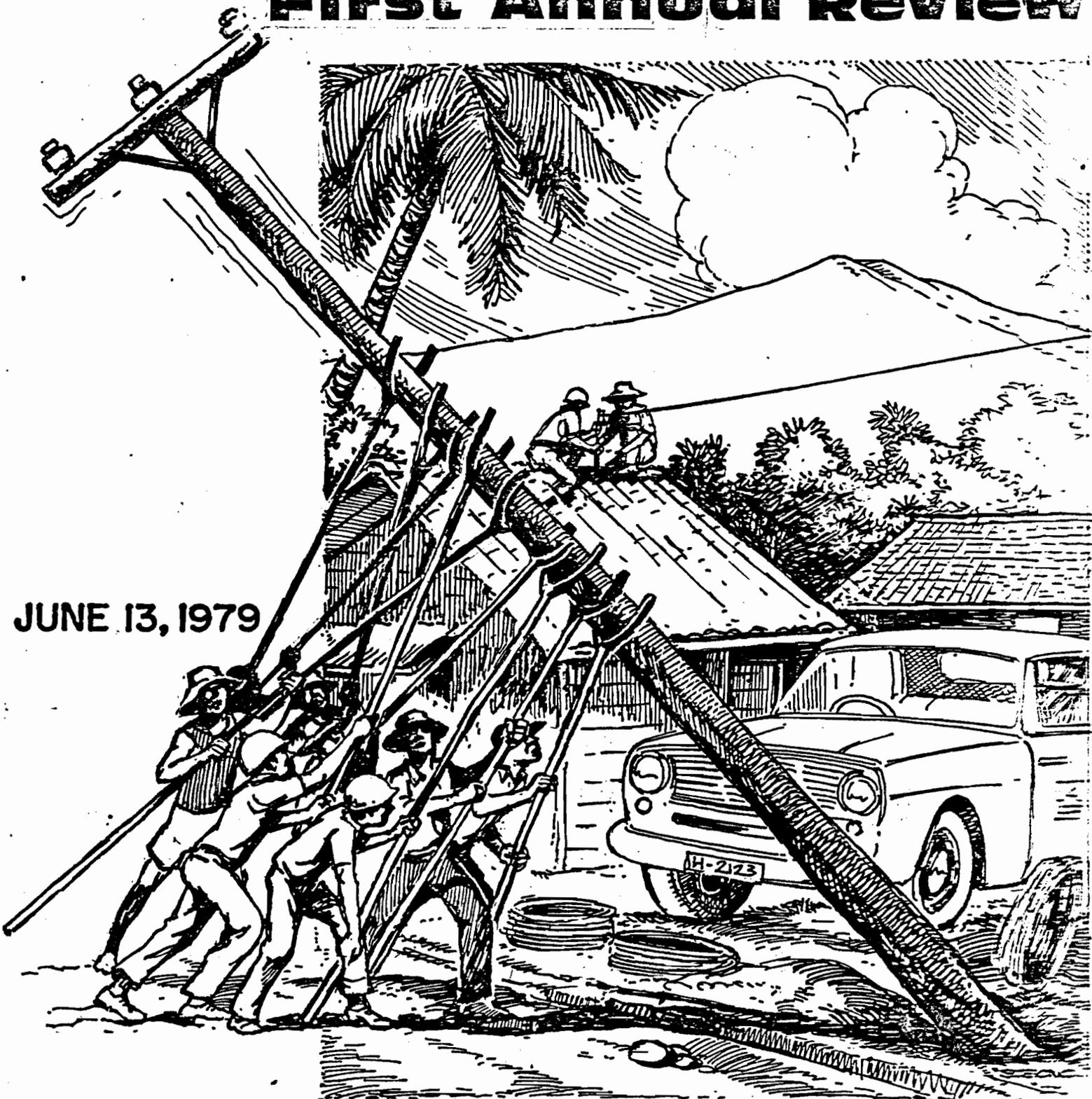


# RURAL ELECTRIFICATION

## First Annual Review

JUNE 13, 1979



USAID LOAN 497-T-052  
USAID GRANT 497-0267

PROJECT EVALUATION SUMMARY (PES) - PART I

PROJECT TITLE  
Rural Electrification I

2. PROJECT NUMBER (9) - 0267-Loan 497-T-052  
3. MISSION/AID/W OFFICE  
Jakarta  
4. EVALUATION NUMBER (Enter the number maintained by the reporting unit, e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) 79-1  
 REGULAR EVALUATION  SPECIAL EVALUATION

KEY PROJECT IMPLEMENTATION DATES  
A. Final Obligations Expected FY 78  
B. Final Inflow Obligations Expected FY 83  
C. Final Inflow Obligations Expected FY 83

6. ESTIMATED PROJECT FUNDING  
A. Total \$ 93 M  
B. U.S. \$ 36 M

7. PERIOD COVERED BY EVALUATION  
From (month/yr.) 3/78  
To (month/yr.) 6/79  
Date of Evaluation Review

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; also those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., telegram, SFAR, PID, which will present detailed request.)

E. NAME OF OFFICER RESPONSIBLE FOR ACTION

C. DATE ACTION TO BE COMPLETED

There are no major issues or actions which require the attention of AID/Wash. or the Mission Director at this time.

David Devin  
USAID Project Officer

Clearances:  
PTE: REDavis  
PRO: RZimmerman  
PRO: RCohen

Drafted by: David W. Devin, Project Officer

9. INVENTORY OF DOCUMENTS TO BE REVIEWED FOR ABOVE DECISIONS  
 Project Paper  Implementation Plan (e.g., CPI Network)  Other (Specify)  
 Financial Plan  PID/T   
 Logical Framework  PID/C  Other (Specify)  
 Project Agreement  PID/P

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT  
A.  Continue Project Without Change  
B.  Change Project Design and/or Change Implementation Plan  
C.  Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Name and Title)  
See attachment for Participants.

