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MID-PROJECT REPORT

Submitted to
Office of Evaluation
Program and Policy Coordination
Agency for International Development
Under Contract No. AID/afr-C-1380

by
Robert R. Nathan Associates, Inc.
Consulting Economists
Washington, D.C.

December 4, 1978

MID-PROJECT REPORT

This mid-project report is being submitted in accordance with the work plan for the RRNA contract with AID/PPC to evaluate AID documentation and its holdings on AID's past and current rural electrification projects. The purposes of the report are (1) to apprise the client in writing of the status of work completed to date; (2) to indicate the results of the project identification and documentation search undertaken in the first phases of this contract; (3) to outline the methodology for undertaking the case study analysis, and (4) to suggest the specific projects and scope of the case study analysis based on the availability of project documentation which must serve as the critical data base.

To these ends, this report has been structured as follows:

Part A inventories the rural electrification projects identified both by type of project and by geographic region. Rural electrification projects are defined as those so named as well as irrigation, power, power-distribution, or integrated rural development projects with a possible rural electrification component. In all, 220 such projects have been identified. Not all of these projects necessarily

have a rural electrification component but we cannot ascertain this on the basis of currently available information. In some instances, particularly for power projects, AID may not have participated in the distribution phases of the project but the infrastructure AID provided is being utilized by local organizations for rural electrification purposes. In this instance, existing AID documentation will not be helpful in ascertaining the ultimate impact or effectiveness of these subsequent activities even though AID would deserve some credit through the development of rural electrification capacity. Part A also provides a discussion of the coverage of each of the documentation holdings -- i.e., DIS, PAIS, PBAR, Status of Loan Agreement (SLA), etc., including extent of gaps within DIS. Finally, the kinds of documentation are also identified as located in each of the source files.

For the purposes of this contract, documentation has been defined as any "evaluative material" which can contribute to an understanding of any phase of a project from its early identification, design and feasibility to evaluation reports on one or more aspect of the project both during the construction and distribution phases and/or after AID's participation in the project was terminated.

Part B reviews the steps taken, and problems encountered in identifying the projects and searching for the documentation.

Part C explains and outlines the conceptual framework for evaluating the documentation for the case study analysis.

Part D, on the basis of the preceding three sections, makes recommendations regarding the specific projects to be studied in the case study analysis, the scope of such analysis and alternate ways of proceeding with subsequent phases of this work. Because we are still awaiting information from the bureaus, the recommendations on projects are based on information we now have and are subject to change should more documents on other projects be forthcoming.

Part A: Rural Electrification Project Inventory

Project Identification

Attachment A lists all AID past and current projects identified to date which are either known to involve rural electrification (RE) or which are of a type which may have involved RE as a component. These are listed by region and are grouped according to the following categories: (1) Rural Electrification Projects; (2) Other Projects with an RE Component according to the DIS Code; (3) Additional Power Projects; (4) Power Distribution Projects; (5) Integrated Rural Development Projects (IRD); (6) Irrigation Projects. Categories 1 and 2 are a comprehensive listing to the best of our current knowledge. Categories 3 and 4 deliberately exclude projects with an obvious urban focus (as in cases where the name of a capital city appeared in a project name), but are otherwise comprehensive. Categories 5 and 6 are thought to represent a fair but not representative sampling of Integrated Rural Development and Irrigation Projects, but should not be regarded as comprehensive listings.

The tables contained in Attachment A list projects (where such information was available) by country, project title, project number, loan number, starting and completion dates. Part 2 of each table cites the information source from which the existence of the project was established. The identification of the RE projects began by making use of the resources of AID's Development Information System (DIS) which has been supplemented through the use of AID's Status of Loan Agreements Report and information provided by various bureau offices and other sources.

Part 3 of each table identifies the nature, source, and date of project documentation which is currently known to exist and, in certain cases, provides space for miscellaneous comments and observations regarding the projects and their documentation.

Table 1 summarizes the progress and findings of the RRNA project search to date. Table 1 contains projects for which a known or presumed RE focus has been established.

As can be seen, 45 past and current AID projects with a direct RE focus have been identified to date: 17 in Asia, none in Africa, 23 in Latin America, and 5 in the Near East. These projects were implemented in 23 different countries. Forty of these were identified by one or another of AID's automated data retrieval systems, but only 17 of these were accessed by searching the DIS files for the Rural Electrification coded identifier. A test run of the DIS-IRD code revealed 8 projects with a rural electrification component which were not listed when simply the RE code was used.

Table 1.

| A. Known RE projects by region | | | | | | |
|---|-----------------------|---------------------|-------------------------------|------------------------------------|---------------------------------|--------------------------------------|
| Regions | Number of RE projects | Active 1974 to date | Retrieved through DIS RE code | Retrieved through automated search | Number of countries represented | Countries with 2 or more RE projects |
| Asia | 14 | 7 | 4 | 13 | 7 | 3 ^a |
| Africa | 0 | 0 | 0 | 0 | 0 | 0 |
| Latin America | 19 | 7 | 6 | 16 | 11 | 5 ^b |
| Near East | 4 | 3 | 0 | 3 | 3 | 1 ^c |
| TOTAL | 37 | 17 | 10 | 32 | 21 | 9 |
| B. Additional projects with presumed RE component | | | | | | |
| Asia | 3 | 3 | 2 | 3 | 3 | 0 |
| Africa | 0 | 0 | 0 | 0 | 0 | 0 |
| Latin America | 4 | 1 | 4 | 4 | 3 | 1 ^d |
| Near East | 1 | 1 | 1 | 1 | 1 | 0 |
| TOTAL | 8 | 5 | 7 | 8 | 7 | 1 |
| GRAND TOTAL | 45 | 22 | 17 | 40 | 23 ^e | 9 ^e |

a. Indonesia, Philippines, Thailand.

b. Bolivia, Brazil, Ecuador, Guatemala, Nicaragua.

c. Syria.

d. Bolivia.

e. The Grand Total avoids double-counting of countries appearing in both Sections A and B.

