA's approval of Phase III was delayed as part of a strategy devised in collaboration with a number of other donors (mainly the World Bank, USAID and ADB) to place an embargo on further power sector assistance until the Bangladesh Power Development Board (BPDB) conformed to a set of conditions set by the World Bank for its Energy Sector Adjustment Credit financed under IDA. By describing this essential work as a continuation of the Phase II project, ODA and ADB agreed that it was not breaking the embargo.

1.10 Under the Phase IIA project two locations were identified where there was a particularly urgent requirement to install two 132/33 Kv substations. These were at Shyampur and Bangha Bhaban.

1.11 ODA agreed to provide a £9.79 million grant for these priority 132/33 Kv works and the exchange of letters between GoB and ODA took place in November 1987. Further details appear in Table 1.3.

**Table 1.3 Phase IIA Project Costs**

| Source | Off-Shore Costs | Local Costs | Total |
|---|---|---|---|

| | 1986 Prices | Cash Prices | 1986 Prices | Cash Prices | Total 1986 Prices |
|---|---|---|---|---|---|
| GoB | | | £1.09m | £1.20m | £1.09m |
| ODA | £7.76m | £8.78m | £2.03m | £2.76m | £9.79m |
| Total | £7.76m | £8.78m | £3.12m | £3.96m | £10.88m |

1.12 In view of the perceived urgency, and the great difficulty BPDB had experienced in meeting the local cost components of Phase II, ODA agreed to meet the local costs of British contractors, excluding land purchase, duties and taxes. The financial aid allocation was subsequently amended (January 1989) to £11.543 million. ODA funds were to be on-lent by GoB to BPDB at 11.5%. Completion of physical works was planned for mid-1990.

1.13 During Phase IIA ODA also funded a study of the organisation, finance and management of BPDB by Coopers and Lybrand (mid-1987 to March 1988) at a cost of £0.34m. It was proposed to make the release of funds under Phase IIA conditional on "satisfactory action by GoB to advance the ODA study". It was subsequently decided that implementation of the management study recommendations would form one of the conditions of the Phase III project.

## 2. IDENTIFICATION, DESIGN AND APPRAISAL

### IDENTIFICATION

2.1 The identification of potential GoB aid projects is governed by two interacting processes: the bids put into the GoB by spending departments on behalf of their operating agencies, and the preferences of the aid agencies who finance the bulk of Bangladesh's public sector investment. Although the GoB prepares Five Year and Annual Development Plans, the large share of aid in public sector investment means that aid agencies play a major role in identifying, designing and financing projects.

2.2 Until recently most donors, including ODA, have designated the ADB as the lead agency in co-ordinating power sector development in Bangladesh. As part of this function the ADB has funded the appointment of foreign consulting firms to undertake power system development plans. These have been completed in 1976, 1983 and 1988. Work on the next plan will start in 1992. More recently the World Bank has played an increasing role in the whole energy sector and, with its Energy Sector Adjustment Credit, (agreed in June 1989) it has effectively taken over much of the co-ordinating role in the sector. The World Bank has particular responsibility for institutional development in the Power Sector and takes the lead in enforcing compliance with aid conditions. The World Bank also chairs the Bangladesh Aid Group Meetings and, since 1988, draws up with the GoB a three-year rolling Priority Investment Programme for the whole energy sector.

2.3 As a matter of policy the ODA currently follows the lead taken by the World Bank and leaves to it the main tasks of project identification and development of sector policy, and the main responsibility for monitoring compliance with aid conditions. In a similar way the main donors accept that the UK is the lead agency associated with financing power transmission and distribution in Greater Dhaka. It is now also the primary source of finance for foreign inputs to management and accounting studies for

the Electricity Supply Authority (DESA).

2.4 Annex B provides a summary history of the GDPDP's identification and development. By 1973 Bangladesh's Power system had become substantially out of balance. It had significant surplus generating capacity (particularly in the Eastern Zone), but lacked adequate T&D capacity to carry the power to load centres. This view was reflected in the 1973 Five Year Development Plan which highlighted the need to reduce the imbalance between generation and distribution, and the need to improve the quality of service to industry. Clearly, ODA's programme of support fitted into this plan and there is no reason, even with hindsight, to doubt that the rehabilitation and maintenance of the existing stock of capital (much affected by the War of Liberation in 1972) and the strengthening of T&D were the generally agreed priorities for the subsector at the time.

2.5 There was some debate within ODA about whether large infrastructure projects of this type directly benefited poorer people and whether greater rates of return could be achieved in other sectors in Bangladesh.

2.6 It was generally believed, however, that T&D projects were relatively easy to carry out, they facilitated the rapid disbursement of funds, and they had a large UK content which, in principle, would benefit British Industry. No evidence was available to ODA at the time about actual impacts on poverty, nor on the relative rates of return of investment in different sectors. The Aid Management Office Dhaka (AMOD) has only recently started research on differing rates of return on investment in different sectors.

2.7 The circumstances of ODA's initial identification of the GDPDP are now unclear. The Phase I project was considered by ODA in July 1973 and was based on an earlier proposal deferred from 1971. In order to develop the project Ewbank Preece Limited (EPL) - then Ewbank Preece Power and Water - drew up a report in 1974 on the development of the power system in Greater Dhaka. This formed the detailed design for the Phase I project agreed in 1976.

2.8 In January 1981 ODA conducted a Project Identification Mission (PIM) to examine the question of extending Phase I.

2.9 Under Phase IA EPL were engaged to report on the electrical power development needed for Greater Dhaka to 1987. The report, issued in February 1983, concluded that the network was in a more critical condition than in 1974 as a result of rapid growth in demand; it was estimated that networks in Greater Dhaka were operating at 170% of their design capacity. EPL's report included a full design study, draft tender documents and specifications for Phase II.

2.10 At the same time ODA financed a Management Study by EPL of the Dhaka Electricity Supply (DES) - the section of BPDB responsible for power distribution and sales in the Dhaka area. This report (February 1983) made recommendations concerning, among other things, management structure, maintenance, system losses, billing and accounting procedures, computerisation, manpower planning and safety.

2.11 As the cost of Phase II was beyond ODA's means, GoB indicated that ADB was its preferred co-financier (with ODA, but excluding the World Bank which had wanted to participate) and a joint ADB/ODA appraisal mission visited Bangladesh in early 1984. In order to expedite works, ADB requested ODA to retain EPL as project consultants and a waiver of competition was obtained in January 1984. The exchange of letters took place between ODA and GoB for Phase II in November 1984.

2.12 The need for a Phase IIA project was identified during the Phase III joint appraisal mission

undertaken by ODA and ADB in January 1987. This mission recognised the considerable damage to consumers that would be caused by the delay of Phase III that had been agreed with other donors. It was therefore decided to bring forward investment in two of the most overloaded locations identified in the design of the Phase III project - Shyampur and Bangha Bhaban.

2.13 The Management Study of BPDB which was funded by ODA under Phase IIA (1987/88) was in effect identified by the World Bank due to its growing concern about the institutional capabilities of the BPDB. The Bank wanted a monitored programme of institutional reform as a condition for its Energy Sector Credit. Funding for such an activity proved easier and quicker to implement using ODA funds. It was this study which led directly to the major institutional reform implementation effort in 1990/91. ODA relied heavily on the World Bank and the ADB for analyses and ideas at the identification stage.

## DESIGN

### Technical Design

2.14 The planning objectives for Phase II and IIA were a continuation of those for Phase I and IA. They can be summarised as the reinforcement and extension of the 132 and 33 kV transmission system to meet the rapid load growth of Greater Dhaka and the supply of 11 kV and LV distribution equipment under ADB finance to allow PDB to provide supplies for unserved areas (approximately 30%) and for new developments within the existing served areas (approximately 70%).