12. Mission/AID/W Office Director Approval  
Signature

Typed Name  
Thomas C. Niblock, Director

Date  
June 15, 1979

LIST OF PARTICIPANTS ATTENDING THE JUNE 13, 1979  
USAID EVALUATION OF THE RURAL ELECTRIFICATION I

I. Indonesian Government Representatives

a. Junior Minister for Cooperatives

1. Ir. Sjoufjan Awai, S.A. to the State Minister for Cooperatives.

b. Ministry of Finance

2. Drs. Djamhar Somaatmadja, Directorate General of Foreign Moneter Staff.

c. Directorate General of Energy

3. Ir. F. Tambunan, Chief of Sub-directorate for Power Usage.

d. Directorate General of Cooperatives

4. Drs. Mamiet Marjono, Director for Coops Business Affairs.

e. Project Development Office

5. Mr. Abdul Djepar Pringgohandoko, Acting Head of PDO.
6. Col. Sugiyartono, Special Staff to Head of PDO.
7. Ir. Adi Muhardi, Chief of Technical Division.
8. Mr. Surono, Chief of Administration.
9. Drs. A. Markam, Special Staff to Head of PDO.
10. Mr. Ismail, Chief of Secretariate Division.
11. Ir. Masfadjar, Chief of Materials Section.
12. Mrs. Indrarty Buchari, S.H., Secretariate Section Chief.

f. State Power Company, PLN

13. Ir. Margono Halimoen, Foreign Aid.
14. Ir. Sambodho Sumani, Chief of Technical Division for R.E.
15. Mr. Soewarno, Foreign Aid
16. Ir. Yuzwar, Deputy Chief Construction, P.I. Ring Central Java.
17. Ir. Soemarto Soedirman, Chief of Operation and Maintenance for R.E.

g. Bank Indonesia

18. Mr. Soewadji, Foreign Aid Staff.

h. Bank Rakyat Indonesia

19. Mr. Iljas Hanafi, Foreign Aid Staff.

II. Canadian Government Representatives20. Mr. Howard R. Balloch, Second Secretary,  
Canadian Embassy.21. Mr. D.E. Chaplin, First Secretary for Canadian  
International Development Agency (CIDA).III. USAID/Jakarta

- 22. Mr. Thomas C. Niblock, Director.
- 23. Mr. Raymond Cohen, Acting Deputy Director.
- 24. Mr. Richard Johnson, Program Economist.
- 25. Mr. Robert F. Zimmerman, Evaluation Officer.
- 26. Mr. David W. Devin, R.E. Project Officer.
- 27. Mr. Robert E. Davis, Acting Chief Engineer.
- 28. Mr. Benjamin Hawley, IDI.
- 29. Mrs. Mary Lewellen, IDI.
- 30. Mr. Douglas Murphy, Summer Student.
- 31. Mrs. Lanna W. Lubis, R.E. Admin. Assistant.
- 32. Mr. Edi Satianto, Electrical Engineer.
- 33. Mr. Jack Wright, Electrical Engineer.

IV. Consultantsa. N.R.E.C.A.

- 34. Mr. Dennis Wilson, Team Leader.
- 35. Mr. Paul O. Swanson, R.E. Specialist.
- 36. Mr. Sam T. Adkins, Central Java Management  
Consultant.
- 37. Mr. Ray Shoff, Training Officer.

b. Chas. T. Main International, Inc.

- 38. Mr. Howard Johnson, Acting Projects Director.
- 39. Mr. Raymond N. Key, Business Manager.

RURAL ELECTRIFICATION I - PES  
AID LOAN 497-T-052  
AID GRANT 497-0267

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13. SUMMARY - The project involves constructing and placing in operation ten separate rural electric distribution systems, seven in Central Java and three in the outer islands. These ten service areas have a population of over two million people who compose about 400,000 families living in over 640 small and very rural villages, now totally without electricity except for a scattered few, small, private generators of 50 KW or less. The project is intended to provide electricity to at least 50% of the people in these villages at a price they can afford, to assist them in wiring their homes, and to promote the use of electricity in productive enterprises. The project expects to demonstrate that electricity can be provided to the rural areas of Indonesia at a price which the majority of the people can afford through unit systems that are technically sound and financially viable and that the introduction of electricity to the selected areas will bring about a significant increase in production and employment opportunities and improve the quality of life of the rural poor. Another purpose is to train a sufficient cadre of Indonesian experts in all phases of rural electrification so as to manage and expand the program.

The project is a multidonor effort with the Canadian Government (CIDA) financing the generation plants for the three outer island projects and the Royal Netherlands Government (Dutch) financing part of the distribution wiring for the seven Central Java Systems. The project financing is as follows:

<u>Country</u>	<u>Amount</u>	<u>Date Signed</u>
USAID Grant	US\$ 6 million	March 30, 1978
USAID Loan	US\$30 million	May 6, 1978
CIDA Grant	US\$ 1.8 million	November 16, 1978
CIDA Loan	US\$21 million	October 13, 1978
Dutch Loan	US\$ 5 million	March 21, 1979
GOI	US\$30 million	Same as above
Total	US\$93.8 million	

The seven Central Java Systems are being constructed by the State Power Company (PLN) which will also operate and maintain the completed systems. The three outer island systems are

being administered by the Directorate General of Cooperatives (DGC). The DGC will assist three private cooperatives to design, construct, and operate their own rural electric systems.

The first year of the project achieved considerable progress in laying the foundations which should result in smooth implementation in future years. Both PLN and the DGC have increased their staffs, and the DGC has established a special Project Development Office (PDO) to implement the project. About 68 Indonesian Officials were sent for orientation tours of the highly successful Philippine Program, 39 from PLN and 29 from DGC/PDO and local government. USAID, with the advice and approval of PLN and DGC, selected C.T. Main as its consultant for design and construction supervision, and the NRECA for organization, management, operation, maintenance and training assistance. Contracts were negotiated and signed with these consulting firms and some 17 long term consultants have arrived in Indonesia with their families and have begun work. These contracts are being financed by the USAID Grant Agreement.

Both PLN and DGC/PDO have prepared detailed project implementation plans covering organization, construction activities, training, and productive uses. Both PLN and DGC have submitted to USAID a schedule for the long term evaluation of the project. Preliminary arrangements for conducting this evaluation have been made by PLN, DGC, USAID and the US Bureau of Census. In addition, USAID consultants are working with PLN, DGC/PDO, and the Bandung Institute of Technology on an Environmental Assessment of the project.

PLN and USAID have agreed on the tariff structure to be used at least initially on the PLN demonstration project.

PLN using its own "off the shelf" materials has constructed a demonstration project in three villages in Klaten, Central Java. As of June 1, 1979 they had connected up over 600 houses. It is expected that within another 45 days over 1750 families, representing 70% of the residents of these villages, will enjoy the benefits of electricity in their homes and a productive uses program will be initiated. The DGC/PDO is also planning a demonstration project in East Lombok which should be energized by December 1979.

The DGC/PDO has organized and granted charters to its three outer island cooperatives. These cooperatives have elected Boards of Directors and Auditing Committees, approved by-laws, and hired temporary managers and other key staff. Financial

arrangements are being finalized between the Ministry of Finance, Bank Indonesia, Bank Rakyat Indonesia and the DGC/PDO to provide loans to these coops for the construction and operation of these systems. The DGC has bought suitable land at each site for headquarters complexes and have begun building housing for the consultants in Luwu. They are also paying staff salaries until the loans for operation and construction are signed with the Bank Rakyat Indonesia.