Table 2

| A. Other power projects by region | | | | | |
|--|--------------------|-------------------------------------|---------------------------------|-----------------------------------|--|
| Regions | Number of projects | Retrieved through auto-mated search | Number of countries represented | Countries with 5 or more projects | Countries names |
| Asia | 74 | 60 | 10 | 6 | Indonesia, India, Pakistan, Taiwan, Thailand |
| Africa | 9 | 7 | 6 | 0 | |
| Latin America | 25 | 9 | 8 | 1 | Brazil |
| Near East | 20 | 15 | 6 | 1 | Turkey |
| TOTAL | 128 | 91 | 30 | 8 | |
| -----B. Power distribution projects----- | | | | | |
| Asia | 16 | 10 | 4 | 1 | Pakistan |
| Africa | 0 | 0 | 0 | 0 | |
| Latin America | 0 | 0 | 0 | 0 | |
| Near East | 4 | 3 | 3 | 1 | |
| TOTAL | 20 | 13 | 7 | 1 | |
| <u>GRAND TOTAL</u> | 148 | 104 | 31 ^a | 8 ^a | |

a. The Grand Total avoids double-counting of countries appearing in both Sections A and B.

It should be noted that the DIS files were established in 1974 with projects then active. Only 22 of the 45 RE projects identified are known to have been active at some time between 1974 and the present. It was found, however, that certain projects identified through the DIS-RE code had in fact been completed prior to 1974. These are included among the total of 17 projects reported as having been accessed through DIS-RE.

Table 2 includes other power and power distribution projects. It indicates that 148 other power or power distribution projects in 31 countries were identified, 104 of which were identified through an automated search of AID computer files.

Project Documentation

Evaluation reports of varying coverage and quality for DIS-RE projects in 10 countries have been identified. These countries are: India, the Philippines, Thailand, Vietnam, Bolivia, Colombia, Costa Rica, Ecuador, Guatemala and Nicaragua. These evaluations are contained in 15 documents, only 3 of which are available in DIS. Other evaluative materials such as Capital Assistance Papers, Project Papers, etc., have been located for 12 additional projects. Undoubtedly, a great deal more of this type of material exists and is readily accessible but its usefulness for the purposes of the current study is limited unless accompanying evaluations or project implementation status reports can be identified.

Part B: Review of AID Documentation Holding as
Data Base for Evaluation of Effectiveness
of AID Rural Electrification Projects

For the purpose of this contract, documentation holdings were defined to include the following:

1. AID centralized computer management information systems, i.e., DIS, PBAR, PAIS;
2. Bureau computer management information systems;
3. Bureau Evaluation Office Files;
4. Bureau Development Projects and Development Resources Files;
5. Central Engineering Office Files;
6. AID Reference Center;
7. AID Budget and Accounting Office -- Status of Loan Agreement.

Initial efforts focused on the AID centralized computer management information systems; however, as the preceding discussion indicated, there was an inadequate identification and even more so compilation of evaluative materials in that system which could form the basis of the case study and

effectiveness¹ analysis. DIS personnel acknowledged from the outset that the system did not contain a representative sample of AID's RE projects, much less the documentation on these projects. For example, only 3 out of 15 evaluation reports located were contained in the DIS system. This is not necessarily the fault of DIS personnel. The primary problem appears to be the absence of an agency wide systematic means of getting such documents from the missions or bureaus into the system. A staff member in the Asia Evaluation Office indicated in a 1 1/2 year of working there she had never received an evaluation report from a USAID mission. The process of getting documents distributed to the central evaluation office to the DIS system is only now being designed and implemented with most probable impact on future rather than past evaluations.

Therefore, it was necessary to search beyond the DIS system for both a fuller identification of the universe of rural electrification projects and to locate more project documentation. This search was complicated by a number of factors. First, the task of tracking down information on such a large group of projects, many of them quite old, is formidable. Bureaus in many instances lack personnel to carry out this task and the RRNA contract did not provide sufficient funds to cover, in addition to other assignments, this kind of task. We are, however, fortunate to obtain the assistance of a PPC/evaluation office staff member for these

1. The coverage of the DIS system may be adequate for other purposes but not for ascertaining the effectiveness of AID rural electrification projects.

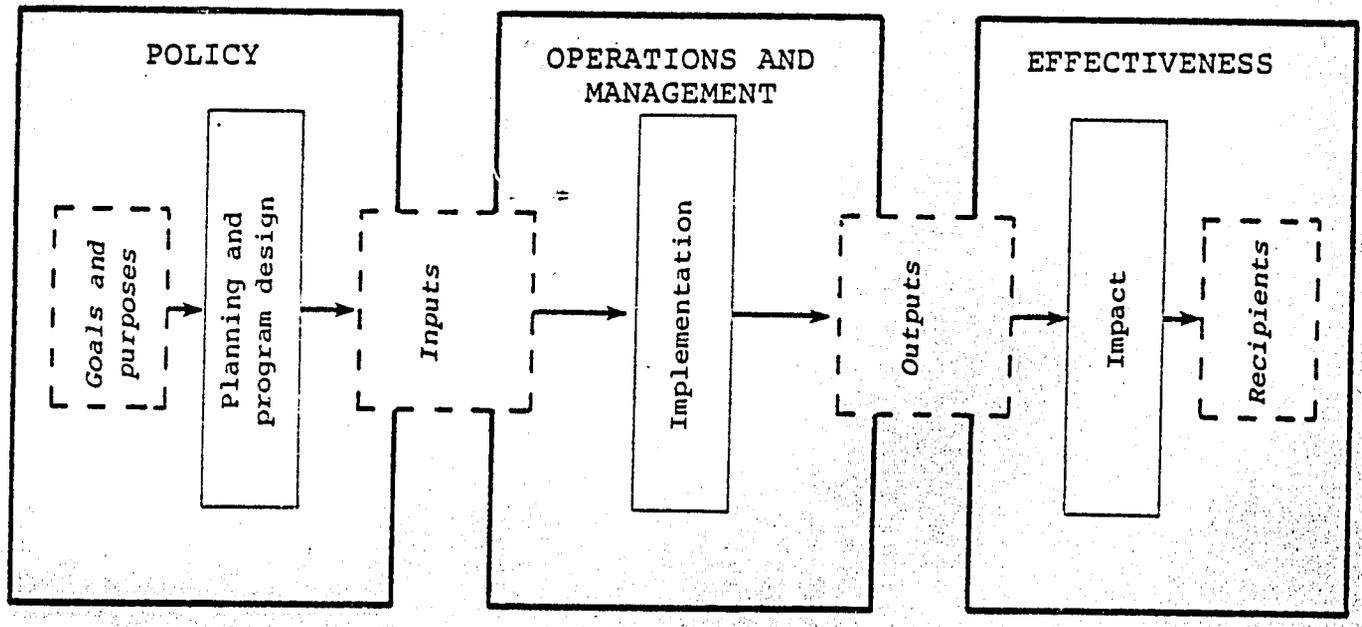
searches. Second, the search is time-consuming and, although all the bureaus have been contacted, we have not yet received a list of those documents which have been located. Hence, recommendations regarding projects to be studied in the case study analysis will be subject to change based on the new information which will be received after this report is written. In fact, the searches are continuing in all four regional bureaus at the present time.

