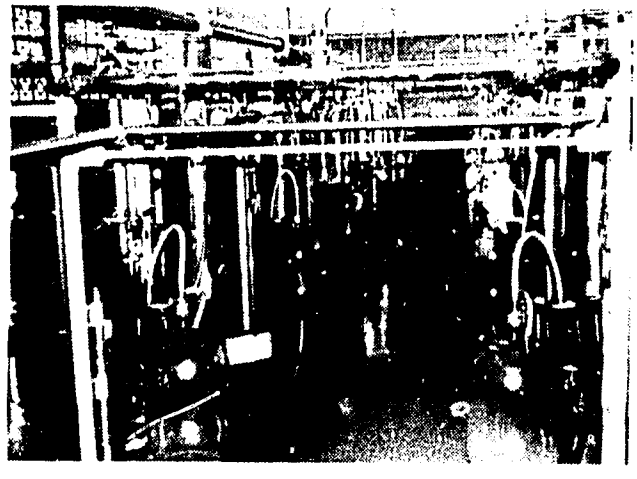
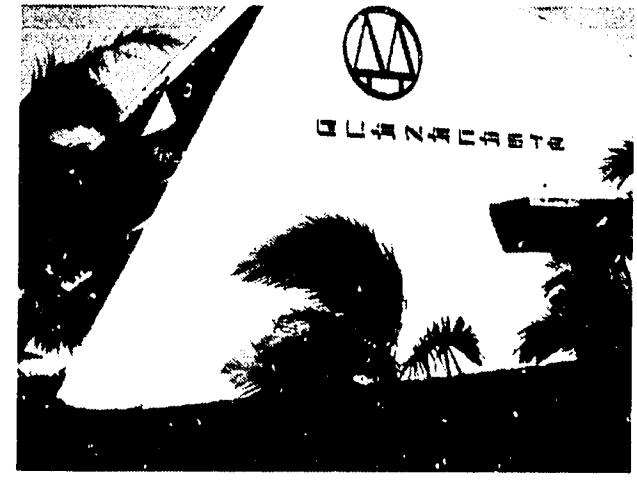
NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION
1800 MASSACHUSETTES AVENUE, N.W.
WASHINGTON, D.C. 20036

EVALUATION REPORT





RURAL ELECTRIC COOPERATIVE OF GUANACASTE, R.L.
Santa Cruz, Costa Rica, Central America
And
RURAL ELECTRIC COOPERATIVE OF SAN CARLOS, R.L.
Ciudad Quesada, Costa Rica, Central America

By

JAMES D. LAY
Management and Operations Advisor

And

JOAN H. HOOD
Evaluation Specialist
INTERNATIONAL PROGRAMS DIVISION

Report Prepared October 1978

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INSERT, Page 1, EVALUATION REPORT - Rural Electric Cooperative of Guanacaste, R. L., Santa Cruz, Costa Rica, Central America and Rural Electric Cooperative of San Carlos, R. L., Ciudad Quesada, Costa Rica, Central America, by James D. Lay, Management and Operations Advisor and Joan H. Hood, Evaluation Specialist, International Programs Division, NRECA, Prepared October 1978.

Correction: The partial sentence in the first paragraph which reads "... the Rural Electric Distribution Cooperative of Guanacaste (hereinafter called COOPELESCA), headquartered respectively...." should read "...the Rural Electric Distribution Cooperative of Guanacaste (hereinafter called COOPEGUANACASTE), and the Rural Electric Distribution Cooperative of San Carlos (hereinafter called COOPELESCA), headquartered respectively...."

I. INTRODUCTION

At intervals between March 1976 and June 1978, a series of visits were made to Costa Rica by James D. Lay, Management and Operations Advisor, NRECA; and Ms. Joan H. Hood, Evaluations Specialist, NRECA, for the purpose of evaluating two of the four Rural Electric Distribution Cooperatives; namely, the Rural Electric Cooperative of Guanacaste (hereinafter called COOPELESCA), headquartered respectively near the towns of Santa Cruz in the Province of Guanacaste and Ciudad Quesada in the Province of Alajuela. An in-depth socio-economic impact evaluation of the San Carlos area had been done in 1972 under the direction of Dr. James E. Ross, who at that time was Project Director for the Evaluation Study under Contract AID/csd-3594, and an Associate Professor of International Agriculture, Center for Latin American Studies, University of Florida, Gainesville, Florida. Other than End of Contract Evaluation, no evaluation had been done in the Guanacaste area.

In these evaluations the NRECA staff did not attempt to do an in-depth socio-economic impact study. The main purpose of these evaluations was to measure progress of the cooperatives and of their members' benefit from and utilization of electric services provided them. In the process we intend to identify the key performance areas to be examined in doing socio-economic impact studies and establish within the cooperatives the importance of such evaluations - particularly as it impacts on future planning. We also intend to show

that the cooperatives are having a social and an economic impact on the areas they were serving. Furthermore, we intend to garner from this evaluation process information which will help in future project planning and implementation by the International Programs Division of NRECA.

This report does not attempt to evaluate the internal soundness of the Cooperatives' financial management. By reference the reader will see that, generally speaking, the cooperatives are well-managed. At the same time, we must say that they are still having growing pains and associated problems which must be addressed if they are to continue to offer reliable service at the lowest possible cost consistent with sound business practices and are to continue to be a contributing force in the development of the areas they serve.

II. SUMMARY

There can be no doubt that the two rural electric distribution systems examined below, COOPEGUANACASTE and COOPELESCA, have had a significant impact on the areas served.

No report, no matter how well done, can really tell the story of what has transpired in these two areas in the past 15 years. Furthermore, the evaluators realize that what has happened is a very complex mixture of human endeavors, the utilization of many resources and the complementing of other rural development programs that have led to the development of the areas presently served by the cooperatives. We conclude, and emphatically state that electricity has been and continues to be a very important, almost indespensable

part of that development, especially in providing a better standard of living for the rural poor, for these reasons:

- Basic Health Services with necessary refrigeration facilities and diagnostic equipment.
- Basic pumping facilities for the development of potable water systems.
- Basic lighting for the homes at an affordable price for just about everyone instead of just the well to do.
- Electricity for the establishment of light, medium and heavy industry and agro-industry and the corresponding increase in job opportunities.
- Electricity for the education facilities, for night classes both for regular instruction and for evening adult education. Provides the opportunity for the use of audio/visual and electro-mechanical devices in the educational activities.
- Illumination of public and private building for evening work and recreational activities.
- Possibility for the use of educational television for instructional purposes.
- Safety at night through public lighting of streets and parks.

This summary will briefly discuss (1) Service areas and the uses of Electricity, (2) Availability to and impact of electricity on the rural poor, (3) Impact on women and women in development and

(4) Lessons learned for program planning and program implementation.

A. Population Served and Major Uses of Electricity

By June of 1978, these two projects were serving approximately 12,000 members, had 14,000 meter connections, over 1,200 kilometers (750 miles) of lines and were reaching a population in excess of 70,000. Together they sold to their membership some 32,597,000 KWH of electricity valued at ¢12,535,000.00 (US $1,457,558.10) in 1977. The two Cooperatives had distribution lines in four of the seven Costa Rican Provinces, 13 Counties, 36 Districts, scores of towns and many rural, isolated homes and farms. By the end of 1977 there were 8,964 residential consumers; 1,730 Commercial Accounts, 276 Industrial Accounts and 328 Public Lighting Accounts.

In constrast to the above, the feasibility study for this project, which was done in 1963, projected that these two Cooperatives would be serving 8,524 families at the end of ten years with a population of some 28,000 and a total estimated annual consumption of some 22,335,000 KWH.

B. Service to Low Income Rural Residents

While no hard data were available on the exact income of the members so that one might readily classify some as poor and others as not, it can definitely be stated that both Cooperatives are serving a significant number of low income persons. Both evaluators had the opportunity to interview a number of these poor. Besides visual proof that a significant number of the poor are being served, we have two sets of

statistics that will support the statement. First, the 1976 Per Capita Gross National Product for Costa Ricas was $1,040; which is high for the Lesser Developed Countries, but very low in comparison with $7,890 for the U. S.[1] We know that rural incomes are lower than urban income so that the figure for rural Costa Rica is lower than that cited above. Second, the Cooperatives' records show that nearly fifty percent of its residential consumers are minimum users, which means they consume 30 KWH/month or less at a cost between $1.40 and $1.64. Though not always the case, it is generally the low income who consume so little electricity because they have little disposable income for electric appliances and thus have few, if any, of these. Not having the appliances, they use lesser amounts of electricity.

As will be seen in the following section of this report, (Section IV, B. 1. b.), COOPEGUANACASTE has a special program for those earning less than $50.00 per month. Begun in late 1977, the Cooperative had connected 175 families who had qualified for the program. In June of 1978, 125 meters were still available for the program and the Cooperative's manager hopes to add more in the future as the qualified poor make application for the benefits.

Both Cooperatives have special arrangements with local banks and/or credit unions for low interest, long-term loans for connections charges, either the special low rates or for the

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[1] 1978 World Population Data Sheet, Population Reference Bureau, Inc.

normal connection charges of ¢400,000 ($46.51) in Guanacaste and the ¢500.00 (58.14) for San Carlos. It is therefore the opinion of the evaluators that only the truly indigent cannot afford to be connected.

The Cooperatives also have in effect what is called a social tariff rate, based on the ability to pay. The schedule is approximately:

First 30 KWH	-	¢12.00 ($1.40)
Next 20 KWH	-	¢0.338 (3.30 cents)
Next 150 KWH	-	0.286 (3.26 cents)
Next 50 KWH	-	0.280 (3.26 cents)
Next 200 KWH	-	0.240 (2.80 cents)
Next 500 KWH	-	0.262 (2.80 cents)
Over 1,000 KWH	-	0.339 (4.00 cents)

With the above and other active programs for facilitating the incorporation of the poor as members we feel that these cooperatives have a very deep commitment to insure that they receive the benefits of electricity.

C. Women in Development and Impact of Electricity on Women

NRECA places considerable emphasis on the involvement of women in development. Nearly a year ago, NRECA hired Joan H. Hood with the intention that she would focus on the impact that rural electric systems had on women and to both assess the role of women in development in the areas served by the cooperatives and to encourage the expansion of that role. See Appendix C for her findings.

Women in the Guanacaste and San Carlos Service areas are very active in the annual meetings of the Cooperatives. Though they do not yet hold positions as either directors or managers, they are members of the education, financial oversight and ad hoc committees.

From personal knowledge the evaluators know that women are also very active in the many Rural Community Development Associations which abound in the areas served by the Cooperatives; thus, they influence not only the rural electric distribution cooperatives, but almost every aspect of rural development in the communities in which they live.

From the statistics on uses of electricity we can see by analyzing the variety of appliances which have been introduced into the home that the lot of the housewife has been considerably improved. Irons, floor polishers, blenders, mixers, pumps for providing in-the-house running water and many other appliances raise the level of life for these rural women. Health and nutrition and primary and secondary education facilities nearer the home give not only better services, but give the added security that they are near at hand when needed. In interview after interview, and from personal observation, it was noted that young women are allowed to continue on to secondary education and beyond because they are not now needed for full-time domestic work. This has not always been so. Though these are not easily treatable statistically they are easy to see and sense. They may sometimes be difficult to link

directly to the provision of electricity, but that the linkage is there, there can be no doubt. The role of women is changing in the areas served by the cooperatives and further in-depth studies could be performed if deemed of value.

D. Lessons Learned For Future NRECA Program Planning and Implementation

Generally speaking we conclude that these two programs were well planned and implemented through the Construction and Energization Stage, except for the establishment of in-depth base-line data which would facilitate socio-economic impact evaluation at some future date. Fortunately we did have two very important studies which gave a sound data base for these studies, albiet not in a form readily comparable. Those two studies, listed in the appendix of this report, are the basis for those comparisons which are made.

Broadly speaking, those lessons learned from these evaluations are:

1. Evaluation methodology must be built in from the inception of the program.
2. Some assurance must be given that Evaluations will follow that methodology, a methodology that will include Key Performance and socio-economic impact indicators that will stand the test of time, and not be subject to the idiosyncracies of either the individuals undertaking the evaluations or the "in thing" of the moment.

3. At the inception of any evaluation, all parties concerned with the evaluation must agree to the extent possible what they are looking for and the expected depth of analysis necessary.
4. To restate items 1 and 2 a little differently, we in NRECA must complete our model building of a socio-economic impact evaluation instrument that will produce the kind of impact data needed by all parties concerned, that will provide us with a system for improving our program planning and implementation, and which will be useful to the on-going program of rural electrification.

Apart from Lessons learned for Evaluation Methodology, there are direct lessons for future program planning and implementation. Among these are:

1. The program documents must contain the setting up of an internal evaluation system within the electric utility for measuring social and economic impact, even though such a charge might be resisted by the local organization managing the utility.
2. If we are going to evaluate a program on its responsibility for serving the poor, aiding in the development of the Role of Women, uses of Alternative Energy, or any other special area of interest, this must be programmed from the beginning. If not, then recognition must be made in the evaluation

process that this was not part of the initial goal or objective of the program and should be treated accordingly. If we expect a project to have "complied" with an objective which becomes critical "after the fact," we must devise a system for so informing the managers of the program, perhaps giving them some assistance in developing a strategy for achieving that objective, and then give them time to achieve the "new objective." In any evaluation we must not judge the project as not having achieved an objective that wasn't in existance during the planning and implementation stage of the project.

3. Because impact evaluation is not traditionally a part of program management and operations, we must give considerable thought to building in a training component in any program in which we are involved which will emphasize the importance of such evaluation and train local staff in the art and science of data collection and record keeping.

III. RECOMMENDATIONS

The following evaluation report is as complete as allocated time and resources permitted. NRECA will continue to keep abreast of developments in the future and update the information. It is suggested that the time is proper for an in-depth socio-economic academically oriented study to be done in one or both of these areas if another such study is considered advisable and funds can be made available. By the time such an evaluation is underway, the cooperative will have more

than ten years of service to its members. Both appear to be financially strong. There is sufficient base-line data available to make a useful comparison with the past, though much of the data is scattered and some would have to be reoganized to be of use.

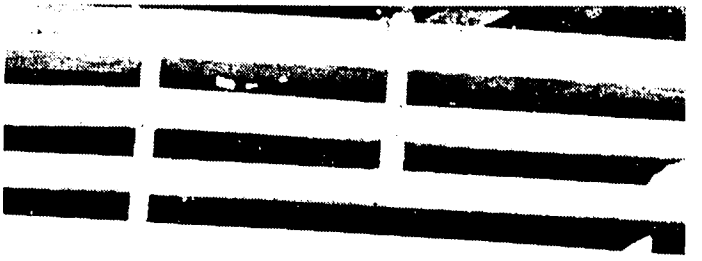
To continue to strengthen the management of these cooperatives to improve their services to the consumer/members, improve agricultural uses of electricity to increase productivity and yield, and to assist in the development of a sound program to attract industry, we strongly urge NRECA's continued involvement with these cooperatives. Training and management assistance should be continued to provide both a desire and a capability for self-sufficiency in these areas. Continued development of systems of internal evaluations and control must continue, although the evaluators have seen substantial improvement in the areas resulting from NRECA's Management Seminars in which more than thirty directors, managers and key staff in Costa Rica have participated.

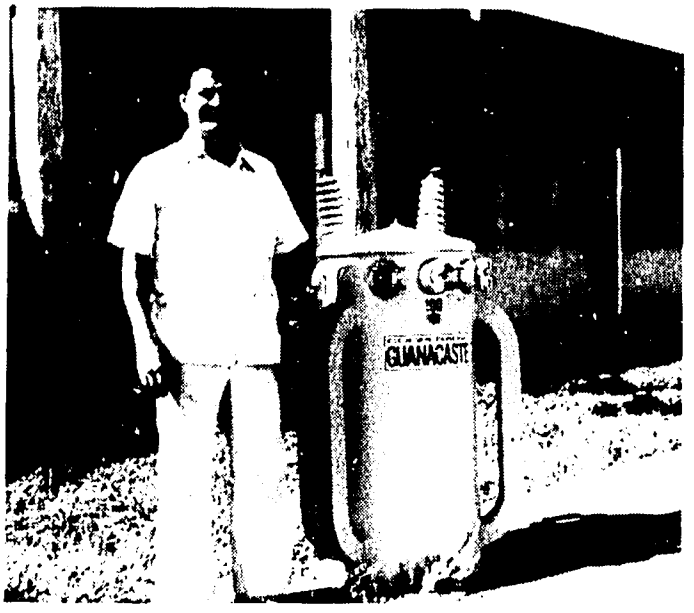
As a part of the above recommendations, it is suggested that these and the other Rural Electric Cooperatives develop Power Use Programs based on the U. S. Model of the 1950's and 1960's which will promote the safe, rational use of electricity on the farm, in the home and in the community. Such a program needs to reach the middle and low income farmer and needs to include low-cost loan programs which will enable them to purchase materials and equipment on affordable terms.

Rural home in Quebrada Honda, Costa Rica. Note TV Antennae.

Rural Single-phase line serving the coastal area of the Province of Guanacaste.

Sign erected at entrance of Santa Cruz, Costa Rica reads "Rural Electric Cooperative of Guanacaste. **Coopeguanacaste R.L.** Symbol of Progress in the Peninsula of Nicoya. Giving electric service to the Counties of Carillo, Santa Cruz, Nicoya, Hohancha and Nandayure."





Sr. Mario **Flores** Bustamente, Manager, Rural Electric Cooperative, Santa Cruz, Costa Rica.

Santos Leon, Public Relations Staff, **Coopeguanacaste**, interviewing owner of small general store in Talolinga, Costa Rica

IV. EVALUATIONS

A. Background on Rural Electrification in Costa Rica

NRECA did the feasibility studies which provided data for the loan paper:

On October 27, 1965, AID loan No. 515-015 was signed for $3,300,000.00, matched by local funding of $818,000.00, with the purpose of organizing and constructing three rural electric cooperative distribution systems to serve 14,000 members/consumers within the first ten years. The following cooperatives were organized:

1. Cooperativa de Electrificacion Rural de ~~Los Santos~~ Guanacaste, R. L., (COOPEGUANACASTE), Santa Cruz.
2. Cooperativa de Electrificacion Rural de San Carlos, R. L., (COOPELESCA), Ciudad Quesada.
3. (Cooperativa de Electrificacion Rural de Los Santos, R. L., (COOPESANTOS), Marcos de Tarrazu.

The program was implemented through the National Bank of Costa Rica (Banco Nacional de Costa Rica - BNCR) as the borrower with the Costa Rica Institute of Electricity (Instituto Costa rricense de Electricidad - ICE) and NRECA as consultants to the Rural Electric Cooperatives. Construction work was started on October 17, 1967. The first segment of COOPEGUANACASTE was energized in June of 1968. COOPESANTOS and COOPELESCA were energized in May of 1969. As of June, 1969, the three Cooperatives were giving service to approximately 7,500 consumers.

NRECA, under contract to BNCR, provided the services of an engineering manager, with responsibility for coordinating materials procurement, construction and energization and initial management development during construction. NRECA's termination of assistance under this contract was July, 1969.

B. Evaluation Process

A series of evaluations were undertaken by James D. Lay and Joan H. Hood between March 1976 and June 1978. Preliminary findings have already been submitted to AID/Washington. This report will highlight the findings and will not include all the detail of earlier reports. (It should be noted that Management Assistance was rendered to all C. R. rural electric cooperatives during period of evaluation.) Only COOPEGUANACASTE and COOPELESCA were evaluated from a socio-economic point of view. Each cooperative will be examined separately.

1. Rural Electric Cooperative of Guanacaste (COOPEGUANACASTE) Santa Cruz, Costa Rica

a. Background

1) Date of Incorporation: January, 1965.

2) Date of Energization: June 1968.

3) Number of Members: July 1978 - 7,333.

4) Number of Connections: July 31, 1978 - 8,005.

5) MWH Sold - 1977: 17,842.

6) Population Served (estimated) - July 1978 - 45,000. Average family size 6.1.

This Cooperative is located in the northwest section of Costa Rica and serves almost all of the Nicoya Peninsula. It presently has distribution lines in the Cantons (Counties) of Santa Cruz, Nicoya, Carillo, Hojancha, Nandayure in the Province of Guanacaste and Lapanta and Paquera in the Province of Puntarenas. (See Map, Appendix A, Map 2.) This Cooperative has just completed its tenth year. It has completed nine fully calendar years. All figures

in this report are based on calendar years and thus 1977 is the 9th calendar year.

It was estimated that "In the Peninsula of Nicoya only 7% of the homes had electric service...and only 5.4% had 24-hour service,"[2] in 1963. It is conservatively estimated that presently more than 50% of the homes in the service area now have electricity and where lines are installed well over 90% of the homes have electricity.

b. Services

Attached are a number of graphs which show the growth and sales and services from 1968 to present. (See Appendix A, Graphs 1A through 1F.)[3] Here I would like to present a columnar comparison between projections and actual use.

	Projections (9th yr.)		1977 Consumption	
	No. of Consumers	MWH Consumed	No. of Consumers	MWH Consumed
Residential & Small Commercial	4,374	840	7,260	12,850
Others	23	4,011	119	5,974
Total	4,397	4,851	7,379	18,824

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[2] General Data, Introduction to Inventory and Inventory of Natural Resources of the Peninsula of Nicoya. Pedro Tirado Sulsona, Agency for International Development, and Miguel A. Munoz. Published 1966.

[3] All projections in this study are excerpted from "Estudio de Ingenieria y Factibilidad Economica..."Costa Rica. By Glen R. Benjamin, Rural Electrification Specialist, NRECA, November 11, 1964. Actual usage statistics are from co-op and ICE records.

c. Area and Population Served

This Cooperative subscribes to the principle of area coverage and ultimately aims to serve all but the most isolated residents of the service area. The Cooperative has expanded far beyond its originally designated service area as can be seen by comparing the original design (Appendix A.1.) with updated Map (Appendix A.3.). Because of the mountainous terrain there are people in the service area who are not now near any of the distribution lines.

This Cooperative has a very active policy of reaching and serving the poor. This policy is carried out through a special "Socio-economic" study. A staff member from the Coop's Public Relations Department visits the family requesting service. If the family is found to be eligible -- earning less than $50.00 per month but with reliability and a desire to pay the minimum rate, the Cooperative will electrify the home for a charge of ¢125.00 (US $14.53). Normal minimum connection rate is ¢400.00 (US $46.84). See Appendix E.1. This special rate includes the installation of basic wiring with three light bulb outlets and two or three plug outlets. The low income person can pay the $14.53 connection charge in ten installments, along with his/her monthly electric bill. Most of these low income members will use the minimum of 30 KWH per month at a cost of approximately $1.40. This allows them liberal use of three

light bulbs, an electric iron and perhaps one or two other small appliances, such as a radio, a blender and even a small black and white television set. It is estimated that about 50% of the residential consumers use just the minimum KWH/ month.

Where the lines are built only the indigent or destitute (poorest of the poor) cannot afford to connect. For most of the non-adopters, money is not generally the reason for not connecting. Tradition and cultural background are the reasons for many not wishing electricity. "My daddy go along without it, and so can I." Some senior citizens and others fear electricity because they do not understand it. A very few don't know about the special program for low-income residents or the installment policy.

d. Uses of Electricity

The 1963 National Census and a special study done in 1963 tell us that at most the Peninsula of Nicoya has an installed capacity of 2,295 KWH, as the following data show us:

ELECTRIC ENERGY AND NUMBER OF CLIENTS IN THE COUNTY SEATS OF THE PENINSULA OF NICOYA*

County	Capacity in KWH	Number of Homes Connected	Utility	Hours of Service Daily
Filadelfia	30	161	Private	6:00 - 10:00 p.m.
Santa Cruz	270	500	I. C. E.	24 hours
Nicoya	460	434	Municipal	24 hours
Carmona	-	-	-	-
Totals	760	1,311 (misprint in Study - total should read: 1,095		

*Data obtained in each municipality, 1966.
Above material excerpted from Datos Generales . . ., Chart No 63., Page 152.

NUMBER OF PRIVATE ELECTRIC PLANTS ON FARMS AND IN BUSINESS IN THE PENINSULA OF NICOYA*

County	Number	Combined Potential** (Calculated) KWH
Carillo	11	700
Santa Cruz	9	185
Nicoya	22	220
Nandayure	9	90
Lapanto y Paquera	34	340
Totals	85	1,535

*Data obtained from 1963 Census Report.

**These plants fluctuate between 5 and 15 KWH. 10 KWH average is estimated for each one. In Carillo, the sugar mill "El Viejo" has a 600 KWH generator. (Ed. note - It is interesting that during the feasibility study for this cooperative, this plant said that it would never connect up to central station electricity. Not only has it since hooked into the system and more than doubled its KWH capacity, but is begging for more power - which cannot be given until the cooperative enlarges its lines to carry a heavier load.)
Above material exerpted from Datos Generales . . ., Chart No. 64, Page 152.

As of the date of this report, the cooperative had one 5,000 KVA Substation with 400 miles of line serving over 8,000 consumers.

1) Residential Uses

In the report of 9/8/71 entitled "Capital Projects Effectiveness Evaluation - Post Evaluation of Completed Capital Projects - Electric Power Project Three Rural Electric Cooperatives," by Frank Masson, Economist and John Rixse, Engineer, it was stated "All three (R. E. Projects) are in an unfavorable position in respect to growth of demand. Residential and small commercial sales are below forecasts (...6% in Guanacaste.)" This is not true today. If you look

at Graph 1.e, Appendix B, you will see that actual usage is 304% above forecast (8.131 MWH actual against 2,674 projected). It is also interesting to note that average monthly consumption is 147 KWH as against a projected use of 70 KWH in the feasibility study. (See Graph 1.f, Appendix B.)

In May of 1976, a partial study or survey was executed and the results of this survey are listed below. This was a random survey. In the towns and more densely populated areas, every tenth house was selected. In the rural areas every fifth house was chosen. If the selected household was found to have no one at home, the interviewers went on to the next house, and the next, until someone was found at home. Of the 173 residences included in the survey it may be noted that 42 of these were connected directly with a business enterprise and 17 of them were part of a farm operation.

173 or 100% had one or more electric bulbs or neon lights
132 or 76% had electric irons
102 or 59% had televisions
75 or 43% had refrigerators
34 or 20% had electric blenders
25 or 15% had electric radios (most households had portable radios)
23 or 13% had electric stoves
21 or 12% had electric fans
16 or 9% had stereo equipment or record players
15 or 9% (approx.) had washing machines

10 or 6% had electric floor polishers
9 or 5% had electric pumps for household water
5 or 3% had electric sewing machines
4 or 2.3% had thermo-heaters for their showers (bath)
6 or 3.4% had electric mixers
3 or 1.7% had one each of the following items - electric skillets, electric ovens, air conditioning, electric tools, juice extractors
2 or 1.1% had electric clothes dryers
There was one each of the following items - hot water tank, hair dryer, electric clock, tape recorder and electric massager.

Of the 173 residents:

28 or 16% were previously connected to a municipal system
26 or 21% had private plants
109 or 63% had no electricity prior to cooperative.

In April of 1978, Ms. Joan H. Hood conducted a series of 22 interviews in the Barrio of Buenos Aires, which is one of the lowest income areas which the Cooperative serves. There are between 250-300 homes, with an average family size of five. Main type of employment is day labor, not steady, and about one of three homes does not have a man as the head of household. Each 11th home was visited. Of the 22 dwellings, 18 were cooperative members. Two of the households had had service for nine years, the remainder of the homes electrified, all had light bulbs, all but two had irons. Seven homes had refrigerators and four had television sets. However, those with the refrigerator and television would accommodate their neighbors with these appliances. The majority of the homes (10) had a two-burner hot plate for cooking, but most baking was done using wood in the typical clay oven outside the home.

One can see from the above data that the consumer/owner in this system is not just changing the candle or kerosene lamp for light bulbs. In the first sampling 76% had electric irons, 59% had television, 43% had refrigerators. Only five households of the 173 had just basic lighting.

COOPEGUANACASTE offers its members the chance to buy a number of small electric appliances at a reduced cost. The interviewer found this is a much valued help. In the case of a tailor shop in Cartagena, the owner-manager told of a fan he was buying with the help of cooperative financing. The price was ¢1,200 ($139.53) and he could pay it at the rate of ¢20 ($2.33) each week. Also cassettes wich normally sell in Santa Cruz for ¢30 ($3.49) were offered through the co-op for ¢27 ($3.14). In every case, the cost to members to buy appliances through the co-op is about 5%-10% less expensive than at a regular retail outlet. Also, the buyer is allowed to pay off the charge in small payments with each electric bill.

As the manager explained, this service benefits the members and the co-op as well, since with increased customer use of other electric appliances, the co-op receipts go up each month.

2) Agricultural Uses

According to information available, it appears that there is still minimum use of electricity on the farms

(outside of household use). No updated statistics were available in readily securable form. However, we can see some changes if we compare available 1963 and 1973 Census Data.

	1963[4]	1973[5]
Number of farms	10,733	11,835
Average size	254 acres	190 acres
Farms with electricity	189	340

Of the 189 farms with electricity in 1963, 115 were served by private plants. No data were available for 1973 in the division between central station electricity and private plants.

A partial survey of 17 farms was made in 1976 which yielded the data listed below. These farms were included in the 173 Households surveyed in section 2.D.1 above.

17 had electricity in the homestead
14 had electric water pumps for homes use and watering of livestock
6 use electric pumps for irrigation
4 had completely electrified farm repair shops
4 had barns, stables and/or corrals with electricity
3 had electric breeders for poultry or hogs

Several of the large farms in the area have made significant use of electricity in their farm operations -- irrigation, grain dryers, silos with conveyor belts, small sugar mills, and the like.

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[4]Data from Page 188, Chart 153, Censo Agropecuario de 1963, published in 1965, San Jose, Costa Rica.

[5]Data from Page 193, Chart 102, Censo Nacional de 1973 - Agropecuario, published June 1975, San Jose, Costa Rica.

It is the evaluators' opinion that there should be a concentrated power use program put into effect in this area - based on the models used by the U. S. Cooperative Extension Service and the Rural Electric Cooperatives. Such a program needs to reach the middle and low income farmer and must include a low-cost loan program which will enable the farmer to purchase materials and equipment on affordable terms.

3) Commercial (General) Uses

Because commercial usage is linked to residential uses in all projections made for this cooperative, it is difficult to isolate the differences between these projections and the actual usage over the years. But from the Cooperative's records we can see the growth patterns in number of accounts and annual consumption.

	1969	1970	1971	1972	1973	1974	1975	1976	1977
Connections	280	338	342	369	420	728	832	922	1,020
Annual Cons. (MWH)	825	1,058	1,257	1,523	1,841	3,073	3,354	3,895	4,719

In looking at the Benjamin Feasibility Study one can see that a total of only 2,674 MWH was projected for both residential and small commercial consumers at the end of the 9th year of operations and a total of 4,081 at the end of the 10th year. By comparing these projections with the above figures, we can see that projections were greatly surpassed.

In May of 1976 a survey was made of 58 businesses that were then being served by the cooperative. Of these 58 businesses, 42 of them had the family home and living quarters directly attached to the business. The results of that survey were as follows:

58 businesses with basic electric wiring and bulbs or fluorescent lights
31 had freezers
19 had refrigerators
17 had cooler chests
16 had juke boxes (record players)
11 had fans
9 had electric blenders
8 had television
8 had ice making machines
7 had stereo equipment
6 had air conditioning
5 had electric stoves
5 had toasters
5 had cash registers
4 had electric frying pans
4 had adding machines
4 had commercial percolators
4 had security lights (apart from public lighting)
3 had electric tools
3 had commercial irons
3 had electric pumps
3 had waffle irons

There were two business establishments with the following items (not necessarily the same two) - radio, lamps to kill insects, soldering irons, juice extractors, floor polishers.

There were business establishments with the following items - welding equipment, compressor, photo lights, bread cutter, filer, calculator, mixer, rock crushers, rock pulverizers, conveyor belt, sander, heater for warming beeswax.

Of the 58, seven or 12% were on municipal service prior to coop.
22 or 38% were connected to private plants.
29 or 30% had no electricity.

During the survey, only one business indicated that it had not improved its sales since the advent of the cooperative and that was an ice factory.

According to cooperative's records, the change (or growth) in major businesses in the service area is as follows:

Business	Pre-coop	May 1976
Pharmacies	2	14 - 700%
Repair shops, mechanic	-	16
Repair shops, other	-	11
Gas stations	3	7
Hardware stores	3	7
Brick and block factory	1 (Diesel)	7
Ice factory	2	3
Restaurants	4	21
Totals	15	86

This growth has continued through the middle of 1978, and appears to be accelerating. As can be readily seen from the above statistics, the provision of reliable, 24-hour electric service has been a boom to business, especially those with the need for cooling and refrigeration services. What cannot be seen is the quantum improvement in cleanliness, sanitation and the preservation of food and other perishable items and the efficiency produced by electrical appliances. These things must be seen to be believed.