PLN has also selected their headquarters sites. C.T. Main is working with both agencies in the mapping, staking and design of the distribution systems as well as on the design of the headquarters complexes. The first procurement documents (IFBs) for PLN's tools and construction equipment and the DGC/PDO poles have been prepared and the other IFBs are in process.

14. EVALUATION METHODOLOGY - This is the first evaluation of this project. It is based upon recent field trips to the sub-project sites, on discussions with GOI counterparts in PLN, DGC/PDO, other GOI national, provincial and local officials, expatriate consultants from NRECA and C.T. Main, other donor personnel and USAID staff.

15. EXTERNAL FACTORS - None at this time

16. INPUTS - The inputs of the project consist of funding from the GOI, AID, the Canadian and Dutch governments, technical assistance, and training.

(a) Funding - The AID, CIDA and Dutch Grants and Loans were negotiated and signed with the GOI. \$476,000 of the AID Grant have already been disbursed for technical assistance and training. The GOI has also expended approximate Rp.247,000,000 for DGC and Rp.1,457,000,000 for PLN. The PLN budget for IFY 78/79 was sufficient to mobilized and keep the seven subprojects in Central Java moving ahead approximately on schedule. The DGC budget for IFY 78/79 was inadequate, resulting in serious delays in the start up of the three outer island subprojects. Reasons for this budget shortfall include (i) the use of inadequate estimates for support of technical assistance supplied by USAID, (ii) overly conservative estimates of the technical requirements for the DGC/PDO staff, in particular office space and travel requirements, and (iii) budget revisions by BAPPENAS because of low standards set for salaries, office space staff housing, vehicles, maintenance, and the expectation that the DGC/PDO would not spend all the funds allotted.

# Legend

- ① A/E CONTRACT SIGNED
- ② A/E START DESIGN WORK
- ③ CIDA CONSULTANT STARTS DESIGN
- ④ START HEADQUARTERS CONSTRUCTION
- ⑤ START SYSTEMS CONSTRUCTION
- ⑥ COMPLETE HEADQUARTER CONSTRUCTION
- ⑦ INTERIM GENERATORS INSTALLED
- ⑧ FIRST VILLAGE ENERGIZED
- ⑨ CANADIAN GENERATORS INSTALLED
- ⑩ CUSTOMER CONNECTIONS

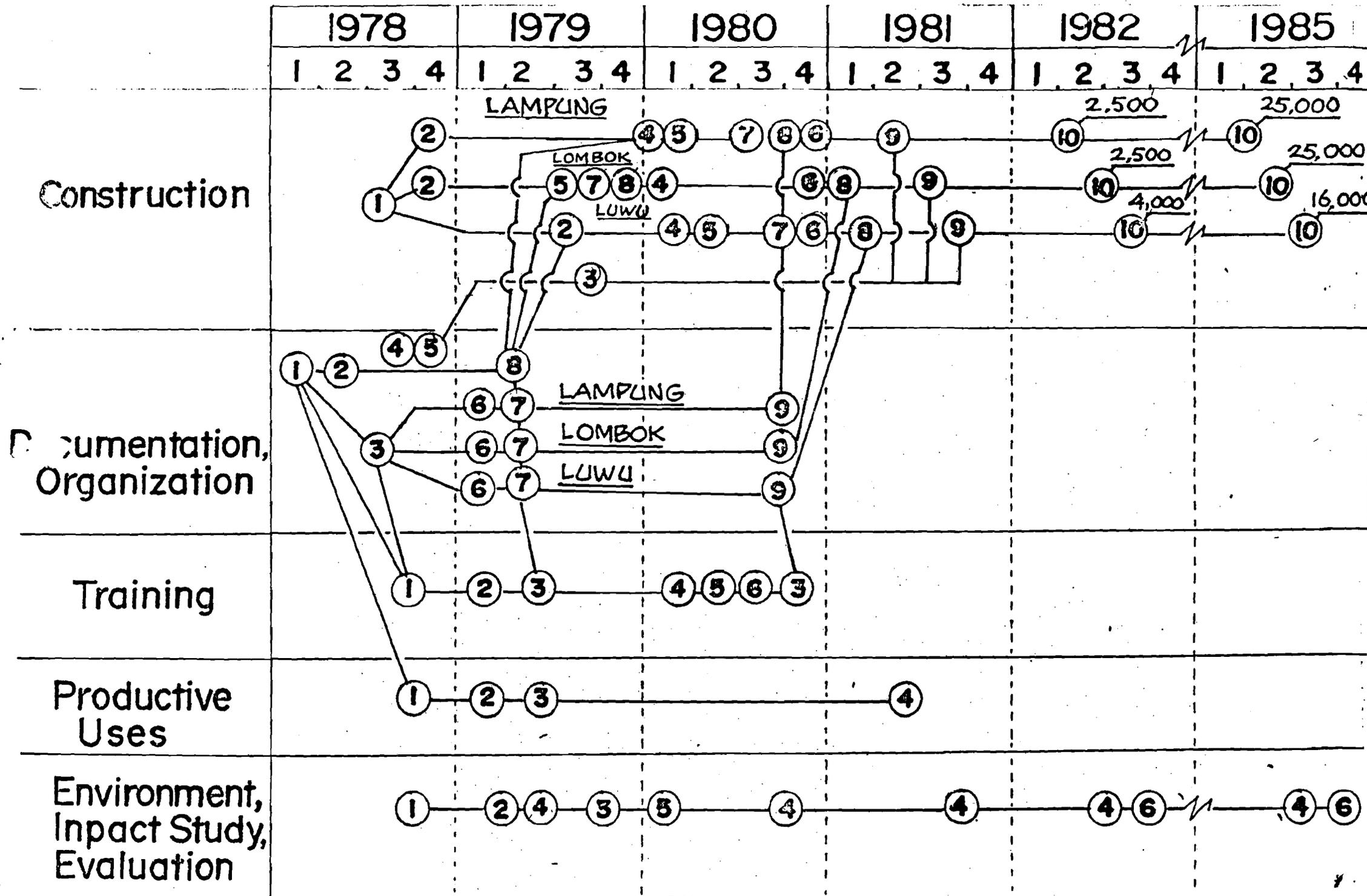
- ① GRANT AGREEMENT SIGNED
- ② LOAN AGREEMENT SIGNED
- ③ NRECA CONTRACT SIGNED
- ④ CIDA LOAN FOR GENERATORS SIGNED
- ⑤ CIDA GRANT SIGNED
- ⑥ START ORGANIZING COOPS
- ⑦ INTERIM BOARD APPOINTED
- ⑧ CONDITIONS PRECEDENT MET
- ⑨ PERMANENT COOP BOARD ELECTED