Part C: Conceptual Framework

A conceptual framework determines what is relevant for reviewing, analyzing or evaluating a program. It serves the purposes of identifying those issues which should be addressed in determining some aspect, in this case, effectiveness, of a program and hence evaluating the existing documentation on a program.

The conceptual framework reflects the structure of a program and hence should identify relationships and raise issues for the specific purpose of evaluating program effectiveness. That is, the conceptual framework decomposes the program into 3 components - policy-making; operations and management; and effectiveness. These components are inter-related in that policy and operations aspects impinge or facilitate effectiveness while the latter feeds back into the policy and operations components. It is thus important to understand to what extent policy issues affect the effectiveness of a program as opposed to operational issues or problems or local conditions in which the program operates. These will surely vary from one program to another and from

one country to another. The three components are linked by program elements - goals, purposes, inputs, outputs and recipients and these elements are tied together by three processes - program design and planning, implementation; and impacts. The implementation process includes both construction and distribution phases as are relevant to a program. The following chart summarizes these relationships.



Conceptual Framework for Rural Electrification Projects

The review of existing documentation on rural electrification program -- both financed by AID and other donors -- has served as a basis for designing a conceptual framework specifically for rural electrification programs. The presentation of the rural electrification program framework is

divided into 3 sections. Section I outlines the range of components, elements and processes which comprise the structure of rural electrification program. No one program is likely to have all of the specified kinds of purposes, inputs, outputs, recipients or impacts since these vary from program to program and country to country depending on the circumstances. The itemization of such categories, however, serves as a useful guide for determining how the programs to be reviewed in the case study analysis compare both in terms of key similarities and differences. It also permits the classification of projects according to each characteristic.

Section II similarly lists the types of program institutional forms -- i.e., projects, which have generally characterized rural electrification programs. For example, in some instances cooperatives are the major program institution whereas in other instances public or private electricity boards serve as the key distribution institution.

Section III provides a suggested list of issues to be addressed in comparing and evaluating these projects and hence the evaluation materials on these projects. The issues flow directly from the program structure as outlined in sections I and II. If additional issues are found in the case study review that are not among the suggested list they will be added and also evaluated.

The proposed conceptual framework is thus provided in Attachment B.

Use of Conceptual Framework

Each of the project documents will be analyzed in terms of the list of issues and questions identified as relevant from the conceptual framework to any effectiveness evaluation. The conceptual framework, therefore, serves as a format for evaluating the existing materials in terms of their usefulness for determining the effectiveness of these rural electrification projects. More specifically, the following items will be discussed:

1. To what extent existing documentation addresses each of these issues.
2. To what extent conclusions are drawn in these documents regarding the effectiveness of these programs.
3. To what extent such conclusions are based on actual testing as opposed to hypothesized assumptions.
4. To what extent conclusions can be drawn regarding the effectiveness of these projects.
5. To what extent one can generalize from these projects on AID's programming of rural electrification projects.
6. Recommendations

In addition to the analysis using the conceptual framework, summaries of each of the case studies will also be provided. This shall include an identification of critical information gaps, if any, which would have to be filled before more effectiveness conclusions could be made. Finally recommended approaches to ascertaining the effectiveness of past and current projects will be provided both in terms of improving existing documentation holdings and/or resort to other evaluation methods and sources.

Part D: Recommendations

On the basis of the current set of evaluation reports available on rural electrification projects the following list of countries and their projects by type can be reviewed in the case study analysis.

Table 3. Distribution of Rural Electrification
Projects with Evaluation Reports by Country

Number of Projects

| Project type | | | | | | |
|--------------------------|------|-----|-------|-------------------------|------------|-------|
| Country | R.E. | IRD | Power | Power dis- tribution | Irrigation | Total |
| <u>Asia</u> | | | | | | |
| India | 1 | -- | 1 | -- | -- | 2 |
| Philippines | 4 | -- | -- | -- | -- | 4 |
| Thailand | 1 | -- | -- | -- | -- | 1 |
| Vietnam | 1 | -- | -- | -- | -- | 1 |
| <u>Latin America</u> | | | | | | |
| Bolivia | 1 | -- | -- | -- | -- | 1 |
| Colombia | 1 | -- | -- | -- | -- | 1 |
| Costa Rica | 1 | -- | -- | -- | -- | 1 |
| Ecuador | 1 | -- | -- | -- | -- | 1 |
| Nicaragua | 2 | -- | -- | -- | -- | 2 |
| Grand Total | | | | | | 14 |

The projects for which evaluations have been located do provide good historical coverage of AID programming in RE-named projects as they include Nicaragua project funded in 1963 through recent (1977/78) RE projects in the Philippines.

Reliance on this group of projects, however, has several limitations. First, these evaluation reports are of widely varying quality and each review different aspects of rural electrification projects. No one report will provide a complete picture of what was intended and what occurred for each project. Together, they will not serve as an adequate basis for RRNA to make conclusions regarding the effectiveness of these specified projects. Nor are these projects a representative sample of the broad definition of AID rural electrification programming so that generalizations can not be made from these specific projects to the universe of projects. Thus, the main focus of the case study analysis would in essence be an evaluation of the "evaluation materials", a scope narrower than that implied in the RRNA contract. An amendment to the contract may thus be in order.

Second, in most instances we still lack adequate other project documentation -- i.e., PPs, CAPs, PARs, PIDs, etc. -- which would help give a broader picture of any one project. The bureau searches which are still ongoing may, however, uncover more reports of this type to improve on the current collection. Third, all of these projects are NRECA-affiliated except for the one in Thailand, hence the desire to achieve a broader mix of project sponsors would not be obtained using this data base for the case study analysis. Fourth, with the exception of one dam project in India the definition of rural electrification projects would have to be limited to those so named rather than to the broader definition as outlined in the RRNA contract. This possibility was acknowledged, however, in the RRNA work plan. Fifth, two regions, Africa and Near East are clearly absent in the

above group of projects.

There are two possible opportunities to obtain a broader coverage. First, the FY 80 annual budget submissions indicate that there were 13 evaluations scheduled in 1978 on 12¹ additional projects. We are in the process of verifying the existence of these evaluations and get copies. This would increase the number of countries by five (adding Indonesia, Bangladesh, Korea, Morocco, and Sri Lanka) and add two more rural electrification projects so named, five irrigation projects, three power project, one power distribution project and one IRD project. The second means of increasing the coverage of the case study analysis is the possibility that many more evaluations and other documents will be uncovered through the bureau searches. Since we are still awaiting some feedback on what these searches are producing and there is still a need for extra PPC staff time to be devoted to locating this material we can not speculate on how productive these efforts are likely to be.

