

PD-ANI-957

**RURAL ELECTRIFICATION PROJECTS
INDONESIA**



**NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION
JAKARTA, INDONESIA**

NRECA TEAM REPORT

PLN

INDONESIA

(MAY 1981)

MONTHLY REPORT

NRECA INDONESIAN TEAM REPORT

UNITED STATES AGENCY FOR
INTERNATIONAL DEVELOPMENT

Contract No. AID/ASIA CI347

Loan No. 497-T-052

IMPLEMENTING AGENCIES:

DIREKTORAT JENDERAL KOPERASI
Directorate General of Cooperatives

PERUSAHAAN UMUM LISTRIK NEGARA
National Electric Power Agency

CONSULTANTS:

National Rural Electric Cooperative Association
Management, Organization and Training

C.T. Main International, Inc.
Architect and Engineering

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NRECA TEAM MEMBERS AS OF FEBRUARY, 1981

<u>NAME</u>	<u>TITLE</u>	<u>ADDRESS</u>
Peter McNeill	Team Leader	Pondok Indah Bukit Hijau VIII/31 PH: 761132
Lloyd Lake	Sr. RE Specialist	P.O. Box 88 Tanjungkarang Lampung PH: 0721-52058
Louie Sansing	Sr. RE Specialist	Jl. Dukuh Patra II/73 Jakarta Selatan PH: 824308 ext. 394
*Sam Adkins	Sr. RE Specialist	c/o C.T. Main Inc. Box 26 Semarang PH: 024-311832
Paul Swanson	Sr. RE Specialist	Kotak Pos 43 Ampenan Lombok PH: 0364-23517
John DeFoor	RE Specialist	c/o Bina Marga Office Jl. Imam Bonjol 8 Palopo, S. Sulawesi
Ray Shoff	Administrative/Finance Officer	Ratu Plaza Jl. Jenderal Sudirman PH: 712034
* PLN Advisor		

DESCRIPTION AND OBJECTIVES OF PROJECT (PLN)

The Government of Indonesia is vitally interested in the electrification of rural Indonesia, and has taken steps with the assistance of the United States Government (USAID) to implement pilot rural electrification programs. Fewer than 1% of the rural people in Indonesia presently enjoy the benefits of electric service. Rural electrification is essential in developing the wealth of forest and agricultural land, minerals, and water resources. The "area coverage" concept of electrification will bring better living conditions to millions of rural residents and will spread benefits to all of Indonesia.

Ten Pilot Rural Electrification Project areas have been selected. Seven of the projects are in Central Java and are to be constructed and developed by the state owned national power company (PLN) who will own and operate these systems. The source of power for these systems will be the existing PLN transmission grid in Central Java. (See tabulation below.)

The National Rural Electric Cooperative Association through their International Programs Division are serving as consultant to PLN in organization, management and technical areas. Services for PLN includes providing assistance in organization of staffs to operate the systems in Central Java, as well as in cost accounting, O&M methods, housewiring and training.

<u>SERVICE AREA</u>	<u>VILLAGES TO BE SERVED</u>	<u>APPROXIMATE NO. OF CONNECTIONS</u>	<u>ESTIMATED NO. OF RECIPIENTS</u>
Klaten	95	25,000	225,000
Pem/Pek	103	20,000	180,000
Bantul	21	20,000	180,000
Wonogiri	54	15,000	135,000
Sragen	49	15,000	135,000
Magelang	83	20,000	180,000
Banyumas	35	15,000	135,000
TOTALS	440	130,000	1,170,000

The above tabulations reflect project expectations after the first three years of commercial operation.

NRECA Central Java Activities

General --- The NRECA Advisor in Central Java, Mr. Sam Adkins, continued his routine duties with officials of Wilayah XIII, the operating division of PLN in Central Java. Contact was maintained with officials of P.I. Ring, PLN's construction division in Central Java. Coordination between C.T. Main representatives and the NRECA advisor was also a part of the advisor's routine.