- ① PDO ADMINISTRATION JAKARTA
- ② KECAMATAN OFFICIALS AT SITE
- ③ GEN. MGR & KEY STAFF - PHILIPPINES
- ④ ACCOUNTING STAFF - JAKARTA
- ⑤ LINE MEN
- ⑥ HOUSEWIRING

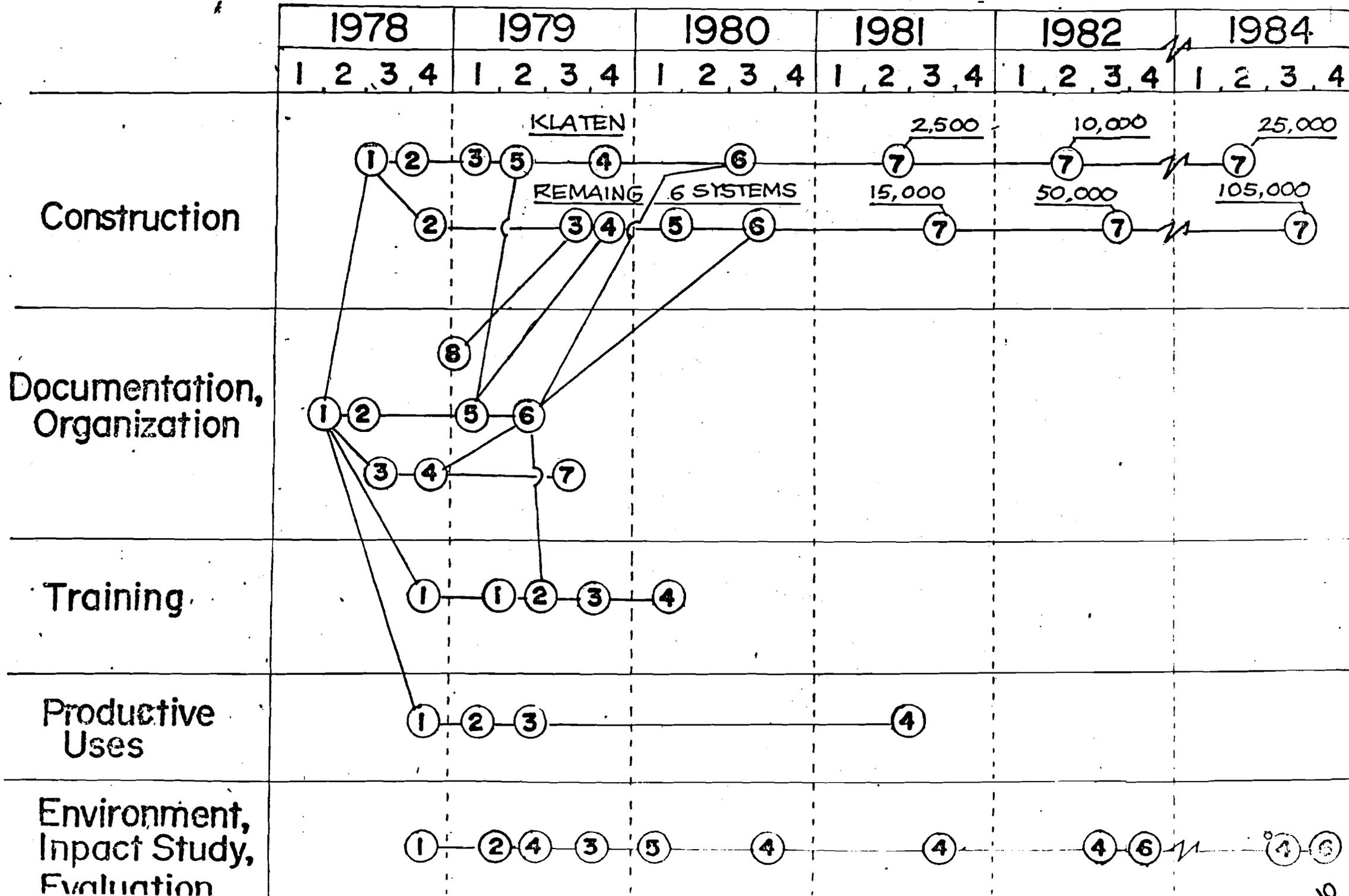
- ① PRODUCTIVE USES CONTRACT SIGNED
- ② SCOPE OF WORK & PROGRAM APPROVED
- ③ TEAM ARRIVE & STARTS WORK
- ④ WORK COMPLETED

- ① ORGANIZE DATA TESTING TEAM
- ② TEST MIN. OF INTERIOR DATA
- ③ ENVIRONMENTAL ASSESSMENT
- ④ PROJECT EVALUATION
- ⑤ BASELINE DATA
- ⑥ IMPACT STUDY

# RURAL ELECTRIFICATION I - DGC IMPLEMENTATION PLAN



# RURAL ELECTRIFICATION I- PLN IMPLEMENTATION PLAN



BEST AVAILABLE COPY

# Legend

- ① A/E CONTRACT SIGNED
- ② A/E STARTS DESIGN WORK
- ③ START SYSTEMS CONSTRUCTION
- ④ START HEADQUARTERS CONSTRUCTION
- ⑤ FIRST VILLAGE ENERGIZED
- ⑥ COMPLETE HEADQUARTERS
- ⑦ CUSTOMER CONNECTIONS,

- ① GRANT AGREEMENT SIGNED
- ② LOAN AGREEMENT SIGNED
- ③ NRECA CONTRACT SIGNED
- ④ NRECA-PLN ADVISOR - SEMARANG
- ⑤ CONDITIONS PRECEDENT MET
- ⑥ APPOINT MGRS & KEY STAFF
- ⑦ SEP UP COST ACCOUNTING - NRECA
- ⑧ DUTCH LOAN AGREEMENT SIGNED

- ① TRAINING & ORIENTATION PHILIPPINES
- ② KEY STAFF TRAINING - PHILIPPINES
- ③ LINEMAN
- ④ HOUSEWIRING

- ① PRODUCTIVE USES CONTRACT SIGNED
- ② SCOPE OF WORK & PROG. APPROVED
- ③ TEAM STARTS WORK
- ④ TEAM COMPLETES WORK

- ① ORGANIZE DATA TESTING TEAM
- ② TEST MIN. OF INTERIOR DATA
- ③ ENVIRONMENTAL ASSESSMENT
- ④ PROJECT EVALUATION
- ⑤ BASELINE DATA STUDY
- ⑥ IMPACT STUDY