If neither the of the above coverages is satisfactory to PPC then one of two alternative options should be considered - either to put more time into the bureau searches on the chance more fruitful materials can be found or seek other means outside of existing documentation for establishing the effectiveness of AID rural electrification projects. This would most likely entail special follow-up reports

1. One evaluation is on a project already included in initial list.

undertaken by USAID missions on the current status of a select group of old and current projects or field visits. This approach however, may not be consistent with PPC's scheduling of a report to Congress nor to budgetary matters. If more time is spent by RRNA staff in the search effort this will reduce time to be devoted to the case study analysis. An alternative to this would be to have PPC staff conduct the search, themselves, particularly since most bureaus have indicated they do not have adequate staff for this effort. The current status of the four bureau searches

is as follows:

| <u>Region</u> | <u>Status</u> |
|---------------------|---|
| Latin America | Evaluation and Development Resources office files have been searched. |
| Africa | List of projects sent to Fred Zobrist who agreed to check on project documentation. No further word yet. |
| Asia | Dennis Brennan has given permission for PPC staff member (Sally Patton) to locate materials in Asia bureau files. Pat Dixon of Asia Bureau is identifying project papers. Sally is to begin work on Monday, December 3, 1978. |
| Near East | Joan Silver has circulated memo regarding rural electrification projects in Near East. Expect to receive results by next week. |
| Central Engineering | By December 8 staff of Costables Associates will have organized documents in Central Engineering division which could also serve as a means of improving data base. |

One major benefit of the searches apart from the information uncovered for our purposes is that these materials can also be channeled into DIS in order to improve its current meager coverage of rural electrification documents. Time devoted to the search during the first week of December, while PPC reviews this report, will not alter the work schedule as outlined in the work plan.

Certain considerations suggest themselves with respect to reviewing the alternatives on the further implementation of this study. First, if further efforts are to be made in locating documentation on power, distribution and other types of projects with potential relevance for RE, they could probably most productively be concentrated on Pakistan, Korea, Taiwan, and Brazil where a large number of such projects are known to have been funded.

Second, if further documentation searches, or review of evaluation office files for those evaluations known to have been scheduled for 1978, substantially increase the number of documented projects available for analysis, it is suggested that any screening which is done to reduce the number of case studies assign priority to those countries in which more than one project has been implemented and where a history of RE programming within a unified setting exists. For example, this will enable us to examine how and why the concept of rural electrification has changed over the past 25-30 years from emphasis primarily on construction to involvement through distribution.

Finally, three very new RE projects are ongoing in Bangladesh, Honduras, and Guatemala. It is proposed that PID's and PP's for these projects be reviewed in the light of whatever findings emerge from the case studies, to determine the extent to which transfer of AID experience with RE has already taken place with respect to project design and evaluation planning.

RRNA principal staff for this project (Phillip Rourk and Phylcia Fauntleroy) each have about 27 days remaining in the contract (as of December 1, 1978), out of 42 working days possible before the contract ends (January 31, 1979). Therefore PPC, in deciding whether RRNA should devote more time to the searches rather than having PPC staff conduct the task must decide what proportion of the 27 days they would prefer to have devoted to the case studies analysis. The more countries and projects to be analyzed, the more time will be required.

Listing of AID Rural Electrification and Related Projects

| Country | Project name | Project # | Loan # | Date begun | Date ended | Project listings | | | | | | Project data available | | | | | | | | | | Type of project | Comments | | | | | |
|---------------|-----------------------------------|-----------|---------|------------|------------|------------------|--------|------|------|-----|-----------|---|--------|------------|-------|-----------|------|------------|------|------------|------|-----------------|----------|--------------|-------|-------|---|---|
| | | | | | | DIS-PC | DIS-UD | FATS | PRAB | SLA | Int. file | Eval. report source | Date | CAP source | Date | FP source | Date | FRP source | Date | FAR source | Date | | | Other source | Date | | | |
| AFRICA | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LATIN AMERICA | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bolivia | Rural Electrification I | 5110049 | 5110046 | 73 | | | | | | X | | | | | | | | | | | | | | | | | | |
| Bolivia | Rural Electrification II | 5110205 | 5110159 | 74 | 79 | | | | | X | X | DA/UD | 1/77 | CE/F. L. | 10/73 | | | | | | | | | | 1A/78 | 25-28 | Evaluation scheduled 4/79; 7/78 report not yet rec'd. | |
| Bolivia | Rural Electrification III | 5110488 | grant | 7 | | | | | | | X | | | CE/F. L. | 6/74 | | | | | | | | | | | | Evaluation scheduled 4/79 | |
| Bolivia | Rural Electrification IV | 5110491 | | 7 | | | | | | | | | | | | | | | | | | | | | | | Evaluation scheduled 1/79 | |
| Brazil | Rural Electrification | 5120228 | | 63 | 71 | | | | | | | | | | | | | | | | | | | | | | | |
| Brazil | Rural Community Electrification | 5120105 | | 62 | 67 | | | | | | | | | | | | | | | | | | | | | | | |
| Chile | Rural Electrification Cooperative | 5130191 | 513024 | 65 | 73 | | | | | | X | | | CE/F. L. | 9/64 | | | | | | | | | | | | | |
| Colombia* | Rural Electrification Cooperative | 5140098 | 514015 | 64 | 72 | X | | | | | | | | | | | | | | | | | | | | | Evaluation scheduled 7/78; 7/78 report not yet rec'd. | |
| Costa Rica** | Rural Electrification | 5150092 | 515015 | 64 | | X | | | | X | X | **DA/UD **DIS-PC **E/F.L. **FATS **PRAB | 7-8/78 | CE/F. L. | 6/65 | | | | | | | | | | | | | |
| Ecuador | Rural Electrification Cooperative | 5160071 | 516023 | 64 | | | | | | X | X | **DA/UD **DIS-PC **E/F.L. **FATS **PRAB | 8/75 | | | | | | | | | | | | | | | |
| Ecuador*** | Rural Electrification | 5160099 | 516015 | 70 | | X | | | | X | | ***A/UD ***DIS-PC ***E/F.L. ***FATS ***PRAB | 6/76 | CE/F. L. | 6/70 | | | | | | | | | | | | | |
| Guatemala**** | Rural Electrification | 5200214 | 520019 | 71 | | | | | | X | X | A/UD | 4/77 | | | | | | | | | | | | | | | |
| Guatemala | Rural Electrification II | 5200240 | 520011 | 76 | | | | | | | | | | | | | | | | | | | | | | | | Report -- Village Electrification Study Good info evaluation scheduled 12/78 |

