



Canadian International
Development Agency

Agence canadienne de
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Power Systems Master Plan - Honduras

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Executive Summary

Introduction

The Performance Review Branch (PRB) of the Canadian International Development Agency (CIDA) is conducting a comprehensive, corporate review of CIDA's performance in the area of Infrastructure Services, one of its six programming priorities. The Infrastructure Services Performance Review (ISPR) consists of desk studies and evaluations of CIDA projects in the energy, transportation, information and communications technology and water, irrigation & sanitation sectors.

The Evaluation of the Power System Master Plan (PSMP) and the Global Revision of Central American Co-operation in Electrical Energy (GRC) are one of the several field evaluations selected for the ISPR. This Report presents the findings of this study. It was conducted in Canada, Honduras and Mexico in February and July of 1998. Data for the evaluation were collected through document review, key-person interview, focus group meetings, field-site visits and case studies. Specifically, the CEA, CIDA's team leader and officers were interviewed in Canada. In Honduras and Mexico, the beneficiaries, users of Project's products and implementing agencies were contacted to interchange perceptions, observations and viewpoints on the Project's results.

Development Context

In 1990, at the time of this Project's design, Honduras was one of the poorest countries in the Western Hemisphere. With a GDP per capita of US\$ 2050, Honduras ranks 116th among countries indexed as Medium Human Development (UNDP 1997), so there has been little or no improvement in poverty conditions. This is illustrated by one fact; Honduras has one of the highest percentages (53%) of people living below the poverty level in the region. However, the country has been making important strides in remedying adult illiteracy and it has nearly solved the refugee problem.

The Honduran urban population has doubled since 1960, an unparalleled trend in the region. During the period 1960-1994, Honduras had a 5.2% urban population growth, the largest in the region. The urban growth projections for 1994-2000 are the strongest for the region

Hydroelectricity is one of Honduras most important natural resources, although it remains largely untapped to date. Only 41 % of the Honduran population received electricity service; of which a mere 15 % in rural areas. In 1994, 71 % of the energy consumed was a net import. The limited industrial base reflects the low level of electricity penetration. Current data indicate a strong upswing in the country's electricity consumption pattern. This is reflected in the per capita consumption: 4886 kWh, the largest in the region.

Honduras backbone is agriculture. Even though the percentage of the active population directly involved in agriculture has decreased, from 72% in 1960 to 41 % in 1990, it remains one of the largest in the region. It will probably remain so because no other activity of importance

looms in the future. Woodlands and forests are destroyed at untenable speed causing an uneasy ecological equilibrium in the country. Indeed, consumption of traditional fuel over the past two decades has been considerable (57%). This suggests that electricity penetration in rural areas remains weak. Under these circumstances, rural electrification seems to be of paramount importance. Yet, the conditions of sustainable rural electrification need to be identified.

Project Description

In line with CIDA's program objectives, the PSMP was created to encourage a rational development of hydroelectricity resources over a span of twenty years with three general objectives: the sustainable development of natural resources, support for structural adjustment and poverty alleviation.

CIDA was also pursuing a short-term strategy in electric energy development for the Isthmus' countries to ensure sustainable development through the GRC Project. Consequently, both Projects are geared:

- to encourage reform intended to enhance efficiency,
- to attract wider private sector participation,
- to improve predictability and equity in the supply of electricity in Honduras and the region, and
- To implement the co-ordinated operation of the interconnected regional system based on each country's sub-sector's reforms.

As reflected in official documents of the time, the following issues had priority:

- To assess the environmental and social impacts that the new projects and electrification would have on men, women and disadvantaged groups.
- The final PSMP will analyze the potential social and environmental costs and the feasibility stage of all electricity investments proposed by the PSMP.
- Women were expected to benefit from more efficient planning in the electricity subsector. Women were to be in the group of 15 ENNE professionals to be trained. Work undertaken had to identify the obstacles facing women at ENNE training and provide suggestions for overcoming them.

Project Performance

The outputs achieved, as validated by the field visits, are considerable. This is significant considering that the electrical sub-sector planning activities up to now had been practically ignored.

Institutional Capacity Building: The Training Component

- The Project trained a cadre of 14 professionals, of which 4 were women. The field visit confirmed that 10 professionals work for ENEE and 2 work for CNEE.