4) Industrial/Agro-industrial Uses

Before energization of the cooperative distribution systems there was only one plant served by central station electricity - a milk processing plant in the city of Nicoya.

There was one sugar mill and there were three rice processing and cleaning plants, and five saw mills operating one diesel fuel - all of which have since connected to the COOPEGUANACASTE lines. The Benjamin study projected a total use of 896 MWH per year at the end of the 10th year. Actual sales for the year 1977 were 4,898 MWH - well above forecast. Cooperative records show that there were 47 Industrial Accounts. (ICE records show 45.) Attached is a list of Industrial Accounts as of December 1975 (See Appendix E.5). This list has grown since then.

In the latter part of 1977 a large processing plant, a cotton gin, was connected to the system. It has an installed capacity of 1,500 KVA at the present time but is expected to expand when in full operation. As noted in the Agricultural Section of this report, there are a number of large farming operations served by the cooperative. One of interest is the farm of Edgar Ugalde Brains. He is unique in the area in that he is the only large scale milk producer. He has been a cooperative (RE) member since its beginning. Before that he had his own generating plant. Sr. Ugalde stated that without electricity for milk coolers, milkers and allied equipment, it would be impossible for him to operate. He is milking 240 animals. This is done each day at 1:00 a.m. and 10:00 a.m. His milk is sold to "La Cooperativa de Los Productors be Leche, R.L." - Dos Pinos, the large milk

producers Cooperative. He has five service bookups, four for houses and one for the dairy operation. His average monthly use is 3,500 KWH and the bill is about $170.00. He has an average of fifty full-time employees and about 15 to 20 seasonal helpers.

The Cooperative has had an industrial growth which has been impressive. This has not happened just by happenstance or without cooperative involvement, but I do believe that it would be better if the Cooperative had a well-defined industrial planning program in conjunction with agricultural and non-agricultural interests. This is not only necessary to add KWH sales but to make long-term plans for the development of an adequate physical plant which will carry them into the future and still be capable of delivering reliable service. This is being done to a degree. At the present time major revisions are under way to upgrade existing three-phase service to Guardia where the new cotton gin is in operation. The Cooperative is also upgrading from single-phase to three-phase, the lines to the coastal areas because the present and planned hotel facilities and other tourist development need the greater capacity.

5) Educational Uses

Prior to the energization of the cooperative lines, there were seven educational centers which had central station electricity (four in Santa Cruz and three in Nicoya).

By the end of 1977 there were more than fifty educational centers on the COOPEGUANACASTE lines.

Before 1968 there were no regular night schools in the service area. As of the date of the last evaluation there was a night branch of the University of Costa Rica, at least three secondary and four primary schools holding regularly scheduled night classes. There were also vocational classes being held by INA, the Costa Rican National Institute of Learning, in Santa Curz. No attempt was made to enumerate the uses of electricity but the evaluators observed visual aids, shops, televisions, potable water systems and much more, all powered by central station electricity.

6) Health/Nutrition - Uses of Electricity

In 1968, prior to the Rural Electric Cooperative of Guanacaste, there were seven health centers (three in Santa Cruz and four in Nicoya) and no hospitals. By December 1977 there was a 120-bed modern, well-equipped hospital, nearly thirty health centers many of which had nutritional centers attached to them and eleven potable water systems. There was no base-line data on potable water systems which existed prior to the Cooperative. It was said that such systems existed in Santa Cruz, Nicoya and perhaps Filadelfia. The only baseline data available on water systems is taken from pages 283 to 287 of the 1963 Nicoya Peninsula Study (cited above), which states

"There were 16 water sources in place, 12 of which had

pumps and four gravity feed...five had distribution systems to households (Filadelfia, Santa Cruz, Nicoya, Carmona and Mansion). The information provided does not state whether they were potable water systems, so we cannot say that they were. At present the National Sewage and Water Service (S. N. A. A.) has overall responsibility for the development and construction of potable water systems and is working very closely with the R. E. Cooperatives and others in the community to develop and maintain such systems.

Through the development of health clinics, nutriton centers and potable water systems, one can see and sense a great improvement in both the health of the people and the provision of these very necessary services. Electricity, reliable and efficient, plays a large part in the success, even the possibility of such systems.

7) Public Lighting

As of December 1977, there were 72 towns in the COOPEGUANACASTE service area with public lighting systems. Prior to 1968 only the towns of Nicoya, Santa Cruz and Filadelfia had central stations electricity to feed public lighting systems. Other towns had diesel or gasoline driven generators, but these were few and then only provided street lights to the very center of the town.

8) Recreational Uses

The most clearly defined recreational use of electricity is that of hotels/motels/tourist type facilities. Prior to the advent of the Cooperative, there were only small pensions in the towns of Nicoya, Santa Cruz and Filadelfia and some "cabins" on the beaches. There were no facilities which could be classified as first class or luxury hotels. Now there are more than a dozen which could be classified in this manner (air conditioning, hot water and many with restaurant facilities). Many are located on the pacific coast and at least one on the Gulf of Nicoya for the express purpose of tourist and leisure time activities. Plans for many more are on the drawing boards. The important part of this development is not only that it brings the tourist "dollar" into the area, but it provides jobs, many of them at the professional level, and thus helps increase the financial base of the community and stem the out-migration.

It would be impossible to cite statistics for all of the hotels, and tourist attractions but let us present a couple. The evaluators had the opportunity to visit some of the resort areas served by the cooperative. Residents and business of Playa Coco have been members of the cooperative since the beginning. The Playa Coco Beach area is averaging a monthly use of some 43,000 KWH at a cost of some ¢18,000.00 (US $2,093.00), with some 253 connections (meters). The Playa Hermosa was planned and developed seven years ago. Average monthly use

here is some 9,000 KWH, at ¢3,500.00 (US $406.97) with 39 meters.

In 1976, one of the businesses which was interviewed was the Hotel Diria Tamarindo Beach. Prior to the Cooperative, this Hotel was energized by a 15 KWH diesel plant, and had an annual gross income of some ¢200,000.00 (US $23,255.00), employing about 10 to 15 persons on a seasonal basis. In the year 1976, it used some 40,000 KWH, had a gross annual income of over ¢1,000,000.00 (US $116,280.00) and employed about 50 persons on a full-time basis. Since that time it has about doubled the size of its physical plant.

The amazing thing about all of the above is that tourist development was not even mentioned in the Benjamin Feasibility Study.

e) Economic Benefits

The reader can infer benefits through statistics given on agricultural, business and industrial enterprises that have developed in the area in the last ten years. In the 1976 mini-survey that was done, one can see that there were 86 major businesses where there were fifteen before, there were 11 first class hotels where there were none before.

If AID wishes to do so, the evaluators suggest this might be a good area to do an economic impact study in more depth. Though the base line data is scattered, it is available from the 1963 and 1973 Costa Rican Census Data,

from the 1953 Nicoya Peninsula Study and the IFAM/AITEC 30 Counties Studies of 1974 and 1975.

f) Social and General Benefits

The major social benefits which have accured to the people in the COOPEGUANACASTE service area are noted above, especially in the area of educational and health services, but also in the provision of public lighting, potable water and other governmental services. There is no doubt in our minds that a goodly number of the poor have benefited, directly and more-so indirectly. Women have benefited and have been involved in the developmental processes affecting their homes and their communities.

Through participation in the cooperative, most of the members have had numerous experiences in the democratic process. There is at least one meeting a year in each of the districts served by the cooperative. In the first place the people to be served make the basic decision concerning their participation as members of the cooperative. Once it had been decided that the area is to be served, the people elect on delegate to represent each twenty members at the annual meeting.

According to the cooperative manager, members of the board of directors and individual members with whom we interviewed, there has been a marked improvement in the relationships between the local/provincial/national

governments and the people. But even more important is that the people have learned that they do not have to wait for governmental decisions to get something done. With such a large representation they can initiate action and not just react.

No attempt has been made by the evaluators to determine the impact on the birth rate, out-migration and similar areas. We know that the overall birth rate is down from 3.9 in 1965 to 2.4 in 1977. Out-migration appears to have slowed but is still high according to "guesstimates." This summary evaluation cannot now link these to the provision of electrical services, but the greater creature comforts made available by electricity must, in time, have a definite and positive impact.

g) General Comments on the Management and Operations of COOPEGUANACASTE

This evaluation does not address itself to the internal management and operations of the Cooperative, but we think that some comments are in order. Financially the Cooperative is in excellent shape as can be seen by studying the Annual Reports and the Financial Reports and Balance Statements. Organizationally, it has come a long way over the last ten years, but still has internal problems that must be addressed if it is going to continue to be successful. In this respect, we would like to examine several items, i.e. the Board of Directors, the Management and Education Program

and the Training programs.

First, the Board of Directors. There is a seven-man Board, with four directors elected one year and three the alternate year. Each director serves for a period of two years. A director can be elected to succeed himself. One of the major problems of this cooperative has been the rapid turnover of the Board Members. Not too many have succeeded in being re-elected to a second term. Another problem has been the politicization of the position of being a Board Member, with a partisan emphasis. (It is politically very desirable to be a Board Member, just as it appears to be politically desirable to take pot shots at the Cooperative to "make points" with the voters.) This latter point we will not dwell on too much because while it very much affects the functioning of the Board and thus the progress of the Cooperative, it is beyond the scope of this report. The major problem of the rapid turn-over of Board Members is that just as one is educated as to what the cooperative is all about, ht goes off the Board. Two Management Seminars have been given in Costa Rica to train, among others, Board Members in Modern Management of Rural Electric Cooperatives. Not one Board Member from this Cooperative (other than the more or less permanent representative of ICE) attended the training sessions, not even the one held in Santa Cruz. The main reason given was that they could not take time off from their farming,

teaching job, business, etc. The second reason given was that it would do no good to receive this training if they were only going to be on the Board for one term. We know that this is faulty thinking. It is apparent that Ing. Jorge Maroto, the permanent representative from ICE, is the one that has held this Board together and has enabled it to make decisions necessary to enable the Cooperative Management to function. He has attended the NRECA Training Program in the U. S. He has been Assistant Instructor for both the Management Seminars held in Costa Rica. Ing. Maroto has been a strong backer of the Rural Electric Cooperatives since the beginning (1963 and before).

Let us now move on to Management. The Cooperative has a very capable Manager, but one who is inexperienced in delegation of authority and directing the formulation of policies. The Cooperative also has a fairly good supporting staff but a staff which is inexperienced in accepting responsibility and receiving delegations of authority. (This phenomenon is not uncommon in Latin America.) With assistance from NRFCA staff and consultants, participation in the two NRECA Management Seminars, participation in training programs offered by the Costa Rican Institute for Cooperative Development, and other specialty training programs, this situation is beginning to turn around. Some Delegations of Authority and Policy Standards have now been written and promulgated.

This Cooperative has a concern which no other R. E. Cooperative in Costa Rica has. It has a Union. Every staff member except the Manager is, or can be, a member of that Union, including the Heads of Departments. The Manager said this would be fine, if it were an experienced union with an experienced union council behind it, but that is not the case. Conditions seemed to be on the upswing as of July of 1978, but the could flare up again. There is still the possibility of work slow-downs, work stoppages, or a strike. It is the belief of these evaluators that the training programs in which the key staff personnel have take part has helped to alleviate the serious problems that existed two years ago.

Training needs to continue, especially basic management techniques. Also required are higher level and specialty training in management, financial forecasting, financial analysis and control, accounting, inventory control and processing, and "Hot Line" Schools.

Top on the list of "must do's" is to set up a Power Use and Member Relations Program. There is a beginning in the Cooperative's Public Relations Program. There is a beginning in the Cooperative's Public Relations Program but it needs to be expanded. All through this report, one can interpolate the need for this. Someone needs to promote the uses of electricity for farm purposes among the medium and low-income

farmer. Someone must show the housewife how to get the most use out of the few appliances she can afford to purchase, how to use them efficiently and safely and how to use them as possible means of increasing household income. What we are saying, in effect, is that this Cooperative needs to have an Electrical Advisor and a Home Economist of the same caliber that our U. S. Cooperatives had in their earlier days.

This Cooperative has an excellent base. Generally speaking, it has had a good first ten years. With support from its members, support from the Government and with continuous training there is no reason that it cannot have even a better second ten-year period.

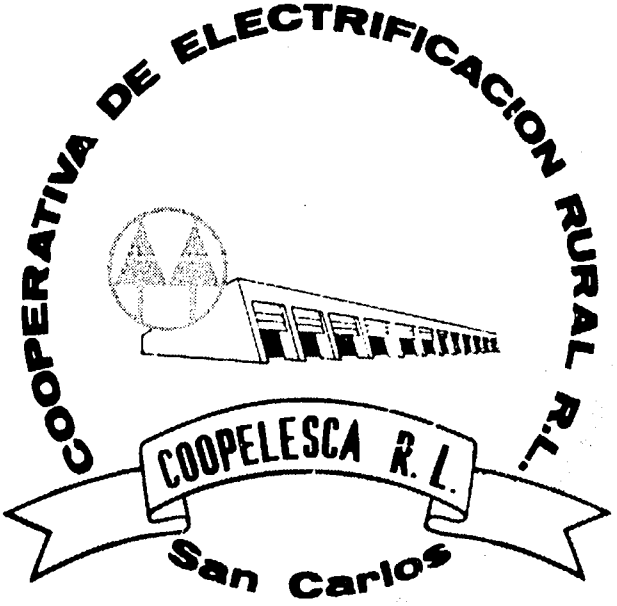
h) Interviews

Interviews are a normal part of any evaluation effort, but special attention was given to them in this evaluation. We are including in the Appendix D of this report a number of them because we think it will give the reader a feeling that cannot be gained through statistics.

i) Financial Stability

This cooperative is in a strong position financially. As can be seen from the growth statistics, this cooperative has increased its membership in all categories at a much faster rate than projected in the Economic and Engineering Studies of Glen Benjamin. To date it has not had any

difficulty in meeting its financial obligations and satisfying its debt service. While this report does not include any financial analysis, it might be interesting for those who look at this aspect of the cooperative to peruse the attached Annual Report for 1977. (See Appendix G.)

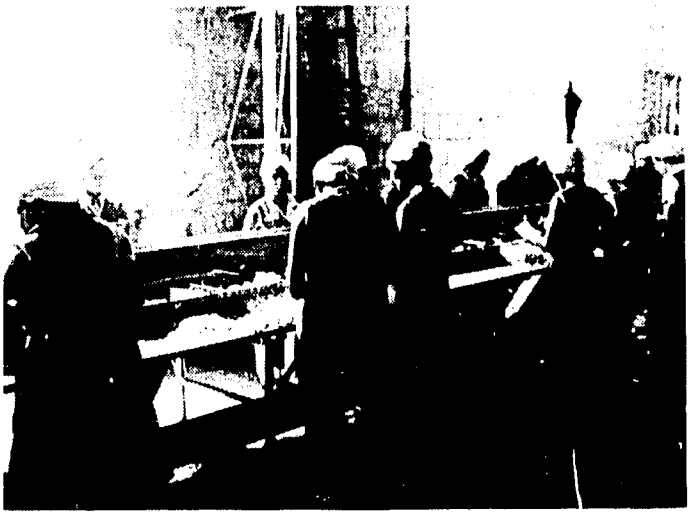


Symbol of Coopelesca

Participants in NRECA Management Seminar held in San Jose, Costa Rica. From l. to r.—Elias Calderon (Back to Camera), Chief Accountant, **Coopesantos** (San Marcos); Roberto Cerdas, Manager, **Coopelerza** (Turrialba); Alvaro Chavez, Director, Costa Rican Cooperative Training Center; Misael Monge (Standing), Manager **Coopesantos**; Alvaro Fuentes, Board Member, **Coopelerza**; and Roberto Silas, President of the Board, **Coopelesca**.

Sr. Freddy **Arroyo** Ramirez, Manager, Rural Electric Cooperative of San Carlos (at edge of blackboard) participating in NRECA Management Seminar "Principles of Modern Management for Rural Electric Utilities."

Rural Electric cooperative crew drilling hole with tractor converted for pole setting in difficult mountainous and rain forest area served by **Coopelesca.**



Cassava factory served by **Coopelesca** which employs more than 100 persons, mostly women.

2. Rural Electric Cooperative of San Carlos (COOPELESCA)
Ciudad Quesada, Costa Rica

a. Background

1) Date of Incorporation: March 1965
2) Date of Energization: May 1969
3) Number of Members: May 31, 1978 - 4,832
4) Number of Connections: May 31, 1978 - 6,289
5) MWH Sold - 1977: 14,755
6) Population Served (estimated) - 26,000
Average family: 6

This Cooperative is located in the north central part of Costa Rica, and serves all or part of the counties of San Carlos, San Ramon and Grecia in the Provinca of Alajuela and the county of Sarapiqui in the Prince of Heredia. (See Map - Appendix A.5.) This cooperative completed its 9th year of service in May 1978. All statistics in this report are based on calendar years, and for purpose of conformity we start the first year as 1969 and count 1977 as the ninth year of service.

No definite statistics on the number of people who had electricity prior to 1969 in the area served were found by the evaluators, but the Benjamin Feasibility Study (cited above) states that other than a privately owned system serving Ciudad Quesada and some private mini-systems there was no electric energy systems in the area. However, Cooperative staff told the evaluators that there had been two small hydro systems serving the centers of the towns of Venecia and La Fortuna (see Attachment E.4 for list of diesel motors or hydro electric plants which existed prior to the cooperative). It can be confidently stated that none of the population outside of Ciudad Quesada could count on 24-hour service.

It is conservatively estimated that more than 40% of the population in the service area has electrical services as of the date of these evaluations. The cooperative personnel estimate that well over 75% of those who have access to the lines are participating.

b) Services

Attached are a number of graphs which show the growth of Sales and Service from 1969 to the present. (See Appendix B, Graph 2.a through 2.f.) Here I would like to show in columnar form the comparisons between projections and actual use for the ninth year of operation:

	Projections (9th Year)		Actual (9th Year)	
Class	Consumers	MWH/Yr.	Consumers	MWH/Yr.
Residential & Small Commercial	3,662	6,152	4,730[6]	8,143
Others	0	9,392	231+	8,466
Totals	3,662	15,544	4,961	14,755

If we examine the above figures, we will see that the cooperative is above projections in number of residential and small commercial consumers and total MWH consumed; but almost on target for MWH per month consumption. Other consumption is down, primarily because the industrial load has not developed as projected. One reason given is because many industries, especially sawmills have their small hydro plants, which they will continue to use until these wear out.

[6] These figures differ slightly from year end totals indicated on Graph 2.4., Appendix B, because they are annual averages. Data from ICE Records.

c. Area and Population Served

This cooperative subscribes to the principal of area coverage and ultimately intends to serve every resident in the service area who wants electricity. (See Attachment S.5 for Map of Service Area.) The service area is 235 square miles and growing. According to the 1973 Census data this area had a total population of 75,488, including the City of Ciudad Quesada, and some 58,000 excluding the City, or 65,788 updated to December 1977 based on a growth rate of 2.3%. Ciudad Quesada is excluded because the cooperative is serving very few residential consumers in the City. With 3,973 residential consumers and 1/2 of the 757 small commercial (379) it is estimated that the cooperative is serving 26,000 residents or approximately 40% of this very rural, very scattered population. As with other areas of Costa Rica, the service area is mountainous and has small centers of populations in very isolated areas, accessible at very high costs. For this reason it is doubtful if the cooperative will ever reach 100% of the population.

This cooperative has a policy of serving the low income which enables all but the destitute to secure electricity if they want it. The minimum quota for hookup is ¢500 (US $58.00) which includes interior installations of basic wiring, 2 outlets and two or three-light fixtures. The prospective member can pay this over a period of five years. The cooperative has an arrangement with the Local Credit Union where a member can borrow at the rate of

interest of 1% per month or 12% per year (fairly inexpensive for Costa Rica). This would mean monthly payments of approximately $1.10 over a five-year period. This, in addition to the average minimum charge of approximately ¢14.00 (US $1.64), means that the average low income person would be paying less than $3.00 per month. As with Coopequanacaste, money isn't the main reason for not connecting. Culture and tradition are the major reasons. Fear is also a reason - fear or electricity. Ignorance is another. This latter factor is being worked on by the Cooperative's Public and Member Relations Department.

d) Uses of Electricity

No data is available on the total use of electricity prior to the Cooperative. As noted above, there were electric service systems only in the towns of Florencia and La Fortuna. If we look at Appendix E.4., we see that it is estimated that there were 114 diesel plants and 24 hydro plants in existence and we were told that almost without exception these were serving individual farms and homes. If we take a random figure of five families per plant plus 50 homes in Florencia and 50 in La Fortuna (greatly exaggerated I am sure), we would arrive at a figure of some 660 homes and farms receiving some kind of electrical service prior to the cooperative. The agricultural census of 1963 shows us that 71 farms in the area had electricity, 61 with private plants and ten purchasing from some other source. Both of these figures indicate a low level use of electricity prior to the advent of the Cooperative.

At the end of May 1978, the cooperative had almost 559 kilometers (344 miles) of line serving some 6,289 consumers, or approximately 11 consumers per kilometer (18 per mile).

1) Residential Uses

A series of evaluations have been done on this project. A baseline study to establish bench marks was done by Galen Moses from August to November 1968.[7] A follow up, indepth, socio-economic impact study was done by Galen Moses and John Saunders in August 1972.[8] Some 400 persons were surveyed including non-adopters and inaccessibles. In August and September 1976, James D. Lay randomly surveyed 41 of the same interviewees and in May-June 1978, Joan Hood did a similar survey of 38 of the 41 previously surveyed by Lay, three family having moved out of the area.

Hood's Report	Lay's Report	LA Center Study
38 or 100% had basic lighting	41 or 100%	100%
37 or 98% had electric irons	35 or 83%	96.5%
26 or 68% had refrigerators	30 or 73%	27.5%
28 or 74% had television sets	28 or 68%	24.6%
21 or 55% had washing machines	20 or 49%	16.4%
20 or 53% had electric radios	18 or 44%	30.4%
18 or 47% had blenders	14 or 34%	7.6%

[7] Rural Electrification, an evaluation of effects on economic and social changes in Costa Rica and Columbia, etc. - Pages 73-201.

[8] Cooperative Rural Electrification. Case Studies of Pilot Projects in Latin America. James E. Ross, Praeger Special Studies in International Economics and Development - 1972. Page 211.

16 or 42% had electric stoves	13 or 32%	18.7%
8 or 21% had water pumps	8 or 19.5%	3.5%
5 or 13% had stereo equipment	7 or 17%	3.5%
2 or 5% had electric sewing machines	3 or 7%	6.4%
2 or 5% had fans	3 or 7%	
2 or 5% had office machines (adding)	3 or 7%	
2 or 5% had floor polishers	3 or 7%	
2 or 5% had electric mixers	2 or 5%	

Though the latter two evaluations include a very small statistical sample and cannot be considered an in-depth study, they do give us an idea of the growth that is taking place. Average monthly use by residential consumers is growing after a slow first six years, as the following figures show us:

	1970	1972	1976	1977
Consumers	1,206	1,675	3,420	3,973
Monthly Consumption (MWH)	61	143	292	384
Average KWH/Consumer	51	85	85	96

The above figures are based on annual level of consumers for entire year.[9] A July 1978 Statistical Report shows 4,609 residential consumers using 472 MWH for a monthly average of 104.2 KWH per consumer.

2) Agricultural Uses

Because of limited time and resources, the evaluators were unable to do an overall evaluation of agricultural uses of electricity. Never-the-less, many uses of electricity on the farm were observed. The 1963 agricultural census showed that only 71 farms in San Carlos had electricity, of the 71, only ten had central

[9] Information from ICE Annual Reports.

station electricity. Cooperative records show that they were serving 258 rural members who had electric milking systems as of June 1978. (This is up from 147 shown on the Cooperative records for August of 1976.)

Census information shows that the Province of Alajuela had 521 of 15,180 farms electrified in 1963 and 630 of 19,510 electrified in 1973. The evaluator was unable to secure detailed information but believes it can safely assume that most of the 109 increase came within the area of San Carlos since no major rural electrification program had taken place in the Province between 1963-1973 outside of that done by Coopelesca.

If a census were taken today, these evaluators feel that one would find a significant increase in use of electricity for agricultural purposes.

There is no doubt that electricity has had a profound impact on dairy operations. It is the opinion of the evaluators that an in-depth study should be made in this cooperative area to ascertain just what the impact has been. Good base-line data on income from agriclture production is contained in the Benjamin Feasibility Study and other baseline data can be secured from the 1963 agricultural census.

In addition to the above data on milking operations, 1976 cooperative records showed that they were serving 22 coffee processing plants and three chicken breeding operations. From visual inspections, the evaluators know there are many other uses of

electricity on the farm, such as lighted barns and corrals, milling and drying of grains and pasture grass, farm shops, and some irrigation (latter not too necessary because most of area is wet the year around).

3) Commercial Uses

According to customer account records the cooperative was serving 407 commercial accounts in August 1976 and 582 in June of 1978. (This list does not include agricultural uses, public use or churches - only private business.) A breakdown follows:

	August 1976	June 1978
Restaurants, hotels, bars and recreation halls	211	291
Garages, warehouses and storehouses	47	56
Repair shops, mechanics and industrial	43	56
Retail stores	24	25
Butcher shops	21	31
Shoe stores and tailor shops	11	15
Professional offices	8	39
Gas stations	7	7
Bakeries	5	5
Drug stores (Pharmacies)	4	4
Radio transmission and relay stations	4	5
Movie theaters	2	2
Wholesale and retail merchandise shops	17	22
Dentist Offices	2	7
Laundries	1	7
Furniture and Truck Wood-body shops	0	10
Ice Cream shops	0	2
Jewellers	0	2
Pole Processing and Treatment Plant	0	1
Totals	407	582

According to available records and personal knowledge of the cooperative staff, almost none of these had central station electricity prior to the establishment of the rural electric distribution cooperative. For details concerning the above, please see Appendix E.3.

4) Industrial and Agro-Industrial Uses

Because of the cooperative's tariff structure and the way it lists its industrial accounts, it is difficult to isolate pure agro-industrial uses of electricity. Listed below are some of those which might normally be listed (in place as of June 1978):

25 Coffee Processing Plants & Facilities
24 Saw Mills
5 Cinder Block Factories
2 Cassava Processing Plants (Starch and Animal Food Meal Concentrates as well as whole cassavas)
3 Sugar Refineries
1 Dairy Products Plant (Whole and Dry Milk)
1 Large Hog Breeding Operation

This is the one area where the cooperative has not maintained pace with the Benjamin Feasibility Study Projections. It was predicted that by the end of the ninth year of operation the cooperative would have industrial sales of some 8,972 MWH. In actuality, they sold only 6,289 MWH, well below forecast. (See Graph 2.a., Appendix B.)

The cooperative staff gave as the main reason for this as being the fact that many potential industrial users, such as large sawmills, are still using the hydro-electric plants which were in operation when the cooperative began operations.

It was estimated that many would switch to the cooperative lines when their hydro plants break down and need costly repairs, but evidently, the energy crisis changed all this. A study would have to be made to make such a determination.

Since the energization of the cooperative's lines, the large milk producers cooperative, Cooperativa de Los Productores de Leche, R.L., has built a large milk collecting and cooling facility which handles more than 80,000 bottles of milk daily. In July of 1978, they

opened at the same location a dry milk processing plant that initially handles 40,000 bottles of milk daily, in addition to the 80,000 bottles of whole milk, and will eventually handle up to 300,000. This is one of the largest plants, if not the largest, in Central America. The dry milk will be used both for domestic consumption as well as be exported to countries in Central America and the Caribbean.

Just recently opened was a large pig breeding operation which will eventually breed up to 10,000 pigs. By July of 1978, they had 125 head of fully registered, top quality pigs. This will be a multi-faceted operation which will include the breeding operation, some experimental research and the slaughtering and sales of pork products.

The cooperative plans to further encourage selected industrial growth. It is the opinion of the evaluators that the cooperative must have a larger industrial base if it is to carry out its desire to extend its lines to more distant, marginal residential and rural farm consumers.

5) Educational Uses

There were no records on how many schools and other educational facilities counted on electricity (private or central station) prior to 1968, but as of June 1978, there were 83 educational centers - 69 primary schools, 12 secondary schools, on branch of the National University and one post secondary vocational school - which were tied into the COOPELESCA distribution system. Many of the primary and secondary schools had night classes, including, but not limited to, Adult Education.

It might be well to say a word or two about the Technological Institute of Costa Rica, Santa Clara Branch, which is located

northwest of Ciudad Quesada and is served by the cooperative. This branch was begun in 1976, continuing the trend in Costa Rica to locate technical institutions in the rural countryside. As of June 1978, the Institute had 10 faculty-houses which provided living for four professors in each house. Individual houses are fully equipped with lights, washer, television, refrigerator, etc. The Institute provides training in dairy practices, machinery repair and maintenance, and forestry and forest management. During the current academic year, there are 180 students including, for the first time, women (20). As a matter of interest, it was found that the school average monthly electric bill is about $700.00.

As a matter of information, the reader should be informed that education has the highest priority in Costa Rica and receives the largest slice of the National Budget. The provision of electricity has greatly facilitated achievement of the goal of having modern primary school facilities within a twenty-five mile radius of every child in the country. This is particularly true in San Carlos, where, as a matter of folklore, it is said that it rains 13 months a year. Anyone who has been in an unlighted classroom during a rainy day need not be convinced of the value of electric lights. Add to this, the advantages of audio/visual equipment, school repair shops, educational television, and safety for the students and teachers, and the importance of having a reliable and adequate system is easily seen.

In closing this Section, it should be added that many of these facilities are also used for community meetings and recreational activities at night.

6) Health Uses

No baseline data was available. As of June 1978, the following facilities were receiving electricity from COOPELESCA.

22 Health Clinics
15 Nutritional and School Lunch Centers
11 Potable Water Systems
4 Pharmacies
2 Hospitals

It is safe to say that those health clinics which may have existed prior to the initiation of the cooperative electric distribution system, few, if any, had reliable, 24-hour service. As in the case of Guanacaste, refrigeration is almost mandatory for the storage of food and vaccines in this tropical area. No estimate is attempted on the lessening of food spoilage and the increase in beneficial and nutritional diets which have taken place because of domestic and non-domestic refrigeration in the homes and business establishments.

7) Public Lighting and Other Public or Governmental Uses Not Listed Above

Prior to 1968, it can be stated that only the City of Quesada had 24-hour service. Venecia and La Fortuna had some street lighting and it can be assumed that perhaps the post offices, telegraph offices and perhaps the Rural Guard Offices had access to electricity from these systems. Other small towns may have had small generating units (hydro or diesel). Some towns could afford to rent diesel motors only for important occasions. The evaluators could not come up with definite information to use as baseline data.

As of June 1978, the cooperative had the following accounts:

543 Public Lighting (Towns and individual Security Lights)
26 Telegraph, Post Office and other government offices
21 Community Meeting Halls
11 Telephone Offices (ICE)
9 Banks
6 Government Agencies (Agriculture, Social Security, etc.)
1 Gymnasium

8) Recreational Uses

The chief recreational uses are mentioned in foregoing statistics on business (hotels, movie houses, community halls and gymnasium). By personal attendance at dances, fiestas, wedding receptions, fairs and the like, the evaluators know the role that electricity plays in the recreational and leisure time activities of the rural folks of the San Carlos Valley. Mr. Lay first visited this area in 1954, when there was little or no electricity in the rural towns, so he has seen the change at first hand. When one stops to think that there are now 102 facilities (81 community centers and 21 educational facilities) where night-time activities, including recreational activities, can take place, it is almost mind-boggling to remember that as little as ten years ago, very few of these facilities could be used at night, and those that occasionally were, usually operated on rented diesel generators. One only has to live in a community without electricity, or with poor, unreliable, part-time electricity to know the tremendous value of reliable systems, particularly as it affects leisure time and recreational activities.

The positive effects on the quality of life in the rural areas are manifold. First and foremost, there is a cleaner atmosphere both in the matter of noise pollution and particulate matter pollution. Secondly, is a matter of out-of-pocket costs. Each KWH of electrically produced light and power is cheaper than either gasoline or diesel fuel, particularly if one considers the time and transportation costs. Thirdly, the rural people are able to partake of their leisure time in their home communities and not have to travel to distant place to do so. Fourthly, there is more of a tendency to

remain in the home atmosphere rather than migrate to the city where conditions are often much worse and the quality of life as the rural folks know is almost non-existent. Lastly, if one considers it an important aspect of life, and these evaluators do, many folks are able to enjoy the better things in life, such as dances, fiestas, and other celebrations; not only in the day time as they have historically done, but also in the evening hours.

e) Economic Benefits

Because very little baseline data were available, the evaluators did not attempt to do an economic benefits study. However, one can extrapolate from the statistics presented above on commercial and agro-industrial uses of electricity, that direct benefits are substantial. Direct and indirect benefits to the low income people requires more study and analysis than can be provided here; however, the evaluators feel that such benefits are there. It is recommended that an in-depth study be done to specifically identify those benefits.

f) Social and General Benefits

By reviewing the health, educational, public and recreational uses of electricity noted above, it can be seen that there has been, and continues to be a great social impact on the residents of the service area. Though the greatest social impact, the raising of the level of living and sense of well being cannot be measured easily, it is there. Though it is difficult to link all of the social benefits to the provision of central station electricity, nevertheless, some linkages can be identified.