Listing of AID Rural Electrification and Related Projects

| Country | Project name | Project # | Loan # | Date begun | Date ended | Project ID# Data | | | | | | Project data available | | | | | | | | | | Type of project | Comments | | | | | |
|--|------------------------------|-----------|---------|------------|------------|------------------|---------|-----|------|-----|-----------|------------------------|------|------------|------|-----------|------|------------|------|-----------|------|-----------------|----------|--------------|------|----------------|----------------------------|--|
| | | | | | | D15-01 | D15-140 | FAS | FDAR | 51A | Bur. file | Eval. rept. source | Date | CAP source | Date | FP source | Date | IRP source | Date | DR source | Date | | | Other source | Date | | | |
| W. EAST (Incl. India) | Rural Electrification | 2760018 | 276016 | 71 | | | | | | | | | | | | | | | | | | | | | | | | |
| | Rural Electrification II | 2760025 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OTHER PROJECTS WITH A RURAL ELECTRIFICATION COMPONENT ACCORDING TO THE D15 CODE: | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| India | Power Dev. | 2860211 | | 66 | 72 | X | | | | | | | | | | | | | | | | | | | | | | |
| Philippines | Provincial development | 4920226 | | 68 | 70 | X | X | | | | | | | | | | | | | | | | | | | Irrigation dam | | |
| Holland | Water Bill Research | 4930248 | | 71 | 75 | | | X | | | | | | | | | | | | | | | | | | | Institution building focus | |
| IN AMERICA | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| India | SEPC Technical support | 5130000 | | 61 | 64 | X | | | | | | | | | | | | | | | | | | | | | | |
| India | Agricultural financing | 5120164 | | | | | | X | | | | | | | | | | | | | | | | | | | | |
| India | Financing Subloan | 5180099 | 518015 | 65 | 67 | X | | | | | | | | | | | | | | | | | | | | | Weak info. | |
| India | Integrated Rural development | 5120046 | 5120010 | 77 | 81 | X | X | | | | | | | | | | | | | | | | | | | | | |
| W. EAST | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Guatemala | Rural Hydro-Electrification | 3660101 | 366011 | 68 | 71 | X | | | | | | | | | | | | | | | | | | | | | | |
| Guatemala | Rural Hydro-Electrification | 3660041 | 366010 | 74 | | | | | | | | | | | | | | | | | | | | | | | | |

Listing of AID Rural Electrification and Related Projects

| Country | Project name | Project # | Loan # | Data begun | Date ended | Project listings | | | | | | Project data available | | | | | | | | | | Type of project | Comments | | | |
|---------------------|--------------------------------------|-----------|---------|------------|------------|------------------|---------|------|------|-----|-----------|------------------------|------|------------|------|-----------|------|-------------|------|------------|------|-----------------|----------|--------------|------|--|
| | | | | | | DIS-RE | DIS-IRG | FAIS | ERAR | SLA | Bur. file | Eval. source | Date | CAP source | Date | PP source | Date | ERAR source | Date | PAR source | Date | | | Other source | Date | |
| ASIA (Continued) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Philippines | Electric Power Industrial Survey | 4920163 | | 64 | 67 | | | | X | | | | | | | | | | | | | | | | | |
| Philippines | Power Resource | 4920115 | | 71 | 77 | | | | | | | | | | | | | | | | | | | | | |
| Philippines | Yebu geothermal | 4920207 | | 73 | | | | | | | | | | | | | | | | | | | | | | |
| Taiwan | Nequa I Thermal | 4840036 | | 52 | 59 | | | | | | | | | | | | | | | | | | | | | |
| Taiwan | Feiya Thermal | 4840035 | | 52 | 58 | | | | X | | | | | | | | | | | | | | | | | |
| Taiwan | Wushu hydro-electrification | 4840018 | | 53 | 67 | | | | X | | | | | | | | | | | | | | | | | |
| Taiwan | Nequa II Thermal | 4840037 | | 55 | 60 | | | | | | | | | | | | | | | | | | | | | |
| Taiwan | San Chien Hydro-electrification | 4840014 | | 55 | 61 | | | | X | | | | | | | | | | | | | | | | | |
| Taiwan | Fu Shan Hydro-electrification | 4840101 | | 56 | 63 | | | | X | | | | | | | | | | | | | | | | | |
| Taiwan | Shen An I Thermal | 4840372 | | 56 | 62 | | | | X | | | | | | | | | | | | | | | | | |
| Taiwan | Shen An II Thermal | 4840494 | | 58 | 64 | | | | X | | | | | | | | | | | | | | | | | |
| Taiwan | Nequa Thermal Expansion | 4840563 | 484A020 | 60 | 64 | | | | X | | | | | | | | | | | | | | | | | |
| Taiwan | Tsichien Reservoir | 4840516 | 484A024 | 61 | 61 | | | | X | | | | | | | | | | | | | | | | | |
| Taiwan | Shen An Thermal | 4840589 | 484B019 | 61 | 66 | | | | X | | | | | | | | | | | | | | | | | |
| Taiwan | Liukou Thermal | 4840593 | 484B045 | 64 | 68 | | | | X | | | | | | | | | | | | | | | | | |
| Taiwan | Lower Tsichien Hydro-electrification | 4840592 | 484B044 | 64 | 73 | | | | X | | | | | | | | | | | | | | | | | |