- There has been a transfer of power planning technology. The cadre participated in a simulation exercise to update the PSMP (Appendix H). The responses showed commitment to follow up the sub-sector's issues and problems.
- The interviews held and the questionnaire filled (Appendix D) suggested the cadre's ownership of the Project's purpose. This is indicative that CIDA's interventions were focused to reinforce the sense of ownership.
- The cadre's adequate academic background was an essential ingredient for success. This coupled with intensive training brought about effective results with clear sustainability potential.
- A regional development bank officer considered the ownership of the PSMP by the cadre of ENEE and CNEE as a pivotal factor to ensure the sub-sector's adequate performance.
- Resources did not appear scarce to execute the training component, yet:
- There were delivery system problems and the information quality of handbooks was compromised by a careless presentation.
- Poor salary conditions and lack of policies for training and human resources management characterized the working environment at ENEE.

The Power System Master Plan (PSMP)

The PSMP's purpose was to produce an expansion plan for the Honduran electricity sector for the period of 1994-2014. It was executed over a period of 27 months through the following five phases:

- Study of available information and definition of planning criteria
- Socioeconomic impact study and load forecast
- Study of the investment program for generation, transmission and distribution expansion
- Tariff study and financial analysis
- Preparation of the Power System Master Plan itself (PSMP).

The PSMP consists of a main report and 10 annexes describing in detail the analysis carried out in the following areas:

- Socioeconomic impact study
- Load forecast
- Hydro planning
- Generation Planning
- Transmission Planning
- Distribution Planning
- Financial and Tariff Studies
- Institutional Aspects

In terms of Purpose-Level results, CIDA anticipated aiding the GOH to improve the electricity subsector planning and strengthening ENEE's planning capabilities. The Ley Marco del Sub-Sector Eléctrico, issued on 26 November 1994, has introduced one of the most radical

institutional modifications in the region's electricity sub-sector. ENEE, a publicly owned vertically integrated utility, has become an independent regulator.

- This radical institutional reform has highlighted the relevance of the PSMP. It continues to provide guidelines to forecast future demand and to prioritize future investments. In line with the Ley Marco (Article 7), many functions now correspond to CNEE and other governmental organizations.
- The electricity sub-sector's biggest challenge today is the application of the Ley Marco by, both, governmental organizations and private sector through suitable regulations and associated instruments.

In terms of Goal-Level results, CIDA's goal was to assist the GOH in the efficient development and utilization of electricity related resources. Under the structural modifications undergoing the subsector, this is being achieved through the interface of the PSMP with the private sector.

This Project produced results that were most prominent in the micro-, meso- and macro-levels.

Micro-Level Results

- The training component of the PSMP Project produced a self-motivated cadre with potential for sustainability because of the cadre's ostensible ownership of the Project concept.

Meso-Level Results

- There has been a successful transfer of power planning technology to ENEE's planning department and CNEE to respond to the requirements of privatization and the co-ordination of electricity planning within Central America.

Macro-Level Results

- The GRC Project delivered the first rigorous analysis of electrical integration within a regional process.
- The follow-up meetings by the Isthmus'Electrical Utility Companies (IEUC) executives held in Managua (4-6 October, 1995) offered the opportunity to enhance the Central American Electrification Board (CEAC) institutional capacity. It became the keystone for coordinated action within the regional framework.
- The management of the IEUC decided to overcome the barriers for coordinated action. These have clear sustainable potential:
- During the 1996-1997 work program the Working Groups on Security and Operative Planning conducted studies on their own.
- The IEUC possess now a methodology and software to calculate the costs of generation and transmission together with the losses and wheeling charges in transmission. Thus, it has possess now the conceptual framework for payment procedures in the exchange of electricity

The PSMP left two outputs for further reconsideration.

- The conditions of sustainable rural electrification have not been identified.

Availability of electricity does not necessarily lead to increased levels of output or agro-processing. Regional experience suggests that it is tenure security that entices farmers to invest their time and resources to increase productivity and output. To the extent that electricity reduces the cost of energy in agricultural production or agro-processing the opportunities for sustainable rural electrification may emerge.

- The studies conducted in relation to women users of electricity so they could benefit from efficient sub-sector planning were unfocused. Thus, the constraints and opportunities to expand women's productive capacity in the sub-sector were not examined. Neither were goals or strategies proposed to advance women's productive capacities in the sub-sector. Therefore, gender-sensitive indicators were not developed.

Key Factors Explaining Project Results

Development Results

The PSMP Project met the needs of the Honduran energy sector in general, and those of the ENEE in particular. The trainee cadres currently are staff members of ENEE and CNEE that have begun regulating the electrical sub-sector.

The GRC Project has equally responded to regional needs. Indeed, by enhancing CEAC's institutional capabilities, it has become possible to take advantages of co-ordinating operations at higher levels of integration.

The GRC Study highlighted the lessons; learned bearing on electrical sub-sector's corporate structuring and regulations. Practical lessons from reforms and experiences of other countries have been drawn as well.