The mere statistics themselves are impressive:

81	Educational Systems
22	Health Clinics
15	Nutritional Centers
2	Hospitals
543	Public Lighting Services
60	Public Buildings
21	Community Centers

Without baseline data, one cannot be sure of what was in place prior to the establishment of the cooperative, nor can one identify what might have occurred had some other type of electric service (municipal, national systems or small diesel or hydro-electric plants) come in to service the areas. But, none-the-less, the available statistics are impressive, and one must concede that by providing stable, reliable, central station electricity, a great many benefits were provided to the rural people of the service area, including those most often forgotten by other types of utility systems -- the low income farmer and rural resident.

It seems self-evident that a great many social benefits have accrued to the poor. The greatest benefit is that now they can afford at least basic electricity, whereas before it was completely out of their reach or begrudgingly given to them by their employers. Many can now have their children study at night and be free in the afternoon to help with household and farm chores. They have more modern medical care near at hand at the many public health clinics - free of charge. Many children are benefiting from free school breakfast and lunch programs. Women are freed from many of the time consuming manual chores. Young women are freed up to be able to go to post-primary educational opportunities - a thing almost unheard of in the past. Communication and educational benefits are derived

from television - something which was also unavailable a decade ago.

Most of what was reported in this same section on GUANACASTE is also true in the case of COOPELESCA particularly as pertains to the social benefits and impact. This area has not as serious an out-migration problem as the Guanacaste area, but it has been significant. With the provision of post secondary educational opportunities and the growing number of job opportunities, the evaluators feel that the out-migration will slow but never cease. This is, after all, the development experience of all advanced countries.

g) General Comments on The Management and Operations of COOPELESCA

This report does not address itself to the internal management and operations of the cooperative, but since good management must be present if the cooperative is to have an impact on the population it serves, we think it important to give some brief comments on the matter.

Financially, the cooperative is in excellent shape. It has always been able to service its debts and carry out all of its administrative and operations responsibilities. Just recently (July 1978) NRECA complied with a request from the cooperative to send in a Specialist to do a Financial Analysis of the cooperative and assist them in a Five-Year Financial Forecast. The Specialist reported that the cooperative was in fine financial health. (See Appendix G.)

As with a new entity, this cooperative has had some organizational problems over the years, but in general terms has handled them well and has now grown to the point that they have a more than adequate staffing pattern and a good board of directors.

As with COOPEGUANACASTE, there still remain some difficulties in the area of Delegations of Authority - from the board to the manager - from the manager to his first-line supervisors and from first line supervisors to supervisors under them. The board often treats subjects that should be handled by the manager and the manager often has to make decisions that should be made at a lower level. There is a corresponding reluctance in accepting responsibility - though we think this cooperative has come a long way in the last three years. There are written Delegations of Authority and Policy Standards. This cooperative was very involved in the two NRECA Management Seminars, sending at least four of their board members and six of their key staff, including the manager. The staff has been involved in the writing of policies and writing their job descriptions This cooperative has the beginning of a very good Member Relations Program, its only drawback is that it is staffed by only one person. To have an effective Member Relations and Power Use Program, the cooperative must commit more of its resources to this area. The board, the manager and key staff are aware of this, but resources are still somewhat limited. It is the belief that NRECA could help in this matter.

The board and the management of this cooperative are convinced that the training of its board members, the manager and all of its staff is very necessary and should be a continuous activity.

It is our feeling that this cooperative has a solid base. Though problems exist and new ones will crop up, those persons involved with the overall management and direction of the cooperative are capable of handling them. If the cooperative continues to have

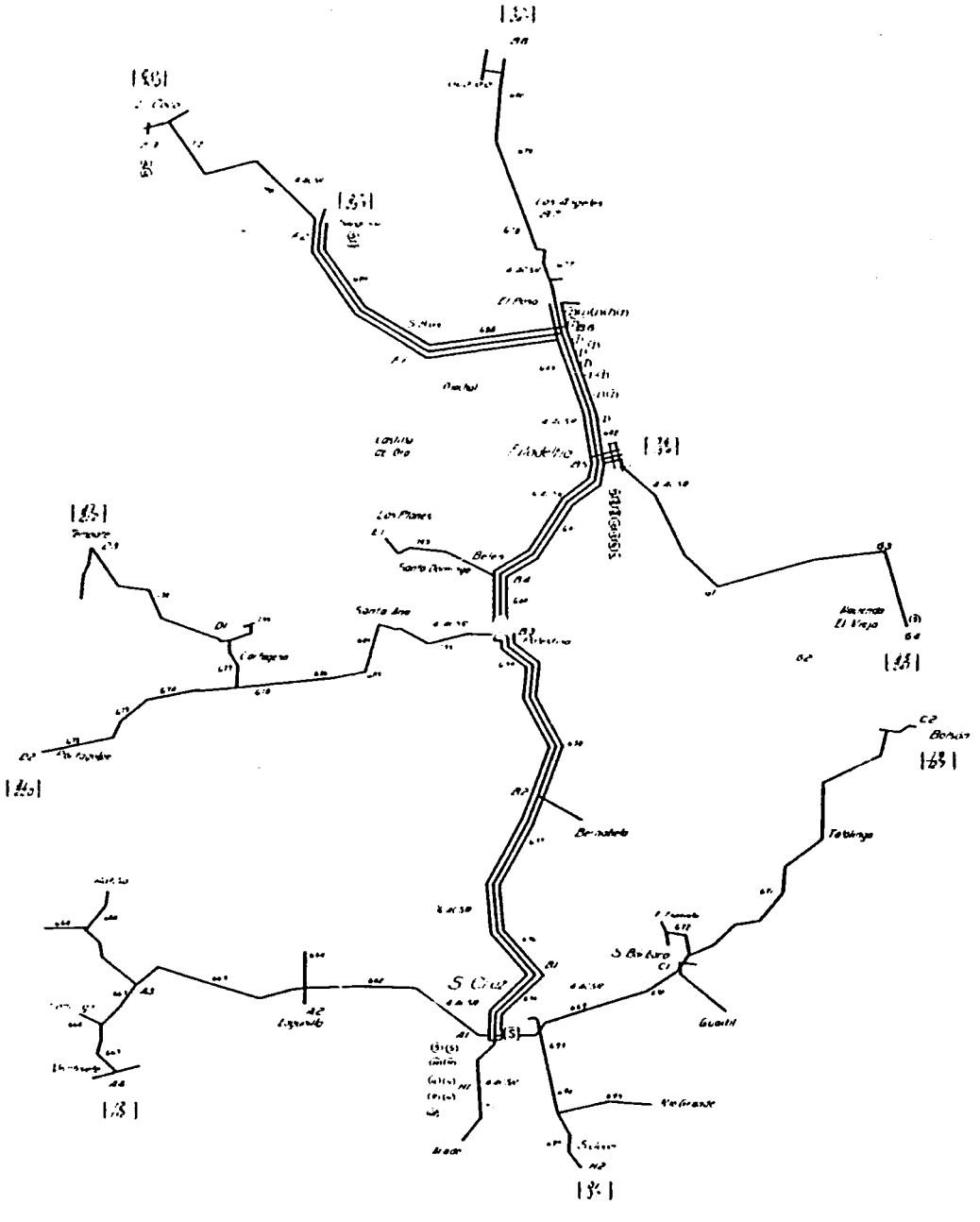
support in the community, support from the government and encounters no strong move to incorporate the rural electric distribution system with that of the Costa Rican Electric Institute (the State Power Authority - ICE), it should have a great future and continue to impact on the development of the area it serves.

h) Interviews

Interviews are a normal part of most evaluations treating socio/economic impact. Special attention was given to them by these evaluators and since they can give us a better insight than an objective evaluation, we are including a number of them as an addition to this report. See Appendix D.

i) Financial Stability

In August of 1978, Mr. Joe Rodriguez, Manager of Kit Carson Electric Cooperative, Taos, New Mexico, undertook a financial analysis and a five-year forecast of COOPELESCA. (Report attached as part of Appendix G.) In that report, he states: "The Cooperative is in a strong financial position and will be able to meet its loan obligations and provide the necessary maintenance to adequately serve the needs in the foreseeable future." No more need be said on financial stability.



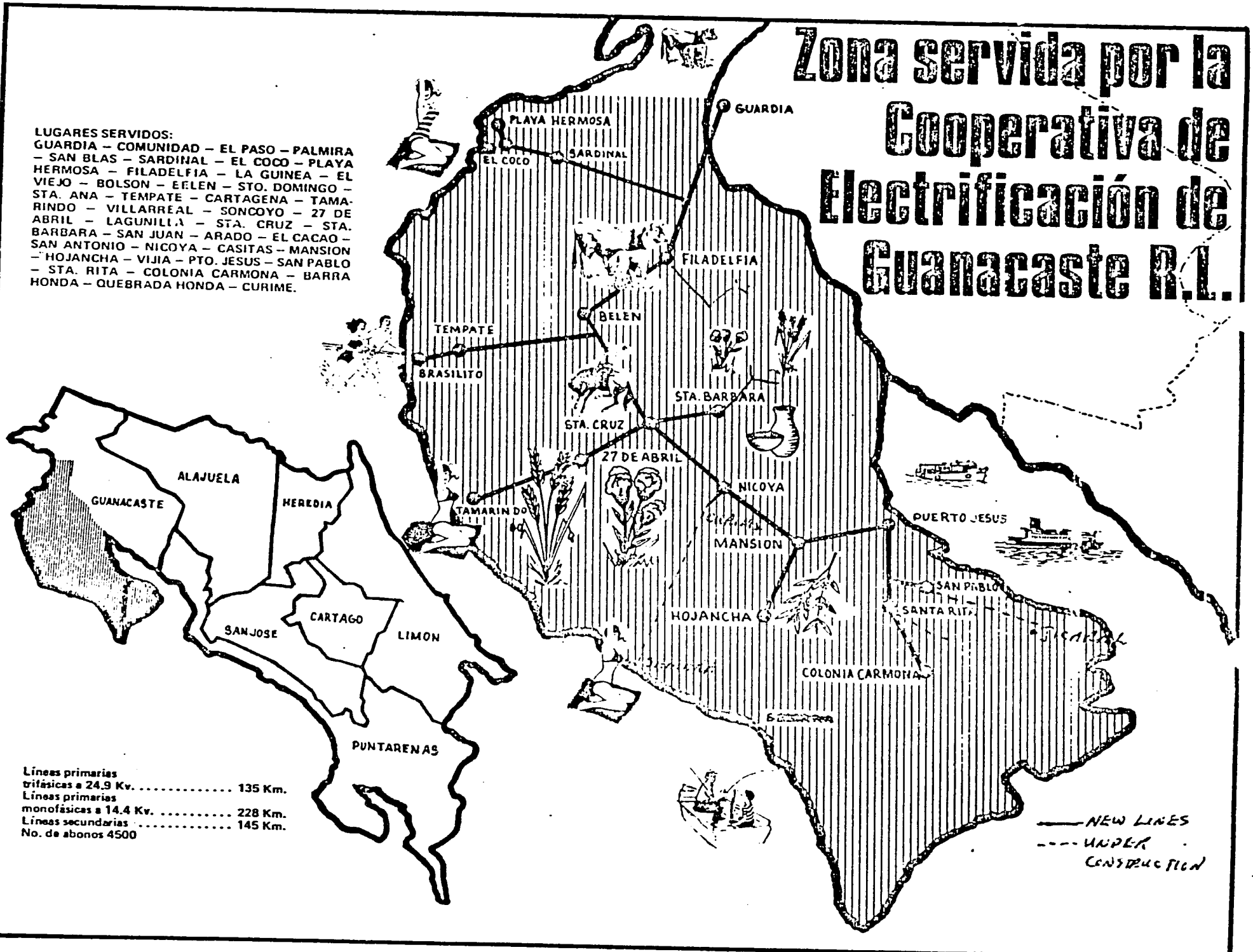
SIMBOLOS

TIPOS DE CARGAS INDUSTRIALES

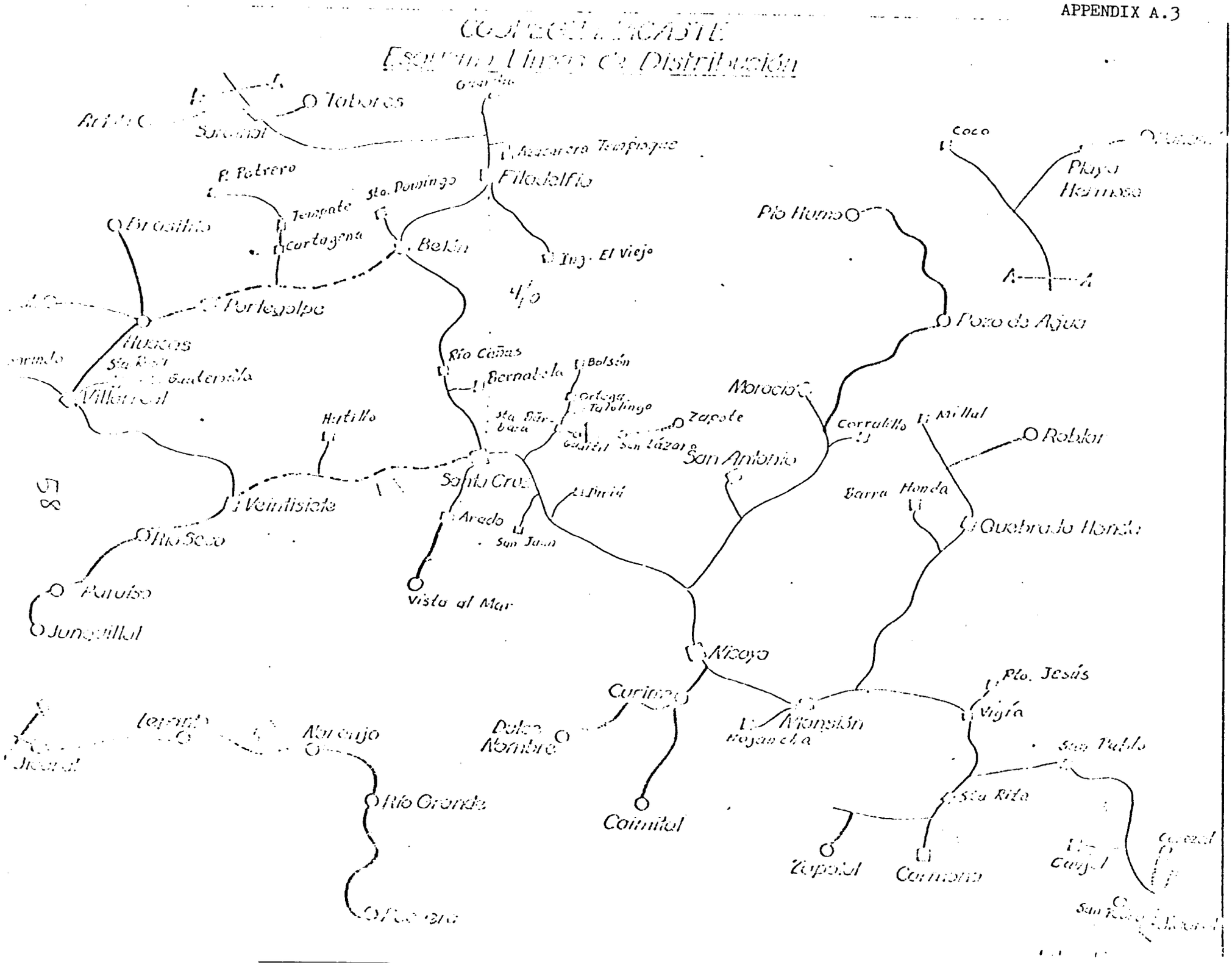
DIAGRAMA UNIFILAR DE LA COOPERATIVA DE [illegible]

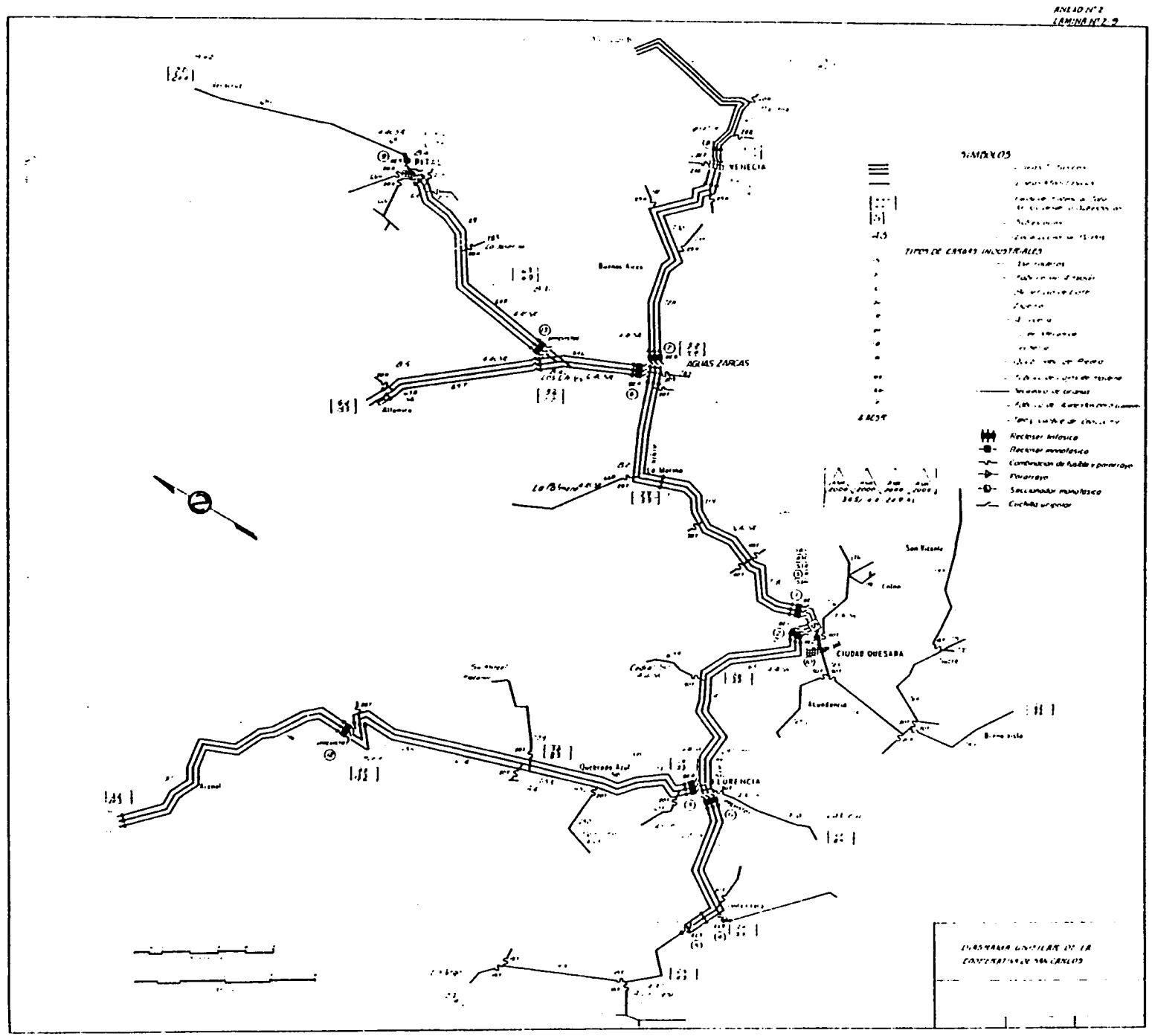
Zona servida por la Cooperativa de Electrificación de Guanacaste R.L.

LUGARES SERVIDOS:
GUARDIA – COMUNIDAD – EL PASO – PALMIRA – SAN BLAS – SARDINAL – EL COCO – PLAYA HERMOSA – FILADELFIA – LA GUINEA – EL VIEJO – BOLSON – BELEN – STO. DOMINGO – STA. ANA – TEMPATE – CARTAGENA – TAMARINDO – VILLARREAL – SONCOYO – 27 DE ABRIL – LAGUNILLA – STA. CRUZ – STA. BARBARA – SAN JUAN – ARADO – EL CACAO – SAN ANTONIO – NICOYA – CASITAS – MANSION – HOJANCHA – VIJIA – PTO. JESUS – SAN PABLO – STA. RITA – COLONIA CARMONA – BARRA HONDA – QUEBRADA HONDA – CURIME.



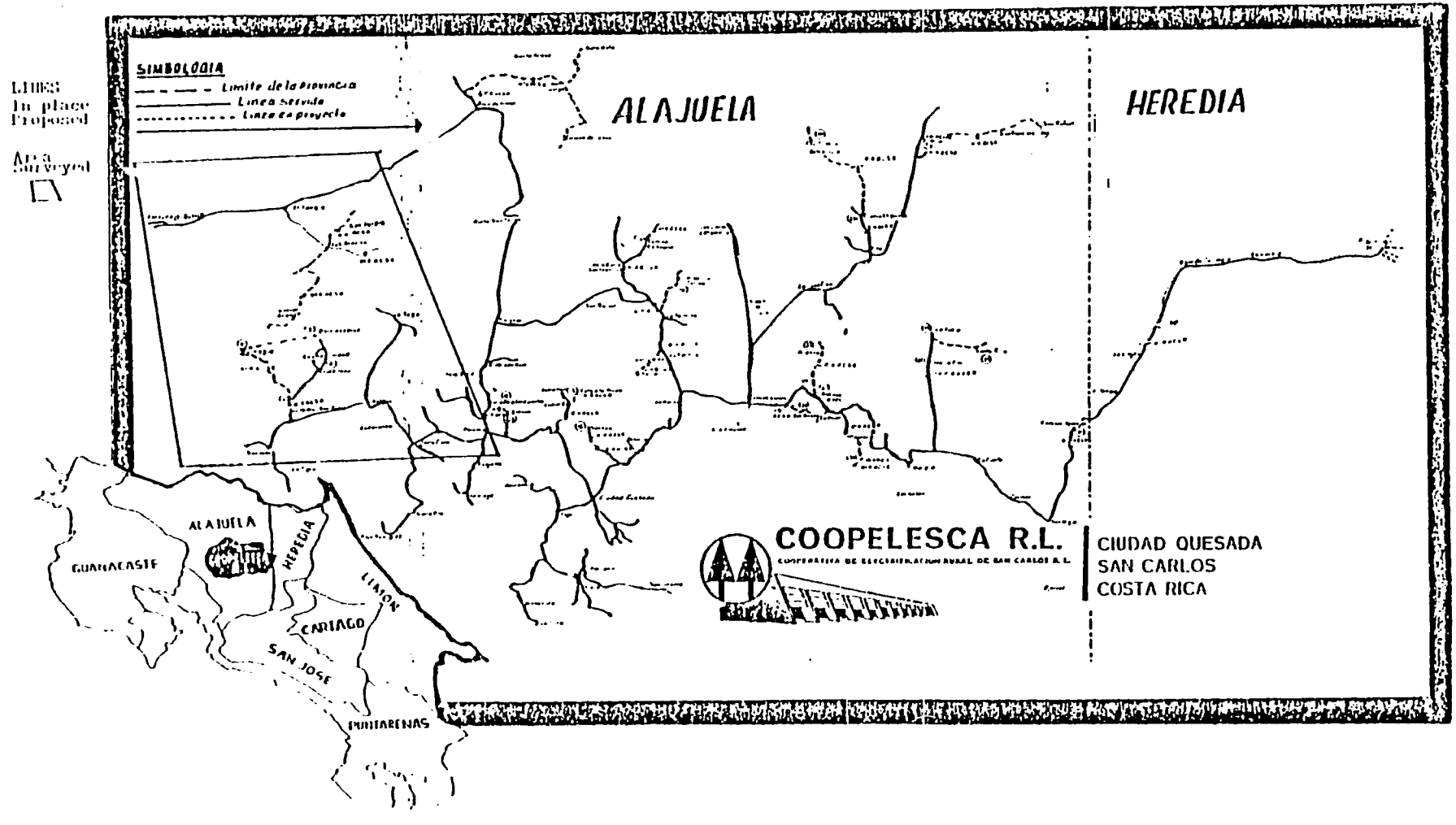
Líneas primarias trifásicas a 24.9 Kv. ..... 135 Km.
Líneas primarias monofásicas a 14.4 Kv. ..... 228 Km.
Líneas secundarias ..... 145 Km.
No. de abonos 4500


Tobores
Filadelfia
Ing. El Viejo
Belén
Cartagena
Tempate
Sto. Domingo
Porlesalpe
Huacas
Villanueva
Veintisiete
Río Seco
Paraíso
Junquillal
Hatillo
Santa Cruz
Arado
Vista al Mar
Río Cañas
Bernabela
Bolsón
Ortega
Zapote
San Lázaro
San Antonio
Morocio
Corralillo
Millal
Robalo
Barra Honda
Quebrada Honda
Pío Humo
Pozo de Agua
Coco
Playa Hermosa
Nicoya
Curimo
Dulce Nombre
Cairnital
Mansión
Vigía
Pto. Jesús
San Pablo
Santa Rita
Zapotal
Carmona
Naranjo
Río Grande


ANEXO Nº 2
LAMINA Nº 2.9
SIMBOLOS
TIPOS DE CARGAS INDUSTRIALES
VENECIA
AGUAS ZARCAS
CIUDAD QUESADA
FLORENCIA
Buena Vista
Quebrada Azul
San Vicente
Colono
Alemania
Aguas Zarcas
Venecia
Ciudad Quesada
Florencia
DIAGRAMA UNIFILAR DE LA
CONTRATA DE SAN CARLOS

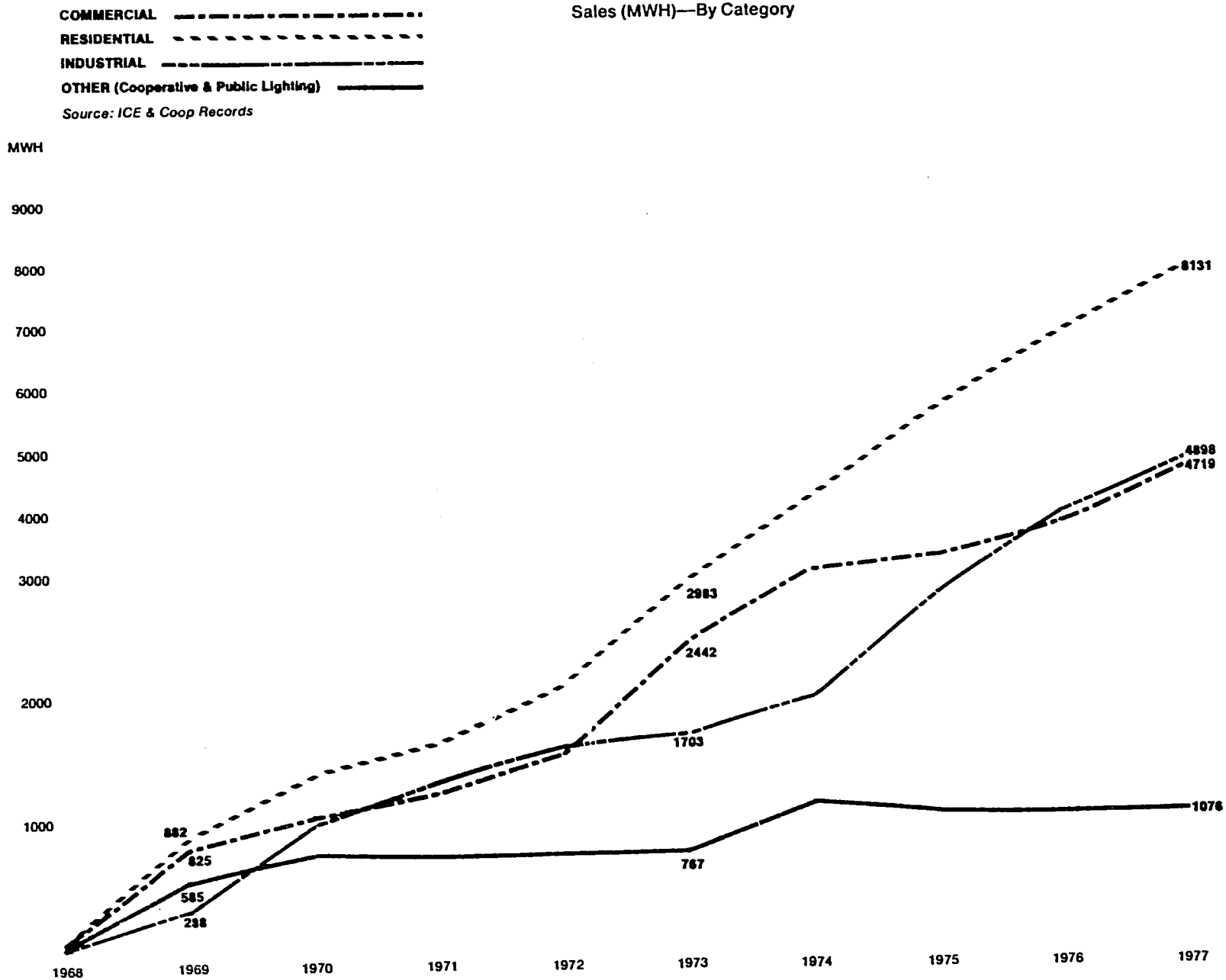
APPENDIX A.5
Cooperative's Lines
October 1978

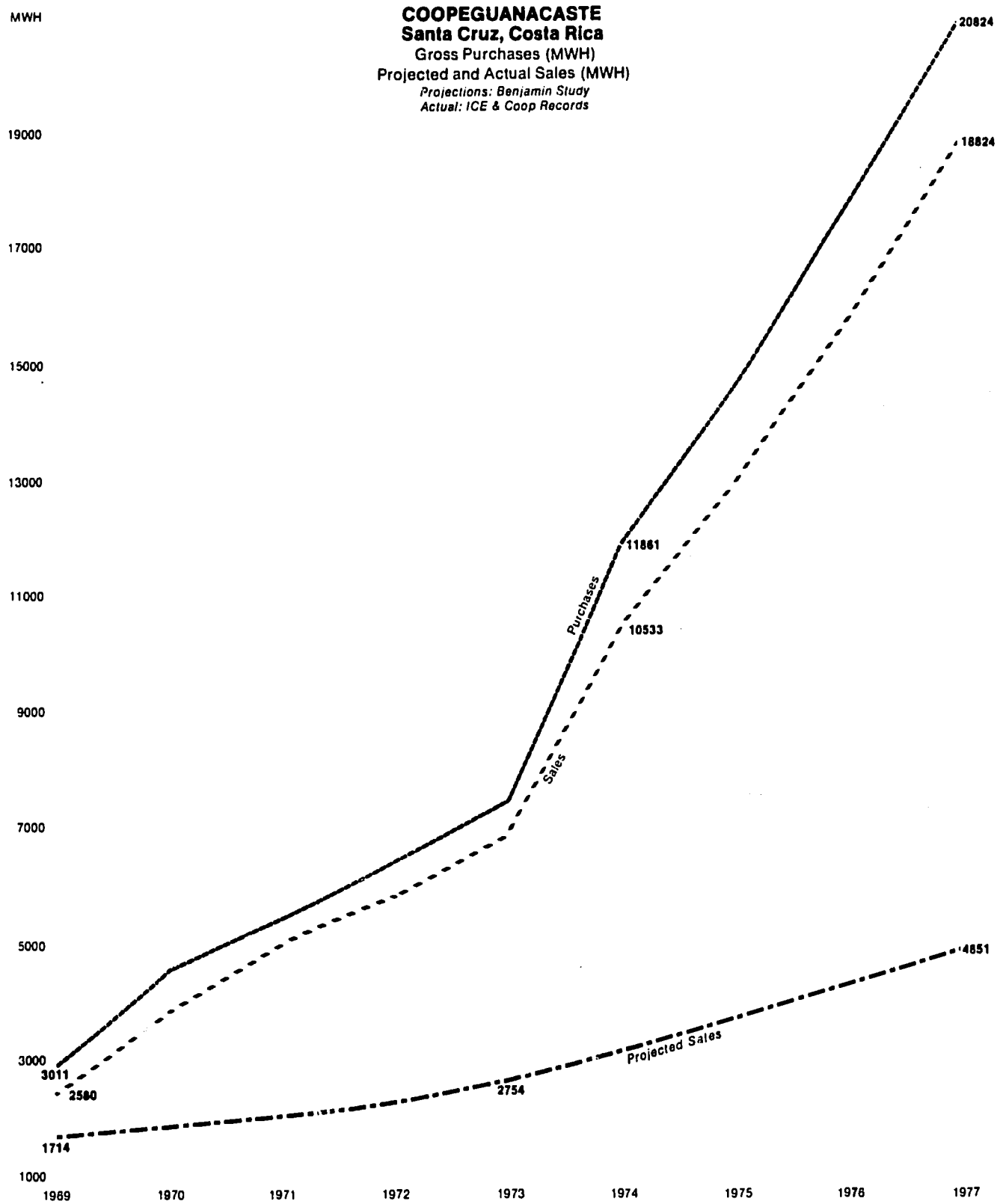
Zona servida y proyectos de la Cooperativa de Electrificación Rural de San Carlos R.L.