2.15 The consultants' terms of reference were to provide the capacity necessary to meet the electrical network's forecast demand over the following 5 - 6 years, in the context of a conceptual horizon of 10 years. In practice, however, a relatively short time horizon was achieved between actual implementation of these such additional plans and the transmission network's reaching full load. This meant that the provision, at a later stage, of such additional network capacity as a second transmission circuit, was made much more difficult, due to the lack of wayleaves. In addition, the acquisition of substation space could not be planned far enough in advance to acquire sites on the outskirts of the city before they became inhabited. Site acquisition is on the critical path for the timely completion of these projects. Reserve substation sites and future transmission line wayleaves need to be included in the medium to longer term planning. This planning will have to be scenario planning, given the uncertainty of load forecasts in Dhaka and also the lack of any coherent town planning in Dhaka.

2.16 The consultants, Ewbank Preece, were instructed to ensure that their designs represented the least-cost solution to meet the needs of the city. Although the technical design of the transmission system was satisfactory, the design of the distribution system (the 11 KV and LV system) was insufficient for the present stage of the city's development, some 10 years after the initial design and following the associated growth in load. In particular the design lacks sufficient customer orientation. This was confirmed by interviews with some customers by the evaluation team. In the opinion of the evaluators the design of the current distribution system is relatively inexpensive to construct but is costly to operate and is subject to high fault outage rates. In particular it is vulnerable to illegal connection and to damage by heavy rain and wind. The LV system design may need to be reviewed to enable heavier electrical loads to be carried on this system, making the changeover to HV at higher levels. This would create fewer problems for smaller businesses and would allow HV metering to be used effectively.

2.17 In the opinion of the evaluators the present distribution design is also unable to cope adequately with the needs of the rapidly developing small business sector. Customers are currently required to buy and maintain their own transformers and to take a high voltage supply when their maximum

demand exceeds only 50 kW (75 Amps at 400 Volts). It was argued by BPDB that any business which can afford to invest in machinery consuming 50 kW can readily afford the cost of a transformer. However, a more customer-oriented design would also have enabled larger companies (eg with a maximum demand of 5 MW) to be fed directly off an 11 KV substation. At present these customers are required to take supply at 33 kV (an EHV subtransmission voltage). This indicates that the business objectives of the PDB may not be focused on service to the customer, as PDB is, in effect, placing the cost of this equipment and its maintenance upon the customer.

2.18 To confirm whether changes to the design of the system arising from consideration of issues raised in paragraphs 2.15 and 2.16 above are in fact required, a financial and economic reappraisal of the choice of certain system components would have to be carried out, to see whether or not a lifetime cost analysis indicates that existing investment decisions were sub-optimal.

2.19 Within the current design, two standards exist. The specification of the ODA-supplied equipment is in essence the UK Electricity Supply Industry's standard, which was designed to be robust in performance and provide a uniform level of operational conformity. Equipment supplied through ADB was manufactured to meet international specifications or to accepted local specifications. It was mainly designed to meet the needs of the cost-cutting and highly competitive international procurement market of the developed world. Consequently a number of key features that are provided on UK-supplied equipment, such as fully rated fault-making transfer-earthing facilities (a safe method of connecting the electrical system to earth, before work on that system commences), are not present on the equipment sourced elsewhere (some had had portable earths which had later been removed from site and, where they were available, required the insertion of probes into high voltage spouts which is a dangerous practice in any country). In addition, the international specification for 11 KV equipment did not have the level of Phase separation and shielding that would be expected on equipment provided in the UK. This equipment suffered, therefore, from flashovers, an occurrence made more likely by the damp cable trenches in some substations.

2.20 Some DESA senior staff argued that they did not require the additional facilities provided by the UK switchgear. This reflects the low priority given by some staff to a uniform operating procedure and the failure to apply the system-earthing requirements of the Operating Code. Lack of an adequate fault-reporting system also makes it difficult to determine the cause of equipment failure. Greater attention in design to providing a uniform operating procedure would have improved safety standards and encouraged competition between local and foreign suppliers.

2.21 Two aspects of the technical specification of the electrical network are of interest. The Phase II design included PVC-covered 11 KV and LV overhead line conductor to reduce the risks of electrocution. It is difficult to confirm if any reduction in accidents had been achieved, owing to the inadequate way in which accidents are reported and recorded. The technical design also included EHV oil-filled cables. XLPE cables were offered at the tender stage of Phase IIA, but were rejected at the time on price grounds even though they may have some advantages in that they are maintenance-free and do not require expensive oil tanks, oil vans and freezing equipment, if a fault occurs. As regards the technical complexity and possibilities of training BPDB staff to undertake any repairs and maintenance associated with the 132 kV cables of either design, it seemed improbable that this would be a reality for many years to come, and that the supplier, therefore, would have to be called back to do such things.

**Institutional Design**

2.22 From the beginning of ODA's involvement with the GDPDP all studies have identified severe weaknesses in the management and institutional arrangements of the PDB in general and

DES/DESA in particular. The first EPL study of 1974 concluded that "there was little hope that the PDB could operate as a viable public utility in the foreseeable future". Despite this, repeated requests for such assistance by GoB and the known importance of better management to the viability of ODA's investment, the main design documents suggest that engineering issues received much more attention than institutional aspects until recently. The details of the changing approach are documented in Annex E.

2.23 No objectives related to institution-building, manpower development or O&M were considered in the Phase II project appraisal report. In Phase IIA the Project Framework includes as a "Wider Objective" support for the rational development for the power sector. This was to be indicated by reduction in system loss (from 34% in 1987 to 28% by end 1988), and parallel reductions in accounts receivable (from 6 months billing to 3 months billing). Institutional reforms arising from the Management Study were mentioned as another indicator of achievement of this wider objective. It is not clear, however, how such reforms, even if implemented, were to lead to such dramatic improvements in principal performance indicators. Co-ordinated pressure from donors was a key assumption in the Project Framework.

2.24 This relative lack of concern over institutional development is particularly surprising in that such issues were given high priority at that time in the design of the Rural Electrification Programme.

2.25 Five particular weakness can be identified in the Phase II project's institutional development design aspects. First, a striking feature of the design was the limited involvement of local inputs in many aspects of the project. The role assigned to EPL was primarily concerned with the supervision of new construction and installation of new equipment. The "transfer of technology" associated with transmission and distribution planning, and the building up of the necessary capacities to operate and maintain the system were negligible. While the availability of human and material resources of sufficient standard was limited in the early days, little effective action had been taken to build local capacities. Indeed, prior to Phase IIA, there was some evidence that local design capacity had even deteriorated, due in part to lack of demand for local services. Understandably, given their different interests, there was strong disagreement between local and foreign staff as to the desirability of greater local inputs and the feasibility of improving local capabilities.

2.26 Second, the choice and way of implementing "turnkey" contracts further reduced the opportunity for "learning" by restricting local involvement in these aspects of the project. Turnkey contracts were favoured to ensure prompt installation and to avoid risks of corruption, which is alleged to have been a major feature of the Bangladesh Power System since its operation as a private company in colonial times. Experience elsewhere, however, suggests that opportunities for learning can be built into the project design without compromising the essential risk-reducing benefits of turnkey contracts.