Organization, Management and Training --- This reporting period had special significance for the NRECA team as the first shipment of equipment procured through the USAID loan arrived in Semarang, Central Java. Scheduling of work assignments included in NRECA's organization, management and training (OMT) responsibilities must be made in accordance with phases of project implementation. Therefore, arrival of equipment and materials to be used in the construction of electrical distribution systems for the seven RE projects is viewed as a benchmark, a point from which OMT activities can be projected.

The NRECA advisor accompanied the C.T. Main representatives who inventoried the newly arrived equipment-items at warehousing facilities of P.I. Ring. Receiving reports were checked and an inspection for damage was made. Coordination between consultants in this manner will be helpful in maintaining continuity as construction material and equipment items become a part of completed-construction to be turned over by P.I. Ring to Wilayah XIII for operation. The OMT consultants responsibilities begin when A&E consultant responsibilities end at the time of turn-over.

--- NRECA continued to work closely with PLN Wilayah XIII in preparation of the operation and maintenance procedures for the Rural Electric Projects in Central Java. Meter reading, customer complaints and power outages were studied during the reporting period. Present plans are to utilize to the fullest the present PLN procedures with suggested adjustments where improvements are needed.

--- The advisor accompanied a group from USAID Jakarta and PLN representatives on a visit of R.E. and ground water activities in Central Java. The Klaten PLN R.E. Demonstration area was toured and visits made to small scale industries to evaluate productive use progress. (See page 9,10 & 11.)

A ground water pumping facility in the Sragen R.E. Project area was also visited. These pumps are presently being operated by diesel motors but considerable interest was exhibited in the possibility of converting to electric power when the R.E. facilities are constructed in this area.

The group also visited ground water facilities and water shed projects in the Madiun area of East Java.

--- PLN, USAID-PTE, C.T. Main and NRECA representatives attended the second and third coordination meetings which were held during this reporting period. The initial purpose of this series of meetings is to monitor progress in material/equipment procurement for the seven RE projects. Later, meeting agenda's will be expanded to include other elements of project implementation such as, labor and transportation requirements.

Training --- PLN representatives in Central Java continued to prepare for the implementation of the Seven Rural Electric Projects by increasing activity in the training program. Several meetings were held with the advisor in attendance.

--- PLN Pusat, Wilayah XIII, P.I. Ring officials and the advisor met in Semarang during the reporting period in preparation for the training course "Accounting and Reporting." The date and number of hours of instruction was established and instructors were assigned.

This course is designed to prepare the administrative employees in each R.E. Project to properly account for the labor, material and overhead expense during the construction period and after the systems become operational. The course also includes a review of existing PLN reporting procedures to prepare the participants for completing special reports

designed for the R.E. Projects.

--- Wilayah XIII officials began preparations for training the people who will complete the wiring of the houses in the projects. Based on the number of houses to be completed during the construction period, Wilayah personnel and the advisor have determined the number of workmen that will be required at each project location.

These workmen will be recruited from the project areas and will be given intensive classroom and practical training in wiring houses and installation of the service conductor. PLN Wilayah XIII Supervisors will train the workmen and also be responsible for coordination and supervision of this phase of the implementation of the R.E. Projects.

--- It is worthy to note that two hundred twenty five (225) PLN employees have received training in ten (10) RE training courses held in Central Java during the past two years. In addition, twenty five (25) PLN employees have received training in the United States and in the Philippines during the same period.

Klaten RE Project --- The Klaten demonstration project has been in operation two years and continues to provide valuable information relative to the acceptability of electric service in rural Indonesia and associated statistical data. One thousand nine hundred and forty six (1946) customers were billed this reporting period for an average consumption of forty (40) kilowatt hours. (See page 8)

--- During this reporting period, the NRECA advisor obtained construction-cost data for the demonstration project from PLN officials. Costs of construction materials/equipment and direct labor costs for the demonstration project were identifiable on PLN records however overhead costs are estimates.