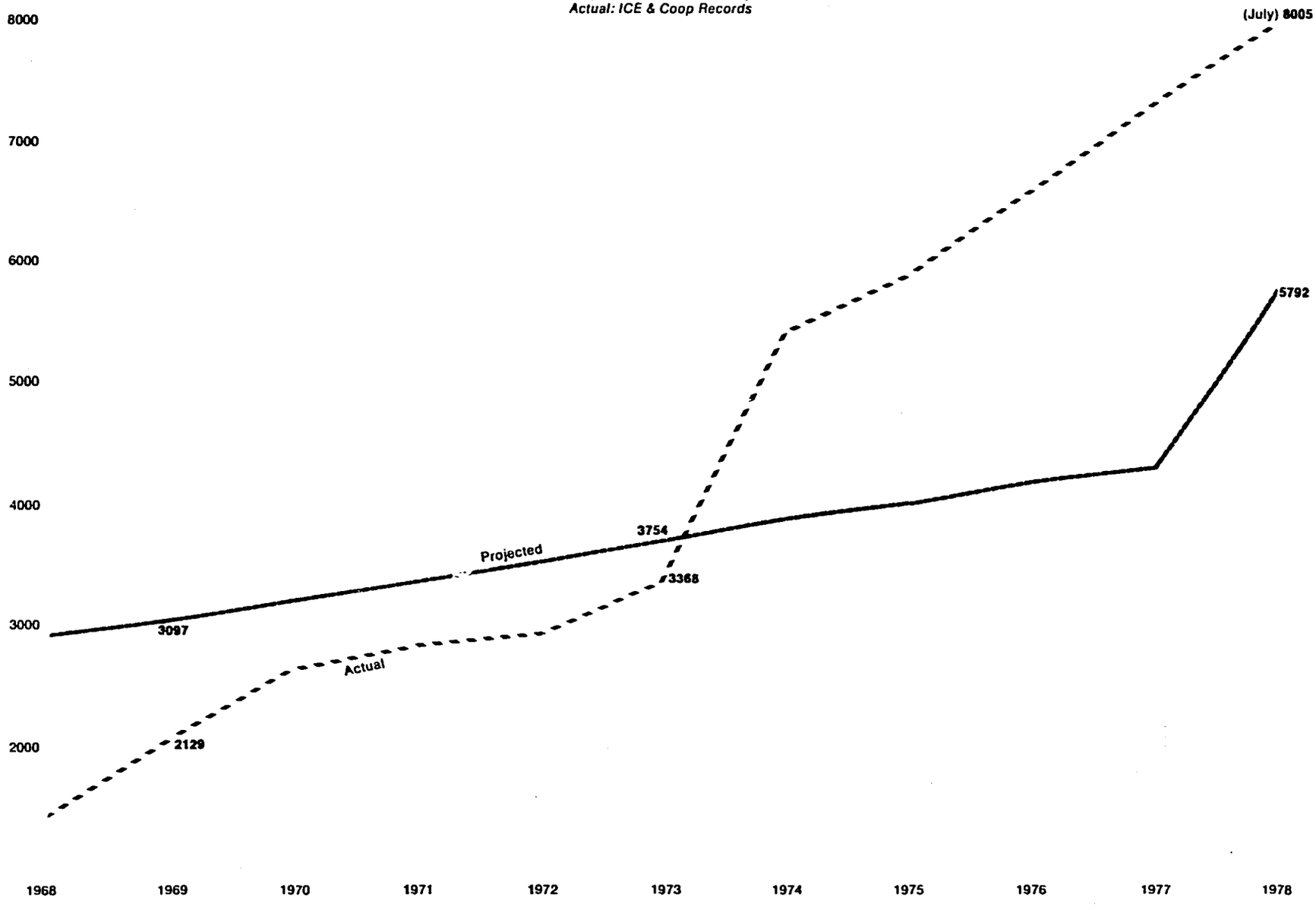
60

COOPEGUANACASTE
Santa Cruz, Costa Rica
Sales (MWH)—By Category




COOPEGUANACASTE
Santa Cruz, Costa Rica
Gross Purchases (MWH)
Projected and Actual Sales (MWH)
Projections: Benjamin Study
Actual: ICE & Coop Records
MWH
19000
17000
15000
13000
11000
9000
7000
5000
3000
1000
1969
1970
1971
1972
1973
1974
1975
1976
1977
Purchases
Sales
Projected Sales
3011
2580
1714
2754
11861
10533
20824
18824
4851

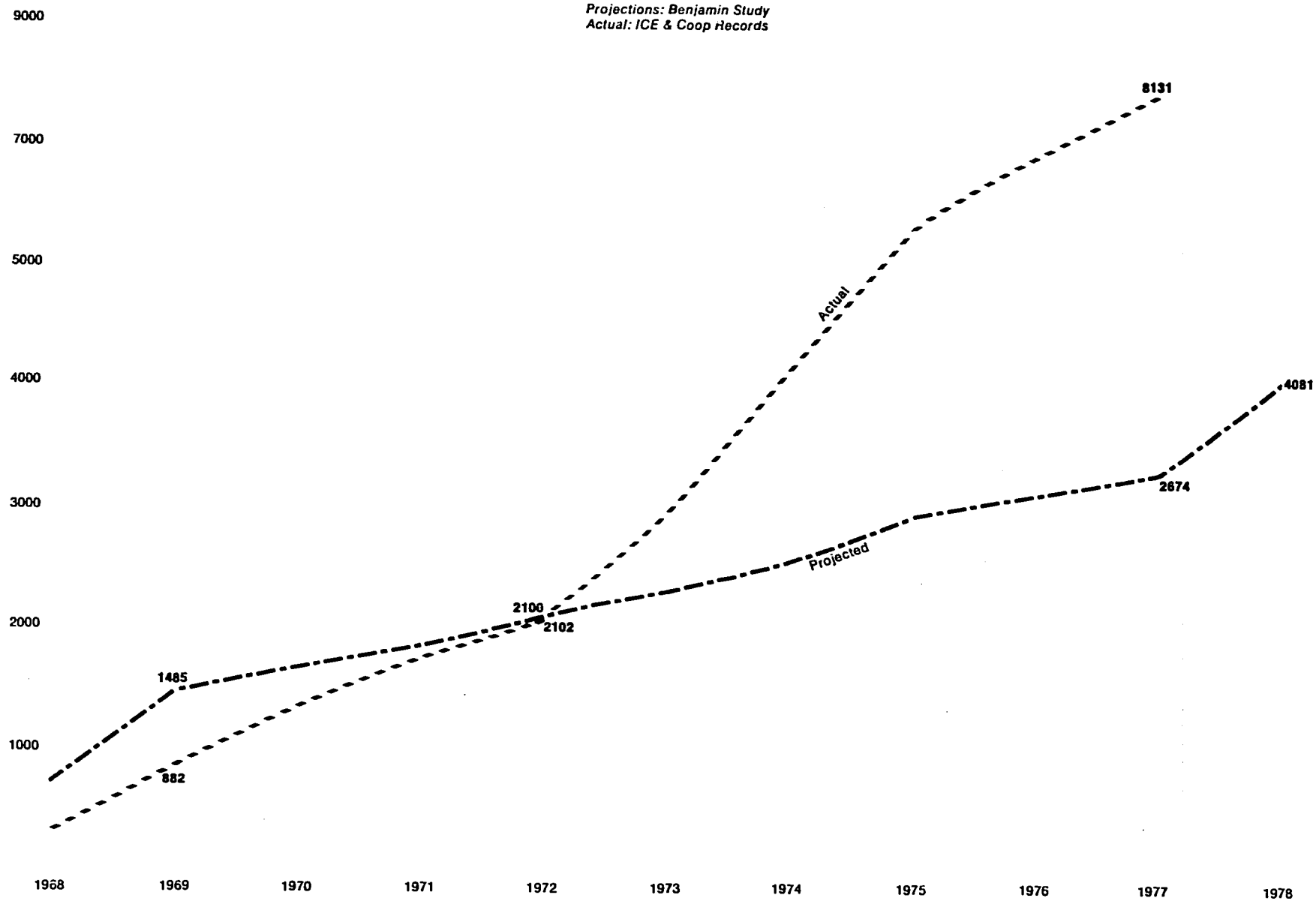
COOPEGUANACASTE
Santa Cruz, Costa Rica
Meter Connections
Projected and Actual
Projections: Benjamin Study
Actual: ICE & Coop Records



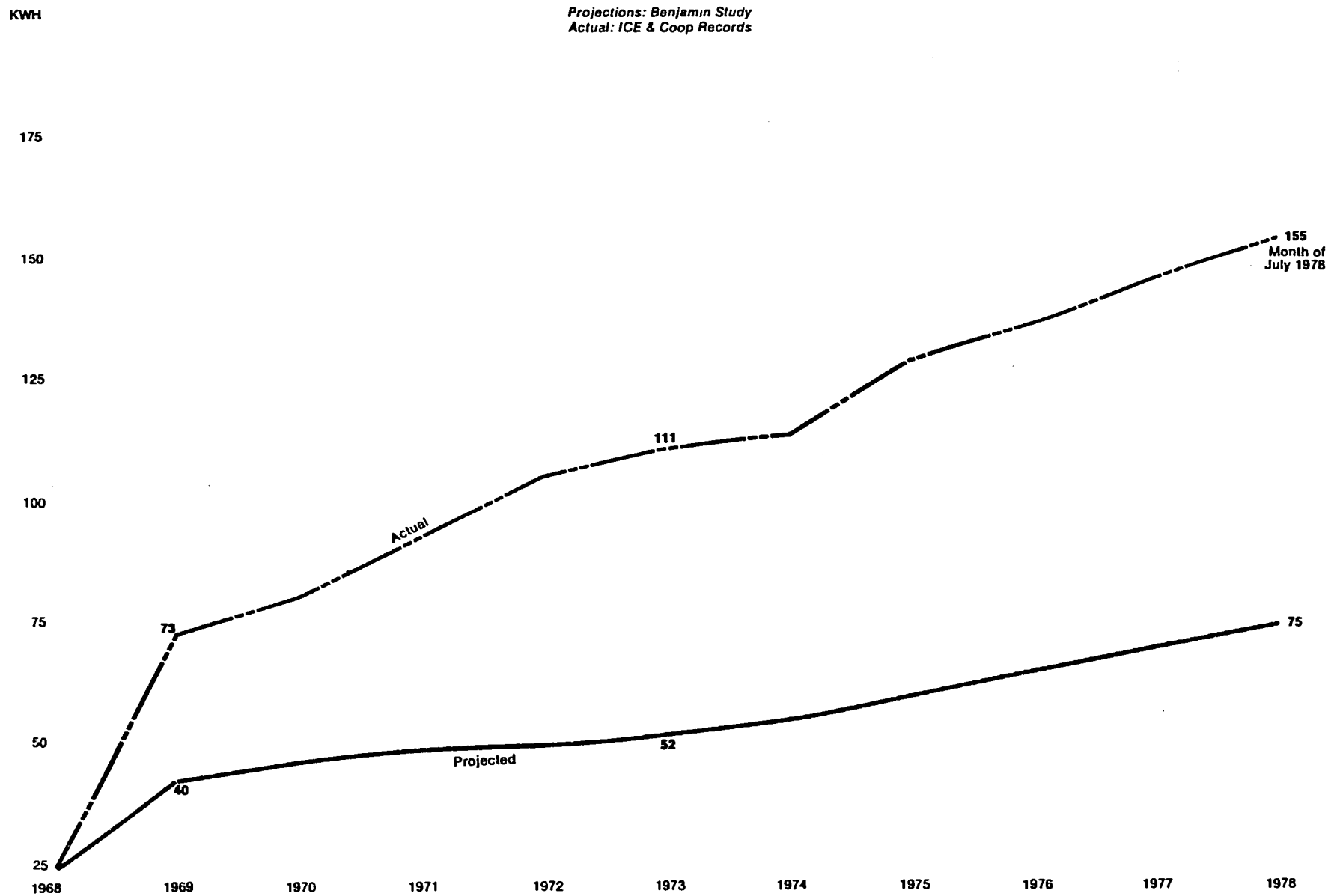
COOPEGUANACASTE
Santa Cruz, Costa Rica

Projected and Actual Consumption
(MHW)
Residential and Small Commercial

Projections: Benjamin Study
Actual: ICE & Coop Records

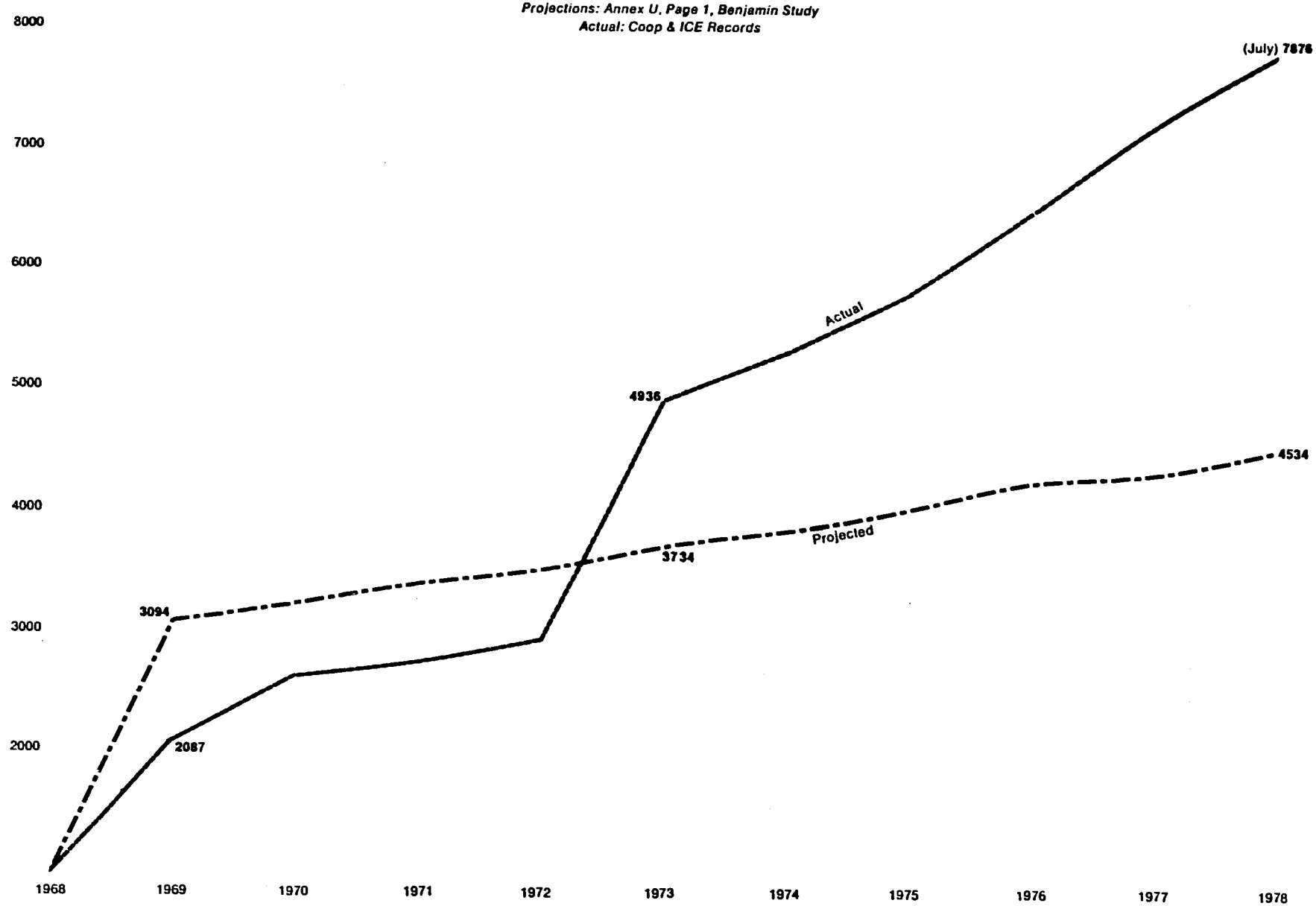


COOPEGUANACASTE
Santa Cruz, Costa Rica
Projected and Actual
KWH Consumption/Month/Consumer
Residential and Small Commercial
Projections: Benjamin Study
Actual: ICE & Coop Records



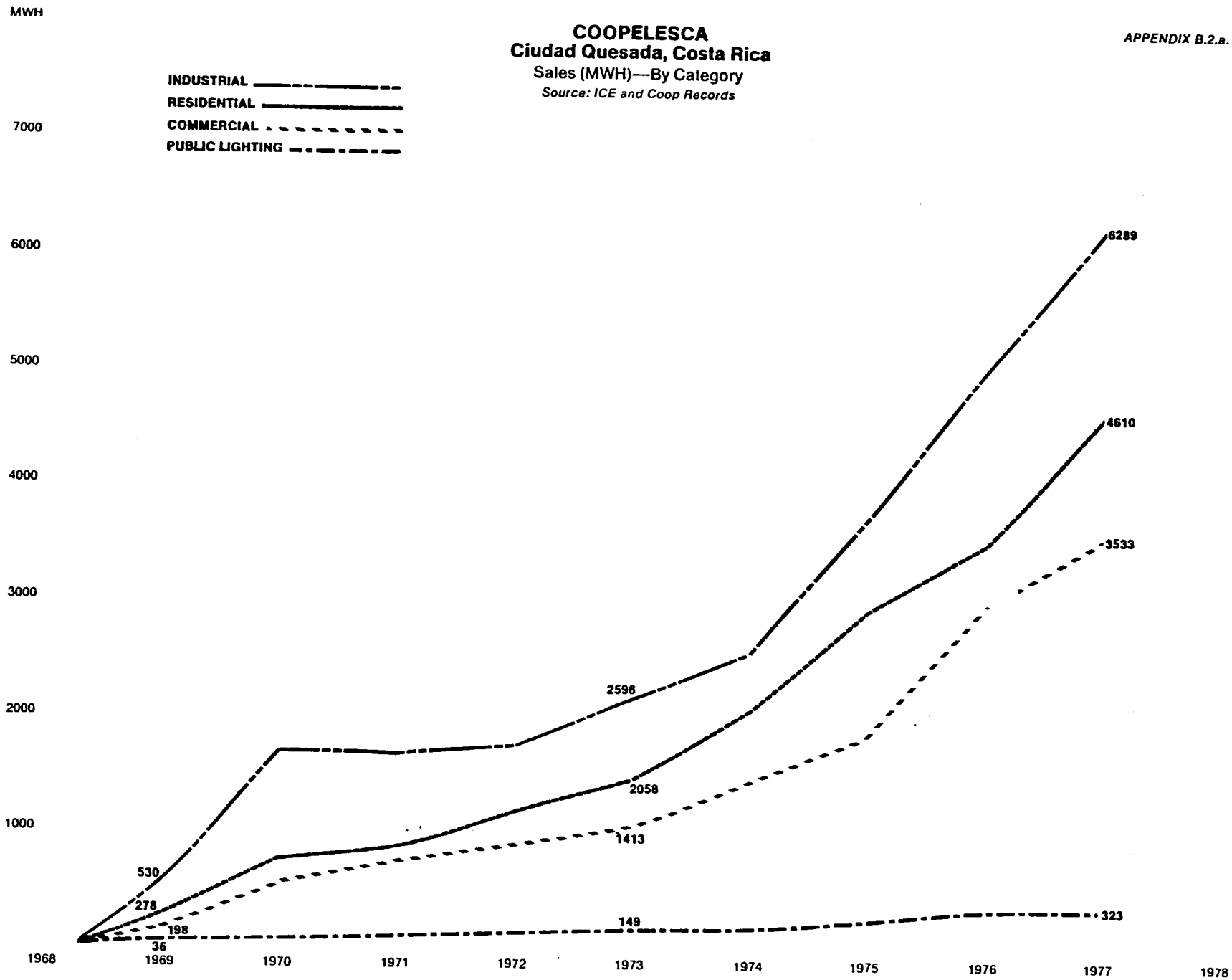
APPENDIX B.1.f.

COOPEGUANACASTE
Santa Cruz, Costa Rica
Projected and Actual Consumers
Residential and Small Commercial
Projections: Annex U, Page 1, Benjamin Study
Actual: Coop & ICE Records

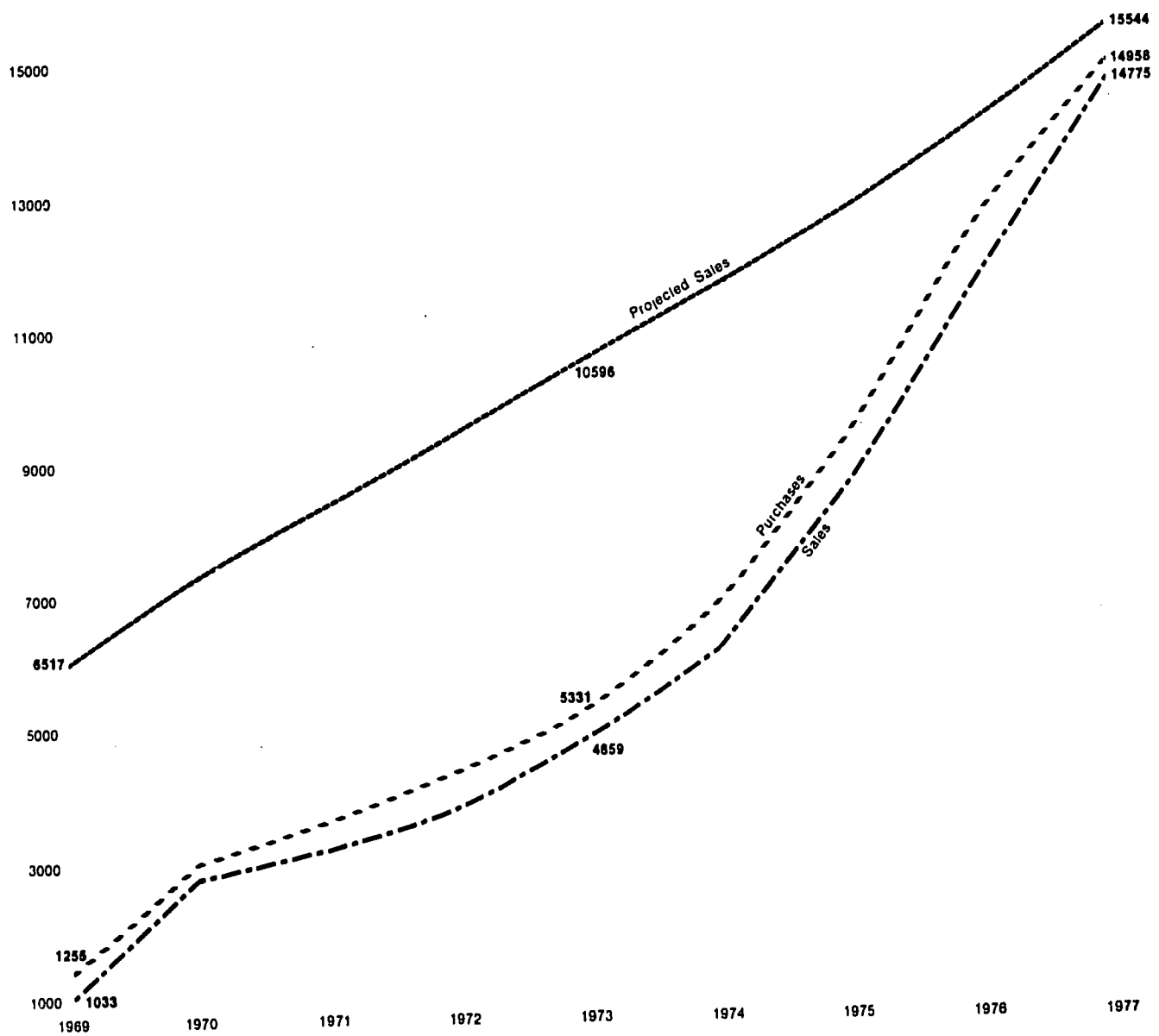


COOPELESCA
Ciudad Quesada, Costa Rica
Sales (MWH)—By Category

Source: ICE and Coop Records



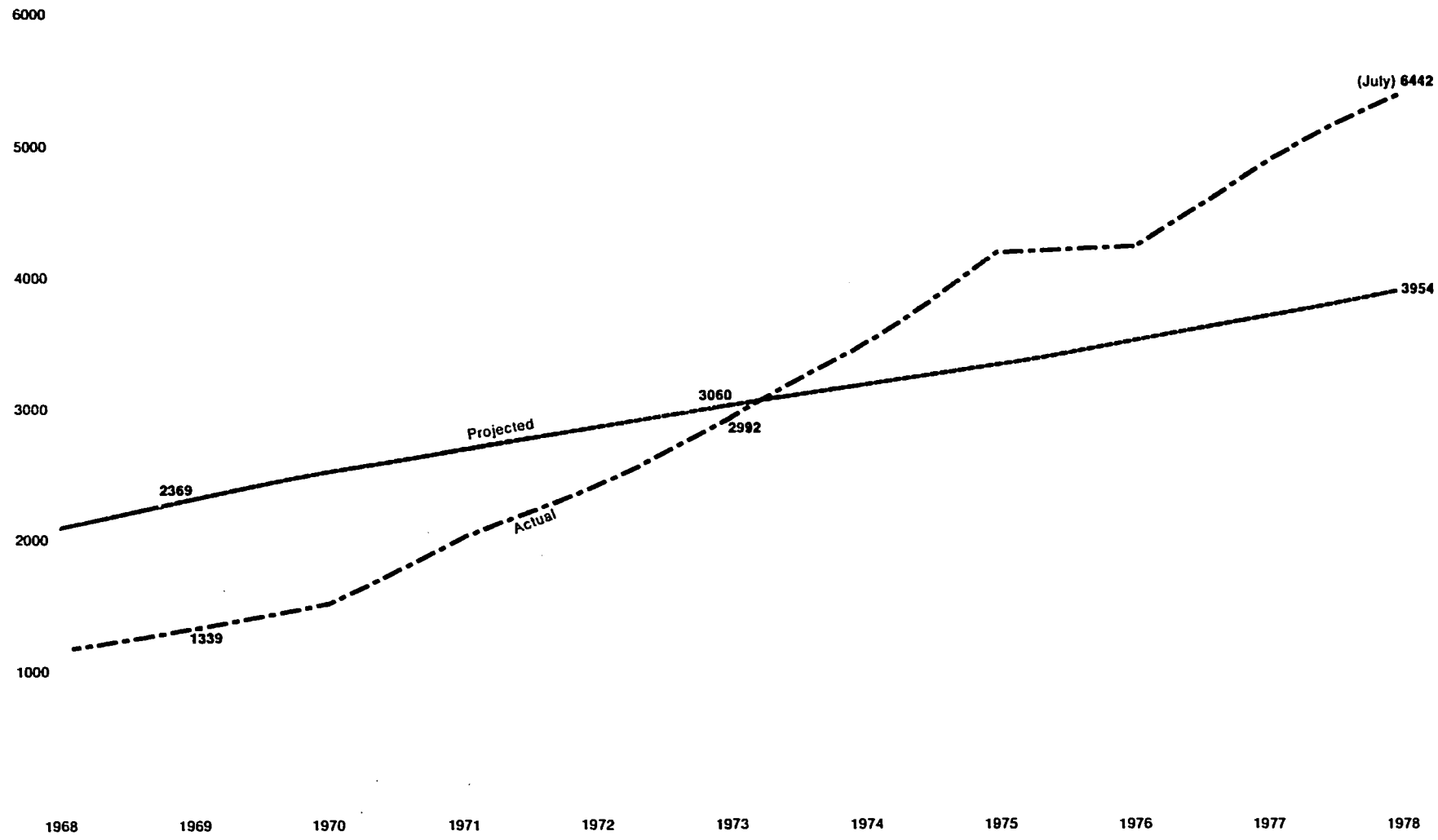
COOPELESCA
Ciudad Quesada, Costa Rica
Gross Purchases (MWH)
Projected and Actual Sales (MWH)
Projections: Benjamin Study
Actual: ICE & Coop Records



COOPELESCA
Ciudad Quesada, Costa Rica

Meter Connections
Projected and Actual

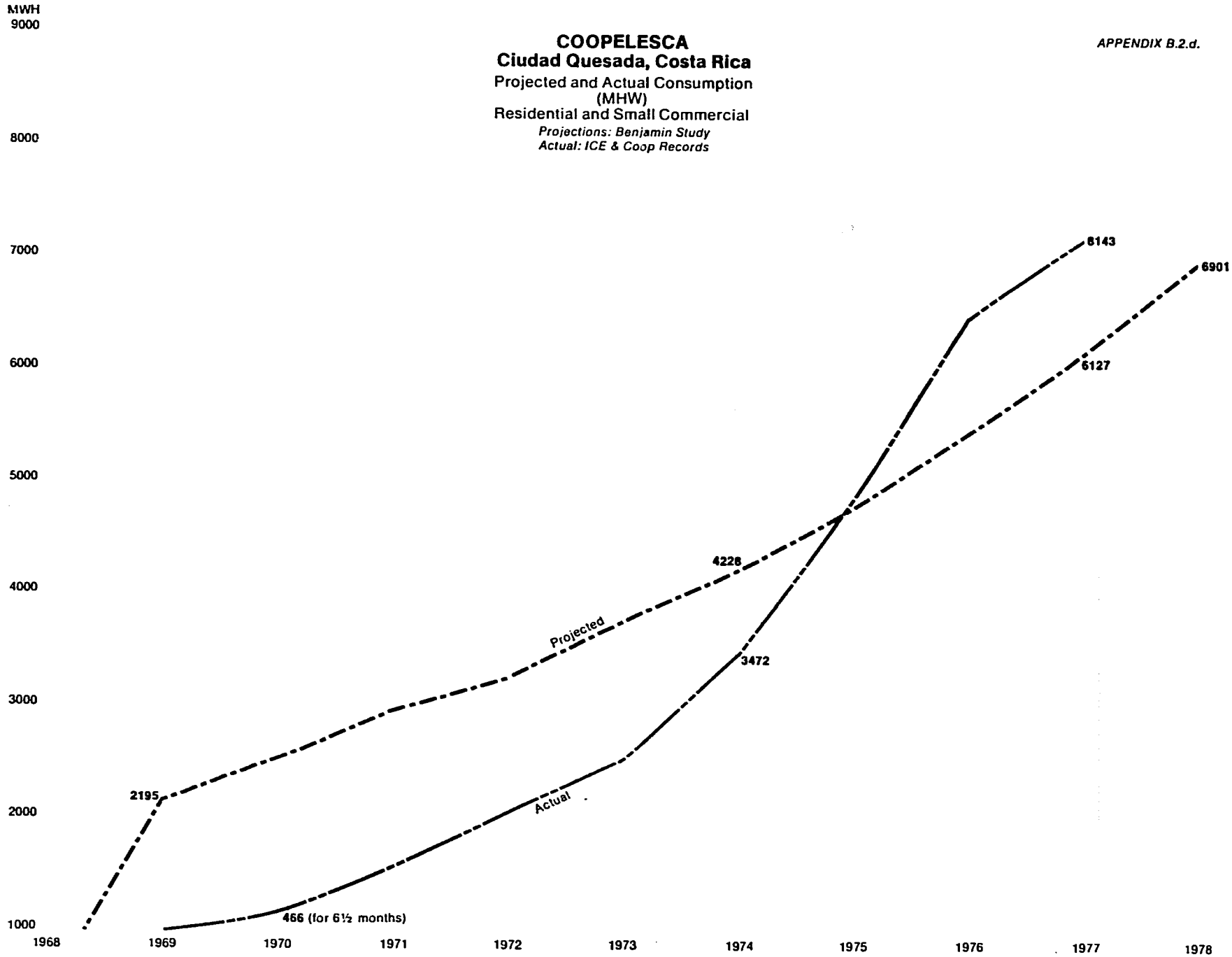
Projected: Benjamin Study
Actual: Coop & ICE Records



APPENDIX B.2.d.