2.27 Third, the EPL Design Study (1983) did not adequately integrate institutional variables into the technical design. For instance, without major improvements to O&M the life expectancy of the investment could not legitimately be assumed to be 25 years; ease or costs of maintenance or repair do not appear as significant features of the design; and, although a study of tamper-proof metering was undertaken, the proposals did not significantly seek ways of addressing the problems of non-technical losses through the design of the distribution system and other consumer-related services. EPL had understood that the institutional problems, of which they were aware, were going to be addressed separately by GoB and the donor.

2.28 Fourth, the strategy, based on the World Bank's Terms of Reference, ultimately adopted for strengthening institutional capacity, was a discrete, intensive, broad-ranging diagnostic study of the DPDP's organisational, managerial and engineering practices. Even at the time the conventional

wisdom suggested that this was less likely to be successful than a more incremental and less comprehensive approach (see for example Powell, 1987, and Israel, 1987).

2.29 Fifth, training, inputs and skills transfer were inadequate in both Phases II, to a lesser extent, and IIA. EPL, however, did make available all training that was required under its TORs. Such training as was provided does not appear to have been based on any analysis of needs, despite the availability of the Shepherd Report of 1974 on training needs, the abysmal record of BPDB training provision up to then, and the lack of technical expertise in O&M of the equipment provided through the project. The PDB repeatedly requested "twinning" BPDB with a British institution with real 'hands-on' experience of operating an electrical utility. This was not pursued by ODA.

2.30 ODA (and other donors) devoted more resources to these issues in subsequent project designs, and some of the weakness had begun to be rectified by Phase IIA. In particular the terms of reference for the technical cooperation provided by the engineering consultancy required a strong shift of emphasis such that, to the maximum extent possible, work should be carried out in Bangladesh involving BPDB staff. The integration of advisory services, training, and capital investment remains far from complete. It is, however, recognised by all involved that there are severe limits to the ability of a bilateral agency to induce effective reform in the areas of human resource and institutional development. It requires innovative ideas, collaboration with others (including other donors), and a long term commitment on all sides.

## APPRAISAL

### Economic and Financial Appraisal

2.31 In general the appraisal was competently carried out using the very pragmatic shadow pricing techniques adopted by the ODA and other donors.

2.32 The problem of attributing benefits to particular investments are particularly severe in T&D and any analysis involves a number of more or less arbitrary assumptions. Many of the important considerations are lost in the crude approximations that have to be made in the appraisal of relatively small investments in the hugh systems now required to generate and distribute electrical energy. Particularly important are the linkage effects between infrastructural investment and the rest of the economy, and the indirect effects of investment in electricity for poor people (see Annexes D and F for more detailed discussion).

2.33 The ODA appraisal of the Phase II and IIA projects followed the two standard procedures. The first approach was a conventional analysis in which the investment in transmission and distribution by ADB, GoB and ODA is compared with the estimated net benefit of electricity sales thought to be directly attributable to that investment. The ODA analyses were largely based on those carried out by EPL.

2.34 The second approach was based on the "time-slice" analysis in which all investments in the BPDB system during a given period are compared with the net benefits that are estimated to result from that investment over the next twenty five years. This is said to provide a conservative estimate of benefits to investment in transmission and distribution as no value is given to electricity generated by equipment installed before or after the time slice. These analyses were carried out by the ADB and, again, were largely based on data contained in the EPL analyses.

2.35 In the 18 months prior to the Phase II project appraisal report, ODA economists raised a large number of criticisms of the way EPL proposed to carry out the financial and economic project appraisal. While most of these problems were removed by the time of the final EPL report, the project

was still considered to be vulnerable to poor management and revenue collection and additional objections were made on the grounds that the project was not poverty-focused.

2.36 In the Phase II project, load growth was based on detailed forecasts carried out by Ewbank and Partners in 1980/81. Although the evaluation team was unable to obtain a copy of this report, load growth for the 1980-86 period appears to have been based on a thorough survey of all authorities planning energy-using investments in the Greater Dhaka area. The resulting data on loads and locations were then adjusted in the light of the Power Boards' own load growth estimates. Estimates for the period after 1986 assumed a net annual growth of 11% as this was consistent with historical trends and the 1980-86 estimates.

2.37 For the Phase IIA project EPL again used a two part methodology which combined a micro-survey of planned electricity-consuming investment in the Greater Dhaka area and a macroeconomic projection.

2.38 The detailed assumptions made in these analyses are examined in the light of experience in Annex D and are summarised in Chapter 4 below. In general, the methods adopted for load forecasting appear very satisfactory in the very difficult prevailing conditions. The approach, however, was conventional and the consultants were not required to pay particular attention to the needs and aspirations of poor people or other disadvantaged groups who form a very large proportion of the city's population. Nor did the forecasts depend on assumptions about the levels of tariffs or thefts.

2.39 In estimating the economic returns to ODA's investment, no attempt was made to estimate the value of electricity to the economy. Minimum values were obtained by using either the average tariff (Phase II) or the LRMC (Phase IIA). As a consequence, the rates of return that were calculated were themselves minimum values rather than actual economic rates of return. This means that the analysis neither confirmed nor refuted the arguments of those ODA analysts who argued at the time that higher returns could be obtained from investment in such areas as irrigation.

2.40 The valuation of electricity, however, poses very practical problems at appraisal. The conventional valuation methods (willingness to pay, the opportunity cost of alternative supplies) have limited applications when the sub-optimal distribution of income places severe limits on consumers' ability to pay, and a ban on the importation of private generators prevents actual alternatives to grid electricity. The problems of estimating the benefits of improving the quality of electricity supplies are even more formidable and are therefore neglected.

2.41 For the Phase II project the base-case economic rate of return in constant prices of 15.6% was considered to be "satisfactory in relation to the GoB Planning Commission's test discount rate, currently 15%". The Phase IIA project was estimated to produce an economic rate of return of 19% and again was considered acceptable "given a discount for Bangladesh of 12%".

2.42 In retrospect, it appears that the real costs of Operation and Maintenance are frequently under-estimated at appraisal, both in terms of the absolute shortage of local recurrent funds (therefore with an almost infinitely high opportunity cost), and the probability that the low levels of O & M performance experienced in the past will continue into the future, thus reducing considerably the performance of the new capital equipment installed.

**Institutional Appraisal**

2.43 The ADB and ODA appraisals of the Phase II project contain highly optimistic interpretations of improved performance (loss rates) that had already occurred and a sanguine view of the impact of recently-introduced institutional changes (more details, together with a discussion on the importance

of corruption, are provided in Annex E). This under-estimation of the strength of opposition to institutional reform, by entrenched patterns of interest within BPDB, reduced the adequacy of ADB and ODA inputs and led to the inadequate monitoring of compliance with conditions agreed with GoB.

2.44 The ODA project document did, however, question the optimistic scenario sketched for Phase IIA and the likely effectiveness of its proposed BPDB Management Study, given the lack of action on the DES Study undertaken in 1982/83. Revenue collection performance had clearly not kept pace with the estimates made at Phase II appraisal. On both counts, the involvement of the World Bank in the power sector was cited as sufficient reason to expect improved performance.

**Social Appraisal**

2.45 During appraisal the social impact and poverty implications for the projects were only considered implicitly as part of the wider discussion of the balance between "poverty and non-poverty focused" aid. In the social justification of the project the categories of beneficiaries were very broad and no attempt was made to determine the needs of the different classes of domestic consumer (see Annex F). Failure to consult with many of the poorer beneficiary communities was a lost opportunity to understand needs and to develop improved means of revenue collection (possibly through the co-operative user groups found so successful in the REB). The project could have had a greater impact on poverty and disadvantaged groups (such as women) if this had been an explicit requirement. The social justification, however, in the appraisal of Phase III was significantly better.