Listing of AID Rural Electrification and Related Projects

| Country | Project name | Project # | Loan # | Date begun | Date ended | Project category | | | | | | Project data available | | | | | | | | | | Type of project | Comments | | |
|-----------------------|-------------------------------------|-----------|--------|------------|------------|------------------|---------|------|------|-----|-----------|------------------------|------|------------|------|-----------|------|------------|------|------------|------|-----------------|----------|--------------|------------|
| | | | | | | DIS-RE | DIS-180 | FAIS | PHAR | SIA | Int. file | Eval. rept. source | Date | CAP source | Date | FF source | Date | EBP source | Date | FAH source | Date | | | Other source | Date |
| AFRICA (Continued) | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nigeria | Electric Energy Project | 6020010 | | 61 | 61 | | | X | | | | | | | | | | | | | | | | | |
| Nigeria | Electric Corporation of Nigeria | 6200759 | | 65 | 66 | | | X | | | | | | | | | | | | | | | | | |
| LATIN AMERICA | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bolivia | Santa Cruz Electric Power | 5110944 | 511011 | 66 | | | | | | X | | | | | | | | | | | | | | | |
| Bolivia | Equipment Operator | 5110971 | | 55 | 59 | | | | | | | | | | | | | | | | | | | | |
| Brazil | Pataloza Power | 5120262 | 512016 | 63 | 65 | | | X | | | | | | | | | | | | | | | | | Weak info. |
| Brazil | Sao Francisco Hydroelectricity | 5120233 | | 64 | 71 | | | X | | | | | | | | | | | | | | | | | |
| Brazil | Picicato Power Expansion | 5120232 | 512026 | 64 | 72 | | | X | | | | | | | | | | | | | | | | | |
| Brazil | Electric Power Expansion | 5120260 | | 63 | 67 | | | X | | | | | | | | | | | | | | | | | |
| Brazil | Cost Power Expansion | 5120107 | 512022 | 64 | 71 | | | X | | | | | | | | | | | | | | | | | |
| Brazil | Santa Cruz Thermal | | 512066 | 71 | | | | | | | | | | | | | | | | | | | | | |
| Brazil | Cost Power Expansion | 5120104 | | 63 | | | | | | X | | | | | | | | | | | | | | | |
| Brazil | Cost Power System | | 512041 | 65 | | | | | | X | | | | | | | | | | | | | | | |
| Brazil | Cost Esperanza Hydroelectricity | | 512051 | 65 | | | | | | X | | | | | | | | | | | | | | | |
| Brazil | Castroshan Hydroelectricity | | 512062 | 66 | | | | | | X | | | | | | | | | | | | | | | |
| Brazil | Power Training and Tech. Assistance | | 512070 | 67 | | | | | | X | | | | | | | | | | | | | | | |
| Brazil | Costo Real Hydroelectricity | | 512075 | 69 | | | | | | X | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |

KEY: AID Rural Electrification Project Inventory

| | |
|-------|---------------------------------------|
| DIS | Development Information System |
| ARC | AID Reference Center |
| RE | Rural Electrification |
| PAIS | Project Accounting Information System |
| P BAR | Country Program Data Bank |
| IRD | Integrated Rural Development |
| SLA | Status of Loan Agreement |
| PPC | Program and Policy Coordination |
| DAI | Development Alternatives, Inc. |
| CE/FL | Central Engineering/Fred Lowell file |
| PRP | Project Review Report |
| LCR | Loan Completion Report |
| LSR | Loan Status Report |
| V | Tom Venable, consultant |

ATTACHMENT B

SECTION I - PROGRAM STRUCTUREProgram Goal

To contribute to an improved standard of living in rural areas, particularly among the poor through rural electrification programs.

Purposes

1. To provide reliable electric service at reasonable rates to rural residents, especially the poor.
2. Increase production, employment, and income in project area - agriculture (irrigation, drainage, etc.). Industry (agro- and other small industry).
3. Reduce social and economic disparity between rural and urban sector.
4. Improve health status - electricity for health centers, refrigeration, pure water.
5. Improve educational opportunity (light for night-time study, electrified schools, radio and perhaps T.V.).

6. Deter night-time crime (security lighting)
7. Encourage democratic participation of people served by the electric system.
8. Improve status of women - ease home chores to provide more time for family, leisure or more productive employment (e.g. home crafts, etc.).
9. Improve communications of the rural electrification area - radio, T.V.
10. Stem rural-urban migration
11. Develop institutional infrastructure - i.e., cooperatives, state electricity boards, etc.
12. Reduce birth rate
13. Increase commerce and trade
14. Facilitate marketing and storage of agricultural goods.

Participating Agencies

1. AID - Washington and USAID Missions;
U.S. Technical Assistance Organizations - contractors
i.e., NRECA, construction companies, etc.;

3. LDC Central Government - Planning authorities, Cognizant Ministries or Departments (e.g. Min. of Agric, Energy, electricity, etc.; State Electricity Authority, etc.)
4. LDC Local Government - Governor, Provincial Planning Authority, Mayors, Community Development Leaders.
5. LDC Central and Local Institutional Leaders - Farmer's Associations, Cooperatives, Community Organizations (School, health, tribal, church, etc.) Electric Power Agency, Company or Individual Franchise - holders, etc.
6. Other International Agencies - World Bank, IDB, ADB, etc.

Planning and Program Design Process

1. Country Surveys - Identify scope for rural electrification within country taking into consideration existing sectoral and regional plans, conditions and other related activities.
2. Program Identification - Identify and design proposed rural electrification programs if need has been established.
3. Program Appraisal - Review engineering, economic and social feasibility of proposed programs.

4. Contract Negotiations and Preparation; and Recruitment of Personnel

Inputs

Personnel

AID - Washington-based planners and project back-stoppers; Mission Specialists, Host Country Engineers and technicians, laborers. U.S. Technical Assistants - Organization and Management advisors, Engineers and other technicians

Finance Capital

Host Country - Tax revenues, Grants, Loans, Contributions from AID or other International Donor sources

Materials

Host country - vehicles, power poles, cross-arms, conductors (the power lines), or other line materials as available. Off-shore Procurement - materials and equipment not provided by host country.

Infrastructure

Roads into the area to be served by the rural electrification as needed. Port and dock facilities to handle imported materials may need improving. Physical plant - Generation, transmission and distribution facilities as

the target population and the achievement of goals and objectives.

Everyone involved in the project should be made aware of the kinds of information that must be collected and maintained to measure specific types of impact subsequently.

Outputs

Economic

1. Dependable and adequate electric service (i.e., number of hookups, utilization rates, etc.)
2. Skilled, trained personnel
3. Institutions
4. Employment on project from construction through distribution phases

Impacts

1. Increase household electricity usage - related consumption (use of appliances, lights, etc.)
2. Increase agricultural and agro-industrial production
3. Increase commercial activities

4. Increase public services (i.e., health, education, safety)
5. Increase communications
6. Increase incomes
7. Increase community interaction
8. Reduce rural-urban disparities
9. Increase women opportunities
10. Increase employment

Recipients

Farmers

Households

Businesses and Commerical Activities

Government Offices

SECTION II - PROJECT TYPES

The following represents a typology of more or less "pure" types of rural electrification projects. In practice one might expect to find varying combinations and/or gradations of these types.