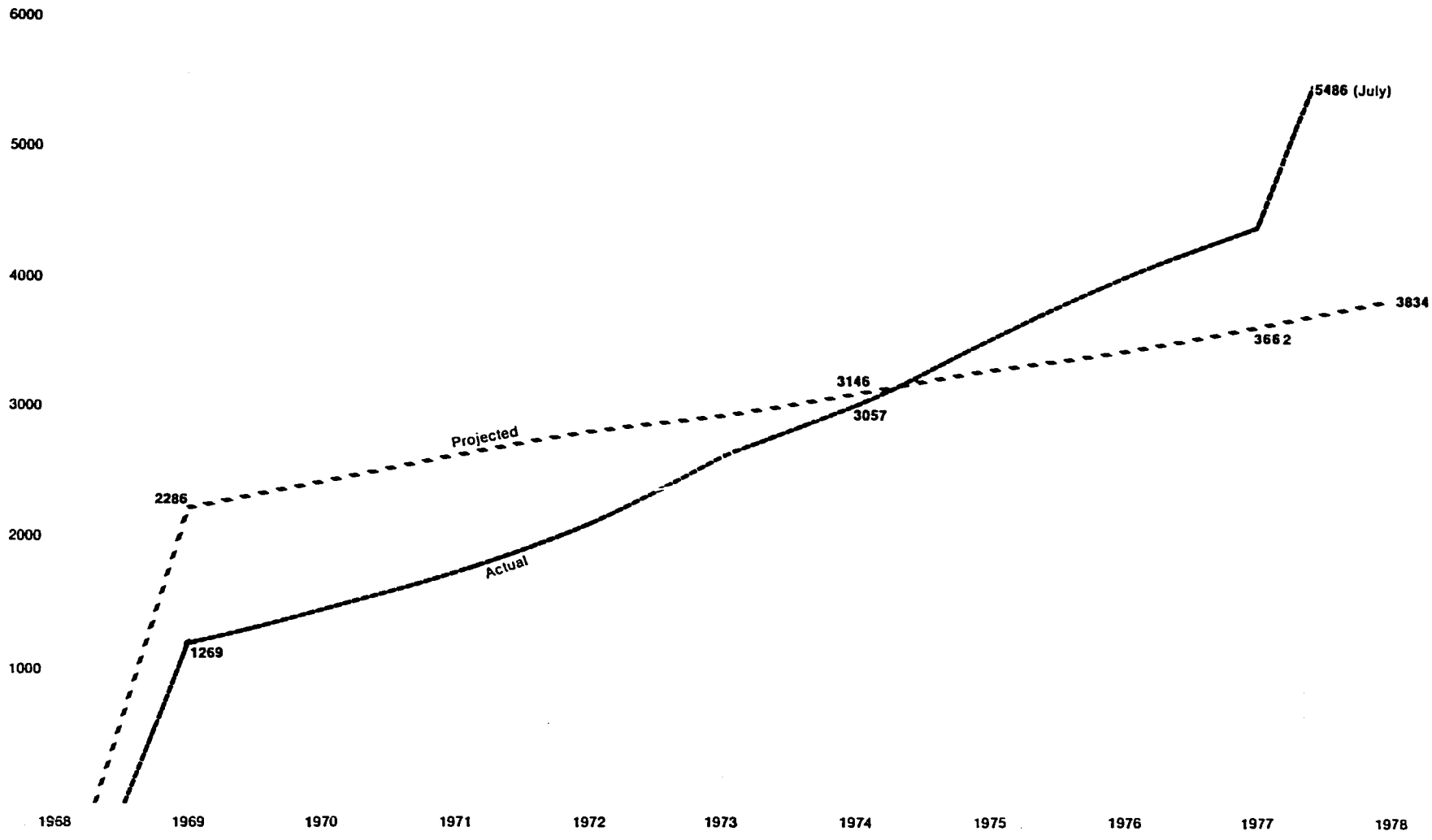
COOPELESCA
Ciudad Quesada, Costa Rica
Projected and Actual Consumption
(MHW)
Residential and Small Commercial

Projections: Benjamin Study
Actual: ICE & Coop Records



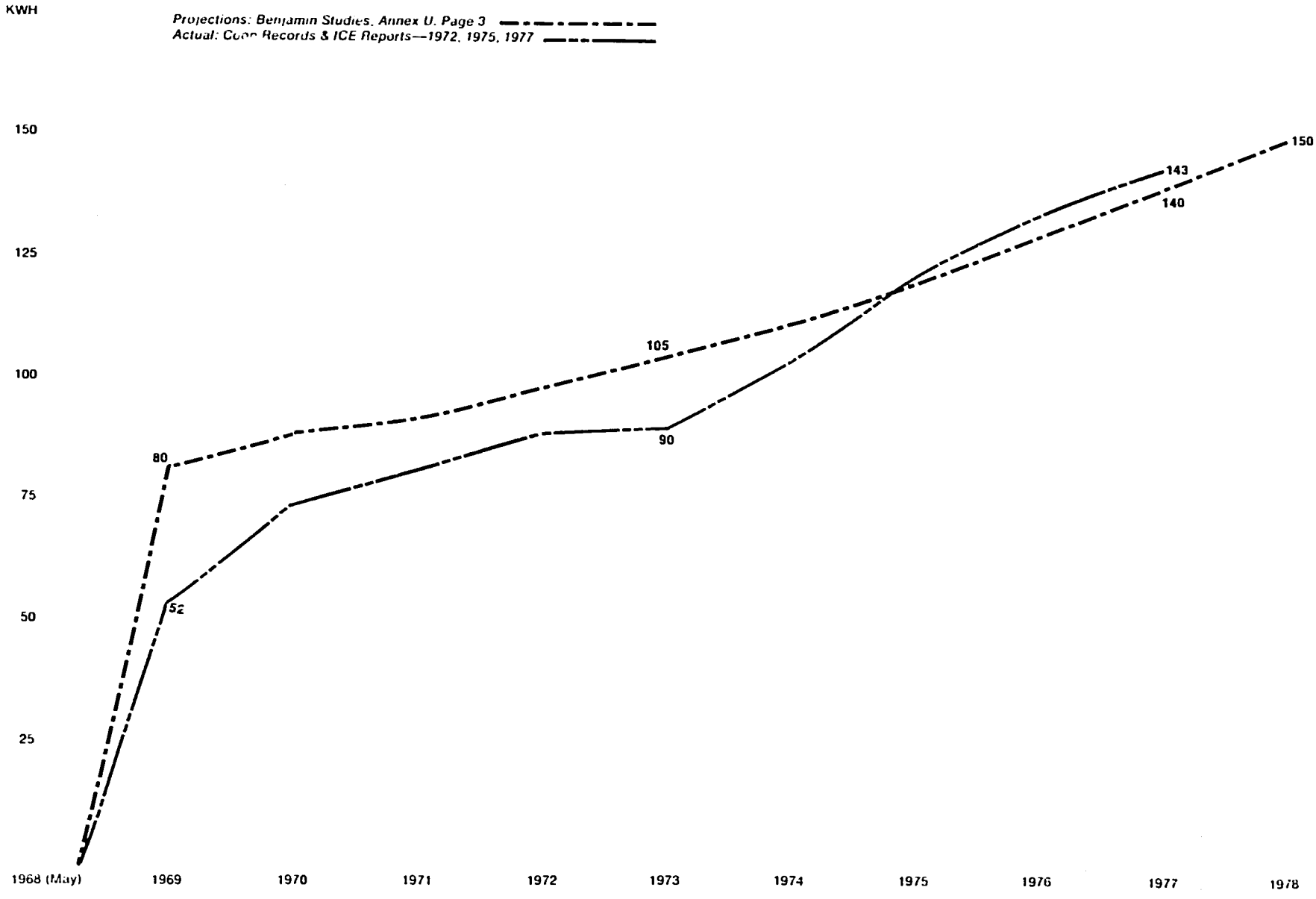
COOPELESCA
Ciudad Quesada, Costa Rica
Projected and Actual Consumers
Residential and Small Commercial

Projections: Benjamin Study
Actual: Coop Records



COOPELESCA
Ciudad Quesada, Costa Rica

Projected and Actual
KWH/Consumption/Month/Consumer
Residential and Small Commercial



APPENDIX C.

WOMEN IN DEVELOPMENT/IMPACT OF ELECTRICITY ON WOMEN

Excerpted below and on the following pages, are parts of reports previously submitted by Joan H. Hood which touch on or impact on the Role of Women in Development and indicated how the electrical services of the distribution systems of COOPEGUANACASTE and COOPELESCA impact on the lives of women in the service areas.

From report of visit to Costa Rica, November 15 through December 19, 1977: "Visited 102 homes in area covered by co-op... (visited Artisan ceramic factory started 3-4 years ago. Use of electric power here also affords 25 women way to earn money. Santa Cruz - Restaurant started 2 years ago by "area poor mothers" who asked for help from a Costa Rican social agency. About 18 women are now involved in the preparation of food. Five to eight persons live in the restaurant facility...Santa Barbara - ... visited five homes where Lay had been. In each case, there was no change in the articles (electric) that were in the home. The light bulbs, refrigerators, blenders, iron and television set had not been replaced by others nor been joined by other appliances. This posed a question in the interviewer's mind. Why?? ... After talking with housewives in the area (Hood) feels the stagnant situation is due to the lack of customer information for proper use. Often the customer felt the iron, stove or refrigerator added too much to the bill so the customers did not use the appliances. In many houses the interviewer saw improper wiring... People may ask if it would be possible to help people understand the correct use of appliances and how to install proper wiring.

"One interview (Hood) wished to sight, points clearly customer feeling regarding power supply and changes. Maya Bruneles Gomez lives 50 meters east of Radio

National in Nicoya; (she is) a woman of 38, who has always had electric service - municipal (owned system) - ICE - and finally through COOPEGUANACASTE. She is employed as a teacher in an elementary school; there are seven rooms in the house with 8 people living here. Four are children under 18 years of age. Sra. Gomez has almost an all electric house. She pays ¢85 to ¢100 (US$12/month) for service. This woman understands that it is cheaper now than buying wood for stove (cooking) and purchasing candles or kerosene for light. One year ago, she did attend classes at INA, Instituto Nacional de Aprendizaje (vocational school) on cooking. Because this woman is quite intelligent, it was interesting and quite beneficial talking with her. ... Sra. Gomez felt the majority of the people in Nicoya did not realize it was COOPEGUANACASTE responsible for electric service - not I.C.E."

"It is felt, upon reviewing the notes taken, that there exists a common need among women, for a course in the best use of electrical appliances. ...(Hood) feels the strong need for a power use - home economist type employee on the co-op staff."

"At least 5 women (Hood) visited were complaining of the very much higher cost of power. Upon further questioning, it was found the family had recently purchased a stove (4 burners with oven - or 2-burner hot plate type). When the woman was asked to demonstrate how she used the appliance, in every case, it was an example of her not realizing the stored heat capability of an electric appliance - nor the primary cost of first plugging in the item. She would keep the rice on the operating burner until the rice cooked; rather than turning off the heat sooner and allowing the retained heat in the burner to finish the cooking. The woman would connect the iron to press one shirt for the husband's work - rather than collecting all items, plugging in the iron and pressing all clothes during the initial heating cost."

"In talking with three groups of people which included the Guanacaste Coop. manager, M. Flores, area women near Nicoya and Santa Cruz, and an A.I.D. representative in San Jose, it was proposed to start a co-op. In this way, area women could make salable artisan type items of seisel-hemp or gourds, earn money and bring more income to the coop in increased electrical use."

"As (Hood) talked with housewives, they would tell of a homemaking course offered by I.N.A. (Hood) notes the female interest in learning."

From Report on Visit to Costa Rica - March/April 1978:

"The manager of the co-op (COOPEGUANACASTE), Mario Flores Bustamante, asked (Hood) to visit 20 - 25 homes in the Barrio of Buenos Aires to determine how the women there would react to co-op assistance in increased employment. That is to say, the co-op would arrange with I.N.A. to have an instructor work with the women... The women would concentrate on making bakery items which could be sold. Appliances to make these items would be provided by the co-op.

Buenos Aires is perhaps one of the lowest income areas which the co-op serves. There are between 250 - 300 homes; family average being about five people. Employment is day labor, (not steady), and about one of three homes does not have a man as the head of the household.

The writer conducted 22 random, sample house surveys. This means each 11th home was visited. Of the 22 dwellings, 18 were co-op members. During each interview, the woman was asked how she was using electricity and for how long she had had this service.

Two of the households had had service for nine years, the remainder of the homes varied in the years of co-op membership from two - six years. Of the homes electrified, all had light bulbs; all but two had irons. Seven homes

had refrigerators and four had television sets. However, those with the refrigerator and television would accommodate their neighbors with these appliances. The majority of the homes, (10), had a two-burner hot plate for cooking, but most baking was done using wood in the typical clay oven outside the home. Also, some simple cooking was done over a small wood fire and grill in the kitchen.

"In conversing with each female, the interviewer found out if she was presently employed and what she thought of beginning food preparation classes with the end thought in mind of making and selling baked goods in the Santa Cruz area. It was explained that appliances for use in the classes would be secured with COOPEGUANACASTE help.

"The majority of the women interviewed, 15, were in favor of working in this way to augment income. However, in each case, they were asking for more information on how the end result, (benefit in sales), would be achieved.

"In summing up the interviews for Flores, the writer recommended that the project be turned over to co-op members who head up the COOPEGUANACASTE Educational Committee.

"The co-op manager also told the writer he had had a visit from Sra. Alicia Diez of Moracia de Nicoya. This was the same person the writer met last November during the first co-op visit. Diez wanted information ahd help in starting a women's co-op. The majority of the families in Moracia are poor. The men work as day laborers on cattle farms nearby. The women have no source of regular income. It had been an idea to begin a co-op for the women to sell hand-made items for profit. (This type of thing has been successfully done in Guytil. A pottery co-op was started there about six years ago and is presently successfully functioning.)

"Flores asked the interviewer to visit Sra. Diez. After talking with this woman and 20 others attending the meeting, the interviewer contacted the AID office in San Jose. This office has recently started a small business program to help women. The writer gathered all the pertinent information from Moracia and turned it over to Marvis Knoespe, AID in San Jose."

From Report on Evaluation Visit to Costa Rica, May-June 1978:

In the COOPELESCA area, Hood conducted 38 interviews with consumers. In talking with the women of the households, she noted the following comments:

"Household of Olin Cordero Alfaro. Los Angeles (San Isrido de Fortuna). This family consists of 12 members. They have a large farm and mainly earn their living by a milking operation. They are producing 450 bottles of milk each day which they ship to Dos Pinos,the large Costa Rican dairy cooperative. The family has had their own private generator providing electricity for the past 18 years. However, when COOPELESCA began providing service, they were the first to hook-up for the milking operation. Ophilia (the wife and mother) says without electricity for cooling the milk and providing water, they would have no operation nor any way of earning their living. When the interviewer asked why they did not have electricity in the home, the husband explained they lived 2kms from the road and power line. Therefore, in order to hook up the residence, it would be necessary to construct and pay for the 2 kms of line. Therefore, they are relying on private power (generator) for their private use. That means they have the generator functioning from 6 a.m. until noon and then it is turned on again from 6 - 8 p.m. It is a diesel power plant.

"The wife told the writer she wanted proper electricity in the home. She said the power plant 'was very noisy and did not function properly.' She explained

due to power drops and shortages in operation, they had damaged and lost 2 electric irons, their television set was not functioning properly; she had just purchased an electric washer to help with chores and she was afraid to use the machine for fear of damaging it. She realized the cost of the line construction would be more than paid for in the savings they would realize in the proper care of their appliances. There would be less chance of appliance damage and destruction with proper electric service.

In a different way but with the same words was the way cooperative members in La Fortuna explained reasons they were members of COOPELESCA. Up to four years ago, this area (La Fortuna) was serviced by its own power plant (hydroelectric). However, it only functioned early in the a.m. until noon and then for a few hours every evening. As Senora Dora Hidelgo Alfaro, La Fortuna, said... 'it was very bad service...one time we went for 22 days without service as the plant had a failure.'...'...now since service from COOPELESCA we have lights in the community center and INA (Instituto National Anzensa--Costa Rican vocational educational institute) offers classes in many areas of adult education.'

"Sr. Jose Joaquin Perez Jiminez operates a general store in La Fortuna with his brothers. There are 7 members in his family and they have been members of COOPELESCA since it started.

"His wife summed up the need for electricity by saying. .' ... it's very necessary. If we didn't have it, we couldn't make a living.' Part of this means since they serve cold drinks without the use of their store cooler and without lighting at night, they surely would not have customers.

"Socorro Varelo Montes, La Fortuna, has a dairy operation and as he and his wife agreed without electricity they would not be enjoying life. Electricity

makes it possible for the milking to go much faster (they have electric machines) and the cooling tank keeps the product from spoiling. That means ease in their operation and certainly more sanitary product for the ultimate customers.

"Jenny Cordero Castro, Los Angeles, said simple...'electricity is everything' ... Her husband earns the living from farming and again electricity plays an important part in the major workload. In the household, Jenny has an electric stove and washing machine. She says the stove is like having a "quiet maid" around and the washing machine never talks back either"! Also, this woman feels electricity gives security and brings the community closer together. Security means at night with street lighting it is safer to go out and not worry about your children and as the community has the chance to extend its day, there are more meetings and people are involved in getting things done together.

"Sra. Mercedes Castro Aguero, La Fortuna, feels electricity is a health help also. With her washer she feels the clothes are much cleaner than they would be if she washed them by hand. There are 7 members in her family and her husband is earning a living from farming.

"In the household of Jose Joaquin Gomez Rojas; his wife, Miriam Salazar; gave a visual demonstration of the importance of electricity in her personal situation. The family is living near El Tanque. The interviewer visited about 11 a.m. on June 7, 1978. The family is working in agriculture and each day 8-9 workers are eating in the household as part of the payment they are receiving. Miriam was busy getting food ready for the "crew". As the interviewer watched, the woman used the electric stove like a third and fourth hand in quickly getting the food ready to serve. The meal was the usual--beans with rice--salad and some meat over the rice with tortillas."

APPENDIX D

SUMMATION OF INTERVIEWS CONDUCTED BY JOAN H. HOOD
NRECA SPECIALIST

Rural Electric Cooperative of Guanacaste, Santa Cruz
November - December 1977

Area

COOPEGUANACASTE has been serving peninsular consumers for the past decade. In an effort to hear the people and record findings, NRECA, with Guanacaste sanction, conducted an in-depth house survey November 22 - December 14, 1977. The NRECA interviewer, with cooperative help, visited 102 homes.

Armed with interview forms, a slip that listed towns to be visited and a letter of introduction from the cooperative manager, Sr. Flores, the day would begin.

The cooperative covers the southern part of the Province of Guanacaste. The interviews were in the same area. Wherever there were semblances of passage to get to dwellings, the NRECA representative visited.

The actual interviews were done by controlled random sampling. That is, in the town of 500 homes or more, every 25th home was visited; in smaller areas, i.e. 100 homes, every 10th family. With the exception -- when an unelectrified home was sighted in an electrified area, that dwelling was always visited.

Eliazar Rojas, the cooperative man assigned to accompany the interviewer, was a great help. Since he was born in Santa Cruz, grew up in the area and worked for the cooperative for the past six years, he was a well of knowledge. The woman's view was sought; Rojas would engage the husband in conversation while the interviewer talked with the wife.

The writer not only conducted the house interviews, but through Rojas friendships, got to know the people. Since the day went from 8 a.m. - 5 p.m.; a majority of the days found the writer and Rojas joining a family for lunch in one of the small communities with no restaurant facilities. Naturally, during the mealtime, many questions were asked by the Costa Ricans and by the interviewer.

Because of this "partaking of normal routine," the interviewer had a chance to be a part of and feel certain problems in Guanacaste.

Use of Electricity

Residential - Visited 102 homes in area covered by co-op.

Guaitil - Artisan ceramic factory started 3 - 4 years ago. Use of electric power here also affords 25 women way to earn money.

Santa Cruz - Restaurant started 2 years ago by "area poor mothers" who asked for help from a Costa Rican social agency. About 18 women are now involved in the preparation of food. Five to eight persons live in the restaurant facility.

SANTA BARBARA - The writer retraced the steps of James Lay in May 1976, in that the interviewer visited five homes where Lay had been. In each case, there was no change in the articles (electric) that were in the home. The lightbulbs, refrigerators, blenders, iron and television set had not been replaced by others nor been joined by other appliances.

This posed a question in the interviewer's mind. Why?? Therefore, in future visits, the answer to be found was, why no considerable change.

After talking with housewives in the area, this writer feels the stagnant situation is due to lack of customer information for proper use. Often the customer felt the iron, stove or refrigerator added too much to the bill so the customer did not use the appliances.

In many houses the interviwer saw improper wiring; i.e. too small an electric wire was used causing it to become overheated on appliance overload, and the exposed wire near wooden house walls promised a real danger.

People may ask if it would be possible to help people understand the correct use of appliances and how to install proper wiring. This writer answers a strong yes, after seeing the situation in Nicoya.

In this area, the writer saw area development due to electricity (view background of Nicoya - #2). This city has had power for many, many years.

First - Municipality - which only served the homes in town's center.

Second - I.C.E. (Instituto Costa Rican de Electrificacion), again only serving the homes in town's center and only in late afternoon and evenings.

Third - In 1973 the cooperative took over; pushed by resident demand for "all day" reliable electric power.

One interview the writer wished to sight, points clearly customer feeling regarding power supply and changes.

Maya Bruneles Gomez lives 50 meters east of Radio National in Nicoya; a woman of 38; who has always had electric service - municipal - I.C.E. - and finally through COOPEGUNACASTE.

She is employed as a teacher in an elementary school; there are seven rooms in the house with 8 people living here - Four are children under 18 years of age. Sr. Gomez has almost an all electric house. She pays ¢85 - ¢100 (US$10 -US$12/ month) for service. This woman understands that it is cheaper now than buying wood for stove (cooking) and purchasing candles or kerosene for light.

One year ago, she did attend classes at INA, Instituto National de Apendizaje (vocational education) on cooking. Because this woman is quite intelligent, it was interesting and quite beneficial talking with her. The literacy rate in Costa Rica is the highest for the Americas. It is most important for the "tico," poor as he may be - to spend the money for light. In this way he and the family may read or study. Also it is necessary to have an iron so the family may be neat looking in well pressed clothes - no matter how worn out they may be.

Srs. Gomez felt the majority of the people in Nicoya did not realize it was COOPEGUANACASTE responsible for electric service - not I.C.E. (Government Instituto Costa Rican de Electricidad). Therefore, P. R. wise, the cooperative is not taking advantage of shaping good public opinion for defense in the future if a government "take over" should ever threaten.

Customer Needs

It is felt, upon reviewing the notes taken, that there exists a common need among the women, for a course in the best use of electric appliances. (Question 4 in visual #3). In fact, the interviewer has a list of names of women, requesting and "wanting to do on record" as feeling this type of course offering from the cooperative, would be most helpful and appreciated.

Along this same vein, having visited over 100 residences for business reasons in the Guanacaste area, and a score more on a personal basis, the writer feels the strong need for a power use - home economist type employee on the co-op staff.

This is stated for two main reasons:

The majority of the homes the writer visited did not have proper type wiring. Meaning - when the homeowner is first electrified, his main reason is to have power for lightbulbs and an iron.

Therefore, when electricity first comes, the recommendation for a #14 wire is sufficient for lightbulb and iron. However, with the help of a home-economist, power-use person working with the cooperative, the customer's future needs will be known and filled.

For, presently, what the writer viewed was the results of almost 10 years of electrification. Families have purchased more electric items without knowledge as to how to use them; i.e. as wood costs go up, families look to electricity for cooking - without proper training.

Results - At least 5 women the writer visited were complaining of the very much higher cost of power.

Upon further questioning, it was found the family had recently purchased a stove (4 burners with oven - or 2-burner hot plate type). When the woman was asked to demonstrate how she used the appliance, in every case, it was an example of her not realizing the stored heat capability of an electric appliance - nor the primary cost of first plugging in the item. She would keep the rice on the operating burner until the rice cooked; rather than turning off the heat sooner and allowing the retained heat in the burner to finish the cooking.

The woman would connect the iron to press one shirt for the husband's work rather than collecting all items, plugging in the iron and pressing all clothes during the initial heating cost.

Also, when a customer is first connected, his household wiring should be adequate for future growth (visual #4). The light #14 cable is for minimum load. Most of the homes visited were residences that had been wired during the 10 year span of the cooperative. In most cases, the writer saw the small #14 wire with more and more appliance add on as a real hazard and danger to the family. Most homes,

in the climate of Guanacaste, are wood; this hot, small wire against the bare, wood wall was a frightening thing to see.

The cooperative "home-economist, power use person" should recommend, upon first installation that, an #8 or larger wire be used with the thought of future "add on" of electric appliances. It is much cheaper to put in the heavy wire initially rather than revising 10 years later.

Areas Non-Electrified

Referring to the Map of Guanacaste (visual #1), the reader will see the cooperative area served which was covered by the writer during the 3½-week interview period.

Haucas and Lepanto, areas without power, were studied by the cooperative during the past year and electricity should be put in these localities in 1978.

In talking with the cooperative manager, it was found the availability of supplies (poles - connecting cable - meters) are almost "nil". Therefore, a time problem exists between the date a study is completed and the need known to the time when material is available and the job can be done.

As the writer concentrated on visiting homes without power in electrified areas (31 contacted), the following two points were brought out:

a. The home is not electrified because the inhabitants are quite elderly and feel no need for light; i.e. they are in bed before dark and grown children living near take care of cooking and other personal needs.

b. The home is not electrified because the family is too poor.

The cooperative realizes there are a number of poor families in the service area. The manager told the interviewer of a program to help poor families, the program is run through the co-op P. R. department. A cooperative person visits the low income family to conduct an economic study and access the need for power (visual #5).

Through the study, data is gathered and if the family earns less than ¢280.00 a month ($30.00), has children in school, a regular, if however small source of monthly income, the cooperative will install power. The cost is about half the regular connecting rate. However, the manager was anxious that the interviewer understand why this program is not widely advertised.

Because of the limited supply of meters (only 300) and the fact, presently, 177 low income members have been connected, the cooperative is not anxious to overly advertise. In the same vein, the cooperative wants to reach the low income families who truly would benefit. So, with some interview contacts, the writer did provide a real help to the cooperative in reaching low income families.

Low Income

Example of the low income families the writer encountered clearly show personal difference.

1. Noegle Munos Dios - Nicoya

   Family of 12 living in 3 rooms. The habitation was very clean and neat. Six children under age of 18 were cared for by older sisters. Father was a worker for the municipality. The family owned this house where they had been for 20 years without electricity.

In talking with the parents, it was rewarding to hear the most important task for each child was to get his school work done. All older children were seemingly intelligent - the oldest boy was in the university in San Jose; having been awarded a scholarship.

After explaining the coop socio-economic study, the father understood the possibility of getting electricity at a lowered cost and said he would apply.

2. Edwardo Espinoza Villalobos, Nicoya.

   Family of 13 living in 2 rooms, there was no mother, an older daughter, about 16, was in charge. The father worked part-time farm jobs. The circumstances were very bad; the house and clothing dirty and ill cared for. The co-op economic study was explained to the oldest daughter, but it is doubtful if the father will take advantage of this help.

The writer sincerely feels the co-op is attempting to service all income levels. And, these two family interviews point out clearly coop problems in singlely finding and deciding which low income dwellings are to be helped.

Resident Income

It is understood the inhabitants of Guanacaste have about the lowest income in Costa Rica. Therefore, the area represents a strong possibility for co-op (handicraft ventures). This is evidenced by a ceramic place in Guaitil - started some years ago and run by area housewives.

In talking with three groups of people which included the Guanacaste coop manager, M. Flores, area women near Nicoya and Santa Cruz, and an A.I.D. representative in San Jose, it was proposed to start a co-op.

In this way, area women could make salable artisan type items of seisel-hemp or guords, earn money and bring more income to the coop in increased electrical use.

Conclusion

The population of the peninsula is largely dedicated to agriculture. Prior to the coop's existence, inhabitants had power through a municipal source or by a generator serving a farm.

Before 1963, rural people were lacking electricity and according to the 1963 AID y MuÑoz book, there was a large annual migration from the area.

With the coming of the coop and electricity, the housewives' first desire was for light and an easier way to press clothes. Even today, over a decade later, all electrified homes have these two things -- light bulbs and irons.

Women also want health and educational centers. In the majority of the interviews when the writer asked what "advantages electricity had brought" women answered -- health centers, schools, and - in 10 instances - school night classes.

The writer talked with the coop "cobrador" (cashier) and found within the past four years an all service hospital has been built in Nicoya and centros de salud (health centers) are in Veintisiete de Abril, Hojancha, Carmona and Santa Cruz. New college (university) extensions are in Nicoya and Filidelphia and vocational agriculture facilities for day or night classes are in Veintisiete de Abril, Santa Barbara, Hojancha, Carmona, Jicero and Cartajena.

As the writer talked with housewives, they would tell of a homemaking course offered by INA (Instituto National de Apendizaje). The interviewer notes the

female interest in learning. It is felt one strong reason the home use of electricity has not progressed further nor faster is due to two things -- LACK of understanding and INCOME level.

SUMMATION OF INTERVIEWS CONDUCTED BY JOAN H. HOOD
NRECA SPECIALIST

Rural Electric Cooperative of Guanacaste, Santa Cruz
March and April 1978

In conversing with each female, the interviewer found out if she was presently employed and what she thought of beginning food preparation classes with the end thought in mind of making and selling baked goods in the Santa Cruz area. It was explained that appliances for use in the classes would be secured with COOPEGUANACASTE help.

The majority of the women interviewed, 15, were in favor of working in this way to augment income. However, in each case, they were asking for more information on how the end result, (benefit in sales), would be achieved.

In summing up the interviews for Flores, the writer recommended that the project be turned over to co-op members who head up the COOPEGUANACASTE Educational Committee.

The co-op manager also told the writer he had had a visit from Sra. Alicia Diez of Moracia de Nicoya. This was the same person the writer met last November during the first co-op visit. Diez wanted information and help in starting a women's co-op. The majority of the families in Moracia are poor. The men work as day laborers on cattle farms nearby. The women have no source of regular income. It had been an idea to begin a co-op for the women to sell hand-made items for profit. (This type of thing has been successfully done in Guytil. A pottery co-op was started there about six years ago and is presently successfully functioning.)

Flores asked the interviewer to visit Sra. Diez. After talking with this woman and 20 others attending the meeting, the interviewer contacted the AID office

in San Jose. This office has recently started a small business program to help women. The writer gathered all the pertinent information from Moracia and turned it over to Marvis Knoespe, AID in San Jose.

During this trip, the writer visited a number of co-op commercial users. The largest, newest customer is the CODESA cotton cleaning plant near Liberia. This plant began operation six months ago. Presently, it is using 1,500 KVs. Due to the seasonability of the cotton crop, the plant is in full operation four months of the year. It is owned 57% by CODESA, (Costa Rica Co-op Development Agency), and 43% by individual growers.

In talking with Ing. Juan E. Ramos, Project Chief from CODESA, he felt Guanacaste is really the food pulse for Costa Rica. With proper economic help and assistance in how to best grow and harvest products, Ramos feels this peninsula will lead Costa Rica economically in the near future.

GROWTH INDICATORS: Industries Visited During This Assignment

Presently Using Co-op Service	Before 1977
2 Sugar Refining Plants	2 - With Self-Contained Power (Diesel)
9 Rice Processing Plants	7
7 Saw Mills	5
1 Cotton Cleaning Plant	0

Located in San Pablo de Nandajure is the farm of Edgar Ugalde Brains. He is unique to the area in that he is the only large scale milk producer. He has been a member since the co-op's beginning. Before that, he had his own generating plant. As Brains stated, without electricity for milkers and milk coolers, etc., it would be impossible to operate. He is milking 240 animals. This is done each day from 1:00 a.m. to 10:00 a.m. His milk is sold to "Dos Pinos, the

large dairy co-op in Costa Rica. He has five service hook ups. Four are to houses and one is to the dairy operation. His average monthly use is 3,500 KWHs and the bill is ¢1,455.40, ($170.42). There is an average of 50 employees working full-time and between 15 - 20 seasonal helpers.

The only commercial bakery serving Santa Cruz is La Panaderia "Las Delicias". In talking with the manager, Otto Cedeno Calveo, the writer was told the operation was begun three years ago and is presently employing 17 people. There is a huge 250 V electric two shelf oven in the plant which holds 10 loaves of bread on each shelf or 20 during each baking. The bakery is producing bread, rolls and sweet pastries for sale in the surrounding area. This establishment is a branch of the larger plant "Pinova" of San Jose and is allowed to sell bread under this label. Plus the large electric oven, the bakery has an electric beater which works 50 pounds of dough at a time and another appliance which is used for kneading the dough. This machine is operated by a 2 h.p. motor.

Besides these evidences of industrial growth, the writer had the opportunity to visit some of the resort areas served by the co-op. Residents and businesses of Playa Coco have been members of the co-op since the co-op started. The Playa Coco beach area is averaging a monthly use of 43,000 KWHs and service charge of ¢18,000, ($2,093.00). There are 253 connections. Another beach area is Playa Hermosa. This site was planned and developed seven years ago. It has been served by COOPEGUANACASTE ever since. Average monthly use in this area is 9,000 KWHs, and there is a charge of ¢3,500.00 ($406.97) with 39 connections.