## 3. **IMPLEMENTATION**

**TIMING**

3.1 Bangladesh is one of the world's least developed countries and this creates implementation difficulties for all types of project. All five phases of GDPDP have experienced some degree of delay, particularly in their starting dates. Although much of the delay was the result of unavoidable events, poor administration by BPDB and lack of local costs, some was also deliberately initiated by ODA to bring pressure to bear on BPDB to implement reform.

**Table 3.1 Timing of GDPDP Phases**

| Phase: | I | IA | II | IIA | III |
|---|---|---|---|---|---|
| Planned Start | | May 1981 | | | June 1987 |
| Project Memo Signed | March 1976 | May 1982 | Nov 1984 | June 1987 | Dec 1989 |
| Planned Completion | | June 1985 | July 1989 | April 1990 | |
| Actual Completion | May 1983 | Dec 1986 | End 1989 | April 1991 | |

3.2 Phase II's completion was 5 months later than the planned date of July 1989. By the time of the

EPL's Phase II completion report (March 1990) all the contractors had completed their works "such as they were able", but HSPE had suspended commissioning and its work to rectify defects, until local payments for contract work had been released by BPDB.

3.3 The Phase IIA project was inserted following ODA's postponement of Phase III and was completed approximately 12 months after the planned date of April 1990. The completion delays were judged by EPL to be "due 50% to local civil disturbance, the Gulf War, and the late payment of import duties [due to poor administration and a shortage of local funds], 50% due to the Contractor". In addition the whole tendering process was fraught with difficulty.

3.4 While the costs of delay within a project is largely borne by the turnkey contractor, the delay between projects is largely borne by the Power Board by increasing financial costs, by increases in technical losses, by declining services, and the lack of capacity for new connections. Although efforts were made to minimise some of these costs by the insertion of the A Phase projects, they might have been avoided altogether by more effective programming of activities, rather than through a series of discrete projects, and by a clearer policy on the purpose, feasibility and monitoring of conditionality clauses.

## COSTS

3.5 A comparison of actual costs with budgets (see Annex D para 19) shows that there were major changes in the cost components in the Phase II project, but on balance these led to only modest cost over-runs: 9.15% on Capital expenditure and 22.33% on consultancy. The contract price for ODA-financed substations was nearly 20% less than budgeted, but actual expenditure was 6.1% over the contract price. Some £3.46m of variations were shown in the ODA Project Completion Report (PCR) but savings must have been made elsewhere in the contract.

3.6 The contract price for cables was nearly twice the amounted budgeted (from £2.07 million to £4.06m). This appears to have been the result of an error in the EPL's original development plan where only one of the two circuits required had been costed.

3.7 Inflation of 11.2% (3.4% pa) was allowed by SEADD on the original contract price for the financial aid component. The consultancy contract was essentially on a cost-plus basis and the rise was due to changes in the work to be undertaken and the increase in the project's duration.

3.8 The cost over-run on Phase IIA was slight (3% on the capital costs and 0.33% on consultancy). During the preparation, however, of the amendment to raise the ceiling on the financial aid element it was discovered that in the project proposal the consultancy costs had been double counted by being included in the amount for financial aid as well as for TC.

## TECHNICAL ASPECTS OF IMPLEMENTATION

3.9 The standard of the physical work by the turnkey contractors under Phase II and IIA was generally good under difficult circumstances. Three types of technical problem occurred (see Annex C paras 16-19). First, substations are frequently located on low quality sites adjacent to squatter areas or over ponds ("tanks") resulting in damage from children, humidity problems and waterlogged trenches. Construction on sites that contain biodegradable materials results in site movement and methane gas production for many years. There was evidence of such an occurrence on at least one site. This has not, however, affected the building or equipment on piles to date although it may possibly lead to damage in the future.

3.10 Second, drawing revisions and changes to site layouts caused delays.

3.11 Third, other delays resulted from the difficulty local contractors had in training or recruiting suitable staff.

**INSTITUTIONAL ASPECTS OF IMPLEMENTATION**

3.12 Implementation of institutional and managerial change proved particularly difficult and ineffective. Little action was taken by ODA or the Bangladeshis as a result of the first management study of DES in 1983. In Phase II, however, Coopers and Lybrand (C&L) were awarded an ODA contract to undertake a Management Study of the BPDB in 1987.

3.13 SEADD noted that donors were "sceptical" about the feasibility of the interim proposals made in October 1987 (see Annex E). GoB reaction was mixed. The Ministry was lukewarm while BPDB reaction appears to have been initially uniformly negative and hostile.

3.14 While the ODA response endorsed the general donor line, the Head of FMAG argued that it would be necessary to consider carefully the volume, order, priority and inter-relatedness of proposed changes to avoid the risk of attempting to do too much at once, thereby sowing the seeds of confusion.

3.15 The GoB and BPDB reluctantly adopted a "Performance Improvement Plan" (known as the APPI or Action Plan for Performance Improvement 1990-91) in response to the final version of the Report, but only after the imposition of the embargo on new lending by the World Bank in 1988. The World Bank was keen to have an expatriate team involved with APPI deep inside BPDB to make circumvention of loan conditions more difficult.

3.16 GoB agreed to set up one distribution entity administratively independent from BPDB - Dhaka Electricity Supply Authority. 36 person-months of expatriate consulting effort were to be requested by BPDB to advise on asset valuation, tariff points of supply and a billing mechanism for DESA; 150 person-months of local consultants were envisaged for updating valuations. Other agreed measures included a restructured training set-up; implementation of training programmes; an Ordinance for DESA, and movement towards other reorganisations as suggested in the C&L report. ODA advised the BPDB that an additional 30 person-months expatriate time was necessary, matched by an additional 30 person months of local consultants. BPDB finally modified its request accordingly.

3.17 Annex E summarises the development of APPI including details of implementation following the CLD consultants' return to Dhaka in April 1990.

3.18 Two issues are of particular concern; the first being the decision to waive the requirement for competitive tendering for the contract to implement the APPI. The grounds cited were the unique experience of CLD in the Board, their work on the 1987/88 Management study and the shortage of time remaining before mobilisation if deadlines for DESA system-establishment and other necessary steps were to be met before July 1990 - IDA's target date for DESA commencement. The urgency in mobilisation was more apparent than real (DESA ultimately began operations on 1 October 1991).

3.19 ODA had experienced difficulty in getting any other firms to bid for the first (smaller) contract. But the size of the second contract was known to be considerable (eventually reaching £1.98m). Furthermore, quantities of documentation existed which would have provided briefing on the situation for any new contractor (who might also have questioned the feasibility of implementing many elements of the programme).

3.20 The ODA argues that the high fees paid under the contract are a function of supply and demand. But the monthly fees paid under the contract averaged more than two and a half times the fees paid

to the most senior expatriate supervising engineers and over ten times the rates charged by the most experienced Bangladesh accountants. Furthermore, although supported by experienced staff in London, the field team had relatively little experience of Bangladesh or of implementing assignments of such a scale, and had an average age of 30 years (this was cited as a factor affecting their credibility with at least some members of the BPDB management). The financial risks associated with the contract were low.

3.21 The second area of concern is associated with the use of local consultants. The role assigned to the seven sub-contractors by C&L appears to the Evaluation Team to have been unduly restrictive. Local consultants, who spoke Bengali, might have been particularly effective, given the known resistance to change and cultural sensitivity of the senior staff in DESA/BPDB. A balance more in favour of local consulting resource use would have enabled a much larger critical mass of effort to have been applied for a much longer time (at the same or lower costs) and would have lent support to the development of local capacities. The consultants did experience difficulty in recruiting sufficient local staff in the time available. But this in turn is part of a widespread aid "malaise" in Bangladesh in which the pressures of the short-term project cycle militate against a longer-term strategic investment in developing the necessary local capabilities.