1. Power generation projects
 - Hydroelectric
 - Thermal
 - Geothermal
 - Diesel
 - Microgeneration of various types, e.g., hydro, wind, diesel, etc.
2. Power Distribution Projects
3. Mixed generation and Distribution Projects

Projects of these types can be and have been implemented through and administered by a wide variety of institutional types or combinations thereof. These include:

1. Governmental Institutions or Agencies
 - National
 - Regional
 - Local
2. Recipient Organizations
 - Cooperatives
 - Other community or regional organizations

3. Private Enterprises

In addition, small-scale auto generation projects may be implemented without recourse to a permanent administrative organization as in the case of microgeneration units distributed directly among farmers, small manufacturers, etc.

SECTION III - SALIENT ISSUES AND ANALYTICAL AREAS

A. The Rural Electrification Setting

1. Is there a consensus among governing officials and rural leaders that rural electrification is needed? What reasons are given for this need?
2. Can rural electrification benefit the poorest segment of the rural population? Will modern clinics, health centers, pure water supplies, the safety of village lighting benefit the poor who are unable to utilize electric service in their homes?
3. To what extent is rural electrification experience from other countries relevant in this context?
4. Is there some rural electrification in the country or area at this time? How does it relate to the above?
 - a. Is it served by the government (power author-

- ity)? By an individual franchise holder? or a company? How is existing power capacity utilized?
- b. Are all people being served by the existing electric system? If not, why? Are they eligible for service? Can they afford it at current rates? And, is the electric service adequate in voltage and is it reliable?
 - c. Is there a need for a voluntary agency to become involved? How would this improve the present system (if any exist)? Would it be desired by a majority of people in the area? by governing officials? others?
5. If there is inadequate rural electrification, is a foreign aid program to improve electric coverage justified? To what extent can governments or private enterprises undertake project without foreign assistance?
- a. How can a rural electrification program benefit all rural people in the area served?
 - b. How will such a program relate to agricultural production and to food supplies?
 - c. How will such a program relate to better water, sanitation and other health factors?

- d. Should a capital-intensive rural electrification program be justified in a labor surplus area found in most LDC's? Will employment opportunities be increased? Will rural electrification stimulate industrial development? local processing of raw materials? crafts, etc.?

B. Program Structure

Purpose: Examine the background and current status of rural electrification at the program and project levels, analyze the role of cognizant agencies (participating agencies at the beginning, if any), cost and range of inputs, the recipients to be reached initially and in the long run. Consider the social benefits to indirect recipients (those not on the rural electrification lines, but benefiting from social uses of energy-school lighting, public lighting, public water supplies, etc.).

1. Are roles of participating agencies and affected groups compatible, conflicting, or complementary? (Agencies would include, where appropriate, AID, the ministries of agriculture, planning, rural development, electricity or energy, cooperatives; present voluntary agencies; ex-patriate advisors and local counterparts.) To what extent is program development coordinated among agencies?
2. What kind of project organization and technology is required? Has the issue of autogeneration vs. central-station power supply been addressed?

3. Required inputs: Do inputs impose a significant constraint on program development (as a capital-intensive project, is extent of project development limited?) Does it impose limits on other projects or activities? Are inputs in existing developmental plans of the state or community?
 - a. Major inputs? (land, labor, materials). By whom provided? Portion provided locally, within the LDC and from abroad? Foreign exchange, loan, grant requirements?
 - b. What inputs can the area served provide? How might local participation be increased?
 - c. How are indigenous inputs obtained? What impediments exist, if any? Are engineering specifications well-suited to local conditions and project purposes?
4. Adequacy of project outputs (e.g., electric service).
 - a. What is the form of the output? (Reliability, duration of service). For whom is it intended?
 - b. How does the area served differ from authorized or planned levels?
 - c. Is training provided to insure continuity of reliable service? and to teach users, conservation and better use of energy?

- d. Is power source adequate to meet growing demand?
 - e. Is cost of service compatible with income levels in the area served? Are rates and charges properly structured?
5. Recipients: Are recipient levels appropriate? Is project design appropriate to the needs of these recipients?
- a. What are trends in recipient (or user) levels by geographic areas or socioeconomic status?
 - b. Do recipient levels meet AID's criteria of assisting the lower 40 percent of the population? Does the project reach the "poorest of the poor"? To what extent are they reached?
 - c. How do participating agencies (official host government and American private voluntary) assess the adequacy of outputs and recipient levels?
 - d. Is it possible to assess the extent to which rural electrification service is reaching the rural target group? Is service as adequate and reliable as intended?
 - e. Were costs of construction comparable to the estimates of the feasibility studies?

C. Policy Analysis

Purpose: Relate the policies of host governments to rural electrification at the project level, testing for congruence and harmony of purpose, strategies and other policy-related matters.

1. To what extent are relevant host government, social and economic policies and conditions consistent with the rural electrification program?
 - a. Are relevant host government policies articulated? If so, is there apparent conformity between stated and practiced policies?
 - b. Is there a host government urban or rural development strategy related to the rural electrification program.
 - c. What host government priorities are assigned to public health, education, family planning or full employment in the context of rural electrifications contribution to economic and social development?
 - d. How do host government agricultural and rural development policies affect the rural electrification program?
 - e. To what extent does local infrastructure facilitate or impair rural electrification operations and effectiveness?

2. To what extent are the goals and purposes of indigenous electric power suppliers (e.g. private companies or individual franchise holders) congruent, compatible, or un-favorable? What is the impact on the rural electrification program?
3. Are goals and purposes of voluntary or other non-governmental agencies compatible? Are they consistent with the AID rural electrification concept?
4. How do government or other participating agencies rank the importance of rural electrification to other rural development projects? To other national development programs or projects?
5. Does the rural electrification project have support of all levels of government? National levels as well as at the local level?
5. At the project level, how carefully are basic AID guidelines followed?

D. Construction, Operations and
Management Analysis

Purpose: Appraise the relation between project inputs and outputs, focussing on how well the rural electrification infrastructure is built and institution is developed and how efficiently key functions are performed.

1. Construction: Building of electrical power infrastructure.
 - a. Was project construction phase completed on schedule? If not why?
 - b. Was construction consistent with standards and specifications? If not, why? Was this properly monitored and by whom?
 - c. To what extent were local as opposed to foreign or imported materials required and utilized?
 - d. What steps were taken to properly maintain and repair equipment?

2. Project organization and physical plant: What type of organization has been developed (e.g. state electricity authority, rural power company, cooperative, etc.)? How was this determined? Does the electric system (plant) adequately serve its users?
 - a. Are the people served by the rural electrification system involved in its management? If so, in what ways? Can they establish operating policies? Select operating staff? Develop by-laws and establish rules and regulations?