SUMMATION OF INTERVIEWS CONDUCTED BY JOAN H. HOOD
NRECA SPECIALIST

Rural Electric Cooperative of San Carlos, Ciudad Quesada
May - June 1978

In talking with the women of the household, the writer was interested in the following comments:

Household of Olin Cordero Alfaro. Los Angeles (San Isrido de Fortuna). This family consists of 12 members. They have a large farm and mainly earn their living by a milking operation. They are producing 450 bottles of milk each day which they ship to Dos Pinos the large Costa Rican dairy cooperative. The family has had their own private generator providing electricity for the past 18 years. However, when Coopelesca began providing service, they were the first to hook up -- for the milking operation. Ophilia (the wife and mother) says without electricity for cooling the milk and providing water, they would have no operation nor any way of earning their living. When the interview asked why they did not have electricity in the home, the husband explained they lived 12 kms from the road and power line. Therefore, in order to "hook up" the residence, it would be necessary to construct and pay for the 2 kms of line. Therefore, they are relying on private power (generator) for their private use. That means they have the generator functioning from 6 a.m. until noon and then it is turned on again from 6 - 8 p.m. It is a diesel power plant.

The wife told the writer she wanted proper electricity in the home. She said the power plant "was very noisy and did not function properly." She explained due to power drops and shortages in operation, they had damaged and lost 2 electric irons, their television set was not functioning properly; she had just purchased an electric washer to help with chores and she was afraid to use the machine for fear of damaging it. She realized the cost of the line construction would be more than paid for in the savings they would realize in the proper care

of their appliances. There would be less chance of appliance damage and destruction with proper electric service.

In a different way but with the same words was the way cooperative members in La Fortuna explained reasons they were members of Coopelesca. Up to four years ago, this area (La Fortuna) was serviced by its own power plant (hydro-electric). However, it only functioned early in the a.m. until noon and then for a few hours every evening. As Senora Dora Hidelgo Alfaro, La Fortuna, said ... "it was very bad service ... one time we went for 22 days without service as the plant had a failure."..."...now since service from Coopelesca we have lights in the community center and INA (Instituto National Anzensa--Costa Rican vocational educational institute) offers classes in many areas of adult education."

Sr. Jose Joaquin Perez Jiminez operates a general store in La Fortuna with his brothers. There are 7 members in his family and they have been members of Coopelesca since it started.

His wife summed up the need for electricity by saying..."...it's very necessary. If we didn't have it, we couldn't make a living." Part of this means since they serve cold drinks without the use of their store cooler and without lighting at night, they surely would not have customers.

Socorro Varelo Montes, La Fortuna, has a dairy operation and as he and his wife agreed without electricity they would not be enjoying life. Electricity makes it possible for the milking to go much faster (they have electric machines) and the cooling tank keeps the product from spoiling. That means ease in their operation and certainly more sanitary product for the ultimate customers.

Jenny Cordero Castro, Los Angeles, said simple..."electricity is everything"... Her husband earns the living from farming and again electricity plays an

important part in the major workload. In the household, Jenny has an electric stove and washing machine. She says the stove is like having a 'quiet maid' around and the washing machine never talks back either!" Also, this woman feels electricity gives security and brings the community closer together. Security means at night with street lighting it is safer to go out and not worry about children and as the community has the chance to extend its day, there are more meetings and people are involved in getting things done together.

Sra. Mercedes Castro Aguero, La Fortuna, feels electricity is a health help also. With her washer she feels the clothes are much cleaner than they would be if she washed them by hand. There are 7 members in her family and her husband is earning a living from farming.

In the household of Jose Joaquin Gomez Rojas; his wife, Miriam Salazar; gave a visual demonstration of the importance of electricity in her personal situation. The family is living near El Tanque. The interviewer visited about 11 a.m. on June 7, 1978. The family is working in agriculture and each day 8 - 9 workers are eating in the household as part of the payment they are receiving. Miriam was busy getting food ready for the "crew". As the interviewer watched, the woman used the electric stove like a third and fourth hand in quickly getting the food ready to serve. The meal was the usual--beans with rice--salad and some meat over the rice with tortillas.

Income

The majority of the residents of San Carlos are involved in some form of agriculture. They are making their living from home operations or are working with coffee, rice or sugar cane. The average income in this Canton would be close to $125 a week as against the $75 earned in Guanacaste.

The family of Jose Luis Sanchez Torres depicts the family in this area. They live in the rural area near San Pedro de la Tigra. There are 5 members in the 4-room house. They have been members of the cooperative since it began -- 10 years ago. They have the "essencials" electric lights, electric iron, television and refrigerator. They have a very small plot of land where they grow some of the food they live on. The father is working with the coffee cooperative located here; he also works in cutting sugar cane.

The mother says..."...we are poor but with the help of Coopelesca, we can get a loan from the bank if it became necessary to build on or increase power consumption." She mentioned through the help of electricity her time is now shortened when it comes to household chores like ironing. She can do the job quicker and better and have more time to help with the cutting of cane or in the coffee fields if necessary to augment family income.

The majority of the residents of this area of Costa Rica seemed to realize by using electricity wisely they can raise their income and enjoy better standards.

In many respects, this area of Costa Rica repeats what the United States Mid Western States (parts of Minnesota and Michigan) must have been like in the early days of the REA. San Carlos also formed the electric cooperative through efforts of rural residents banding together 10 years ago to form a co-op power company to replace the sporatic service they were receiving from private power sources. Coopelesca to this day is a cooperative in a true sense of the world.

TRANSCRIPTS OF INTERVIEWS MADE WITH RURAL ELECTRIC CONSUMERS/MEMBERS OF THE RURAL ELECTRIC COOPERATIVES OF COSTA RICA

JULY 5 - 10, 1978

Interviewing done by James D. Lay, Management and Operations Advisor, IPD

We are here in Santa Cruz talking with Mr. Mario Flores Bustamante, the Manager of the Rural Electrification Cooperative of the Peninsula of Guanacaste (COOPE-GUANACASTE.)

Mario, I would like to know something about the progress in the zone caused by electricity. Can you tell me something about it?

Of Course, yes, with much pleasure, Mr. Lay. It is definite that rural electrification through the Guanacaste Cooperative -- with the Rural Electrification Cooperative of Guanacaste -- has produced a great impact on the social and economic development of the Peninsula of Nicoya. It is without a doubt fundamental that that development, that great impact, has been produced througn electrification as a fundamental instrument for the development of different economic and social activities of the region.

And, how old is the cooperative now?

The cooperative was founded in the year of 1965 and began operations in December of 1968 in the counties of Carillo, Santa Cruz of the Peninsula of Nicoya.

And do you think the cooperative could have begun without the help of A.I.D. or the United States?

In my opinion, and I share it with many people in Costa Rica, as far as the cooperative movement is concerned as well as responsible institutions of electric development, no, at that time, Costa Rica did not have the possibility

of carrying out rural electrification with its own resources. Thence it was fundamental, the help of AID, in order to give a chance to Costa Rica toward electrification of the rural zones. It is without a doubt this help through the participation of AID in Costa Rica gave a cooperative base to rural electric development. That which effectively gave a new conception of rural electric development in the country-side, that has permitted in the last years a coverage of great rural zones -- in this moment they are, we would be able to say, with conveniences that are equal to a series of advantages and conveniences that people in the city can count on. Also, the help which we have relied on from NRECA has been of very great importance through technical assistance, an invaluable aid as far as the promotion, the education which was given to cooperative and the improvement in usage of energy in the country-side.

Here in the zone, are you serving everyone or only those who are rich?

It is a zone that is pretty much agricultural (rural) in regard to the different classes or economic levels are covered, although, logically, the greater percentage is of people with lower incomes who effectively can, at this time, count on electric service and have a better way of life.

In the zone, what is the priority of the uses of electricity in the sense of appliances -- or agriculture -- or what sort of thing?

As I said before, electrical energy in the country-side has become fundamental for development. And if we take into account that our zone is an agricultural zone, well, perhaps I would say, in spite of the fact that some electrification is lacking in the agricultural field, the best improvement that energy has made is in the agricultural field, independently of usage in homes where families have greater comfort, more time to spend on other activities, on the basis of the possibilities that present themselves when electric service can be relied upon in the home.

And, in the homes, what appliances are the most popular or most useful?

In our type of house or in our family, rural, the use of the electric iron is fundamental, appliances in the kitchen such as blenders, the washing machine itself, refrigerators are used in many of our homes - the electric stove too - and television has come to play a very important role in education and in a greater concept of our people through the different methods of communication such as the television which has permitted, effectively, that our rural people be up to date on everything that is happening in the world every day -- and this thanks to the fact that we can rely on electric service in the home.

If you could get some help from NRECA or from the United States at this time, what type of aid would help you most?

Although the cooperative has already developed or has had, let's say, a considerable stage of expansion in the electrification of new towns, it still remains to electrify bordering towns where, at this time, there are cooperative lines. But, within the same area we are, in this moment, confronted with the problem of a group of members who cannot count on electric service and in order to serve them it is necessary to secure additional resources, not inconsequential ones, and I believe that that would be, let's say, one of the aids that could be counted on from AID in order to be able to saturate and effectively satisfy the need for energy of these families that still do not have the possibility of counting on constant service.

And these families, are they low income?

These families are of the lowest income existing in our area, a zone pretty much rual. Being able to give service to them represents a pretty considerable cost and on our part, we are very worried and very much pledged to give them electric service because we believe that by completing that effectively with the

philosophy and the spirit and the original objectives which were to create the cooperative and which were established from the beginning, as a basis of an idea and the great restlessness and interest that prevailed in AID when financing was given so that the cooperatives could be established, it was logically fundamental that electric services serve the families of lowest incomes in the country-side to effectively advance men and women of families toward a new attitude toward life and society.

Now we will talk about rural electrification in the Quebrada Honda Zone.

How many years have you had electricity in this zone?

In Quebrada Honda, scarcely two years.

Two years -- and do you think it is important in the zone?

Yes, because what we formerly did in Quebrada Honda well is now done a little better. It revolutionized the way we were before and for us it is most important in the field of nutrition because we can maintain fresh foods well and have more commodities which previously the lady here could only have on the truck because there was no other facility.

And outside of the nutritional center here, is there also a health center and what do they do?

They benefit too from electrification in the same way because they have more vaccines that they can maintain in a good state that they can apply at any time and they don't have to bring them in from outside in order to maintain them. They have their refrigerator and can maintain more vaccines.

Great! -- and, you, for you personally, what is the importance of electricity?

Well, for the housekeeper it is important because she has more conveniences like the electric floor polisher, the refrigerator to keep foods and the electric stove and all that can -- that is to say, everything that will help a little more in the house and the homemaker will have better creature comforts.

Good, thank you.

Here we are in Santa Cruz visiting with a man who has a sugar mill for refining sugar.

Sir, how many years have you had electricity here in the sugar mill?

We have had electricity here since January 14, 1970.

And before electricity, how were things done?

Before electricity the sugar mill functioned with oxen for about 18 years.

And is it much faster with electricity?

A lot. The change with electricity has been enormous - it used to take 5 hours and now with electric current, it takes 1½ hours, and the production, logically, has been superior.

And is it cheaper to operate the machine with electricity than it was with oxen?

Yes, the consumption of energy is very small.

And to feed the oxen and everything -- is it cheaper?

The consumption was more difficult, you know?

Yes.

Through this means I would like to thank the Manager of COOPEGUANACASTE, Mario Flores Bustamante, friends and visitors for the fact that everything done by the cooperative takes us into account. I hope that this will neither be the first nor the last time that they visit us since we will always be happy to see them. To all, many thanks.

Now we are in the town of San Juan, a small town that is served by the cooperative of COOPEGUANACASTE, and here we are at a station for potable water.

How many years have you had water here? - Something like ten months.

It's recent? - Yes.

And is it much easier to have water in this form?

Yes, much easier.

And is it good water?

Yes, it's good water.

Very very potable?

Yes, pure water.

And where did your water come from before?

The water before? - From the wells and how one labored?

But, you had one here in (near) the house?

Yes -- there is where the well used to be.

Then, it came from a private well?

Yes.

O. K., very good, let's have a look.

Small Business - general store - San Juan, Guanacaste, Costa Rica.

Good morning, Senora.

Good morning, how are you?

Very well, and can you tell me if your business here has benefitted much from electricity or not?

Yes, some, a lot.

Can you tell us if you sell more things or better things or what?

Of course, one sells a lot better with electricity because of refrigeration.

And can you also keep the store opened longer with light at night, or what? The store, the grocery?

Ah, yes.

And in your own words, can you tell me how electricity has affected your life -- you, your children, your family?

O. K., for me it has been a social benefit that is very good for the town, for health too.

Great.

And for the education of your children?

Also good for education because through the use of electricity they have a better way to study, it's easier, you know?

Great.

Interview conducted by Eduardo Espinosa, Public Relations, COOPEGUANACASTE.

We are doing an interview here with Sra. Lea Angulo Mendez de Carillo about why she doesn't have electricity at this time.

Dona Lea, can you give us an explanation?

O. K., there is no electricity here because my father and mother went to Guapiles to work. It is for that reason that there is no electricity. There hasn't been for many years.

Do you have any plans to install electricity?

Yes.

What do you think electricity will bring to your home?

O.K., many things. Naturally, it's a wonderful thing.

Can you tell us if it will bring benefits to your home?

What?

Benefits, such as, let me explain -- hummm -- ironing, or ...

Of course, ironing clothes, many things.

Do you have any electric appliance that you have bought or don't you have anything?

Nothing.

O. K., that's it, thank you.

Here we are in the headquarters of the Cooperative of COOPEGUANACASTE with the Board Secretary of the Cooperative, Carmen Lia.

Can you tell me something about your impressions of the work of the Board?

Yes, say, for example, when the Board meets to make decisions, for example, they read a note, the Board arrives, they talk about it and ultimately they come to a basic agreement, and if the matter is purely administrative, they pass it on to management and the manager makes a decision about the note.

Very good, and you -- from your point of view does the Board function well?

Ah, yes, magnificently. The latest Board is working very well. They support the regulations very well too.

And how many members are there on the Board and where do they come from?

The Board has 9 members -- 7 are permanent directors and 2 are substitutes. And they are named by the Assembly of Delegates and this is done according to the canton -- the canton of Santa Cruz, a representative from Santa Cruz, another representative from Nicoya, Hojancha, Nandayure, Carrillo. And now that they are electrifying Jicaral, they extended some line, there is a representative from Jicaral who is presently the president of the Board.

And for how many years are they elected?

They are elected for two years. Later they can be re-elected by the same Assembly of Delegates.

Very good, thank you.

Thank you.

CLASSIFICATIONS AND DEFINITION OF CAPITAL CONTRIBUTIONS*

Cooperative de Electrification Rural de Guanacaste, R. L.
Santa Cruz, Costa Rica

TYPE OF SERVICE	CONTRIBUTION	
Small Residence	¢ 400.00	US$ 46.84**
Medium Residence	600.00	70.26
Large Residence	800.00	93.68
Small Commercial	1,000.00	117.10
Medium Commercial	2,500.00	292.74
Large Commercial	4,000.00	468.38
Small repair shop	800.00	93.68
Medium repair shop	1,500.00	175.64
Large repair shop	3,000.00	351.29
Tourist Establishments in Playa Hermosa, El Coco and Tamarindo		
Small	1,000.00	117.10
Medium	1,500.00	175.64
Large	2,000.00	234.20

Special contribution for low income persons is ¢150.00 (US$17.56) at 4% monthl interest and includes modest internal installations in member's home.

Extra special contribution for rare cases is ¢100.00 (US$11.70) at 4% monthly interest and includes modest internal installations in member's home.

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*These contributions are what we would call a connection charge in the States. As such, there is no membership fee.

**Exchange rate at time of report was 8.54 colones to one U. S. Dollar.

ANEXO 11

CUADRO COMPARATIVO DE LA TARIFA DE LA COOPEGUANACASTE R. L., CON LA DE OTRAS EMPRESAS

KILOVATIOS HORA	COOPE-GUANACASTE ¢	I.C.E.	CIA. NAL. FUERZA Y LUZ ¢	COOPELESCA ¢	COOPESANTOS ¢
30	10.90	11.80	12.10	11.45	11.80
40	14.32	15.31	16.14	15.05	15.60
50	17.74	18.82	20.18	18.65	19.40
60	20.64	22.33	23.45	22.25	23.07
70	23.54	25.84	26.73	25.85	26.74
80	26.44	29.09	30.01	29.45	30.41
90	29.34	32.34	33.28	33.05	34.08
100	32.24	35.59	36.56	36.65	37.75
150	46.74	51.84	52.94	53.00	49.65
200	61.24	68.09	69.32	69.35	61.55
250	75.39	84.34	85.70	85.70	73.45
300	87.54	101.09	102.90	102.60	88.95
350	100.29	117.84	120.10	119.50	104.45
400	112.74	134.59	137.30	136.40	119.95
450	125.19	151.34	154.50	153.30	135.45
500	137.64	168.09	171.70	170.20	150.95
600	164.54	203.79	208.28	205.10	184.05
700	191.44	239.49	244.86	240.00	217.15
800	218.34	275.19	281.44	274.90	250.25
900	245.24	310.89	31.802	309.80	283.35
1.000	272.14	346.59	354.60	344.70	326.45
1.500	450.64	538.09	551.20	524.70	502.45
2.000	629.14	729.59	747,80	704.70	688.45
2.500	807.64	921.09	944.40	884.70	874.45
3.000	986.14	1.112.59	1.141.00	1.064.70	1.060.45
Cargo por Demanda					
Por 10 KW	127.50	329.00	339.00	177.50	239.00
Por 5 KW adicional	63.75	164.50	169.50	88.75	119.50
Por cada KW adicional	12.75	32.90	33.90	17.75	23.90
Alumbrado público					
Por 50 vatios	5.10	5.80	6.25	5.90	5.80

COOPERATIVA DE ELECTRIFICACION RURAL
DE SAN CARLOS R. L.
Ciudad Quesada, Costa Rica

Type of Service	Total Number of Connections	
	August 1976	June 1978
Residential	3,483	4,560
Public Lighting	538	543
Bars, Dance Halls, Hotels, Restaurants, Soda Fountains, Dry Goods Stores, Rooming Houses	211	291
Dairy Farms	147	258
Primary Schools	69	69
Halls (galerones), garages, wharehouses	47	56
Churches	44	48
Mechanical and Industrial Work Shops	43	56
Telegraph Offices, Post Offices, Government Offices, Jails	26	26
Retail Stores	24	25
Health Clinics	22	22
Coffee Processings Plants and Coffee Receiving Points	22	25
Butcher Shops	21	31
Community Centers	20	21
Saw Mills	19	24
Wharehouses	17	22
Nutrition Centers and School Dining Facilities	15	15
Banks	12	9
Cooperatives	12	10
Shoe Shops and Tailor Shops	11	7
ICE Telephone Offices (Public)	11	11
Professional Offices	8	39
Educational Centers - High School, Agricultural, Technical, Teacher Education and Universities	8	12
Gasoline Service Stations	7	7
Ministry of Agriculture and Livestock Officers	6	7
Agencies and Branch Offices	6	6
Municipal Offices	5	5
Bakeries and Pastry Shops	5	6
Drug Stores	5	4
Cement Block Factories	4	5
Radio and TV Antenae Stations and repeaters	4	4
Sugar Refineries	4	3
Barber Shops	3	6
Chicken Barns	3	3
Movie Houses	2	2
Casava Processing Plants	2	2
Dentist Offices	2	7
Hospitals	2	2
Laundries	1	2

Continued...

Type of Service	Total Number of Connections	
	August 1976	June 1978
Libraries	1	2
Furniture Makers and Stake Body Shops	0	10
Water Pumps	0	11
Pig Breeders	0	3
Ice Plants	0	2
Jewelry Shops	0	3
Discoteques	0	2
Gymnasiums	0	1
Wooden Posts Factory	0	1
Total Number of Services	4,892	6,295

COOPERATIVA DE ELECTRIFICACION RURAL

DE SAN CARLOS, R. L.

Ciudad Quesada, Costa Rica

September 29, 1976

ELECTRIC ENERGY FACILITIES EXISTING PRIOR TO COOPERATIVE
(Gasoline or Diesel Motors or Hydro Electric Plants - Generally Privately Owned)

Location	Motors	Hydro-Electric Plants
Santa Fe de Ciudad Quesada*		1
Los Leones (San Juan de Ciudad Quesada)		1
San Rafael de La Marina	2	
La Marina de Ciudad Quesada*		1
Aguas Zarcas	4	1
Los Negritos de Venecia*		1
La Marinita	1	
La Palmera	1	
La Union de Venecia	1	1
San Cayetano de Venecia	4	
Venecia (Town Center Only)		1
Marsella de Venecia	3	1
Rio Cuarto de Grecia	2	
La Flor de Rio Cuarto	1	
San Miguel de Sarapiqui	3	
La Virgen de Sarapiqui	4	
Puerto Viejo de Sarapiqui	8	
Altamirita de Aguas Zarcas	5	
La Josefina de Pital	2	
Pital	8	
Veracruz de Pital	2	
Cuatro Esquinas de Pital	1	
Florencia		2
Quebrada Azul*		1
La Sapera	3	
Muelle	3	
Rio Kopper	2	
Arenal	5	
Terron Colorado	3	
San Francisco de La Palmera	5	
La Vieja	2	
Santa Clara*	2	1
Jabillos	2	
La Tigra	1	
San Isidro	1	
La Vega	3	
San Josecito de Cutris	2	
San Cristobal de Cutris	1	1

Continued....

Location	Motors	Hydro-Electric Plants
El Tanque de La Fortuna	1	
La Fortuna (Served the entire Community)	2	1
Los Angeles de La Fortuna	4	
Colon de Ciudad Quesada	5	2
Sucre de Ciudad Quesada	4	1
Porvenir de Ciudad Quesada	2	
San Vicente de Ciudad Quesada	1	1
Buena Vista	1	2
La Abundancia	0	0
Santa Fe de Aguas Zarcas	3	
La Tabla y Santa Rita de Rio Cuarto	4	
Ciudad Quesada*		4
TOTAL NUMBER OF PLANTS	114	24

*These hydro-electric plants are still in operation and the majority are for private businesses, that is to say, only for the personnel or farm service. Only in Venecia, La Fortuna and Ciudad Quesada did the plants provide service to the town.

As for motors, one can say that they are all private or only provide service for the owner. There are some cases where service is for a large farm and the tenents enjoy the service from the same plant.

Statistics on those members classified as INDUSTRIAL in COOPEGUANACASTE

Name	Date Connected	KWH Use First Yr.	KWH Use for year 1975.
Ingenio El Viejo La Guineo de Carrillo	10 Oct. 70	118,440	799,840
Bodega Nacional de C.R. Santa Cruz	Aug. 71	4,112	8,077
Hacienda Tempisque Paso Tempisque	15 May. 70	2,201	1,675
Hacienda Tempisque Paso Tempisque	15 May. 70	5,546	1,336
Hacienda Tempisque Paso Tempisque	14 Apr. 71	1,950	6,068
Consejo Nacional de Prod. Santa Cruz	21 Jul. 72	568	131
Consj. Nac'l de Prod. Carillo	15 May. 71	5,163	16,463
Consj. Nac. de Prod. La Mansion	New in '75		4,622
S.N.A.A.* Santa Cruz	May. 70	63,818	185,724
S.N.A.A. Sardinal	Nov. 71	4,575	40,619
S.N.A.A. Belen	17 Jun. 75	New	35,867
S.N.A.A. Rio Canas	19 Sep. 75	New	3,155
S.N.A.A. Nicoya	5 Sep. 74	28,396	97,113
S.N.A.A. Nicoya	11 Feb. 75	New	57,751
S.N.A.A. Nicoya	5 Jul. 75	New	56,843

*Servicio Nacional de Agua y Alcantarria - National Water and Sewage Service

Water Pump - Municipality of Carrillo	71	57,201	118,119
Municipality of Sta. Cruz	74	2,711	2,325
Fabrica de Hielo Santa Cruz	14 May. 70	35,663	70,517

The Cooperative Movement In The Americas Today

By Alejandro Orfila
Secretary General, Organization of American States

NRECA's international programs division, with the assistance of the Agency for International Development and the strong support of the NRECA membership, is increasing its efforts to work with regional and hemispheric organizations and with international lending agencies to develop rural electric cooperatives around the world. Orfila's recognition of NRECA attests to the success of these efforts.

Alejandro Orfila

In Latin America today the new name for peace is development, not just in the traditional sense of economic growth alone but with the goal of achieving integral human development: political, economic, cultural, social and personal. Contemporary governments and peoples are concerned specifically with the problem of distributing the gross national product in a just and fair manner. In the pluralistic and mixed public and private economies now found in our hemisphere, it is important to create or to strengthen social and economic institutions through which all citizens can come to play a responsible and democratic role in helping to achieve development.

While the cooperative movement in Latin America is not yet of powerful economic significance, it already has demonstrated that it can offer substantial support for inspiring and promoting integral development. Its horizons and capacities should therefore be strengthened and enlarged for the future well-being of our hemisphere.

Today there are more than 25,000 cooperative societies and organizations in Latin America, with some ten million members. Cooperatives exist in every form: producer, consumer, marketing, argricultural production and export, credit union, fishing, transportation, housing and rural electrification. Governments increasingly have recognized the value and importance of the cooperative movement for national well-being and have taken many concrete measures to help this movement grow.

One of the more critical aspects of the hemispheric development process has been that millions of persons, especially in isolated rural zones, have been living on the margin of life. In some regions this has resulted in weak social institu-

tions which are unable to respond to the urgent development needs of the present moment.

The cooperative movement has become a living school of participation and self-help whereby these conditions of underdevelopment are being overcome. It is democracy at work in daily life, promoting tolerance and respect for the rights of all citizens and therefore is helping to form an authentic and well-integrated spirit of national identity among its members. Moreover, cooperatives have been helping their members to learn habits of sound management not only to run the cooperative organization itself but for their own personal and family affairs. Also, the cooperative movement is assisting the various nations and communities to reach out for and use technology appropriate to their cultural levels and living standards. This is a vital role to play in societies where the population is heavily rural and where there are still extensive and untouched frontier zones.

Dr. Arnulfo Carces Vivas, engineer, chief, Division of Rural Electrification, "Empresa de Energia Electrica de Bogota," Bogota, Colombia (Municipal Electric Utility of the capital city of Colombia) and the Department of Cundinimarca, and James D. Lay, NRECA, near San Gabriel, Colombia. Picture was taken during a portion of a visit to review part of the electric system which serves approximately 30,000 consumers.

Development of Co-op Movement

The cooperative movement in Latin America began in earnest in 1898 with the formation of the Pingué cooperative in the province of Buenos Aires, Argentina. A second strong impulse came at the turn of the century when Father Teodoro Amstad helped create Raiffeisen credit unions in Rio Grando do Sur, Brazil.

In its initial phase cooperativism in Latin America was a European transplant, and perhaps for this reason progress was at first slow. During the past two decades, however, the movement has become quite strong throughout the hemisphere as governments and societies began to lay great stress on improving national human resources as the foundation stone for development. Despite its steady and continuing growth, the co-op movement still faces heavy obstacles in the rural areas, a situation which has led to the creation in several countries of the kinds of community organizations termed precooperatives. As conditions and circumstances allow, however, these organizations are gradually being incorporated fully as cooperative societies.

An indication of the rapid increase in the movement is that while in 1962 there were only 17,000 cooperatives in Latin America, today this number has become more than 25,000 societies. During this relatively brief period of time, membership doubled from 5-million to 10-million. Argentina and Brazil now have 31% of all cooperative societies in the hemisphere, with 57% of all members.

Cooperatives for producing goods and services have been formed by groups of workers and employees in industrial plants, providing work opportunities for their members. In Argentina alone 26,000 co-op members are engaged in industrial work related to the metallurgical, textile and housing sectors.

Co-op societies found in Latin America are involved in a wide range of ventures. These include:

- A cement plant "Cruz Azul," one of the most important in Mexico;
- A prepared food co-op in Chile which provides 15,000 meals each day to factories in Santiago;
- Eleven sugar co-ops in Peru own 425,000 hectares of land;
- Coffee production cooperatives in Costa Rica, which control 27% of national coffee exports;
- Urban transportation co-ops which have grown rapidly in Peru, Colombia, Ecuador, Venezuela, Panama and Central America;
- Credit unions which have experienced the strongest growth of all since 1962, nearly 140%.

Agricultural cooperatives also have developed with great speed. Generally, they have started with marketing and then assumed other concerns such as the provision of credit and basic tools or fertilizers. They have proved particularly use-

ful ways to help improve storage, transport and processing of crops.

Consumer co-ops have found strong roots as a way to help offset the impact of rising prices. They often have originated in trade unions or in mutual associations. These cooperatives are established most firmly in Argentina and Chile, but the government of Costa Rica and Panama are giving considerable support to establishing rural co-op supermarkets.

Role of the OAS

Since 1945 the Organization of American States has pioneered in promoting the cooperative movement in Latin America. In the initial stages of its efforts the OAS attempted to develop a concrete and practical knowledge of the movement so as to organize realistic supporting programs. In carrying out its activities the OAS was guided by a continuing series of resolutions and recommendations related to the cooperative movement as adopted by member countries in such documents as the OAS Charter (1948, and revised in 1967), the Charter of Punta del Este (1961), and especially the conclusion of the Tenth Inter-American Conference (1954), which underscored that the cooperative movement, precisely because of its democratic character, is a highly suitable instrument to promote economic and social development throughout the continent. This conference also urged the Pan American Union to promote leadership training for co-op direction and to establish pilot projects for stimulating the rural cooperative movement.

Responding to these general guidelines, the OAS, over the subsequent years, has carried out an extensive publications program to fill the gap in hemispheric education on cooperatives, as well as broad training and technical assistance programs. This has included providing technical assistance to pilot projects for rural electrification in Brazil and in Costa Rica. During the 1960s joint training activities were developed by the OAS with national cooperative development offices in England, West Germany, Switzerland and Israel for middle management.

As the cooperative movement has grown in Latin America, a broader interchange of information and programs has taken place on a regional basis. This process was greatly advanced following the first Inter-American Conference on Cooperatives which was held in Argentina in 1968 at the request of the Argentine government.

This conference specifically led to more extensive credit to the cooperative movement from the member governments of the OAS in such areas as housing, production, consumption, credit and transportation. It also resulted in relating co-op programs to national efforts for functional alphabetization and technical vocational education, especially for rural zones. The conference further requested the secretary general of the Organization of American States to intensify its cooperation with the Cooperation Organization of America, which was founded in 1963, and with the Inter-American Society for the Development of Cooperative Financing (SIDEFCOOP), established in 1966. This latter organization was set up by co-op banks and cooperative financing institutions from Argentina, Chile,

Participants in the closing session of the basic management seminar for rural electric systems personnel held in San Jose, Costa Rica, October 25 to 29, 1976. Pictured in the photo below (from the left) are: Alvaro Chavez, director of the training division of INFOCOOP, Costa Rica Institute for Cooperative Development; Jorge Maroto, ICE, Bolivar Cruz, executive director, INFOCOOP, and Clyde Aultz, management consultant for NRECA and the instructor for the management seminar.

Costa Rica, Colombia, Ecuador, Peru and Puerto Rico.

The second Inter-American Conference on Cooperatives was held in Chile in 1974. The maturity of its work and recommendations evidences that the movement has come a long way in a short time. This conference agreed that planning for co-op development should be related to overall national planning efforts, recommended that tourism should be promoted through co-ops and called for strengthening of co-op ties with the international lending agencies such as the Inter-American Development Bank.

In particular, the conference requested the OAS to expand its inter-American training programs so that national co-ops could become more self-sufficient and autonomous. In 1975 specific measures to put these recommendations into effect were taken when the OAS collaborated with the Consumer Cooperatives of Chile in a training program for supermarket co-ops. Persons who had held previous OAS fellowships served as teachers.

A successful impact project of these OAS efforts was developed with the government of Israel from 1968 through July, 1976, in the field of agricultural co-ops. Some 2,000 persons were trained from nearly every Latin American country. During this same period another 500 OAS scholarships were given for co-op leadership training in Canada and Europe.

Since 1975 the OAS's cooperative efforts have functioned within our program of rural/urban development which attempts to give a balanced approach to development, taking into account the practical needs of both the rural and the urban sectors. Co-ops are able to assist the rural zones in responding to the broader challenges of malnutrition, illiteracy, low agricultural productivity, unemployment, lack of credit and housing shortages.

The Future

Between 1971 and 1976 the OAS increased its technical assistance budget for cooperatives by 23% and it also signed an agreement with Canada whereby that nation will provide over $1-million in technical services to co-ops in OAS member states during the next five years. This assistance, together with that provided by the government of Israel, is directed primarily to the poorest sectors of rural society.