Seventeen (17) kilometers of primary distribution line, twenty six (26) kilometers of secondary line and forty seven (47) kilometers of services (total of ninety km) were constructed for an installed cost of two hundred twenty million rupiah (Rp 220,000,000). Existing customer connections and potential

connections approximate two thousand (2,000).

Cost per kilometer of line is computed at two million two hundred forty five thousand rupiah (Rp 2,245,000) or approximately three thousand nine hundred U.S. dollars (\$3,900). Capital investment per customer approximates one hundred ten thousand rupiah (Rp 110,000) or one hundred seventy six U.S. dollars (\$176).

The relatively low investment per customer (\$176) is attributable to the dense population in the Klaten area. (In this demonstration area, twenty two customers are served per kilometer of distribution line.) By comparison, feasibility studies projected an investment of three hundred dollars (\$300) per customer, for the Klaten project as a whole, in the second year of operation, dropping to one hundred fifty dollars (\$150) in the tenth year of operation. Although construction costs have increased considerably since the feasibility studies were prepared, a much larger number of potential customers are availing of the electric service than had been anticipated. Therefore the projected investment per customer may still be realistic.

In summary, it has been proven in the Klaten demonstration project that electric service can be made available to the rural population of Central Java with a moderate investment per customer and that electric service will be utilized by the vast majority. (96% of the potential customers in the demonstration areas are now receiving service). PLN officials, representatives of the A&E and OMT consulting firms are eagerly awaiting the arrival of additional USAID-procured construction materials to permit expansion of electrical distribution systems throughout the seven RE project areas.

Conferences and Trips

- May 4 - Meetings at the offices of PLN Productive Use Consultant in Klaten, at Wilayah XIII-Solo, and NRECA-Semarang to review productive use progress in the Klaten Demonstration Project.
- May 5 - Meeting at the office of "Direktorat Jenderal Pengairan" in Madiun with a group from USAID and PLN: was briefed on the status of ground water activities in the Madiun area.

- May 7 - Meeting at P.I. Ring office with officials of PLN Pusat, P.I. Ring, Wilayah XIII and NRECA in attendance. Discussed training course "Accounting and Reporting."
- May 13 & 14 - NRECA Team Meeting in Jakarta.
- May 27 - Meeting at P.I. Ring. Discussed arrival of the first shipment of R.E. Project material. reviewed material logistics.

KLATEN RE DEMONSTRATION UNIT

BILLING STATISTICS 13 MONTH PERIOD

COLUMN NUMBER								
1	2	3	4	5	6	7	8	9
MAY 1980	58,514	1844	32	5,929,585	3216	2181	1035	101
JUNE	54,406	1877	29	6,011,450	3202	2106	1097	110
JULY	53,969	1879	29	4,894,580	2605	1498	1107	91
AUGUST	56,150	1893	30	5,080,895	2684	1532	1152	90
SEPTEMBER	60,791	1903	31	5,311,065	2790	1592	1198	87
OCTOBER	62,316	1903	32	5,347,175	2890	1611	1198	86
NOVEMBER	62,020	1932	32	5,492,130	2872	1609	1262	88
DECEMBER	61,533	1922	32	5,436,135	2828	1593	1234	88
JANUARY 1981	63,133	1927	33	5,488,030	2848	1610	1238	87
FEBRUARY	64,127	1927	34	5,424,930	2815	1624	1189	85
MARCH	77,843	1932	40	5,753,450	2978	1816	1162	74
APRIL	67,780	1932	35	5,411,925	2801	1655	1147	80
MAY 1981	77,873	1946	40	5,753,855	2956	1808	1148	74

COLUMN NUMBER

- 1. MONTH
- 2. TOTAL KWH BILLED
- 3. TOTAL CUSTOMERS BILLED
- 4. AVERAGE KWH PER CUSTOMER
- 5. TOTAL RUPIAH BILLED
- 6. AVERAGE RUPIAH PER CUSTOMER (TOTAL)
- 7. AVERAGE ENERGY CHARGE PER CUSTOMER
- 8. INSTALLATION & HOUSEWIRING CHARGE
- 9. COST PER KWH (RUPIAH)

Klaten Demonstration Project
Customer Connections



One of the numerous modern dwellings that have been constructed since electric service was made available in the RE demonstration area.