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(b) Technical Assistance - A three-year contract was signed on August 23, 1978 with the National Rural Electric Cooperative Association (NRECA) to provide 298 man-months of consulting services in the organization, operation, maintenance of the distribution systems, and training. Another three-year contract was signed on September 18, 1978, with Charles T. Main International (CT Main) to provide 467 man-months of consulting services for the design and construction supervision of the distribution systems and headquarters complexes. Because C.T. Main already had a six-man team in-country finishing another contract with PLN, mobilization was not required. They were able to quickly begin work on the mapping, staking, and design of the systems for PLN which was able to provide full financial, logistical, and technical support. On the three outer island subprojects, C.T. Main has encountered considerable difficulties not only because of the budgetary constraints mentioned above and the remoteness of the project areas but also because C.T. Main expected that the DGC would provide them with 330 man months of technical support from a local subcontractor. A subcontractor could not be agreed upon, and USAID is no longer encouraging the DGC/PDO to find one. Instead, plans are now underway to increase both PDO's and C.T. Main's engineering staffs and to do the job by force account. C.T. Main now has a ten-man permanent team in-country and will eventually employ sixteen expatriates.

The NRECA took a little longer to mobilize. They had one consultant in-country at the time of contract signing, and the team leader arrived in November 1978. By March of 1979 the staff had increased to six long-term consultants and one short-term. The contract calls for seven long-term consultants, though this number may be increased to ten. To date, they have assisted DGC in the organization of the Coops, the writing of job descriptions, and by-laws. They have also assisted both DGC and PLN in the preparation of Implementation plans and in the establishment of demonstration projects in the three villages in Central Java and in one village in East Lombok.

(c) The CIDA Grant provides for 325 person-months of technical assistance for the design and construction of the generation plants for the three outer islands, as well as training in their operation and maintenance. A contract has been negotiated and signed with Sandwell and Company of Vancouver B.C. for these services, and the advance team is expected to arrive in late June 1979.

(d) Training - Training plans were prepared by both PLN and the PDO with the assistance of the NRECA Training Consultant as part of the overall implementation plan. Over the next three years PLN plans to train 758 people in 22 in-country training courses and 71 people in the US and in the Philippines. Likewise, in the same time period the DCC/PDO plans to train 350 people through 30 in-country training courses and 32 people in the US and in the Philippines. Estimates are that this training program will cost approximately \$920 thousand instead of the \$600 thousand provided for in the USAID Grant and Loan Agreements. The reason for this increase is that both the numbers of people to be trained and the numbers and type of training courses has been significantly expanded over the estimate made in the project paper. For example, the PP estimated that 300 Coop and only 140 total PLN staff would receive training. Both the GOI and USAID agree on the importance of this training to project success and funds are being sought by both parties to provide this training.

Under separate contracts AID has also provided 4 months of consulting services of a productive uses planner and 4 months of an expert to conduct an Environmental Assessment (EA). Many of the ideas taken from the report of the Productive Uses Planner have been incorporated into the Implementation Plans of both PLN and the DCC. The EA is still underway.

## 17. OUTPUTS

### (a) Plans, Specifications and Procurement Documentation (IFBs)

The implementation plans prepared by PLN and DCC/PDO are very comprehensive plans and among the best USAID has ever received on any project. While flexible, they describe in considerable detail how the subprojects will be organized, constructed, the training plan and a plan for stimulating productive uses of the electricity. Both agencies are to be commended for the high quality of these plans.

Mapping and staking of two of the outer island sites and six of the seven Central Java sites is underway. To date 2076 kilometers of three-phase primary feeders and associated single phase and primary taps have been staked and 394 field staking sheets have been prepared in Central Java. Likewise 176 kilometers of lines have been staked and 15 field staking sheets have been prepared for the outer island subprojects. This represents 71% of the estimated total for Central Java and 23% for the two outer island subprojects started thus far.

PLN's IFB's for tools and construction equipment has been finalized and only awaits the signing of a subloan agreement between PLN and the Ministry of Finance before issuance. The IFB for local procurement of poles for the cooperatives is likewise prepared and has been submitted to the DGC/PDO and USAID for review. PLN will prepare their own IFB's for poles. The Dutch procurement documents for PLN's conductor are in final stages of preparation. The hardware IFB's for both PLN and DGC are being prepared and it is expected that all IFB's will be issued by August 1979.

(b) Headquarters Facilities - The DGC has bought the necessary land in Luwu and Lampung and 1.75 hectares in Lombok. The remaining 4.25 hectares in Lombok will be purchased in the near future as soon as DGC receives its annual budget allotment. PLN has selected centrally located sites at each of the seven areas in Central Java and only await the approval of their IFY 79/80 budget to purchase them. C.T. Main is working on the design of the outer island complexes and will assist PLN in their design as well as perform construction supervision for all ten sites.

(c) Operating Electric Distribution Systems - PLN has lent its own materials to the project and has constructed and placed in operation a demonstration R.E. project covering the first three villages leading out from the Klaten substation in Central Java. This has involved construction of 17 Km of three phase and single phase lines, 26 Km of Secondary underbuild, setting 483 poles, 32 transformers and the wiring to date of over 600 houses. Within the next 45 days, it is expected that 70% of the 2500 homes in these three villages will be enjoying the benefits of electricity. PLN also plans to promote the community and productive uses of electricity in these three villages. Although project materials were not used for this effort, technical assistance has been provided, and construction has followed as closely as possible system design for the overall project. PLN will be reimbursed for their materials when the project materials arrive. It is expected that this demonstration effort will show among other things that the rural poor of Central Java want and can afford electricity. The U.S. Bureau of Census team has visited the three villages and plans are underway for a mini-evaluation of its immediate impact for use in developing the R.E. II Project Paper.

(d) Internal Housewiring - Both PLN and DGC have developed basic designs and material specifications for housewiring with assistance from the consulting teams. IFBs for procurement of materials are now being prepared. As mentioned above over 600 houses in the Klaten demonstration effort have been already wired by PLN. They have 40 people employed for this purpose.

(e) Training Courses Completed and Trained Personnel  
 In-country training courses have been held for PDO staff, the Coop Boards of Directors, the Auditing Committees, temporary managers, and other local government officials associated with the outer island projects. A total of 749 Indonesians including local government officials and informal village leaders received in-country orientation training in support of the outer island subprojects. In addition 68 Indonesians have been sent for orientation tours of the highly successful Philippine Program in the past year. This includes 39 PLN officials and 29 DGC/PDO staff and local government officials.