- b. Has plant operating personnel been adequately trained? Is voluntary agency assistance required for operations and management? If so, for how long (when can operation and management be turned over to local people?)
 - c. By what criteria is service provided to users? Does the rural electrification system have a defined service area? Is the rural electrification system obliged to provide service to all persons living in its area ("Area coverage" is the American term). Or, can users be selected by the system management? What plans are there for broadening coverage?
 - d. Does the physical plant adequately meet the needs of those it serves? Will it accommodate expected growth?
 - e. Is plant construction of good quality materials and equipment?
3. Logistics: How efficiently were (and are) plant equipment, fuel supplies and other commodities ordered, received, installed, warehoused or stored?
- a. Is construction efficient? What bottlenecks were, or are, encountered? To what extent do bottlenecks or other problems reflect lack of concern at the policy level, as distinct from mechanical or operational carelessness.

- b. Are logistical problems being reduced as construction and maintenance proceeds?
4. Costs and Budgeting: Are cost and operational data complete and accurate? Do they reflect all significant aspects of operations at the project and program level?
- a. What is the level of detail in the cost accounting system? Are accurate records maintained at the project level? Are the personnel engaged in billing, collecting, bookkeeping, and accounting thoroughly trained in the purpose and practice of utility record keeping? If not, is a training program planned?
 - b. How is cost effectiveness measured? Within the rural electrification system? By an involved agency such as a state utility commission? Are audit reports by others available?
 - c. How are such data utilized or analyzed?
5. Monitoring and evaluation output: To what extent and by whom is the impact of the rural electrification program on users being monitored and evaluated? Is impact on community development being evaluated?
- a. Do users have meters to measure their electrical usage? Are data collected which show

how electric power is used (e.g. agriculture, industry, small industry, home crafts)?

b. Are efforts made to provide service to all persons in the service area? Is information obtained regarding reasons some do not take the service? Have users and non-users been surveyed as to their economic status? What kinds of surveys or measures are taken? By whom? How frequently?

c. How are such data utilized or analyzed?

6. Monitoring and evaluation-operations: To what extent and by whom is the operation of the rural electrification being monitored and evaluated?

a. In addition to cost and budgeting evaluations, is the effectiveness of other operational factors appraised on a continuing basis? By whom?

b. How is such information analyzed and used?

c. Are the measures adequate? Is the concept of evaluation being used to improve the operation and the effectiveness of the rural electrification projects and programs?

E. Program Effectiveness

Purpose: Access the contribution of rural electrification outputs to the improved economic, educational, health and general welfare status of target recipients. (Outputs have a wide range of benefits, with both direct and indirect effects. Measurement of these impacts depends on availability of data. If, as in the case of social impact, data are difficult to quantify, some inferences can be made and recommendations should be offered for undertaking surveys or studies to provide evidence of impact and effectiveness.)

1. To what extent is cost effectiveness of project
certained?
2. Project outputs are related to target users of
rural electrification: are the target groups
correctly identified, and to what extent are the
projects reaching these groups?
 - a. What are the criteria for appraising the
impact of a rural electrification project on
the individual user? On his family? On the
community served? How and by whom are these
established? By AID or other donor? By
voluntary agency? Other?
 - b. Is there concensus as to the suitability of
these criteria?
 - c. How closely do project users conform to these
criteria?

- d. How do project outputs conform to the location of target groups? To classes of users, residential, farm, commercial, home crafts, industrial? To economic level of users (e.g. the lower 40 percent).
3. What is the economic impact of rural electrification on recipient groups?
 - a. Is energy used to increase agricultural production, storage, marketing, irrigation, drainage, poultry production, feed grinding and mixing, home crafts, light industry, income from services such as repair shops, etc.? Is individual or family income increased? To what extent has electricity replaced other energy usage? To what extent does the project imply a government subsidy?
 - b. How has the project impacted investment, employment and production in the project area?
4. What is the educational -- non-formal and formal -- impact of rural electrification?
 - a. Is energy used to electrify schools? Does this increase adult educational opportunities? Provide better conditions for regular classroom operation? Provide community meeting place?

- b. Has community radio and television viewing increased? Are educational programs now available?
5. What is the impact of rural electrification on health?
- a. Has rural electrification resulted in improved water supplies (deep well pumps and piped delivery of pure water where it is available to the villagers)?
 - b. Is refrigeration improving the storage and saving of produced food? Has it made possible sterile conditions in clinics or other health centers? Has refrigeration made possible the storage of vaccines and other medical supplies? Provided better lights for examinations, treatment, etc.?
 - c. Is night lighting used for recreation purposes of local people?
 - d. Are fans used in homes and medical centers to improve comfort level?
6. What is impact on security?
- a. Is electricity being used to improve radio and telephone contact between and among police stations?

b. Are village streets lighted? Has this provided greater security? In what way?

7. Is rural electrification service well accepted (Is there adequate service with few interruptions and of constant voltage and frequency?) To what extent are people requesting more service and is there mechanism for this?

8. What are other direct impacts of rural electrification activities (i.e. has it resulted in other cooperative activities in the community, have new productive enterprises come into, or are developed in the community as a result of available electric power, have household chores been lightened, are women more participative in local affairs)?

a. How can these activity impacts be measured?

b. Are such measures appropriate and significant?

c. Using such measures, what judgments can be made concerning rural electrification project effectiveness in directly contributing to economic development? In attaining a measure of social equality with the urban sector?

9. What are other effects of rural electrification project outputs?

a. Have family attitudes been affected? How

does the family perceive the coming of the services of the rural electrification program?

- b. Have community attitudes been affected? How do communities perceive the rural electrification project activities?
- c. Has rural electrification had any effect on family planning practices? In what ways?
- d. Have employment opportunities been increased or changed?
- e. Has worker productivity been affected? Can this be measured?
- f. Can any spillover effects be discerned? (e.g. improved diet and general level of health through higher food production, refrigeration and sanitation). Has community pride been enhanced as shown by neater premises, house painting, etc.?
- g. Has migration to the cities been reduced as economic activity absorbs more of the rural labor force?

F. Rural Electrification and
Other Programs

Purpose: Assess the extent to which the rural electrification is coordinated with other similar programs and how closer this and improved integration might be affected at both program and project levels.

1. What is the relationship between rural electrification and the programs and projects of host country participating agencies (e.g. ministries of electric power and rural development), multilateral donors (e.g. the World Bank, regional development banks), and other donors?
 - a. How do other programs affect the AID financed rural electrification program?
 - b. How does the AID financed rural electrification program affect other programs?
2. Is greater integration or linkage desirable? How can it be brought about and what purposes would be served?

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