PLN workmen installing a kWh meter entrance on a new dwelling.

Klaten Demonstration Project
Productive-use of Electric Service



A PLN customer engaged in his battery-charging business.



A PLN customers finished product, constructed with the assistance of READY KILOWATT (Douglas Tinsler of USAID in the foreground).

Potential for Productive-use of Electric Service



PLN-RE Chief for Wilayah XIII, Mr. Ristam observing the results of diesel-powered irrigation of rice fields near Sragen, Central Java.



NRECA Advisor to PLN, Mr. Sam Adkins, studying horse-power requirements for a Sragen irrigation site and relating this to future electric motor installations.

12a

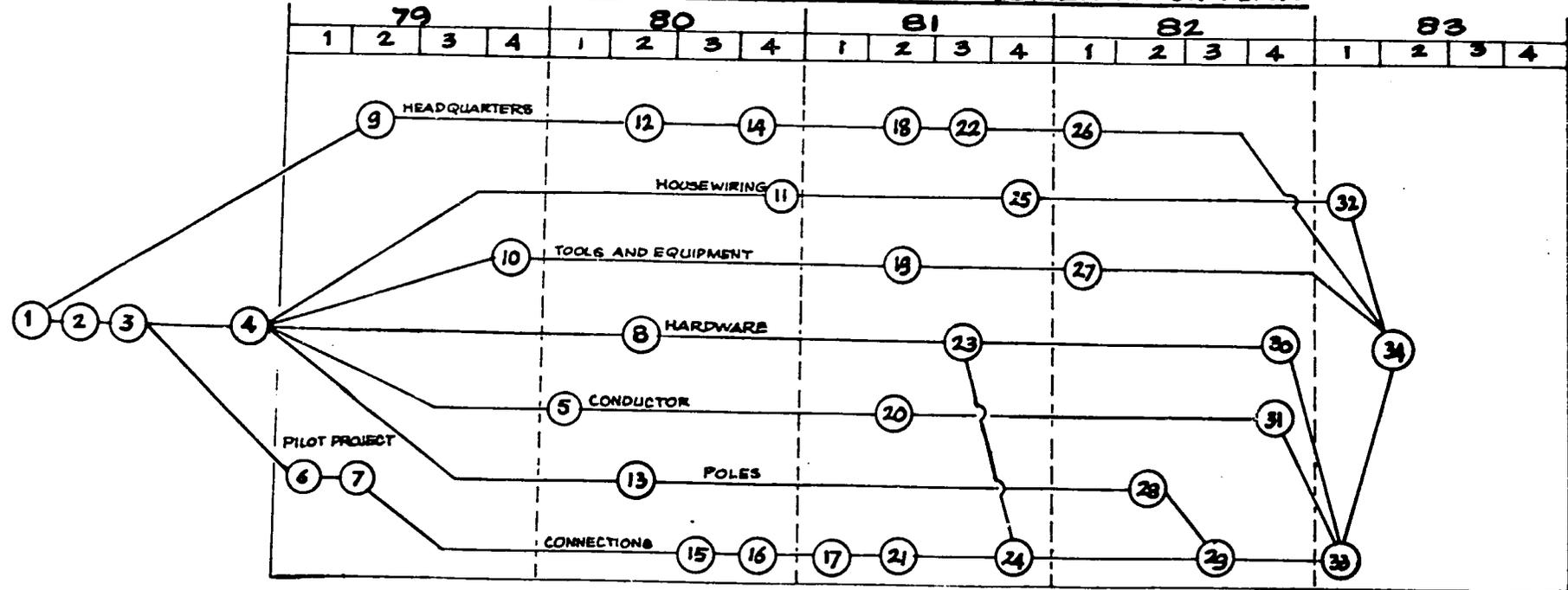
█ : INDICATES PERIOD OF PERFORMANCE
 ▨ : INDICATES PERIOD OF EVALUATION

**ORGANIZATION MANAGEMENT
 RURAL E**

DESCRIPTION		1979																
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M
ORGANIZATION & MANAGEMENT	PROJECT IMPLEMENTATION PLAN - PREPARATION	█	█	█	█	█												
	MANPOWER REQUIREMENTS - CONST. - PLANNING																	
	MANPOWER REQUIREMENTS - OPERATING - PLANNING																	
	SELECTION OF MANAGEMENT PERSONNEL - ADVISING																	
	HEADQUARTERS COMPLEX REQUIREMENT - ADVISING																	