(f) Billing and Collection System - A short-term consultant from NRECA worked with PLN and the DGC for about six weeks in the design of an accounting system for the project. The NRECA has also made recommendations for billing and collecting, but implementation will have to await energization of the systems. The billing and collection systems in the demonstration project is the same as PLN's present system for urban customers in Central Java and is being handled by personnel from the Klaten PLN sub-branch office.

(g) Evaluation Feedback - Staff from the U.S. Bureau of the Census (BUCEN) which assisted the NEA conduct the evaluation of the Philippine Program has visited Indonesia twice in the past six months, and preliminary arrangements have been made with PLN and DGC to conduct a similar evaluation of the Indonesian R.E. Program over the next five years. This evaluation will be the responsibility of PLN and DGC which have agreed to assign staff as required to this effort. The U.S. BUCEN personnel will train and assist PLN and DGC to conduct the evaluation.

18. PURPOSE - The purpose of this project is to demonstrate that electricity can be provided to the rural areas of Indonesia at a price which the majority of the people can afford through systems which are technically sound and financially viable and that the introduction of electricity to the selected areas will bring about a significant increase in production and improve the quality of life of the rural poor. Another purpose is to train a sufficient cadre of Indonesian experts in all phases of rural electrification so as to manage and expand the program.

While it is too early to evaluate the project purpose, USAID remains optimistic that by 1983 the End of Project Status as described below will be achieved.

(1) Seven rural areas in Central Java including over 400 villages will be provided with reasonably priced, reliable electric power 24 hours a day from the PLN grid. These areas

have a combined population of over 1.3 million people including approximately 260,000 families. It is expected that at least 50% of these people will enjoy the benefits of electricity in their homes and nearly all the people living in these areas will benefit through street lighting, the lighting of schools and other public buildings, the increased use of refrigeration and ice in markets and restaurants, the use of irrigation pumps, potable water pumps and other productive usages.

(2) Three rural areas in the Outer Island districts of Central Lampung, East Lombok and Luwu including almost 200 villages will be provided with reasonably priced, reliable electric power 24 hours a day by member-owned and managed electric cooperatives. Likewise the combined population of these areas is over 650,000 including approximately 130,000 families and it is expected that at least 50% of them will be connected to the system. All the other people in the area will benefit in much the same manner as described above for the Central Java systems.

(3) A three-phase backbone system expandable to serve additional residents in all these areas.

(4) An active power usage program at each of the ten areas which is working with local leaders and private individuals to promote a whole host of productive power use projects and enterprises.

(5) The existence at each site of a three to four hectare headquarters site (six or ten Ha in the outer islands) complete with office space, warehouse, storage yard, maintenance facilities and as necessary staff housing.

(6) Each system will have a fully trained and functioning management and operating staff to operate, maintain and expand their service.

(7) Both PLN and the DGC will be fully capable of organizing financing, designing, procuring materials for, supervising construction and initial operation of rural electric systems.

(8) The Project will have been continually evaluated during implementation and the first three years of operation by a local research contractor working under the direction of PLN and the DGC. This evaluation will provide a continuous flow of feedback information to the GOI and USAID project managers and will indicate the linkages between project purpose and the sector goal.

19. PROGRAM OR SECTOR GOAL - The goal of this Project is to improve the standard of living and increase productivity of the rural population in ten selected areas of Indonesia.

Again while it is too early to evaluate this goal, USAID is optimistic that the provision of electric power to these areas should bring a new dimension to the package of existing rural development programs that together will improve productivity and employment opportunities as well as raise the quality of life for the people who live in the target areas.

There is a very large number and variety of potential productive uses of electricity in these ten rural areas, most of which could benefit the poor and the very poor. A partial list would include rice and other grain mills, irrigation, poultry farms, sugar processing, copra, tobacco and other food processing, refrigeration in shops, sawmills and box factories, rattan furniture and other woodworking shops, hollow blocks, floor and roof tiles and pottery factories, blacksmith, machinery and repair shops, food, pharmacy and general merchandise stores. Many of these activities already exist in the target areas using substitute forms of power. However, in other countries the extension of electricity to the rural areas caused significant increases in the number of new activities as well as increased output from existing farm, commercial and agro-industrial enterprises. There is strong reason to believe that this will also occur in Indonesia.

In addition to stimulating production in the selected areas, the introduction of electric power into these rural areas should generate considerable employment thus making a contribution to one of Indonesia's more intractable problems. For example, one Co-op in the Philippines reports that in the four years since energization twenty-five new business enterprises have been established creating a total of 430 new jobs. This does not count additional employment generated at the existing firms or home industry, e.g., handicrafts. Also each system will employ over 100 people in management, operation and maintenance. Extrapolating from this example we estimate that the ten utilities planned to be established in this proposed project should create at least 5,000 new jobs in small to medium scale industry plus untold thousands of new employment opportunities for home and handicraft industries. The project may also demonstrate that further indirect benefits to rural residents will occur through the impact of electricity on such things as potable water supply, quality of health services, availability of education and training, and the nature and quality of government services.

20. BENEFICIARIES\* - The numbers of target villages and households at the proposed project sites are given below:

\*/ Also see attachment

Site	No. of Target Villages	Pop. of Target Villages	No. of Target Households*	Est. Target Pop.	Village Pop. Density**
<u>A. Central Java</u>					
Pek-Pem.	102	242,120	20,000	102,000	1141
Klaten	93	245,105	25,000	120,000	2003
Bant.-Sleman	21	169,964	20,000	84,000	1403
Sragen	47	139,278	15,000	70,000	1132
Magelang	83	175,630	20,000	100,000	1002
Wonogiri	54	167,081	15,000	81,000	872
Banyumas	35	145,301	15,000	75,000	791
<u>B. Outer Isl.</u>					
Luwu	65	132,263	15,000	85,000	34
Lampung	108	272,505	25,000	150,000	590
Lombok	34	262,312	25,000	115,000	828
<b>TOTALS</b>	<b>647</b>	<b>1,952,559</b>	<b>195,000</b>	<b>983,000</b>	<b>-</b>

\* Based upon assumption that 50% of households would connect to the system, an assumption which was made for planning purposes and which has since been confirmed to be within reason by various social/economic surveys.

\*\* Based on average household size at each site.

\*\*\* No. of persons per sq. Km of village land.