- These results are consistent with CIDA's policies. At the time of PSMP Project design (1989) CIDA's policies included three general objectives: sustainable development of natural resources; support for structural adjustment; and poverty alleviation. The Project was implemented taking these policies into account.
- Forthcoming hydro development will take into, account environmental considerations in their design.
- A final verdict on poverty alleviation is unclear. It may come as result of rural electrification.
- The constraints and opportunities to expand women's productive capacity in the sub-sector need reconsideration. The Project, however, trained 4 women out of a group, of 14 ENEE employees. No particular obstacle faced ENEE women during this training.

Appropriateness

All stakeholders met during the field visit (see Appendix B) were satisfied with the commitment and methods chosen to achieve results by the CEA, ECLAC and CIDA. The criticism of PSMP was, constructive.

Canada is endowed with the entire human and capital resources required to provide the services needed in these Projects. In short, the match between Project needs and expertise among Project participants was satisfactory. Flexibility in management at the CIDA level facilitated the achievement of Project results.

Appropriate Human Resources Utilization

Flexibility, together with resourcefulness, was pivotal factors in the achievement of Project results. For example, when the need to foster new partnerships arose to ensure sustainable results at the regional level, CIDA Project Team asked ECLAC to participate in the GRC's execution. ECLAC brought to this effort more than 30 years of regional experience in electrical energy development. Most likely, a structured approach to project management would have had limited results.

CIDA's Project Team showed competent leadership skills and flexible management procedures for project execution. It has shown the benefits of building a learning organization. By contrast, ENEE's lack of policy in human resource training introduced frictions between trainees and peers, among others.

Policy Themes and Issues

Equity and Access

The enactment of the Ley Marco fostered by the Project has delegated a demanding role to the private sector that must shoulder broader responsibilities, such as providing quality services to society at competitive prices.

In the milieu of public sector reforms a small business-class of enlightened entrepreneurs is emerging. In the final analysis, it is transparent and accountable rules to conduct business linked with good governance that will ensure the sustainability of the electricity sub-sector's privatization process.

Capacity Building

Though it is difficult to discern the cost of investment on people, it has been shown that investing in people has a higher return than on roads and dams; but the fruition period is much longer: it may take a generation. It is essential to begin documenting the results and costs associated in capacity building. These can be done as case studies.

Lessons and Recommendations

Lessons

Policies

- Training plays a vital role in institution building. Although it is difficult to quantify, investing in people through training appears to have a higher return than on physical infrastructure. Canada has comparative advantages in training resources and capabilities. These provide considerable opportunities for CIDA's mandate to promote economic growth within the framework of poverty reduction.
- Within the framework of the contractual agreement, the CEA's PCR should be a source-document bearing witness CEA's accountability of public funds. CEA must show a full account of resources used within the framework of project objectives supported by a project database.
- In the context of countries in the process of institutional evolution, flexibility in management procedures is vital to ensure expected results, provided it is based on framework of a development strategy. In the ongoing world of institutional evolution provoked by the globalization process, this lesson is relevant for CIDA's mandate.

For Country Programs

- Training programs should consider conditions in the selection of trainees, such that:
- Trainees have a clear position including freedom from other responsibilities.
- Trainees have a job to go back to.
- Trainees have an obligation to use training obtained for a minimum of time agreed.

For Projects

- Training delivery should consider the language of trainees despite the world-wide predominance of English and French languages.
- For sustainability purposes, high quality presentation of handbooks, manuals, is of critical importance.

Recommendations

Capacity Building: Training Programs

- Consider documenting the results and associated costs of training projects as case studies. These should be conducted by subject matter, region, methods used and associated -costs. This information will be central for the design and costing of future projects.

Sustainability of Training Programs

From the standpoint of the recipient organization, for the selection of trainees there must be at least three factors in the human resource policy concerning training:

- Trainees should have a clear position including freedom from other responsibilities.
- Trainees should have a job to go back to after training.
- Trainees must have an obligation to use training obtained for a minimum of time agreed beforehand.

From the standpoint of trainers, despite the worldwide predominance of English and French languages,

- The delivery of training should consider the use of the trainees language.
- High quality presentation of handbooks, manuals and other training material, is of crucial importance because they may have application in the region or elsewhere.

Project Completion Report

Consider using the CEA's PCR as a source-document to enhance the effectiveness of the evaluation processes.

- From the project database, the crux of the PCR, the CEA must show quantitatively the results obtained and impacts. Thus, the core task of the evaluation will be to appraise the CEA's PCR with particular reference to results obtained and induced impacts.
- This approach will enhance the review of issues and drawing lessons rather than collection data to reconstruct what happened in the absence of a project database.
- It should be cost effective since the PCR supported by the project database is drafted from information available with the CEA.