	TOOLS-WORK EQUIPT. REQUIREMENTS - ADVISING																	
	BILLING-ACCOUNTING REQUIREMENTS - ADVISING																	
	SELECTION OF SERVICE/HOUSEWIRING DESIGN-PERFORMING																	
	SELECTION OF SERVICE/HOUSEWIRING PERSONNEL-ADVISING																	
	SELECTION OF CONSUMER-CONTACT PERSONNEL-ADVISING																	
	PRODUCTIVE USE PROGRAM - ADVISING																	
	REPORTING & MONITORING SYSTEMS - PREPARATION																	
	SELECTION OF R.E. SYSTEM EMPLOYEES - ADVISING																	
	TRAINING COURSES	MANAGEMENT PERSONNEL - IN COUNTRY																
MANAGEMENT PERSONNEL - OUT OF COUNTRY																		
CONSUMER CONTACT PERSONNEL																		
SERVICE/HOUSEWIRING PERSONNEL																		
ENGINEERING/CONSTRUCTION PERSONNEL																		
METER READING/BILLING PERSONNEL																		
PRODUCTIVE-USE DEPT. PERSONNEL																		
MATERIALS/EQUIPMENT PERSONNEL																		
ACCOUNTING DEPT. PERSONNEL																		
OPERATIONS AND MAINTENANCE PERSONNEL																		
SAFETY AND TRAINING INFORMATION																		
EMPLOYEE INFORMATION SEMINAR																		

LEGEND :
 - - - - - WORK SCHEDULED - 55%
 _____ WORK COMPLETED - 40.5%
 ● NOT COMPLETED.