Thus a total of 195,000 households (composed of, as shown above, an estimated 983,000 people) in 647 initial target villages will immediately and directly benefit from the project spread effects (through street lighting, the lighting of educational and public buildings, potable water pumps, increased jobs and productivity resulting from more activity in the formal and informal economic sectors, etc.). The project will almost immediately benefit the remaining 1,000,000 people of the target villages even if their households are not electrified. The cost of the project (\$93.8 million) should be less than \$100 per primary beneficiary and less than \$50 per secondary beneficiary.

Tabulations of the data gathered by the 1977 survey of these areas show the following classification of the proposed beneficiaries by primary occupation of the heads of households:

<u>Primary occupation of household head</u>	<u>No. of house- hold heads</u>	<u>%</u>
Farmer	44,743	60.0
Wage laborer	18,200	24.4
Salaried	6,454	8.6
Tradesman	4,078	5.5
Cash crop farmer	1,122	1.5
TOTALS	74,597	100.0 .

From the above table it can be seen that the proposed direct beneficiaries will be the rural poor; the small farmer, the daily wage laborer and the small entrepreneur. Together, they total some 90% of the 74,597 sample households.

From further analysis of the survey data it can be stated that:

(a) The vast majority of the farmers in these areas (37,045 or 82.3% of farmers) cultivate less than one hectare of land; this is at or below the national average holding of 0.98 ha. In general, especially in Java, the land holdings of the cash crop farmers conform to this pattern. Because of this, they are forced into secondary, tertiary and even quaternary occupations to sustain a livelihood so that the line between small farmers and daily wage laborers is hard to delineate. Wage laborers rarely earn over Rp.500 (\$1.20) a day; more usual is half that sum.

(b) Tradesmen are also generally engaged in small-scale enterprises. Of 4,078 tradesmen, 3,499 (86.0% of tradesmen) have a maximum of two employees.

(c) Salaried and professional people, including civil servants, amount to 8.6% of the total sample households and usually constitute the village elite.

(d) Transmigrants (i.e., settlers in newly-opened lands in islands outside of Java) are the predominant potential direct beneficiaries in Lampung and, to a lesser extent, in Luwu. In the latter site, however, many of the possible beneficiaries have never had the opportunity for participation in the national life of the country. The provision of electricity will aid considerably their efforts in this direction.

21. EFFECT TODATE - The project has already caused a great deal of discussion and debate among policy makers within the GOI. They well understand the linkage between RE and Rural Development and have attached priority to the project. These discussions have resulted in the lowering of the burden to consumers, by extending credit for connection and construction costs, the trail use of kilowatt hour meters for small consumers, and the acceptance of rural electric coops, at least on a trial basis, as a complementary institutional vehicle for rural electrification. It is expected that the project will eventually convince the GOI leadership that the model being demonstrated is replicable, appropriate and can be used to electrify the entire country in a financially sound manner.

## 22. LESSONS LEARNED

1. USAID is learning that its consultants will be mobilized more rapidly and work more effectively when the GOI is relieved of the burden of logistical support requirements. USAID took a significant step in this regard by providing housing for Jakarta - based and Lampung, Lombok consultants and some of their vehicles.

2. In planning future projects more precise attention should be given to defining the duties and responsibilities of the consultants as well as their working relationships with their counterparts.

3. More lead time should be allowed for mobilization of the consulting teams and for the provision of local support. A possible solution for alleviating some of the start-up difficulties in the future loans would be to provide for a small draw-down on project loan funds for this purpose prior to satisfaction of all conditions precedent to disbursement for major procurement.

4. Every attempt should be made to reduce to the maximum necessary the number of conditions attached to the loan agreement.

5. USAID should ensure that it has adequate personnel to backstop a project of this magnitude.

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PROJECT TITLE: Rural Electrification

I. Impact on Section 102(d) Criteria: (Rural Dev)

**Increase Agricultural Productivity**

Electrification should enable farmers, either individually or cooperatively to establish electrically powered irrigation pumps for areas where alternative irrigation systems are not physically or economically feasible. This should lead to more extensive and intensive land utilization and a shift  
(Cont'd)

**Reduce Infant Mortality**

Electrification should stimulate improvements in medical and health care and in environmental sanitation through the establishment of local electric-powered water supply systems and the increased investment by rural health clinics and maternity centers in electrical equipment such as sterilizers, refrigerators, x-ray machines, operating lamps, etc.

**Control Population Growth**

Electrification should increase standards of living and quality of life that will generate changes in the consumption and investment patterns and aspirations of the rural households. These factors will raise the opportunity costs of additional children thus creating pressures for limiting further child-bearing. Reinforcing the shifts in the economics of fertility,

**Promote Greater Income Distribution**

(Cont'd)

Electrification should generate increase incomes of the rural poor and increase participation in the labor force by women and the poorest of the poor. Higher incomes should result from increased production from irrigation new farm inputs, or additional land brought under cultivation, increased employment in new or expanded enterprises and higher prices (Cont'd)

**Reduce Un-Under Employment**

Electrification should generate new small-scale business enterprises and stimulate existing firms. It should also help attract medium and large scale industrial enterprises to establish in rural areas. The more intensive labor requirements of irrigated farms as well as the development of idle or unproductive land should generate significant increases in  
And related criteria: (Cont'd)

**Strengthen/Creates institutions which aid social/economic development**

The Electrification of schools, government offices and other institutions should expand their productive use and (Cont'd)

**Improve condition of women: Social/Economic/Political**

Electrification should increase female employment opportunities and incomes and improve the quality of life for women. Electrification and the increased use of machinery tends to equalize the natural strength advantage of men. Studies  
(Cont'd)

## CONTINUATION

### Increase Agricultural Productivity

from cultivation of low-productivity (corn) to high-productivity (rice) cash crops. Farm losses should also be reduced through the use of electrified dryers, grain mills and storage facilities.

### Control Population Growth

The increased social, educational and community activities of children tend to reduce the children's economic value to parents as productive agents. Also the increased incomes and greater opportunities for saving and investment should reduce the need for the traditional investment in children for old age security. Finally the increased evening hours devoted to work and other leisure activities should reduce sexual activity.

### Promote Greater Income Distribution

for farm products. Increased participation for women and disadvantaged groups should result from agricultural changes, increased educational opportunities, industrial and business developments and household use of time.

### Reduce Un-under Employment

agricultural employment opportunities.

### Strengthen/Create Institutions Which Aid Social/Economic Development

increase the quality of their services to the communities thus generating widespread social and economic changes in the rural areas.