**IMPLEMENTATION OF TRAINING**

3.22 There is no composite picture of the implementation of local or overseas training under the Phase II and IIA projects. No one party appears to have overall control of, or interest in, training inputs. Aid support for locally based training was very limited (£170,000 for some training in Bangladesh by BEI linesman). EPL undertook on-job training of its counterpart staff in the Project office during the period. No record, however, has been kept of the numbers involved. There are strong disincentives within BPDB and local firms that make staff reluctant to undertake training.

3.23 Training was provided overseas (12 in Japan and 12 in the UK by respective contractors) and 28 in the UK through the British Council during Phases II and IIA. Annex E contains the comments of alumni made during a gathering in Dhaka convened by the Evaluation Team. In general the implementation of overseas training was highly variable in quality. Training through the British Council appeared more successful than that carried out by contractors, although many of the weaknesses lay in poor incentives and policy within BPDB.

**MONITORING**

3.24 During implementation the projects gradually evolved from a straightforward engineering task into a complex multi-faceted programme, involving institutional development. Over time, the incremental but unstated changes in project objectives compounded the problems of monitoring, and the roles of key parties (eg the project consultants EPL) were not adequately amended to take the new emphases and components (eg APPI) into account.

3.25 This led to a split in responsibilities for project monitoring. In general, the arrangements for monitoring physical progress and for prompting the required corrective actions have been more successful than those for monitoring financial expenditure and institutional development (see Annex H for details).

3.26 The formal ODA-approved arrangements were that the project consultants reported physical progress and financial expenditure to SEADD, where Economic and Engineering advisers monitored the Project. The institutional aspects (the BPDB Management Study in IIA and latterly the APPI) were

monitored by SEADD's Economic Adviser and the FMAG Adviser in London. No monitoring responsibilities for the human resource development aspects of the project are defined in the project documentation.

3.27 The introduction of the Project Framework in the Phase IIA project had considerable potential. But the lack of detail and absence of time-bound targets identified at the design stage meant that its value as a monitoring tool was limited. Its effectiveness was also reduced by the lack of reference to any related ODA activities (such as institutional development) and the absence of mechanisms for adapting the Framework as experience was gained through monitoring.

3.28 Physical monitoring of the project on behalf of ODA was the responsibility of SEADD Engineering Advisers during inspection visits at "appropriate intervals". Through close contact with ODA HQ, SEADD Engineering Advisers were also expected to follow up points raised by the ODA HQ Advisers. The system used for monitoring of physical performance appears to have been effective. The extent, however, to which BPDB and DES were involved in the monitoring process is unclear. EPL's reports concentrated on physical progress to the exclusion of wider issues affecting BPDB and DES performance. This does not appear to have had any deleterious impact on physical implementation.

3.29 Monitoring of financial flows was inadequate. No one party was unambiguously responsible for monitoring financial expenditure on all components of all the ODA's projects being undertaken with the Power Board. SEADD found financial progress reports unclear, late, erratic and unhelpful, in that reasons for variations from forecast were not provided, and because there was a lag between an expenditure commitment and actual disbursement.

3.30 In practice, the Desk in London was often in a better position to monitor financial progress and commitments than any other party. Only they had an overview of what had been committed and spent on all accounts. There was a serious time-lag between commitment and reporting of disbursements between the geographical desk and SEADD. This information gap enabled an overspend of £50,000 to occur in Phase IIA.

3.31 "Joint" monitoring (ODA-SEADD/ADB/GoB) took place usually as part of joint appraisal missions. It is, however, unclear what the obligations and responsibilities for collective decision-making were or what level of additional resources could be committed by each party. In practice, GoB presence on the "joint" Missions has been non-existent or symbolic.

3.32 No mechanism for feeding-back lessons learned from monitoring into current practice and into ODA's institutional memory were apparent.

**TENDERING OF FINANCIAL AID**

3.33 Achieving effective tendering procedures has been a major concern of the ODA for many years in order to preclude corruption by both buyers and sellers of capital goods. The tendering arrangements operating under Phase II were changed under Phase IIA, principally by involving the Crown Agents to negotiate prices with the technically successful contractors (see Annex H for details). This may have made corruption more difficult, but it is not clear whether this change led to better value for money. It did add four extra months to the process, and reduced the time available for the Bangladeshis to assess the bids to less than one month. The current procedure implies that local technical preferences have little legitimacy. More generally, the tendering process tends to be technologically static, ie the procedures require judgements to be made on the basis of existing capabilities rather than, more dynamically, in terms of the investments required to enable local

suppliers to meet the standard.

3.34 BPDB acknowledges the generally high standard of British goods, but alleges that British goods supplied under tied aid are between 20% and 300% more expensive than similar goods supplied under international competitive tendering. If true this would make British aid relatively expensive to BPDB, particularly if their liability for foreign exchange risk and on-lending were enforced (see Annex H). The Crown Agents' value for money exercises are not required to check the value of British goods against those of comparable European suppliers and are therefore not able to provide authoritative evidence from this source to counter the allegations. The necessary evidence should be readily available from a number of sources in Bangladesh but unfortunately the Evaluation Team was unable to gain access to it during its visit.

**THE IMPLEMENTATION OF AID CONDITIONS**

3.35 In recent years the World Bank (IDA) has taken the lead in imposing conditions on power sector loans, which ODA and some other donors have followed. They principally cover tariffs, system losses, accounts receivable, and institutional changes such as the creation of DESA and APPI (see Annexes B and E for details).

3.36 While conditions have been harmonised since 1989 between donors associated with GDPDP, attitudes towards compliance have varied considerably. The difficulties experienced by individual bilateral donors are well illustrated by ODA which approved Phase IIA despite incomplete compliance with Phase II conditions and despite the reluctance of BPDB to agree to the conditions for Phase III.

3.37 Even though the Evaluation Team found considerable unofficial support within Bangladesh for the donors' position and for widespread reform, doubt was also expressed even among the aid community as to whether all the conditions could feasibly be met by BDP/DESA alone, given the prevailing internal tensions and the declining economic situation. It also proved difficult for donors to obtain reliable indicators of compliance (for example crucial data are derived from hand-written billing data from 300 local offices). Furthermore, short-term improvements from "crash programmes" are not sustainable and cause severe costs elsewhere (eg the allocation of senior engineers to meter reading has high opportunity costs elsewhere).

3.38 The donors have had some notable victories (eg the partial separation of DES from the BPDB), but the record indicates that "commitments" given by GoB have been ignored, breached, or evaded on many occasions. Foreign consultants are accepted at little or nor cost to the Power Board and are explicitly regarded as the 'price' that it has to pay for obtaining foreign exchange for essential capital works. For the most part, donor pressure for time-bound "commitments" has been counter-productive. This is particularly true in the case of the APPI programme - a costly exercise for the ODA, which has so far produced little of concrete reform, action or impact apart from support for the establishment of DESA (see Chapter 4 below and Annex E).

3.39 The shortage of power, the poverty of the economy and the low real wages of state employees encourages rent seeking behaviour which have been difficult for both military dictators and democratic governments to prevent. Similarly, the strength and durability of prevailing patterns of interest associated with current aid practices have been consistently underestimated by donors. From its side, GoB has been able to exploit the interests of individual donors to keep the flow of aid resources going, despite considerable pressure.

3.40 Under such circumstances, it is questionable whether non-technical losses should form such a major focus of aid conditionality. Technical losses are more damaging to the economy in that the

energy is wasted. Nonetheless theft remains a serious problem and the current levels are high by international standards. Novel solutions (such as tendering revenue collection to private contractors, or community groups) may be required.