RURAL ELECTRIFICATION - PLN IMPLEMENTATION PLAN

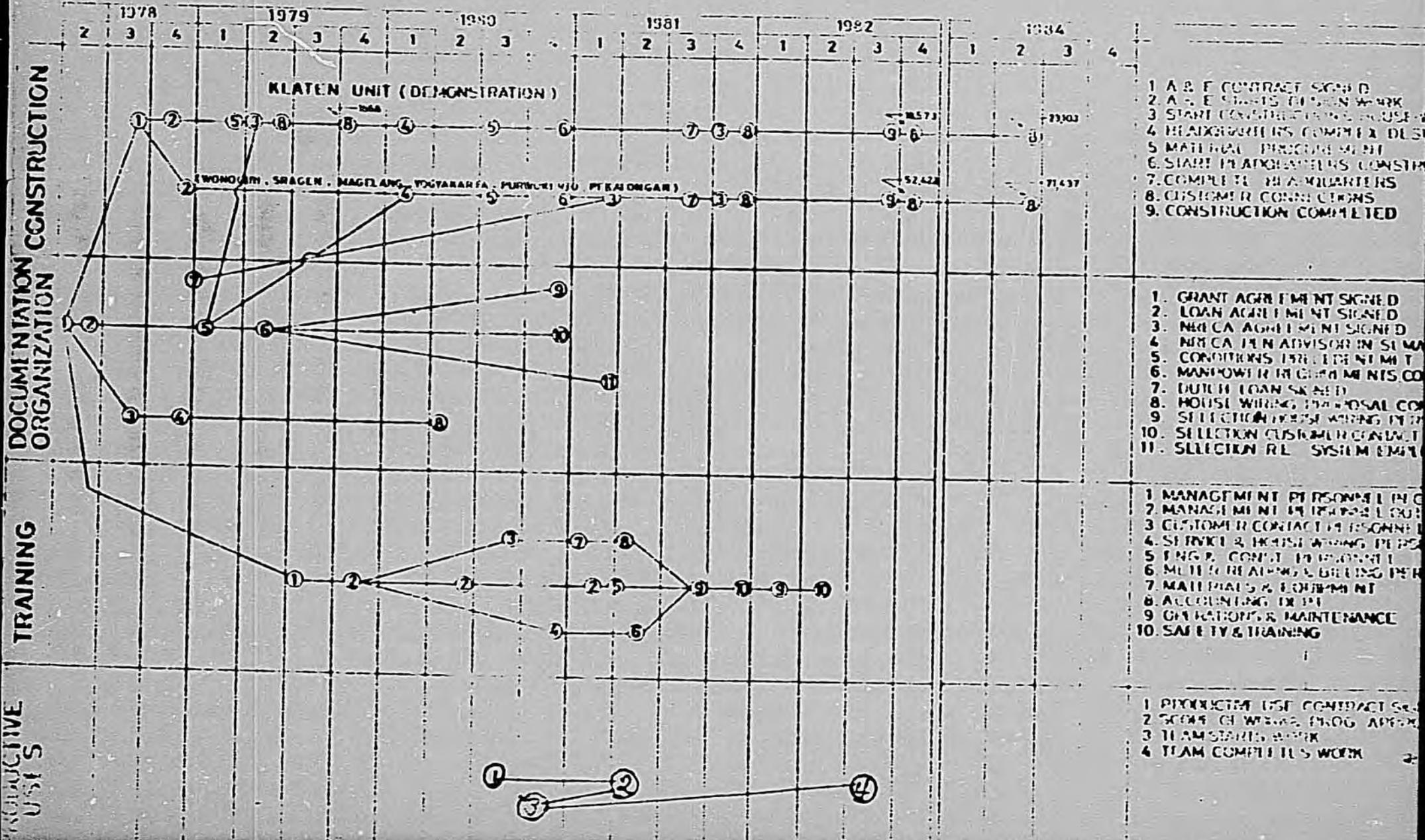


LEGEND

- | | |
|--|--|
| <ul style="list-style-type: none"> 1. FEASIBILITY REPORTS COMPLETED (8/77) 2. LOAN AGREEMENT SIGNED (5/78) 3. AE & OM CONTRACTS SIGNED (9/78 & 8/78) 4. CENTER LINE STAKING BEGINS (10/78) 5. IFB^s ISSUED - CONDUCTOR 6. BEGIN CONSTRUCTION OF KLATEN PILOT PROJECT 7. BEGIN OPERATION OF KLATEN PILOT PROJECT 8. IFB^s ISSUED - HARDWARE 9. BEGIN PURCHASE OF HQ SITES 10. IFB^s ISSUED - TOOLS AND EQUIPMENT 11. IFB^s ISSUED - HOUSE WIRING 12. SURVEY PROPERTY & SOIL TESTING 13. FIRST DELIVERY OF POLES 14. CONTRACTS LET. FOR SITE PREPARATION 15. CENTER LINE STAKING COMPLETED 16. SYSTEM DESIGN COMPLETED 17. CONSTRUCTION ENSIN. (STAKING) COMPL. 18. SITES PREPARED 19. FIRST DELIVERY OF TOOLS & EQUIPMENT 20. FIRST DELIVERY OF CONDUCTOR | <ul style="list-style-type: none"> 22. WAREHOUSES COMPLETED 23. FIRST DELIVERY OF HARDWARE & MATERIALS 24. FIRST TESTING AND ENERGIZATION OF SYSTEM 25. FIRST DELIVERY OF HOUSE WIRING 26. HQ^s COMPLETED 27. FINAL DELIVERY OF TOOLS 28. ALL POLES DELIVERED 29. COMPLETE SETTING OF POLES 30. FINAL DELIVERY OF HARDWARE 31. FINAL DELIVERY OF CONDUCTOR 32. FINAL DELIVERY OF HOUSE WIRING 33. SYSTEM COMPLETION 34. HOUSE CONNECTIONS IN PROCESS SYSTEM OPERATING |
|--|--|