CONTINUATION

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Improve Condition of Women: Social/Economic/Political

of electrified areas show that women engage in more productive types of works, work for longer periods during the year and have higher mean annual cash incomes than their counterparts in non-electrified areas. They also benefit from increased numbers and types of household electrical appliances.

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

ANNEX A

Project Title & Number: Indonesia - Rural Electrification

Life of Project:  
From FY 77 to FY 81  
Total U.S. Funding \$48 million  
Date Prepared: August 12, 1977

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><b>Program or Sector Goal:</b></p> <p>The broader objective to which this project contributes:</p> <p>Improved standard of living and increased productivity of rural population in ten selected areas of Indonesia.</p>	<p><b>Measures of Goal Achievement:</b></p> <p>Some of the following are expected to be present as OVI:</p> <ol style="list-style-type: none"> <li>1. Electric lights replacing kerosene in homes and for street lights.</li> <li>2. Markets, stores, homes, restaurants utilizing refrigeration and other appliances.</li> <li>3. Small irrigation (electric pumps) projects increasing yields and allowing for multiple cropping.</li> <li>4. Increased production from small industries and increased numbers of new rural industries.</li> <li>5. New employment opportunities especially for women.</li> <li>6. A slow down in rural migration to cities.</li> <li>7. Correlation of home lighting and decrease in population growth rate.</li> <li>8. Limited school and other public facilities utilized at night.</li> </ol>	<ol style="list-style-type: none"> <li>1. Cooperative, PLN and Government records, Min. of Agriculture records. Observation, research and special evaluations.</li> </ol>	<p><b>Assumptions for achieving goal:</b></p> <ol style="list-style-type: none"> <li>1. Rural electrification is part of an integrated rural development program defined and adopted by which includes agriculture research extension, family planning, crop marketing and rural roads.</li> <li>2. Government policies encourage enterprises.</li> <li>3. Moderate inflation rate.</li> <li>4. Government price, tax and policies support rural development.</li> <li>5. Farmers respond to economic incentives.</li> </ol>

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

ANNEX A  
Page 2

Life of Project:  
From FY 77 to FY 81  
Total U.S. Funding \$48 million  
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Project Title & Number: Indonesia - Rural Electrification

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><b>Project Purpose:</b></p> <p>The purpose of this project is to demonstrate that reliable electric power can be provided to the rural areas of Indonesia at a price which the majority of the people can afford through systems which are technically sound and financially viable and that the introduction of electricity to the selected areas will bring about a significant increase in production and improve the quality of life of the rural poor. A subsidiary purpose is to train a sufficient cadre of Indonesian experts in all phases of rural electrification so as to manage and expand their rural electric systems.</p>	<p><b>End of Project status:</b></p> <ol style="list-style-type: none"> <li>At least 50% of a combined population of 1.3 million people living in over 400 villages in seven areas of Central Java will be served 24 hrs/day from the PLN grid.</li> <li>At least 50% of a combined population of 650 thousand people living in almost 200 villages in three outer island locations will be served 24 hrs/day by member owned and managed electric coops.</li> <li>Nearly all the people living in all ten areas will benefit through such items as are listed as OVI for Goal achievement above.</li> <li>A three phase backbone system expandable to serve additional residents in the area.</li> <li>An active power usage program at each of the ten areas.</li> <li>The existence at each site of a three to four hectare headquarters site complete with office space, warehouse, storage yard, maintenance facilities and as necessary staff housing. Coops will have generators.</li> <li>Each system will have a fully trained and functioning management and operating staff to operate, maintain and expand their service.</li> <li>Both PLN and the DCC will be fully capable of organizing financing, designing, procuring materials for, supervising construction and initial operation of rural electric systems.</li> </ol>	<ol style="list-style-type: none"> <li>GOI reports.</li> <li>Field visitation and system inspection.</li> </ol>	<p><b>Assumptions for achieving purposes:</b></p> <ol style="list-style-type: none"> <li>The central government will continue its commitment to the project and provide the necessary local support including funds, charters for the and other policy guidance.</li> <li>That PLN will be able to reduce construction costs and connection charges so that at least 50% of the people living in the target areas be able to afford the service.</li> <li>That financial arrangements will be made to pass on the AID loan terms to the local systems so as to make them financially viable.</li> <li>That sufficient manpower will be made available capable of being trained for the jobs requiring technical</li> </ol>

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PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

ANNEX A  
Page 3  
Life of Project: From FY 77 to FY 81  
Total U.S. Funding \$48 million  
Date Prepared: August 12, 1977

Project Title & Number: Indonesia - Rural Electrification

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><b>Outputs:</b></p> <ol style="list-style-type: none"> <li>1. Detailed designs and material specifications.</li> <li>2. Headquarter sites including office space, warehouse, storage yard maintenance, staff housing and for the outer island coops, generation plants.</li> <li>3. Operating electric distribution system.</li> <li>4. Internal housewiring including light fixtures, switches and convenience outlets.</li> <li>5. Billing and collection system.</li> <li>6. Training seminars and courses.</li> <li>7. Train personnel.</li> <li>8. Evaluation feedback.</li> </ol>	<p><b>Magnitude of Outputs:</b></p> <ol style="list-style-type: none"> <li>1. Designs and specification for 10 systems, 7 in Central Java and 3 on the outer islands.</li> <li>2. 10 headquarter sites of which 3 will have generation plants.</li> <li>3. The ten systems will require an estimated 4,000 Km of primary and secondary lines, 2,400 Km of secondary underbuild 60,000 poles, 2,500 transformers and 208,000 KWH meters.</li> <li>4. By PACD it is estimated that 195,000 conductors will have been provided with housewiring. A minimum package will consist of three light fixtures, three switches and one convenience outlet.</li> <li>5. Approximately 35 courses and seminars.</li> <li>6. Over 500 people trained including at least 100 at each coop, 20 at each PLN area and 60 project management staff from PLN, DGC, BAPPENAS and BRI.</li> <li>7. One billing and collection system for the PLN utilities and a comparable system for each coop.</li> <li>8. One baseline survey plus 4 annual surveys.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reports completed.</li> <li>2. NRECA, USAID, GOI records.</li> </ol>	<p>Assumptions for achieving outputs</p> <ol style="list-style-type: none"> <li>1. The NRECA team with the help of PLN and the DGC staff will complete feasibility studies for all systems.</li> <li>2. The GOI will meet the CP's.</li> <li>3. Contracts will be signed with NRECA/NEA team and the Consultants.</li> <li>4. Participant trainers will be available.</li> <li>5. Counterpart funds will be available on a timely basis.</li> <li>6. The materials will arrive in good order and be properly distributed.</li> <li>7. PLN and local contractors construct the systems.</li> </ol>