**ON-LENDING**

3.41 Many donors, including ODA, insist that their grant funds are on-lent to revenue-earning entities at rates of interest that are similar to local commercial terms. This was the case with the Phase II and IIA projects.

3.42 The intention of this practice is to ensure that aid-funded foreign capital should not become cheaper than other sources of funds, particularly recurrent revenue for maintenance or rehabilitation so that sound investment and charging decisions are made. In the Power Board, however, local funds for recurrent expenditure are even more scarce than foreign exchange. This means that the on-lending requirements further reduce the availability of local funds for O&M, training and improved management. This problem is further compounded by the requirement that the Power Board carry the foreign exchange risk of the loan while having no mechanism to defend itself from the effects of the falling value of the Taka. As a consequence of this its annual interest liability has risen from the 10.5% intended by ODA to 17.3%. This in turn has contributed to reversing PDB's debt equity ratio to 66:34 (rather than the agreed ratio of 40:60). ODA offered to remove this condition in 1990 and 1991, but was told that the Ministry of Finance would not agree. It seems unlikely, however, that either the Power Board or DESA have at any time met this condition (these issues are developed more fully in Annex D).

3.43 The inability of BPDB or DESA to meet debt obligations is very deep rooted. At a superficial level it clearly results from "inadequate" tariffs, and poor revenue collection. But tariffs and thefts are themselves related to the ability of consumers to pay (many firms can no longer meet many expenses), and strong anti-inflationary considerations of governments prevent utilities increasing tariffs (and wages). Furthermore, there are rigid institutional barriers which prevent capital funds being used to finance recurrent expenditures such as training or wage increases.

4. **IMPACT**

**PHYSICAL IMPACTS**

4.1 Taken overall the project's physical impact has been very favourable, relative to its objectives and relative to the situation that would have existed in Dhaka without it. This view is widely held by DESA staff, government officials, aid agencies and electricity consumers. It is certain, however, that had ODA not supported GDPDP other donors would have done so.

4.2 Load growth for the Greater Dhaka Power Distribution Project was well-predicted, despite huge exogenous factors. Of the 5 substations at 132 kV for which data exist four were still within firm capacity (total capacity minus the largest transformer) by 1987, the target date set for the Phase II project. Of the 28 substations at 33/11 kV for which data exist half were outside firm capacity by 1987, and by 1991 19 out of 28 substations were outside firm capacity (see Annex D). Furthermore, at the time of the evaluation, the main electrical infeed for the whole of Dhaka at Tongi was well outside firm capacity (see Annex C).

4.3 The impact of Phase II and IIA work has also been to improve the security of the grid system and the sub-transmission system. These benefits have been partly obscured in practice due to the failure to update the distribution system design and the poor maintenance of the 11 kV and LV systems. Many faults occur when trees contact the lines and damage is also caused by lack of skills amongst

the linesmen. Recently the lack of generation capacity has added to the outages, further obscuring the effect of poor distribution system performance.

4.4 These two project phases will have reduced technical losses in the areas in which re-enforcement took place. It is not possible, however, to determine the precise level of technical losses without a network analyser and accurate load readings.

4.5 Many instances were observed where BPDB/DESA practices contributed significantly to increased technical loses (see Annex C for details). Improvements are becoming evident with DESA now insisting that new and existing supplies to heavy users of electricity (large LV and HV consumers) have to correct their power factors to 0.95, but since no permanent means of measuring and monitoring this is installed, the effectiveness of these measures in the medium to long term is questionable. In addition, the current tariff fails to penalise the consumption of reactive power.

4.6 Most of the existing metering measures only kWh (albeit at two rates) which means that there is little encouragement to the customer to reduce technical losses or demand (except at the system peak period, if peak rate kWh metering is fitted). Some kW maximum demand metering is now fitted on new supplies but for the majority of customers there is no metered record of the customer's maximum demand or the reactive power consumed. This means that those who contribute most to system overload are not restrained by market forces. It also means that those who cause the highest system capacity-demand problems are not necessarily paying the full economic tariff for their actions.

**ECONOMIC AND FINANCIAL IMPACT**

4.7 Economic and financial internal rates of return were estimated using current data and these are compared with those carried out at appraisal. From the point of view of the Bangladesh economy, the project had an outstanding economic return. The financial return, however, is very much more doubtful.

4.8 The results and assumptions of these ex post analyses are provided in Annex D together with sensitivity analyses. Depending on variations in ODA's and EPL's assumptions, between one quarter and one third of DESA's electricity sales can be attributed as a benefit to the project. Despite adequate load forecasting, actual sales were less than predicted, largely because the level of losses was higher than predicted.

4.9 Using an estimate of the real value of electricity to the economy, the ex post economic return on ODA's investment is 36%. But, in the ex post financial analysis, the level of theft is so high that in no year are benefits larger than costs. Even if no value is attributed to stolen electricity in the economic analysis the internal rate of return is still acceptable at 15%. At current costs and tariffs, however, even if theft were eliminated the financial internal rate of return would remain negative at a 10% discount rate. It is only if theft is eliminated and tariffs are raised by 30% in real terms that the project becomes financially viable.

4.10 In the years prior to the appraisal, technical and non-technical losses had fallen from 40% to 30% on the BPDB system. On this basis the analysts assumed that they would average 35% for the life of the project (15% technical and 10% non-technical). The data available now shows that although, 1986/7 gross losses were put at 23% they were back at 42% by 1988/9. The evaluators' current analysis assumes 33% losses.

4.11 The impact of the high levels of theft is far from clear. Conventionally, it is assumed that demand unconstrained by consumer charges adds inefficiently to the need for additional generating capacity. The findings of the Evaluation Team, however, suggest that in Bangladesh no such simple conclusion

can be drawn. It appears likely that a significant proportion of consumers are in fact paying for stolen power, even though the revenue does not always find its way to BPDB or DESA. Slum tenants pay more than the tariff to their landlords and people providing illegal connections, repairs and other services are able to charge "market clearing rates" that are above those charged by the utility.

4.12 The level of theft appears to be related to rates of increase in tariff rates and the ability of industrial and domestic consumers to pay. Levels of consumption, however, do not appear to be related in the medium term to the absolute level of tariffs. Indeed, prices have not yet been included as a variable in the forecast of electricity demand carried out by British consultants. Under conditions of such inelastic demand, tariff increases are a cost-plus pricing principle which passes on to industry and other consumers the inefficiency of the utilities. It adds to inflation and reduces the competitiveness of Bangladesh's industry relative to international competitors.

4.13 System losses in Bangladesh are very high even in comparison with those of other developing countries. The precise split between technical and non-technical losses is not known but no one doubts that theft is a very serious problem and one which undermines the power system's viability.

**SUSTAINABILITY**

4.14 Technically the standard of maintenance has improved slightly since the start of Phase II. The impact of Phase II and IIA, however, on skill transfer to the artisan work force has been negligible. Without improvements in the training of the substation and network maintenance artisans and the further development and training of the engineering operations and maintenance (O&M) staff, the durability and sustainability of the project work is seriously in doubt. While the internal rate of return is not sensitive to a simple reduction in the life of plant and equipment (because future net benefits are highly discounted with such high rates of return) in practice, the impacts of equipment failure are large, cumulative and unpredictable in occurrence (see Annex D).

4.15 Inadequate maintenance (and training) are partly a function of the utilities' lack of financial viability, and particularly their inability to meet local recurrent costs. This shortage is a problem of long duration and is unlikely to be adequately dealt with at the project level. The returns to additional investment in maintenance and training are likely to be very high indeed.