PLN RE. CENTRAL JAWA CPM

NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION



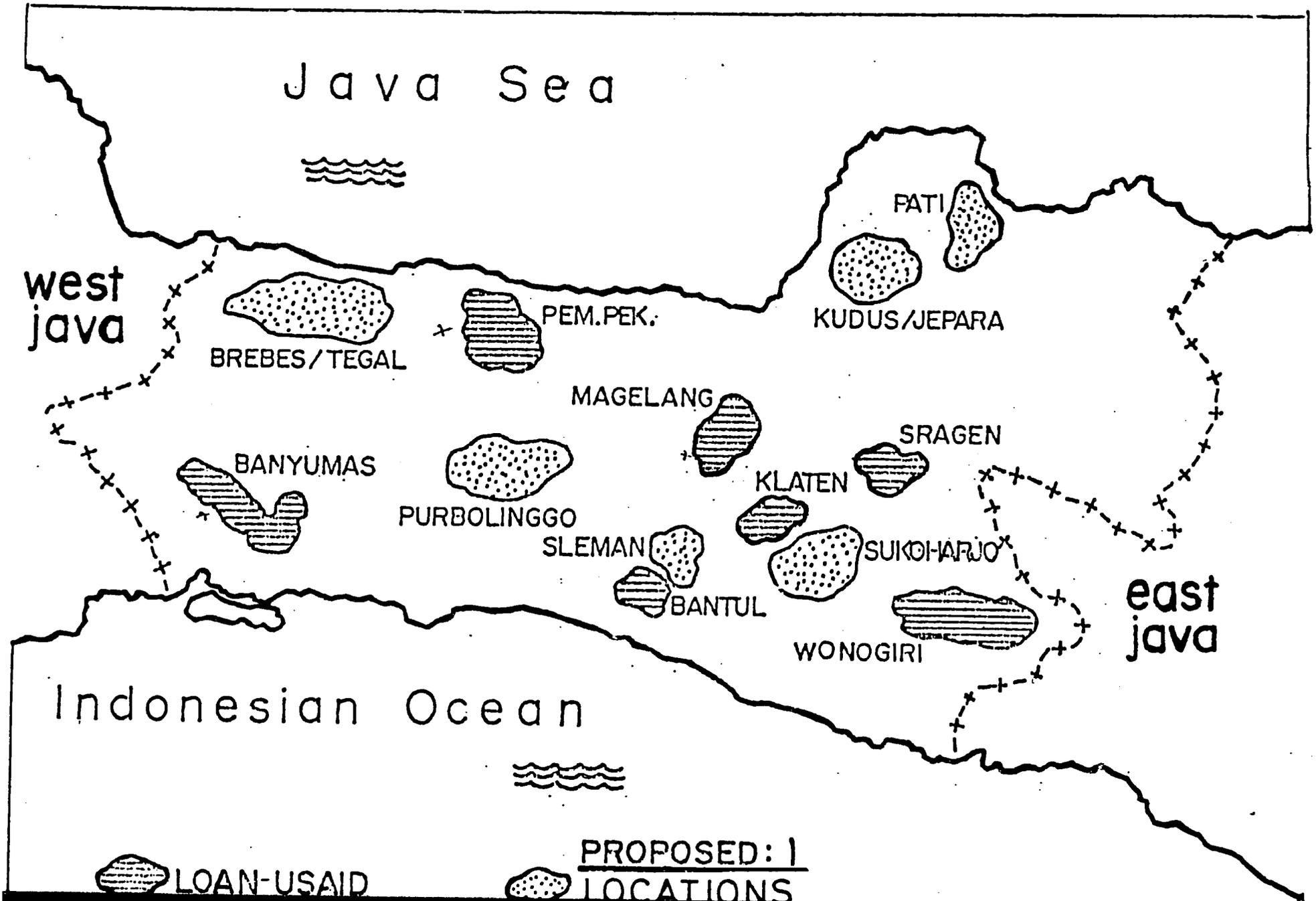
1. A.B.F. CONTRACT SIGNED
2. A.B.F. STARTS TO DO WORK
3. START CONSTRUCTION HOUSE
4. HEADQUARTERS COMPLETED
5. MATERIAL PURCHASEMENT
6. START HEADQUARTERS CONSTRUCTION
7. COMPLETE HEADQUARTERS
8. CUSTOMER CONNECTIONS
9. CONSTRUCTION COMPLETED