The OAS has initiated collaborative steps with the World Bank to help accelerate rural development by effective use of co-op programs and is working with the Inter-American Development Bank to coordinate technical and financial assistance to fishing cooperatives.

The cooperative movement in Latin America has received strong encouragement and support from cooperative organizations in the United States. In 1954 CUNA (Credit Union National Association) started its programs in the hemisphere. This resulted in 1970 in the founding of COLAC—the Latin American Confederation of Credit Unions and Savings Co-ops. By 1975 there were 2,042 credit unions in 16 Latin American countries with savings valued at $189,000,000. Recently, COLAC received a $9-million loan from the Inter-American Development Bank and a $1,-250,000 loan, guaranteed by the

(See Cooperative Movement, page 36)

Participants in workshop session at recent basic management seminar held in Costa Rica included: Carlos A. Sanchez, training assistant, INFOCOOP; Freddy Arroyo, manager, COOPELESCA; Gerardo Rodriguez, chief, operations and maintenance, COOPEALFARORUIZ; Jose A. Angulo, chief, accounting section, COOPEGUANACASTE; Martin Mora, director, COOPESANTOS; Jorge Moroto, chief of adminis on and finance, ICE, and director for COOPEGUANACASTE.

COOPERATIVE MOVEMENT

(Continued from page 23)

Overseas Private Investment Corporation, from the U.S. Central Credit Cooperative.

Other U.S. co-op sectors are equally active with the Latin American counterparts, especially the Cooperative League of the U.S.A. and the National Rural Electric Cooperative Association. Technicians from NRECA have assisted in developing 43 rural electrification co-ops in eight Latin American countries. NRECA's work has had a broad impact on overall rural development in the hemisphere. Much of this U.S. effort has been made possible through contract grants from the Agency for International Development in agreement with an amendment to the U.S. Foreign Assistance Act, introduced by Sen. Hubert H. Humphrey (D-Minn.). During the 1974-1975 fiscal year AID loaned $30-million to cooperatives in Latin America.

The cooperative movement of the United States and Canada and Latin America and the Caribbean, with their more than 70-million members and 72,000 societies, constitutes a powerful force promoting integral human development in the Americas. It is critical and vital for the further peace and well-being of our entire region that the OAS and its member states do everything possible to help build up this vast movement in every way possible. □

The Quiet Revolution In

LATIN AMERICA

By James D. Lay
Management and Operations Advisor
International Programs Division, NRECA

For the past six months, I have been traveling in Latin America, evaluating many of the rural electric cooperatives on behalf of NRECA and the Agency for International Development. My travels have taken me to Chile, Colombia, Costa Rica and Peru.

There is indeed a quiet revolution taking place in Latin American rural and small town areas thanks to the efforts of NRECA, AID, host-country governments and the rural people themselves. Since the early 1960s, NRECA has assisted in exporting the REA pattern to our Latin American friends. In this period NRECA and its member cooperatives have aided in the formation of, or assisted in the strengthening of 33 rural electric cooperatives. AID has loaned $50-million and host country and local participants have loaned or contributed $22-million. When all systems are in place, 238,000 meters will be in service, giving central station electricity to more than one-million rural people.

But figures alone cannot tell the story. If the readers could only walk with me to an isolated village 10,000 feet above sea level in the Andes Mountains of Peru and see the local people who are so happy and proud to have light; walk with me to what was an isolated beach on the Pacific coast of Costa Rica where now there is a 29-room luxurious hotel complete with air conditioning; walk with me in Casablanca, Chile, where once there was an arid desert and see the ground blooming and producing abundantly because of deep-well irrigation powered by electric pumps; walk with me to see a flourishing coffee processing operation in Caicedonia, Colombia, which gives employment to many people; walk with me to see the many health centers and night schools and community centers; walk with me in the mountains to see the beauty of the night with the stars overhead and the man-made stars of light in the valleys and on the hillsides; yes, walk with me over the many miles I have journeyed in the last six months—then they would see the real, human and touching effect that electricity has wrought in many, many areas of Latin America.

Yet the story is only beginning. The seed has been planted. Most of the host-country governments know that they must provide electricity to their rural populations.

In the small towns and on the farms, another kind of quiet revolution is taking place. Before the advent of central station electricity from the cooperatives, many of these towns and farms were electrified by the diesel or gasoline engine—with its accompanying noise. Towns of 200 and 300 people well may have had as many as 10 to 20 plants running at a single time. At intervals the "noise pollution" was horrible. Now these towns are quiet and bright.

From my evaluations, I note that the use of electricity apparently is not growing as rapidly as it did in the states. There are many reasons for this. Most of the rural people do not have the economic base we have in the United States. In many cases they are economically below where we were in the thirties and early forties, as hard as that may be to believe. But the growth is coming, gradually, slowly. The utilization of electric systems and electric appliances will be geometrical. Use of electricity on the farm and in agribusiness is beginning to take hold. Many farmers need to be convinced that such investments as are necessary eventually will result in more disposable income. In spite of this, one can note significance of electricity on the farm. Electric milkers and cooling tanks are becoming more visible in areas devoted to dairies. Arid areas are becoming productive by use of either river or deep-well irrigation systems powered by electric pumps. In tropical areas, more air conditioning is being used, primarily in offices, factories and public buildings, but also in homes. Hot water and room heating devices are being used, especially in the cooler mountain climates.

Electricity is, in part, changing the role of the women in the community and in the business world. Because of the introduction of electrical appliances such as the iron, the electric hot plate, the electric blender, the refrigerator and other labor saving devices, the women have more free time. They are taking active leadership roles in community activities, including being members and leaders in community development associations, boards of education, health boards and rural electric cooperative boards. They are able to devote time to political

activity, pressing for laws favorable to their points of view. More and more, women are involved in the business and professional world. Today in Latin America there are more women lawyers, doctors and dentists; more women leaders in government, serving as ministers and in other policymaking positions.

The benefits to children have been so numerous that it is difficult to list them here. Because of well-equipped health centers, infant mortality is steadily declining. Because of health centers, but also because of the widespread use of television, family planning has taken a strong hold in many Latin American countries, reducing the birth rate. Thus, even with the decrease in infant mortality, the overall growth rates of these countries are being reduced. This is especially true in Costa Rica where in 1965 the rate was 3.9%; at the end of 1974 it was down to 2.3%. Though it is difficult to document, I know that more children are able to participate in the educational process because of electricity either through educational television programs, as in the case of Colombia and other countries, or because of night schools—primary, secondary and post-high school, academic and vocational—both of these directly related to the reliability of electricity in the after sundown hours. I know from firsthand experience that many more of the young women are able to continue on to secondary and post-high school educational pursuits because of labor-saving devices in the homes. In addition to the above, electricity has enriched the lives of the young by enabling them to participate in leisure-time and recreational pursuits unheard of prior to the advent of electricity in the rural areas: participating in nighttime sporting events because of light in the plaza; the arrival of name bands for the local celebrations because of reliable electric current; enjoying national and international sports events; cul-

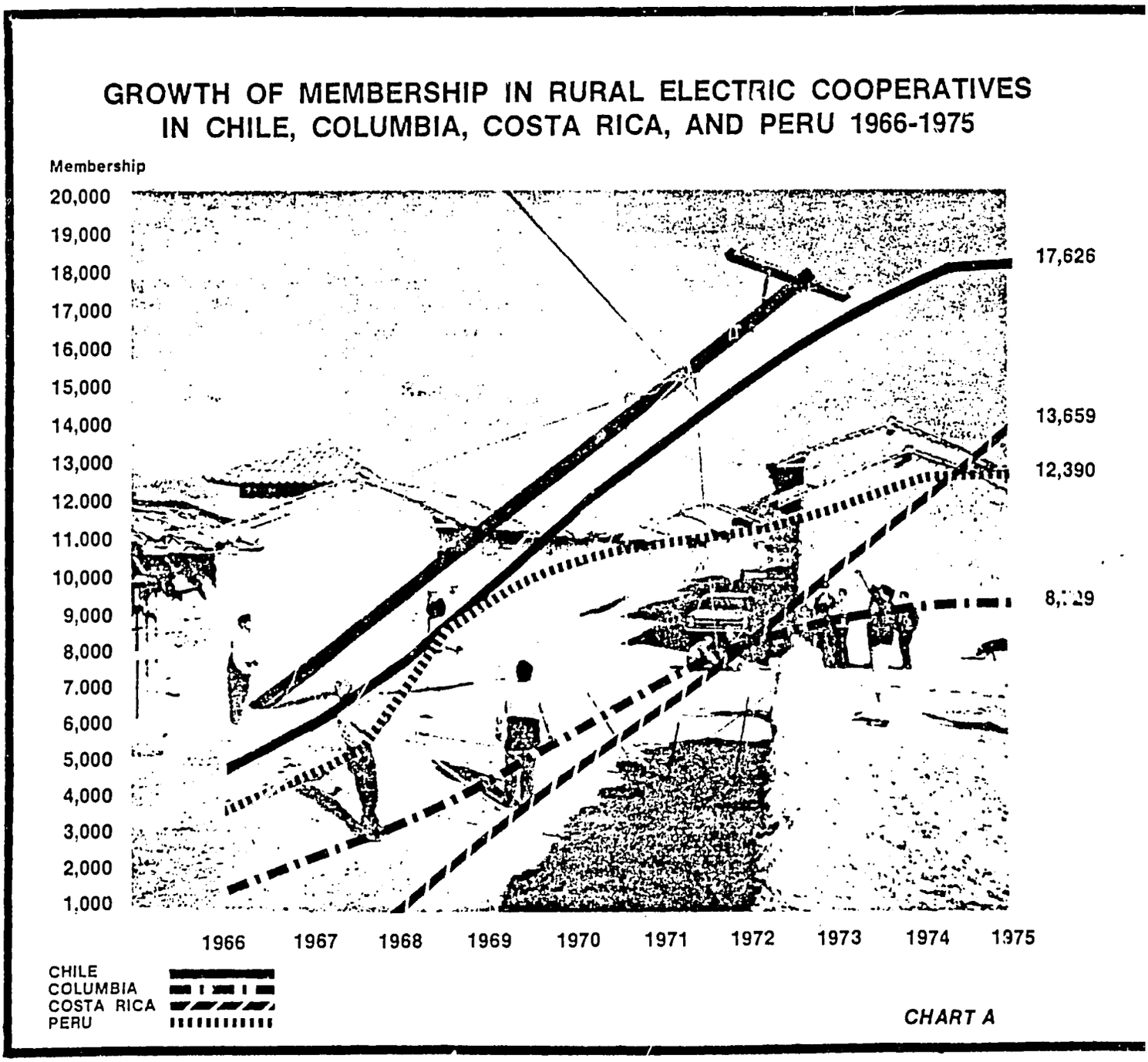
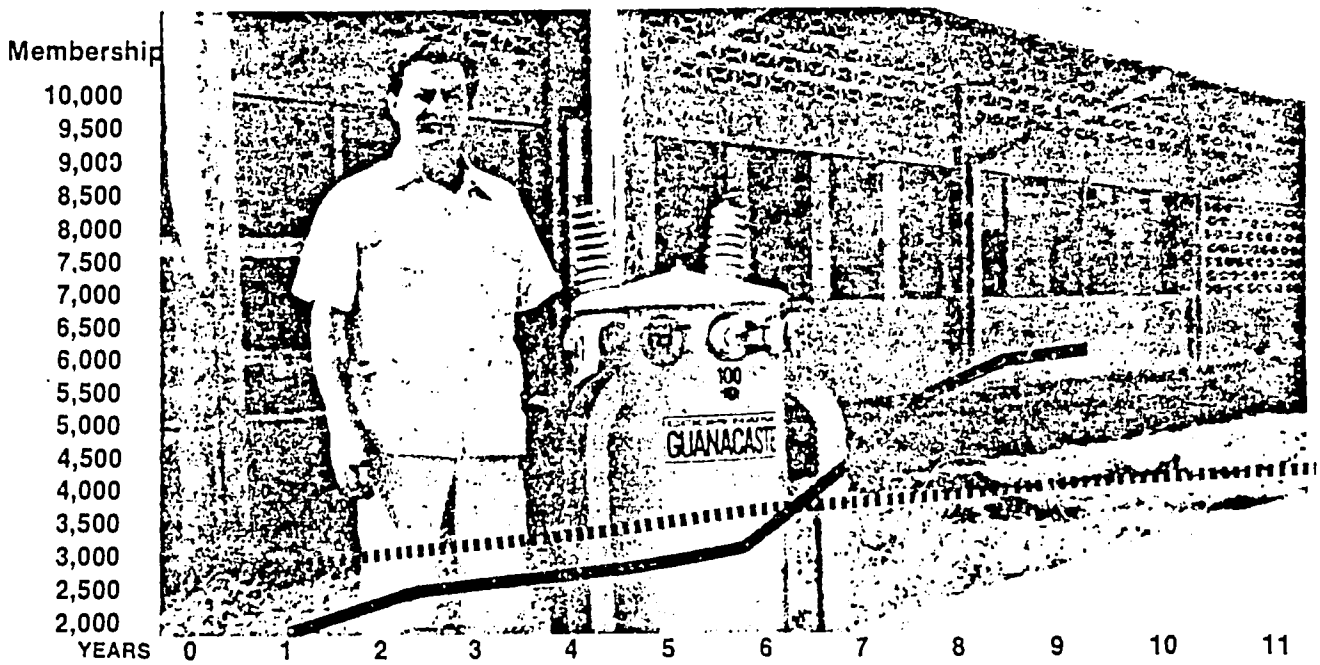


CHART A

COOPEGUANACASTE
SANTA CRUZ, COSTA RICA



Note: Cooperative system was energized December 1968. Year 1 of Cooperative is 1969.
▮▮▮▮▮▮▮▮▮▮▮ Projected 10 year growth of COOPEGUANACASTE*
▬▬▬▬▬▬ Actual growth of COOPEGUANACASTE**

*Data from "Engineering and Economic Feasibility for Three Pilot Projects of Rural Electric Cooperatives in Guanacaste, Three Friends and Los Santos," Glenn R. Benjamin, Specialist in Rural Electrification, dated November 11, 1964.
**Taken from Records of Coopeguanacaste, May 1976.

CHART B

tural programs brought to the poorest of homes by the flick of a switch. One could go on and on describing the benefits to the young people of these countries.

I mentioned health centers. As one example of their growth, let me cite the case of the area served by COOPEGUANACASTE in northwest Costa Rica. In the area now served by the rural electric cooperative there existed in 1965 seven health centers, two pharmacies (where the druggist also was the shot-giver, prescription prescriber and often served as the only "doctor" within reach of most of the people), no hospitals and no dentist. At the end of 1975, there were 23 health centers, one hospital and 14 pharmacies.

In many of the areas agricultural-industrial complexes are being set up in the area of the rural electric cooperatives, helping to decentralize such industries away from the heavily populated centers and closer to the crops or animals being raised. A few examples are:

- Large fish hatchery in Ingenio (Huancayo), Peru.
- 30 deep-well irrigation pumps in Casablanca, Chile, irrigating 4,000 hectares (9,880 acres). Only five wells irrigating 300 hectares (741 acres) and utilizing diesel fuel were in operation ten years ago.
- 1,000-room ski resort hotel being built in Orsorno Department of Chile.
- 60,000 liters (15,484 gallons) of milk being processed and pasturized in San Carlos, Costa Rica.

Chart A represents the growth in the use of electricity by rural electric cooperatives in the four countries where I have traveled.

For comparison, I am listing the projected use of electrical energy in the first ten years of the rural electric cooperative of Guanacaste, C.R. (COOPEGUANACASTE) and the actual growth in the first ten years of the project (Chart B).

As the reader can see from the foregoing, there indeed has been a quiet revolution taking place in Latin America. NRECA can be proud of the part it has played, and still is playing, to make this revolution one that has improved, and will continue to improve, the economic and social well-being of our friends south of the border.

In closing, we would like to take the opportunity to thank the many hundreds of our members who have taken an active part in supporting the international program of your association by allowing key people to accept long- and short-term assignments in Latin America, by accepting trainees and other visitors in your cooperatives and by your active vocal support both at NRECA meetings and among the membership at home.

There is yet much to be done. Though nearly a million people have service from these projects, less than 1% of the farmers in Latin America have access to central station electricity. As we go forward with the exporting of the REA pattern, we know that the membership will continue to support our efforts in Latin America and other developing areas of the world. □

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RURAL ELECTRIC CO-OPS OVERSEAS

INTERNATIONAL PROGRAMS
NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION
2000 FLORIDA AVENUE N.W.
WASHINGTON, D. C. 20009

NO. 22 SEPTEMBER 1976

RURAL ELECTRIFICATION AT WORK

Background

Nearly 500.000 families are now receiving central station electrical service from projects financed by AID and assisted by NRECA in 11 countries of the world. This means that some three million people are receiving around the clock electric service from these projects.

Though no full-scale. long-term evaluation has been carried out, there have been several analyses completed and all of these indicate these rural electric systems are having high impact in the rural communities they serve. Any visitor to these project areas can see that electric power is truly at work to assist rural people to increase production, to store and preserve harvested crops and to improve the quality of life for people living in these rural areas. This issue of NRECA's monthly newsletter is devoted to showing to some degree the improvements brought about when dependable service is introduced into rural communities in the developing countries.

In the United States. it is recognized that rural electrification has been a key factor in bringing about tremendous increases in agricultural production and rural industry. In many cases, these improvements or increases required years to develop and it is true that in many cases a certain amount selling, promotion and education was used to bring about full utilization of the potential of electric service. These same observations apply to the projects developing overseas: so. some time may be required to bring about the full development potential.

Increasing Production

An evaluation study of rural electrification in the Philippines carried out by Xavier University shows that many improvements are brought to rural areas by electrification.

One of the more important benefits evident is an increase in production. Even the casual observer can see that there is increased production during the dry season with the use of electric power for irrigation. Then, closer observation reveals that electricity is put to work to improve storage and combat spoilage and pests and to increase the preservation of food with refrigeration.

Agricultural production has increased due to electric power for pumping water and also for making water and lighting available for livestock production. It was found that production had increased in existing businesses and industries and that new industries had been attracted to the area because of the availability of electricity at a reasonable price. Employment and income had increased with a greater number of better paying jobs in the area.

In the service area of one rural electric co-op in Nicaragua. more than 2.000 people are employed on new banana plantations made possible with irrigation from electric pumps. In another area. a new frozen food plant has increased on-the-farm employment as well as at the plant.

All of these increases in employment and production mean increased incomes for rural people.

Helping People

How is rural electrification helping the people of the developing countries? This is a question Congress has asked the Agency for International Development (AID) to answer. In fact, the Congress has asked AID to have answers to this question before it makes a loan for *any* developmental purpose—will the benefits reach those who need it most?

While NRECA's overseas advisors have come to take the benefits of electricification for granted, they too are pleased to see objective studies of benefits being undertaken.

A former AID employee. Dr. Frank Denton, now with the Asian Development Bank with headquarters in

Continued Page 2

Ceramic tile manufacturing made possible because of electricity provided by COOPESANTOS. One of many small industries introduced into the area since the energization of the cooperative electric system.

From Page 1

Manila, has made an analysis of the social and economic benefits accruing to the people in nine (9) Philippine rural electric cooperatives.

The Denton study states that, "it appears that all but the very poorest of the poor will receive power not long after a distribution line reaches the area in which they live . . . all but the very poorest (perhaps the bottom 15%) of the population have their houses connected within a reasonable interval after power becomes available."

The question then arises, can the people afford electric service and will they pay for it? The study states that they can, ". . . except for initial wiring and connection charges, electric lighting is cheaper than candles or kerosene." There follows a list of power uses in addition to lighting: some are the following: Improved entertainment—radio, T.V., movie houses, lighted play areas for sporting events in the cool evenings: school lighting—regular and adult evening classes, PTA meetings, Boy and Girl Scout functions and other civic organization meetings: Health benefits—public deep well water systems, rural health centers which provide better medical care: Safety benefits—street and security lights give a feeling of greater safety and of less isolation.

Life becomes more pleasant.

When one adds up all of the social and economic benefits, then it can be concluded that in the developing countries, as was found in the United States, rural electrification "doesn't cost, it pays."

Poultry production is improved in rural areas with electric lights, pressure water systems, feed grinders and mixers.

LATIN AMERICAN PROJECT EVALUATIONS

COSTA RICA PROJECTS BUILDING BETTER COMMUNITIES

Sr. Zapata, member of Staff of COOPEGUANACASTE, assisting in interview with Jesus Viales Acosta, Talolinga, Guanacaste, Costa Rica. General Store in rural community which received electricity about two years ago. Store and house together have 6 50-Watt light bulbs, 1 cooler, television set, stereo equipment and electric iron.

Three rural electric cooperatives were completed in Costa Rica in 1969 with loans from AID and technical assistance from NRECA. The projects are now serving more than 14,000 families and Mr. James D. Lay, NRECA Management and Operations Advisor, has been doing some analyses of the growth of these rural electric systems and their impact on the communities served.

Jim has had an unusual opportunity to observe and feel the change that has taken and is taking place in Costa Rica for he first visited there in 1954 when he lived with various farm families while participating in the 4-H International Farm Youth Exchange Program as a delegate from Virginia. He recalls then having to use a flashlight to read and write reports because the illumination from the electric light in his room there did not provide enough light to enable him to read and write.

Compare this with recent obser-

THE GROWTH OF THE PROJECTS CAN BE SEEN IN THE FOLLOWING STATISTICS:

	COOPE-SANTOS	COOPE-GUANACASTE	COOPE-LESCA	TOTAL
Membership Projected (7th Year)	5.314	4.054	3.318	12.666
Actual Membership (7th Year)	4.935	5.929	3.508	14.372
Total Estimated Sales—MWH (7th Year)	9.606	3.708	12.896	26.210
Actual Sales MWH—7th Year	7.721	12.985	8.766	29.472
MWH (7th Year)				

vations of progress in the project areas of these cooperatives—COOPELESCA, serving the San Carlos Valley, COOPEGUANACASTE, serving the province of Guanacaste and part of Puntarenas, COOPESANTOS, serving parts or all of nine counties.

In Guanacaste where there were only seven health centers, two pharmacies and no hospital, there are now 23 health centers, 14 pharmacies and a modern two hundred bed regional hospital served by the rural electric system. There were only seven educational centers which had lighting and now there are 48 such centers, including night classes at the university level.

In many areas, the use of irrigation for crop production and for increased beef and milk production is beginning to take hold. It has taken some time to convince the farmers that it is feasible to irrigate and for them to learn how to do it properly. Now cropping patterns are beginning to change. More vegetables are being grown in the once arid areas of Guanacaste and San Marcos. Crops can be grown on a year-round basis where there is water available whereas production once had to stop during the six month dry season.

In Ciudad Quesada there is now a milk storage facility handling 60,000 quarts of milk a day. Soon there will be added a dry milk processing facility to use up to 80,000 quarts a day. Plans are pending for a pasteurizing facility which will mean improved quality of milk for local consumption. Many of the farmers are installing electric milkers and cooling tanks in their dairies.

The development of rural industry may be illustrated by the "Hacienda La Lucha" in the COOPESANTOS area. It used nearly one-fourth of the 7,721,000 KWH sold by the cooperative in 1975. This power was used to process rope from hemp, to make gunny sacks synthetic rope and sacks from nylon fiber, to fabricate fiberglass sinks, basins, showers, toilets and other household items and to construct prefabricated houses. The complex employs hundreds of workers at improved wages.

With dependable central service in Guanacaste, there has been a big boom in the tourist industry with eleven modern hotels and motels developed that attract many people to the Pacific beaches, not only improving recreation for local citizens but providing many jobs and increasing income with the influx of tourists to the area.

ELECTRIC COOPERATIVES MOVING FORWARD IN CHILE

A USAID loan of $3.1 million was extended to Chile in September, 1964, to expand 14 existing small cooperatives and to build one new one. Assistance to the cooperatives and their Federation was provided by NRECA. The cooperatives were then serving 3,489 members.

In April, 1976, some of these cooperatives were visited by Leon Evans, Deputy Coordinator, IPD, and James D. Lay, Management and Operations Advisor, to plan for further in-depth evaluation of these cooperatives at a later date. They found these 15 rural electric cooperatives now serving a combined membership of 19,000 with sales in 1975 exceeding 77 million KWH's. Their national organization, FENACOPEL, headquartered in Santiago, Chile, has moved to better quarters and is planning new services for its members. The Federation leaders and individual cooperative leaders were full of hope and enthusiastic about the future. They realize they have a tremendous job to do to reach more of the unserved areas of Chile, and they face some of the same problems faced by rural electric systems in the United States in the early days—that of opposition from other utilities.

The cooperatives have developed a plan for an expanded program of rural electrification through 1981, and it states the following:

From 1966 through 1975 the electric cooperatives have increased their membership 302.65%. They have increased their area of service over 300%, their distribution lines by 75%, and their installed KVA capacity by 90%. Their service area has increased from 2% of the agricultural land in 1966 to 8% in 1975.

There are signs of industrial and agricultural progress in each of the cooperative areas. In the Casablanca area, the newest of the cooperatives, there is a tremendous increase of irrigated land. Where there were 300 hectares irrigated ten years ago, now there are 4,000 hectares irrigated by deep wells energized with electricity. They expect a substantial increase in 1977.

In the Los Angeles cooperative area, one of the members has a poultry breeding and egg laying operation that is fully electrified and is as modern as any that could be seen in the DelMarva Penninsula of the U.S.

In most co-op areas, there is an increase in the number of small land holdings in recent years, and many of these farmers are using electricity in their homes and on their farms productively. The cooperatives have plans to serve many more of these smaller farms when finances are available.

The electric cooperative leaders at every level agree that Chile must diversify its agricultural production and increase industry in rural areas. They believe that the electric cooperatives can be instrumental in bringing about these improvements, and the cooperatives are striving to obtain the financial assistance and technical assistance that is needed to further the development of their systems and provide improved electric service to their people.

Julio Hurtado (Manager of CASABLANCA Electric Cooperative and V. P. of Fenecopel); Emilio Seguel, Acting Manager, FENECOPEL; Jorge Montt, President of FENECOPEL and member of CASABLANCA Electric Cooperative; and Leon Evans, NRECA—discussing the installation of deep well irrigation system.

Philippine Evaluation Study

In May, 1976, an independent evaluation study of Philippine rural electrification projects was undertaken by a branch of Xavier University located at Cagayan De Oro City, Mindanao, Philippines. It compared the results being obtained with rural electrification in the Philippines to the goal of improving the quality of life of the rural poor. It considered not only the economic aspects but the social as well. This study was also to explore the nature and extent of the impact of rural electrification on the rural poor to see if they had been reached by the program. Since the rural electrification program in the Philippines served all of the people, the study was intended to explore the impact upon the community as a whole. The findings have been considered as quite significant and revealing on the impact of rural electrification in this area served by the Misamis Oriental Rural Electric Cooperative (MORESCO), the first and oldest cooperative established in the Philippines with USAID financing and NRECA assistance.

The major findings of the study include the following. The rural electrification program in the area is reaching the rural poor for mean per capita income in the area is only $69.00 per year. It was found that approximately 62% of the users of electric service among the area's household population are below the subsistence level of income. Low income farmers or fishermen constitute 59% of the households in the area.

John Taylor, NRECA Advisor, explains a point in the Monthly Financial & Statistical Report to Manager Dave Aguila, Office Manager, Trinia Viduya and Accountant, Cecille Boadilla of La Union Electric Co-op (LUELCO), Aringay, La Union Luzon, Philippines.

Electrification has brought the advantages of pure and safe water to many poblaciones and barrios to lower the incidence of gastro-intestinal disease. There is more electric service to clinics and hospitals with a vast increase of services available to the people.

The use of existing educational facilities has been multiplied by electrification and made more effective. Teachers are better able to prepare their lessons and materials for the following day. Students can study better with electric illumination. All the users comment most favorably on the convenience of electric illumination compared to the kerosene lamps they had been using.

As in most countries, the first electric appliance bought by most users was a thermostat controlled electric clothes iron which was favored not only for not burning clothes but for prevention of fires in the house, when compared to the charcoal irons used before. Small refrigerators have been bought by many households to lower the spoilage of meat and fish and for the preservation of other foods.

From the economic side, it was found that in many cases the minimum electricity charge was less than they had been previously paying for kerosene.

People were not just using lights and irons in the home, but they were purchasing motors for sewing machines, house pumps, cottage industry and farm equipment repair.

The most interesting data from the study are those which indicate a sharp decline in births from 46 per 1,000 in 1970 to 31.7 per 1,000 in 1975. This phenomenon did not occur in the eastern portion of the same province, which is not served by the rural electric system.

The Research Institute concludes to a very substantial and highly satisfactory degree that the MORESCO project has been realizing its goals and objectives which have been set for it, namely improvement of the quality of life of the rural poor. At the same time, it has shared these benefits with other segments of society and thus contributed to a general social up-lift in the area in which it operates.

MANILA REGIONAL CONFERENCE ON RURAL ELECTRIFICATION

President Marcos of the Philippines greets Jim Cudney of NRECA and other visitors at Manila Conference in March. Col. Pedro G. Dumol, Philippine Program Administrator, is shown at left. NRECA's Bob Kabat is on right.

In Manila, March 1-12, 1976, the National Electrification Administration of the Philippines, with NRECA assistance, hosted a conference study tour on rural electrification. It was attended by high-level officials from the governments of Thailand, India, Bangladesh, Papua New Guinea, Pakistan, Indonesia, Bolivia and Jordan. In addition there were representatives from the Asian Development Bank and other agencies of the Philippine Government and USAID.

Director of Management Services at NRECA, Mr Bob Kabat, was NRECA's top representative there and participated in the program for these visiting officials.

The group was acquainted with the institutional framework of rural electrification in the Philippines, heard addresses from President

Marcos and Senator Emmanuel Pelaez, former Vice-President of the Philippines and a leader in program development in that country. The group visited three of the rural electric systems in the Philippines to see electrification at work for increasing production and improving the quality of life in rural areas. They saw irrigation being used to let the farmers produce up to three crops where previously they had had only one crop—and in some cases no crop at all.

The program was well received by the distinguished visitors from these other countries and plans have been made for additional training sessions of various types to acquaint additional leaders in other countries with the advantages of cooperative rural electrification and to see how rural electrification does work to build rural communities.

Partridge Praises Progress in the Philippines and Indonesia

General Manager Partridge returned from a two week trip to the Philippines and Indonesia in mid-August. Upon returning he said, "We have every reason to be proud of our work in the Philippines, and to be grateful to our specialists who have helped in the development of their rural electric program. In the two years since my last visit, the transformation of the rural Philippines, resulting from rural electrification is readily apparent in upgrading sanitation, housing, education, industry and irrigation for crop production." Continuing, "Also evident and satisfying is a sense of excitement, of momentum, of pride found in every individual connected with this program, from Colonel Pedro Dumol, Administrator of the National Electrification Administration down to every member of his staff. Our NRECA team also shares in this exciting experience.

One of the highlights of Mr. Partridge's visit was a ceremony in the Presidential Palace, at which time a new loan supporting the expansion of rural electrification in the Philippines was signed. Besides President and Mrs. Marcos, those in attendance included Charles W. Robinson, Undersecretary, U.S. Department of State; Arthur W. Hummel, Jr., Assistant Secretary of State; William H. Sullivan, the American Ambassador to the Philippines; Mr. Garnett A. Zimmerly, Director, USAID Mission to Manila and Mr. Partridge. In addition, sixty (60) managers and board presidents of Philippine cooperatives were present at the signing.

Speaking for the U.S. delegation, Ambassador Sullivan emphasized the importance of electricity in improving rural health facilities and educational opportunities while providing the basis for small and large industries, as well as irrigation and other agricultural uses to improve food production.

Bob Partridge, NRECA Executive Vice President, visits with officials of MORESCO co-op in the Philippines.

When Mr. Partridge met the sixty managers and board presidents in Manila, many of them explained that they had been in the United States under the NRECA training program, and all asked him to convey their regards and best wishes to their many friends in the United States.

While conferring with the NRECA team members and representatives of the National Electrification Administration, Mr. Partridge assisted in launching NEA's Southeast Asian Rural Electric Training Center. Partridge stated that NRECA expects to assist initially with this effort, which will make a real contribution to the further electrification of the rural areas of many Asian countries.

In Indonesia, Partridge conferred with USAID Director Tom Niblock, formerly Mission Director in the Philippines, as well as with several cabinet officials and the head of the National Power Agency. The Indonesian Government has made a decision to develop a rural electric program, and the AID Mission Director and the American Ambassador are giving rural electrification top priority based on the recommendations made by an AID/NRECA study completed in May.