4.16 It is unclear at this stage whether those few institutional reforms which have occurred are sustainable. The evaluation team felt, however, that the desire for reform was widespread (see Annex E). While the GDPDP demonstrates ODA's increasing commitment to these concerns, it makes plain the inadequacy of the approaches adopted so far (see 4.20 - 25 below). Unless improvements can be made, the sustainability of future capital investments is likely to be equally uncertain.

**IMPACT ON INSTITUTIONAL DEVELOPMENT**

4.17 From the outset, weak management and inadequate institutional structures have been accepted as the major threat to the viability and sustainability of ODA's investment in GDPDP. Nevertheless, neither Phase II nor Phase IIA of the Project had any explicit institutional development objectives. ODA's inputs have evolved from diagnostic studies, through plans of action, to the enforcement of implementation through the postponement of further new grants. So far, the positive impacts have been very limited.

4.18 The first management study of DES by Russel Ewbank in 1983 had no discernible impact. No action was taken by BPDB. No direct follow-up support was provided by ODA to the consultants. The issue, however, was not dropped and a further attempt was made to address institutional issues in the BPDB Management Study in 1987/8. This provided the evidence and analytic framework for the

Action Plan for Performance Improvement 1990/91 (APPI).

4.19 DESA has been established and its creation has been facilitated by some of the achievements of the APPI programme. The Board's organisational structure has been amended to separate Generation and Transmission functions. Some senior and middle-ranking staff in BPDB have been given management training. The basis has been laid for further refining of DESA and BPDB structures and procedures, once decisions are made by the authorities (see Annex D).

4.20 There has, however, been no sustained improvement in the commercial performance of BPDB or DESA since APPI began. Most action has taken place since April 1992. Much of the impact is essentially "latent". Implementation of the APPI is still a condition of resumed lending from the IDA to the power sector. As such it represents a tool for reform which can be used by the donors as they negotiate further projects with BPDB and DESA.

4.21 However, one is left with the impression that APPI never "took off" nor attained much momentum. It was never communicated - as the consultants repeatedly proposed - throughout the organisation. Therefore most staff never knew of its existence. Even if they did, they remained confused and suspicious of its purposes, and felt threatened by its potential impact on their livelihood. The administration of APPI has not been transferred to DESA.

4.22 With hindsight, the lack of impact has many causes at different levels (see Annex E for a further elaboration of these points). Clearly Bangladesh has been a very difficult environment in which to produce positive change of any sort, but particularly at the subsectoral level in a hostile political and economic environment. Rent seeking behaviour is endemic and long standing throughout the economy. Weak governments have been the norm. Donors have underestimated the entrenched nature of the vested interests both inside and outside the BPDB that maintain the status quo. The Government and BPDB rarely initiated any programme of reform and, in the view of the evaluators, only endorsed the APPI programme when constrained by World Bank pressure. ODA misinterpreted this response as commitment to reform. Too little time was available to build an understanding of, and support for, the reforms within the country. Elements within BPDB did not regard the consulting team as having sufficient 'hands-on' experience in running an electric utility. Management's capacity to organise change was severely limited and the range of the 57 detailed action plans too wide and complex.

**Impact on Human Resource Development**

4.23 BPDB has a number of training facilities for local training but these are not being used effectively. DESA has no facilities at present. Local training does not have enough emphasis in BPDB's and DESA's human resource planning programmes.

4.24 No reliable quantification of benefits or impact could be identified. Very little ODA-sponsored on-job Bangladesh-based training has been undertaken during these phases. Records of ex-trainees were not available. The evaluators, however, discussed training experiences with 24 alumni of overseas training (see Annex E for a detailed analysis). Generally there is a hostile climate within BPDB to training and promotion is based exclusively on seniority rather than ability. Thus, in terms of career development, training has no benefits while significant costs have to be incurred by any individual who undertakes it, in terms of lost overtime and allowances.

4.25 The overseas training provided under contractors' contracts in 1987 appears to have been much less comprehensive and effective than that provided by the British Council. BC gave participants much needed English language instruction beforehand and arranged for Electricity Boards in UK to

handle training connected with the operation of transmission and distribution systems. Contractors focused only on equipment operation and maintenance.

**Safety Procedures**

4.26 Although some training relevant to safety did occur, the project had negligible impact upon the improvement of safety procedures. Improvement is hindered by the lack of a coherent safety policy and the under-reporting of accidents. This is most alarming, given the increased sophistication and complexity of the electrical system following the Phase II and IIA work. (See Figure 5 for accident data).

4.27 DESA has produced a revised operating procedure (the "Black Book") but this is not properly observed and is inadequate for the complex electrical power system that now exists. No training on the new procedure had been given to the staff interviewed. The new Distribution Control Centre installed during Phase II did not fully meet the objectives of providing increased safety and security because an operating code of practice, appropriate to the increasingly complex power system, was not implemented (see Annex C). Without the implementation of a suitable operational code and control room-centred safety system the proposed SCADA system will be of only limited use.

4.28 Batteries were generally found to be in a poor state of maintenance with some batteries having cells shorted out. This could result in a dangerous situation where switchgear failed to trip due to the failure of the tripping battery.

**SOCIAL IMPACT**

4.29 GDPDP had impacts on a diverse range of social groups, some of which were unexpected. There were the direct impacts of people employed on the project and those using electricity domestically; and indirect effects on people employed in industries that use electricity. The social problems resulting from land acquisition were slight.

4.30 GDPDP had a remarkable impact on the growth of cottage industries and informal enterprises, often in the mixed residential/commercial areas of the Old City. The variety and dynamism of this subsector cannot be over-emphasised. Many of the enterprises depend on electricity not only for lighting but also for productive purposes such as light engineering and plastic recycling. The income derived from these activities is a vital element in the survival strategies of poor urban households.

4.31 In the slum areas, which constitute 40% of Dhaka's population, a large proportion of households have access to electricity and use such appliances as fans, lights (and to a lesser extent) cookers. Even within the urban poor the impacts of the project vary between the numerous social groups involved (this is discussed further in Annex F). But generally those electricity consumers that do not own their own property will often pay more for electricity than those that do.

**The Impact on Gender**

4.32 There were few direct impacts on women resulting from GDPDP employment but the indirect affects were considerable. These resulted largely from the growth in the garment industry which provides employment to thousands of women. The evaluators, however, were advised that, on the evidence presented, the projects should be classified against ODA's Women in Development Markers as "WID not relevant" as there was no direct impact.

**The Environmental Impact**

4.33 Assessment of the environmental impact hinges crucially on whether the observed effects are caused by the provision of electricity or are merely associated with it. The evaluators take the latter view in this case and believe the environmental impact of the GDPDP to be minimal (see Annex G for a further development of these arguments). Dhaka planners do not believe that the distribution of electricity within Dhaka influences the distribution of development, although it may influence the pace of development in some areas. Some believe that the relative availability of electricity in Dhaka encourages industry to locate in the capital rather than elsewhere and that this has

social costs. Many factors, however, influence industry location and there is no evidence that electricity supply is decisive.

4.34 On the other hand, the improved distribution system had some significant environmental benefits. It saved energy costs (most of which benefits show up as user benefits); reduced the pollution associated with displaced energy sources; and reduced the incidence of industrial accidents.

4.35 Many people live close to electricity distribution facilities and even under transmission lines. It is not yet known whether this is dangerous to health. Land requirements for access are generally planned in advance and social costs are not substantial.