1. GRANT AGREEMENT SIGNED
2. LOAN AGREEMENT SIGNED
3. NRCA AGREEMENT SIGNED
4. NRCA FIELD ADVISOR IN SUMBA
5. CONDITIONS ESTABLISHED
6. MANPOWER REQUIREMENTS COMPLETED
7. DUTCH LOAN SIGNED
8. HOUSE WIRING PROPOSAL COMPLETED
9. SELECTION HOUSE WIRING PERMITTED
10. SELECTION CUSTOMER CONDUCTED
11. SELECTION RE. SYSTEM EMPLOYED

1. MANAGEMENT PERSONNEL IN CONTACT
2. MANAGEMENT PERSONNEL CONTACTED
3. CUSTOMER CONTACT PERSONNEL
4. SERVICE & HOUSE WIRING PERSONNEL
5. ENG. CONSULTATION PERSONNEL
6. MATERIALS & BILLING PERSONNEL
7. MATERIALS & EQUIPMENT
8. ACCOUNTING PERSONNEL
9. OPERATIONS & MAINTENANCE
10. SAFETY & TRAINING

1. PROJECT USE CONTRACT SIGNED
2. START OF WORK PROGRESS APPROX.
3. TEAM STARTS WORK
4. TEAM COMPLETES WORK

CENTRAL JAVA



PERSON-MONTHS BY POSITION, NRECA CONSULTANT TEAM

POSITION	PRESENTLY FILLED BY	CONTRACT PERSON-MONTHS	EXPENDED THIS PERIOD	EXPENDED THROUGH MAY	PERCENT OF CONTRACT
Team Leader	Peter McNeill	36	1	32	89
Training Officer	Louie Sansing	36	1	28	78
Administrative Officer	Ray Shoff	19	1	19	100
PLN Advisor	Sam Adkins	42	1	27	64
Lampung Advisor	Lloyd Lake	44	1	32	73
Lombok Advisor	Paul Swanson	44	1	28	64
Luwu Advisor	John DeFoor	44	1	27	61
Short-term Advisors		27	0	18	67
Consultants		31	0	0	0
		323	7	211	65

Summary of Expenditures

National Rural Electrification Cooperative Association
1800 Massachusetts Ave., N.W.
Washington, D.C. 20036

AID/ASIA - C 1347
Date: March 1981
Period of contract: 8/25/78 - 8/25/82

	Budget	Total Expense To Date	Prior Billings	Current Billings
Salaries - Field	\$ 874,520	576,487.86	554,283.88	22,203.98
Salaries - Home	140,050	98,720.49	95,689.18	3,031.31
Fringe Benefits	256,664	217,147.18	208,834.19	8,312.99
Consultant Fees	95,800	33,906.625	33,906.25	
Allowances	366,145	219,851.94	215,294.34	4,557.60
Travel and Transportation	310,000	206,094.91	196,736.19	9,358.72
Other Direct Costs	125,900	69,886.08	67,727.47	2,158.61
Overhead	225,960	154,486.97	148,682.85	5,804.12
Equipment and Materials	15,000	15,705.27	15,705.27	-
TOTAL	\$ 2,410,000	1,592,286.95	1,536,859.62	55,427.33