## APPENDIX 1. TERMS OF REFERENCE

### 1.1. Identification, Design, Appraisal

Assess the procedures by which the project was identified, designed and appraised, (to be judged within the context of the general standards of project appraisal at the time), including:-

(a) Whether the objectives were appropriate, and were determined on the basis of an adequate analysis of the constraints to improving performance of the civil service.

(b) Whether any constraints to performance were not addressed by the project, and if so whether the project could realistically have reduced them by focusing on these issues in a more direct way from the start of the project. (Examples of these might include structural problems of the civil service such as overmanning, and lack of adequate pay).

(c) Whether the use of project conditions (to encourage necessary action by the recipient to promote the prospects for project success) was adequately considered by those designing the project, and if, in the view of the evaluators, the imposition of such conditionality on government would have been useful and feasible.

(d) Whether the project design was complementary to the activity of other donors.

(e) Whether the views of government were incorporated into project design.

(f) If the scope of the project was appropriately identified (and in particular the coverage of institutions).

(g) If the phasing of project activities was logical in terms of the priority of activities, and the need to tackle certain tasks at an early stage in order to be in a position to complete other activities subsequently.

(h) The extent to which sufficient flexibility was allowed for during project implementation, (in other words whether the "process" approach could usefully have been adopted).

(i) The extent to which in determining the mix of project inputs, (with a heavy emphasis on short term rather than long term advisory inputs and a large amount of UK training), sufficient account was taken of relative cost-effectiveness.

(j) Whether suitable indicators of achievement were established, and whether these were quantified and time-bound whenever possible.

### 1.2. Implementation and Management

Assess the factors affecting implementation outside ODA control, including the following:-

(a) The motivation and ability of consultants, as evidenced by their record of meeting implementation targets.

(b) The external factors which influenced the pace of progress in the various departments assisted under the project.

(c) The extent to which the government was able to provide suitable candidates for training courses, and counterpart staff for technical cooperation inputs.

Assess the success of the ODA procedures in ensuring successful implementation and management of the project including the following:-

(d) The appropriateness of the criteria used to select consultants.

(e) The adequacy of logistical/field management arrangements.

(f) The quality of project monitoring by BDDEA (either directly or through London based advisers) in identifying and rectifying any problems.

(g) The level of co-ordination of the project with other donors during implementation.

(h) Whether the ODA maintained sufficient dialogue with the recipient government, in order to be able to implement the project successfully, (for example through the government implementing policy recommendations, and providing required counterpart project inputs).

### 1.3. Impact

In assessing project impacts it will be necessary to take account of factors external to the project: in particular the security and economic situation of the country.

A description will be made of the magnitude and types of the project's impacts, including the following:-

(a) The direct impact of the project on staff, through staff training. The pass rate of candidates in assessed courses, and the extent to which training has been used by candidates on return to work are relevant factors.

(b) The direct institution building impact on the central government ministries assisted under the

project. A key element in this assessment will be the extent to which the government has implemented the recommendations of the consultants provided under the project.

(c) The indirect institutional impact as a result of the dealings of departments assisted under the project on other departments.

(d) The wider impact of the project on the Economic Recovery Programme, for example through changes in the ability of government to implement new policies, and to improve the delivery of services; and as a result of any changes in the magnitude of public expenditure and revenue arising from the project.

(e) Any social, poverty and gender impacts of the project.

### 1.4. Sustainability

Assess the sustainability of the identified impacts of the project, taking account of the following evidence:-

(a) The extent to which revised systems have been maintained to date.

(b) The extent to which the project appears to have promoted a sustainable change of management attitudes.

(c) The extent to which the government has been able to retain and motivate staff trained under the project, and is likely to continue to do so in the future. In this context the ability of the service to offer adequately competitive salaries should be assessed.

(d) The likelihood that external constraints (such as economic and security factors) are liable to undermine the sustainability of the project.

(e) On the basis of this assessment of the sustainability of the project, comment on the contribution that additional technical assistance can make towards enhancing the prospects for maintaining the project impacts.

### 1.5. Assessment

In order to make an overall judgement on the value of the project:

(a) Document the unit costs (such as cost per trainee or cost per consultancy review) of the key components of the project.

(b) Make an assessment as to whether there is a clear cut case that either the project was a benefit or impact (in terms of the effects of the project which have been described) significantly more than, or significantly less than, the unit costs for the major project components.

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Mr S Sebagereka Minister for Public Service

Mr D Orech Permanent Secretary & Head of Civil Service

Mr M Legara Commissioner for Pensions

Mr C Muyingo Commissioner for Management Service

Mrs Sezi Commissioner for Personnel Management

Mrs Tumwine Commissioner for Personnel Development

Mrs D Katurmu Commissioner for Records Management

Mr R Okusam Records Officer

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**UNDP**

Mr T Teshome Resident Representative

**ODA**

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Mr G Glentworth Former Senior Public Sector Administration Adviser (now Joint Assistance Unit).

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Mr D Bell Uganda Programmes Adviser

Mr E Hawthorn Senior Economic Adviser

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Ms J Moodie Secretarial Project Consultant, Glasgow College

Mr M Penlington Establishment and Personnel Officers Project Consultant

Mr J Henstridge UMI Corporate Plan Consultant

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## APPENDIX 4. WOMEN IN DEVELOPMENT ISSUES

This questionnaire is intended to comply with an initiate under the Development Assistance Committee to assess Women in Development as a cross cutting issues in Development Aid Evaluations. DAC members have agreed "to incorporate the following questions in project evaluations undertaken from April 1992 to March 1993 for all evaluations which are ex-post, completion or interim, and also which cover direct or indirect effects on beneficiaries."

1. Design, Appraisal and Implementation

a) How were the interests and role of women (compared to men) taken into account on each of the design, appraisal and implementation stages?

In general, the project took no account of the differing interests of women as compared to men at any stage of the project cycle. The one exception to this was the sub-project which provided 12 "Women into Senior Management" courses for women candidates only.

b) In what ways did women (compared to men) participate in these processes?

Women contributed to the project cycle fortuitously through their employment in departments receiving technical assistance under the project.

2. Effects and Impacts

a) What were the effects, positive or negative, or the project concerning women's (compared to men's) access to income, education and training and with respect to workload, role in household and community and health conditions?

With regard to this project, the only relevant question is the access to training. Unfortunately project monitoring did not distinguish between the impact of the project on men and women, so it is not possible to comment on this question in any detail for in-country training. For UK awards, gender differentialted data is available for the period 1986/87 - 1991/92. The proportions of women taking up these awards is as follows:-

Ministry of Finance 16.5%

Ministry of Public Service 26.4%

Others 28.0%

PATID Total 22.7%

Some of the sub-projects (notably Secretarial on 94.4%), have had a greater impact on women than others (notably the TOA Project on 7.5%, and the Personnel Officers Project on 2.2%). Whilst the secretarial project's direct beneficiaries have been predominantly female, this would not be true of the indirect beneficiaries - the staff that the secretaries work to.

b) How were the interests and role of women (compared to men) taken into account in the evaluation stage?

No specific research was undertaken to ascertain the gender impact of the project, although use was made of readily available information.

c) Were significant factors concerning women (compared to men) overlooked at the appraisal stage?

The heavy reliance of the project on training courses in the UK may have disadvantaged women with family commitments. The project made no provision for the collection of gender specific data to ensure that no bias was operative in the allocation of training places.

3. Data Availability

a) Were gender specific data available for each of the project stages?

i) design - no

ii) appraisal/approval - no

iii) implementation - no

iv) monitoring - no

v) evaluation - limited

4. Sustainability

Are the results achieved by the projects equally sustainable between men and women beneficiaries?

There is no information which would indicate otherwise.