MANAGEMENT SEMINAR IN COSTA RICA—OCTOBER 25-29, 1976

Participating in the Seminar will be directors, managers and key personnel from five rural electric cooperatives in Costa Rica, namely COOPESANTOS (San Marcos), COOPELESCA (Ciudad Quesada), COOPEGUANACASTE (Santa Cruz)—these three initially funded by loans from AID—COOPE ALFARO RUIZ (Zarcero)—finances and construction assistance from Arkansas Electric Cooperatives, Inc.—and COOPELERZA (Turrialba). Also participating will be representatives from INFOCOOP, AID, ICE (Costa Rican Electricity Institute) and SNE (Costa Rica National Electricity Service—the regulatory agency).

Much time and assistance in planning this Seminar has been given by Mr. Travis King, Rural Development Officer, AID, and Prof. Bolivar Cruz, Executive Director, INFOCOOP.

As noted elsewhere in this *Newsletter*, the Costa Rica rural electric cooperatives have built a solid foundation for the future. Notwithstanding this, the managers and directors feel a special need for training in management and administration as it pertains to modern electric utility organization and operations in the cooperative mold.

Clyde E. Aultz was a member of the Training and Consulting Staff of NRECA from 1963 until 1975. He is officially retired and living in Guadalajara, Mexico, but continues to assist NRECA from time to time with special assignments.

Peruvian workers are shown using electric drill press during construction of rural electric co-op system to bring more power to this rural area.

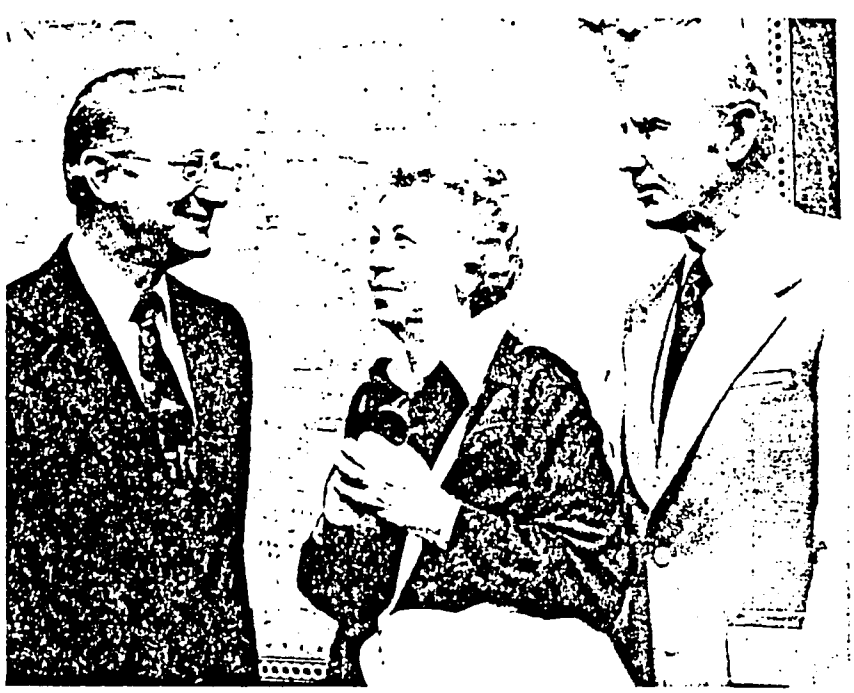
Clyde E. Aultz, NRECA Management Consultant, will present a week long Basic Management Seminar for Rural Electric Systems' Personnel in San Jose, Costa Rica, from October 25 to October 29, 1976. The Seminar, based on NRECA's Basic Management Institute, has been organized by James D. Lay, NRECA/IPD Operations and Management Advisor, in cooperation with the Agency for International Development's (AID) Mission in Costa Rica and with INFOCOOP, the Costa Rican Institute for Formation of Cooperatives.

Pakistan Starting Rural Electrification Program

Three veteran rural electrification specialists departed early in August for Islamabad, Pakistan to conduct a study for the U.S. Agency for International Development and the Government of Pakistan. During the 90-day assignment, the team will develop plans for a country-wide rural electrification program, and make detailed studies of several areas suitable for rural electric systems.

The team consists of Paul H. Tidwell, former General Manager, Meriwether Lewis Electric Coop., Centerville, Tennessee and former President, NRECA Board of Directors 1965-66; Curtis L. Funston, General Manager, N.W. Electric Power Coop., Inc., Cameron, Missouri; and, John H. Scoltock, former Director, Southwest Area, Rural Electrification Administration.

Wives of each team member are on the trip, and sharing in this interesting experience.



Mr. and Mrs. Tidwell discuss last minute travel plans with International Programs Coordinator, Tom Venables.

RURAL ELECTRIC CO-OPS OVERSEAS

INTERNATIONAL PROGRAMS
NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION
2000 FLORIDA AVENUE N.W.
WASHINGTON, D. C. 20009

SEPTEMBER 1978 NO. 26

Dr. Thomas M. Venables' Retirement

After more than 14 years as [illegible] of the International Program, Dr. [illegible] of NRECA Dr. Thomas M. Venables retired on August 31, 1978.

Born and raised in South Dakota and has degrees from the University of South Dakota and PhD from Purdue.

Prior to joining NRECA, he worked with the Farm Security Administration in South Dakota, then as an agricultural economist with the U.S. Department of State in Germany, as an economic analyst with the U.S. Department of State and Department of Agriculture in this country, and as an economic officer in the American Embassy in Mexico.

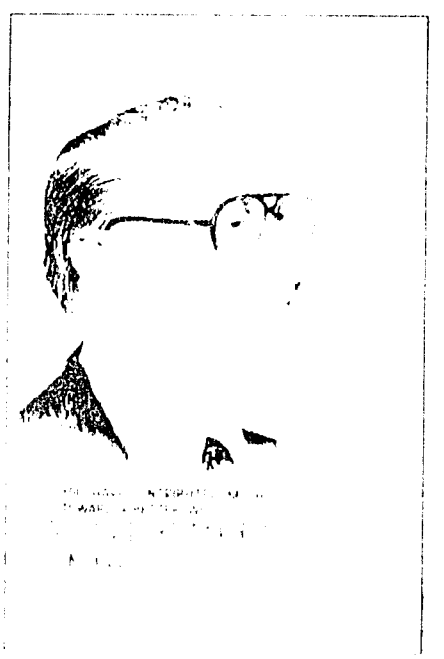
As the director of NRECA's foreign assistance program, Dr. Venables has visited more than 30 countries of the world and has provided supervision over a program that made rural electrification [illegible] developing countries. This program used [illegible] in 180 rural electric [illegible] and nearly 300 [illegible] in the developing world.

The NRECA staff under Dr. Venables' leadership has worked in the development of more than [illegible] programs in [illegible] countries, [illegible] which are [illegible] the [illegible] Mexico, Central America, Peru, Ecuador, Bolivia, and Honduras. Most of these projects have been financed by the U.S. Agency for International Development, which has [illegible] million in loan and grant funds to the countries involved.

Additional activity has been carried out by the World Bank and the Inter-American Development Bank as well as contracts financed by the countries themselves in many areas of the world. He has been most responsible for NRECA's activity in the Far East, including major project development in Viet Nam, the Philippines, India, Indonesia and Bangladesh.

Dr. Venables plans to remain in the area and will be available for consulting assignments to NRECA and other interested organizations involved in rural development projects domestically and overseas.

He will be succeeded by Mr. Samuel Bunker in September 1978.



Dr. Thomas M. Venables' Appreciation

During nearly 30 years in rural development programs, I have found NRECA's International Program the most challenging and satisfying work I have undertaken. This has been a team effort.

The success we have had in partnership with the Agency for International Development has been possible because of AID's confidence in our capability and the support of NRECA's membership, its Board of Directors and especially the Boards, managers and staff of the cooperatives and power districts which have actively participated in the program. To all of them, I express my deep appreciation.

NRECA new building nears completion

Ceremonies were held in the [illegible] for the new NRECA building at 1800 Massachusetts Avenue. The structure overlooks Dupont Circle, a rapidly developing business and commercial area of the northwest section of Washington, D.C.

The ceremonies were presided over by Gene W. Porter, President of NRECA. Appropriate remarks were made by the Honorable W. R. Poage, Vice Chairman [illegible]

Continued from page 1

Committee on Agriculture, United States House of Representatives; the Honorable Walter B. Washington, Mayor, Washington, D.C.; David Hamil, Administrator of Rural Electrification Administration; and Alex Mercure, Assistant Secretary of Agriculture for Rural Development. Robert D. Partridge, Executive Vice-President and General Manager of NRECA served as Master of ceremonies. Charles A. Robinson, Jr. presided at the cornerstone placing portion of the ceremony in which two boxes containing appropriate memorabilia, one new, the other from the present NRECA building where it was placed twenty years ago, were both put in the lobby of the location.

EGYPT Declares Rural Electrification a Development Priority

For more than twenty years, Egypt has had a desire to provide reliable electric service to its rural areas. Most of its "Village Electrification" has been accomplished with the technical influence of Eastern Europe—with only limited success.

During the past two years, members of the IPD staff have met a number of times with staff members of the Ministry of Electricity and Energy, and its two Agencies—the Egyptian Electricity Authority (EEA) and the Rural Electrification Authority (REA), to assist with the planning for the major rural electrification effort.

The United States Agency for International Development, and the World Bank provided loans to the Government of Egypt for rural electrification development in 1978. The U.S. concept of providing electric service to rural areas through cooperatives, as well as the technology which produced economies in construction and operation, so vital to the U.S. program, was all new to the leaders in the Electric Power Sector of Egypt.

USDA/REA and NRECA collaborated in developing a rather rigorous program and travel schedule for the officials to accomplish during their month with us.

Their agenda provided for Seminars at REA and NRECA followed by meaningful visits to rural electric cooperatives serving the Southwest and Mississippi River delta areas. The team was warmly received wherever

Canadians Assisting Rural Electrification Project in Indonesia

Leon Evans and Jim Cudney recently met with the Canadian International Development Agency in Ottawa, Canada to discuss CIDA's involvement in the Indonesian rural electrification project. The Canadian Government is presently planning a loan for $23.5 million and a grant of $2.5 million for installation of generators on the 3 outer island projects being undertaken by the Agency for International Development and the Indonesian Government with the assistance of NRECA. Mr. Wilson Hodgin of AID and Mr. J. Rumondor, Mr. Ima Suwandi and Eng. Adhi Satriya officials from Indonesia were also present at the meeting. This was the last stop for the 3 Indonesians who had been travelling in the United States viewing rural electric cooperatives and discussing plans for the Indonesia program.

Present plans call for power to be available on the 3 island sites of Indonesia somewhere between October and December of 1980. The Canadians, in addition to supplying the generators, will provide training and technical assistance in the maintenance and running of the generators.

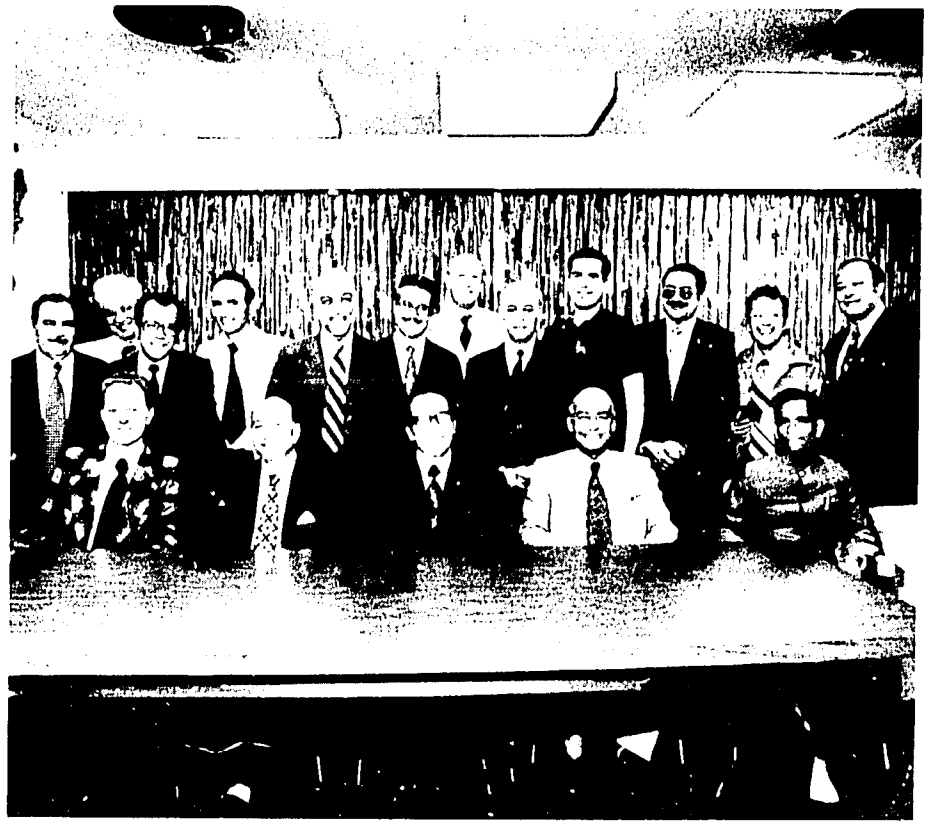
This project will be carried out under the auspices of the Indonesian Government with the loan money supplied by the Agency for International Development of the United States and the Canadian International Development Agency. USAID had contracted NRECA and Charles T. Main to implement the project. This is a first instance of NRECA working closely with another donor Government to implement a rural electrification project.

Officials from Indonesia, Canadian International Development Agency (C.I.D.A.) and NRECA met in Ottawa, Canada to plan the Indonesian Rural Electrical Program.

they traveled and they responded with an enthusiastic interest for learning everything possible from our cooperative systems. Such a program gave the officials an opportunity to effectively evaluate the U.S. rural electric program, and to determine the possible application of the cooperative approach, with its advanced technology, management and operations, to the rural electric program being developed for Egypt.

The team returned to Egypt with much enthusiasm for what they had seen and experienced. A glowing report on the rural electric systems in the United States was given to their Minister.

REA and NRECA has subsequently had the privilege of conducting a special rural electric training session for eighteen staff members of EEA, REA and the Ministry. AID/W was the sponsor of this special program, at the request of the Minister of Electricity. The course, "Organization and Operation of Rural Electric Distribution Systems," by REA, NRECA and many of the U.S. rural electric cooperatives has now been attended by 345 participants from developing countries since its inception. Many of them have returned home to become strategic leaders in the development of rural electric projects for their countries.



Senior officials (seated) from the Electric Power Sector of Egypt confer with IPD officials at NRECA.

Engineering Feasibility Study Completed for LIBERIA

Upon his inauguration in 1976, President Tolbert stated in his inaugural address that rural electrification (villages) would be a top priority of his administration.

It was not long after President Tolbert took office, that NRECA received his invitation to send a team of ". . . Rural Electrification Specialists who will assess projects and, *inter-alia*, recommend steps for the attainment of rural electrification goals." NRECA completed a country-wide prefeasibility study for rural electrification during March of that year. The Liberia Electricity Corporation served as the focal point for the study activity, and its management gave full support and cooperation to the team.

Since that time ten of LEC's key staff—management, planning engineers, financial and operations—have come to the U.S. to be trained for "The Organization and Operation of Rural Electric Distribution Systems." In anticipation of rapidly expanding its electric services, NRECA was asked to conduct a manpower and training evaluation study of the LEC organization, with an eye to establishing a capability for an on-going training activity within LEC. A Director of Training has been employed to head up this new division.

In most instances, rural electric projects require that a proportionate share be funded by outside sources. In order to make application to International Financial Institutions for funding assistance, loan applications must be supported with detailed justification information if they are to receive favorable consideration. To generate such information, LEC again turned to NRECA to provide the necessary expertise for conducting an engineering feasibility study and report preparation. It is the hope of Mr. Samuel Burnette, Managing Director, that LEC will soon be in a position to implement Liberia's country-wide program which will provide reliable electric service to the rural areas of the country.

Edward U. Masters, U.S. Ambassador to Indonesia, signs Rural Electrification loan agreement for $30 million in Jakarta on May 6, 1978 as Vice President Walter Mondale looks on.

Mr. Ray Shoff briefs Senator Quentin Burdick (D-N.D.) on his work with the Philippine rural electrification program during a visit to Capitol Hill. Shoff has spent 10 years with National Rural Electric Cooperative Association/Agency for International Development overseas program as a volunteer in organizing electric cooperatives in Vietnam and the Philippines. He is back in the states on a home leave that includes de-briefings on Capitol Hill and the State Department.

For the Record

From President Carter's speech in Venezuela:

I remember the almost unbelievable change the coming of electric power made in the farm life of my childhood.

Electricity freed us of the continuing burdens of pumping water, sawing wood and lighting fires in the cooking stove—but it did even more: It gave us light by which to read and study at night.

It gave us power—not just to perform the old exhausting tasks, but power to make more of our own choices.

Because electric power came to us through cooperatives, in which we all had to share the responsibility for decision, it changed our lives in other ways.

Farmers began to meet to discuss local needs and national issues, and to decide how to influence government and to negotiate with large, far-off companies that provided their supplies.

I have seen the farm life I knew and the fields of my childhood transformed by energy and technology and increasing knowledge, and by the opportunity to participate in the decisions that affect ourselves and our families.

I can understand the unfulfilled yearnings of other people in the developing nations to share these blessings of life. . . .

THE WASHINGTON POST
Thursday, March 30, 1978

The 1978 class in Organization and Operation of Rural Electric Systems included 15 participants from the Philippines, Syria, Egypt and Jordan.

Aid official and NRECA staff visit COSTA RICA

From July 5 through July 12, Mr. Harold J. Datta, Development Officer, PHA/PDC/OPNS, Agency for International Development (AID), visited Costa Rica seeing first hand the progress made by rural electric cooperatives. Mr. Datta was accompanied by James A. Cudney, Engineering and Special Projects Advisor, IPD/NRECA, and James D. Lay, Management and Operations Advisor, IPD/NRECA.

During the visit, Mr. Datta was able to visit all four areas served by the functioning electric cooperatives, namely The Rural Electric Cooperative of "Los Santos" in San Marcos de Tarrazu; The Rural Electric Cooperative of Guanacaste, Santa Cruz; The Rural Electric Cooperative of Alfaro Ruiz, Zarcero and the Rural Electric Cooperative of San Carolos, Ciudad Quesada.

The cooperatives in San Marcos, Santa Cruz and Ciudad Quesada were initiated with an AID loan of $3,300,000.00 (matched by $818,000.00 in local funding) in 1965, to serve approximately 14,000 rural consumers by the end of ten years. At the time of the visit when the three were in their ninth operating year, they were serving approximately 18,000 members and a population of over 100,000.

In San Marcos, Datta, Cudney and Lay were able to visit several low income families served by the cooperative. They were told by the Manager, Sr. Misael *Monge* Alvarado that approximately 50% of their rural consumers used the minimum of electricity (30 KWH/month) at a cost of about $14.00. The point made here is not that so many are using the minimum but that the cooperative is indeed serving the low income.

In Santa Cruz, the group observed the functioning and use of many potable water systems, spoke with nurses and other personnel at nutrition and health centers, visited small agricultural and commercial operations, all of them benefitting from electricity supplied by the Rural Electric Cooperative of Guanacaste. In this area the group also visited low income farmers and housewives.

In the areas of Alfaro Ruiz and San Carlos, the group observed the tremendous progress being made in the Dairy Industry where they saw electric milking machines, cooling tanks and cleaning systems. One small dairyman had just one portable milker with which he milked an average of 10 to 15 cows daily. A large dairyman had a completely automated system from milker to cooling tank where he milked an average of 150 cows daily. During the visit, Mr. Datta, Mr. Cudney and Mr. Lay were able to observe many other new and non-traditional uses of electricity, such as pig breeders, grinding of sugar cane, irrigation, voltage insect exterminators and cement block factories.

The trip was culminated by a visit with the newly elected President of Costa Rica, Rodrigo *Carazo* Odio. During the conversation, Carazo emphasized the importance of rural electrification for Costa Rica. Some of his remarks are translated and paraphrased as follows:

"We Costa Ricans have been the recipients of much good will since 1965, (When NRECA/AID began collaborating with us) in giving electric service to the 'Campesionos' in many areas of the country." ". . . the need to carry this energy to all Costa Ricans obliged us to make important efforts to reach rural areas and this we were able to do with the assistance of AID." "I cannot forget one time in a place called San Andres de Leon Cortes, a rural person told me, one afternoon, upon seeing a light bulb in which he realized the benefits of civilization, more or less the following phrase:

'I see through this light that someone has remembered me, and I also feel that I have the right to many things that are enjoyed in the city.' "(The Rural Electric Cooperatives) can project themselves over the areas where up to this point these services do not exist in such a manner that I predict the permanent success of rural electric cooperatives in Costa Rica."

As indicated by the President, the Rural Electric Cooperatives are alive and well in Costa Rica. But, these same coops know they need to continue to mature and better serve their present and future membership. All the managers and members of the various boards of directors with whom Datta, Cudney and Lay spoke emphasized the need for continued improvement and for management assistance and training. They stated again the need for better member service and power use programs. It can truly be said that these men and women will not be happy until every person in their service areas who wants electricity has it.

NRECA Staff Members meet with the President of Costa Rica l. to r.—James D. Lay, Management & Operations Advisor, IPD; Harold Datta, AID/W; President Rodrigo *Carazo* Odio; Misael *Monge* Alvarado, Manager, COOPESANTOS; James A. Cudney, Management and Engineering Services, IPD.

Second Management Seminar held in COSTA RICA

Recognizing the need for continued training in management, a second seminar was planned and carried to fruition in Costa Rica under the direction and support of IPD/NRECA. Participating in this session, held in Santa Cruz, Costa Rica, from June 5 through 9, 1978, were 21 representatives from four of the five rural electric cooperatives, from the Institute of Cooperative Development (INFOCOOP), from the National Electricity Service (SNE) and from the Costa Rican Institute of Electricity (ICE). Included among the trainees were managers, directors and key staff personnel.

The principal instructor for the Seminar was Geoffrey F. Smith, of NRECA's Management Services Department—Managers Search Division. Mr. Smith was assisted by Misael *Monge* Alvarado, Manager of COOPESANTOS (Rural Electric Cooperative of "Los Santos"); and Jorge Luis *Maroto* Casrola, Chief, Administrative and Finance Division, ICE and a Director on the Board for COOPEGUANACASTE (Rural Electric Cooperative of Guanacaste).

Though this basic course in "The Principles of Modern Management for Rural Electric Cooperatives" is geared primarily for managers and directors, it was felt by the managers and Mr. James D. Lay, IPD/NRECA that key staff personnel should also receive this training. One of the main problems of the REC's in Costa Rica is the delegation of authority from the Board to the Manager and from the Manager to key staff. Another problem is the writing of policies; still another is planning. This seminar treats these matters in depth. The results gained from the first seminar (held in October, 1976) were so great everyone concerned said that all directors, managers and key staff should under-go such training.

Second Management Seminar Held in Costa Rica
NRECA Staff Instructor Geoffrey Smith (Manager Search) with Misael Monge A., Manager of COOPESANTOS and Mario Alfaro, Director from COOPELERZA (Turrialba).

Coordinator of International Programs Division Named

Samuel E. Bunker will succeed Dr. Tom Venables who retired in August after 19 years of service with NRECA. Bunker was serving as the Ford Foundation Deputy Head of the Middle East and Africa Office in New York.

After attending primary school in New York City, Bunker attended secondary school in Putney, Vermont and Yale University in New Haven, Connecticut. Following service in the U.S. Army with the Military Police, he graduated from Yale with a B. A. in Political Science in 1950. Holder of a Master's Degree in Public Administration from Harvard, Bunker has been involved in agricultural oriented assistance programs in India, Egypt and the Middle East. His experience also included a nine-year stretch managing a 400-acre family-owned dairy and poultry farm in Vermont.

Bolivia program makes good progress

After three years of hard work by Bolivian agencies, USAID, NRECA and other consulting organizations, the Bolivian rural electrification program is beginning to make large strides.

Two USAID loans of approximately $20 million were originally authorized to serve projects in

the area of Santa Cruz, Cochabamba, La Paz, Sucre, Potosi, and Tarija. Progress has been made in each of these areas, and in the area covered by the first loan, Santa Cruz and Cochabamba, it is expected that construction will be completed by the end of 1978. More than 10,000 families are included in each of these major areas.

In the southern project areas of Sucre, Potosi, and Tarija, construction has just started after several problems have been resolved including the arrangement of pole supplies. In the La Paz area, project development was delayed due to organizational problems but it is now expected that construction will commence by October of 1978 with cooperatives now headquartered in Huarina and in Coroico. Each of these projects has a potential service area of more than 10,000 families and it is expected that each will have major impact on the development of the rural areas involved.

USAID La Paz is now studying plans for the future and expects to make additional inputs into Bolivian rural electrification, subject, of course, to approval of Congress and AID/Washington.

Women in Development

This is the time when every newspaper and radio broadcast tells us of the importance of "involving women"—women as a forgotten resource . . . etc. etc. Certainly effective participation of women at all levels of planning before a project is undertaken is essential to success. The truth is the realization that women's concerns cannot be analyzed without an awareness of the relationship to other issues.

NRECA realizes that fact. In late 1977 and in 1978, in an effort to discover the impact of electrification on women and the rural poor, studies were conducted in Costa Rica and Chile by Joan Hood, NRECA Evaluation Consultant. In both countries it was

Continued page 8

Women in Rural Electrification Conference hear about Philippines and Indonesia

Ann Niblock, wife of Thomas C. Niblock the USAID Director in Indonesia addressed the recent Women in Rural Electrification Conference in Washington, D.C., and told of her experiences with the rural electrification projects in the Philippines and Indonesia. She stated that she had gotten to know many NRECA families overseas, and was impressed by their dedication to their work and their competence in doing their jobs.

Mrs. Niblock said "Indonesia's large population is 70% rural and less than 5% of the people in rural Indonesia have electricity. Poverty stricken youth are looking for a brighter future than the rural areas offer and are moving to the urban centers where they must live in even worst poverty. The city simply cannot accommodate all the people. Jakarta has no sewage system. Water is a constant problem, and it is always unsafe for drinking. The countryside is beautiful, but life for those living in the rural areas is hard and offers few rewards. Young boys spend long hours gathering brush and leaves for the family animals if they are lucky enough to own one. Young girls are sent off to the creek to do the family washing. A mother works the field with a baby strapped to her back, while an older child stays home to care for the next youngest baby and to prepare the family's rice. Medical facilities are practically nonexistent. Many small bundles are carried to the hillside gravesites."

"Can't you feel the excitement of bringing electricity to an area like that? Can't you see the new hope it will give to the people? Can't you see more doctors and nurses willing to serve rural areas if they could have necessary equipment and refrigeration for medicines and vaccine? Can't you see more teachers willing to serve rural areas if they could have a light bulb by which to read at night? Can't you see young men and women willing to stay on farms and in the small villages if they could have some of the benefits of electricity? Can't you see the fruits of development being more widely and equitably distributed as power extended to the rural areas results in more people power?"

Mrs. Niblock then challenged the women to insist that more women be brought into the planning and execution of overseas program. She stated that "in a program as big and far reaching as rural electrification, the planning and execution needs the best heads and hearts of both men and women working together. The Indonesian women take great pride in the fact that they worked hand in hand with their men during the independence movement and fight for freedom from colonial domination. I think it will be a grave error if those who plan the rural electrification program for Indonesia don't recognize the part women can and should play from the outset in what might be called a second struggle for freedom—freedom from darkness."

"Perhaps one of the strengths of the Philippine electrification program is that women are involved in the most responsible, administrative positions. This very conference is an indication of the importance of the role of women in rural electrification in the United States. The role should be no less in developing countries, and the time to get the women involved is at the very beginning."

Continued from page 7

discovered that electrification of the home and work areas has elevated living conditions much as it did in this country in the early 30's.

In evaluating the impact of electrification on the women in third world countries, it is first necessary to realize that women are not a homogenous class—there are important class differences among women that must enter into the full description of what they do. The full definition of women's work must include analysis of the following: the status of the women, at national and sub-national levels; the conditions of their work; the productivity and efficiency of women's work and the consequences of the work done by the women. Needless to say, with electrification through cooperative effort, women are considered equal right members of the Cooperative. The working conditions have improved in rural and urban areas as evidenced by mechanization illustrated in visits to three cooperatives in Costa Rica and two in Chile. (Detailed reports are on files in NRECA office.)

It can be firmly stated that the vital role of women in rural electric cooperatives as well as in other national development programs is receiving increased recognization in third world countries.

Appropriate Technology Advisor to the Philippines

Mr. Dale Fritz has just recently completed an assignment in the Philippines for NRECA where he advised the National Electrification Administration on Appropriate Technology. For nearly 25 years, Mr. Fritz has been involved in the design, development and introduction of tools, equipment and machinery that fit the local situation in developing countries. He participated in the development of a program to establish centers in developing countries where people could see, try out and copy actual working models as a means of transferring technology from one country to another. Such Appropriate Technology centers are now being established in several countries.

The House of Representatives Committee on International Relations has placed a strong emphasis on Appropriate Technology. A quote from the Committee Report of July 27, 1976 states "The Committee strongly believes that Appropriate, or Immediate Technology through its favorable impact on employment and self-reliance, can be an important means of implementing a development strategy which emphasizes participation and concentrates on improving the lives of the poor majority of the people in the developing world." The Committee defines Appropriate Technology as "tools and machines that are suited to labor-intensive production and fit LDC small farms, small businesses and small incomes." The Committee does not say that capital intensive technologies are inappropriate in developing countries, but that developing countries require a mix of technology.

NRECA feels that new technology brought about by electrification needs to be molded in with the traditional ways.

Mr. Fritz utilizing his considerable experience in this field studied the relationship between rural electric cooperatives and the concepts of Appropriate Technology.

Mr. Fritz made a number of interesting findings and observations and his recommendations are now being studied for possible implementation not only in the Philippines but in other developing countries.

Phil Costas back from Jakarta

Phil Costas and family have returned to Washington after a one-year assignment in Jakarta, where he supervised NRECA's Feasibility Study Team activities in Indonesia. Phil now will resume his position as IPD Staff Economist, and will work closely coordinating IPD activities in program design, evaluation and financial development.

In addition to collecting socio/economic and technical data and preparing numerous pre-feasibility studies and ten preliminary engineering and financial feasibility reports, the team conducted nationwide training seminars on rural electrification concepts and program development methods and practices. Also, as part of the team's effort a five-year training program for R. E. cooperative development was prepared, and the common approach to the preparation of feasibility studies was formulated and computerized for future utilization by the Government of Indonesia (GOI). Presently, the NRECA Team is assisting its GOI counterparts, ascertain its utility pole requirements, in order to establish domestic pole manufacturing and treating capacity.

As a result of the Feasibility Study Team work completed in Indonesia, ten rural electric systems will be constructed in that country, which will constitute the first major step taken by Indonesia to bring electricity to 100 million Indonesians living in rural areas, dispersed throughout islands spreading a distance of over 3,000 miles.

APPENDIX G

Cooperativa De Electrificacion Rural De San Carlos R. L.

COOPELESCA R. L.

Ciudad Quesada San Carlos, Costa Rica

Five Year Financial Forecast

1978 - 1983

Jose M. E. Rodriguez
NRECA Specialist

Jose Joaquin Castro Campos
Administrative Assistant
COOPELESCA R. L.

The Financial Forecast for COOPELESCA was prepared with the assistance of Jose Joaquin Castro Campos, the Staff Assistant. The five (5) year forecast took into consideration the new BID loan of ¢ 7,000,000, that COOPELESCA will use to extend its distribution lines to new territory. The Cooperative is in a strong financial position and will be able to meet its loan obligations and provide the necessary maintenance to adequately serve the needs in the foreseeable future. Because of their strict extension policy, I did not see the need for a rate increase, but they must be prepared, in the event that ICE raises the wholesale rate to the Cooperative. In the study, it was assumed that no wholesale rate increase would take place.

The maintenance schedule presently followed is adequate, and during my short trip to the rural areas, I observed that the lines appear to be in very good condition. The right-of-way is generally very good.

I talked to the consulting engineer who feels the need for additional equipment to meet the increased growth of the area. He is presently doing an engineering study to determine the particular needs of the area. The engineer was unable to determine the monetary requirements, but felt that if large amounts of money were needed, the Cooperative could borrow on short term loans and later combine with larger long term loans. It is their feeling that they would have enough working capital to meet additional interest to meet the new loan requirements.

Consumer growth took into consideration the new consumers to be added because of the extension of new lines and the normal growth within the service area. The consumers from Ciudad Quesada were considered in the normal growth of the Cooperative. There were no new lines to be built to the City, except upon requests by individual consumers. Even though the Cooperative will grow from the present 5,900 consumers to 10,900 consumers, they will maintain a healthy ten (10) consumers per kilometer.

The KWH requirements were projected, taking into consideration the new consumers who are anticipated to use fewer KWH per month than the existing consumers, thus lowering the average KWH per month. Since these consumers would be paying the extension fee, it will be a few months before they would have the extra cash for the purchase of appliances. All other consumers would also start with low consumption, thus bringing the existing KWH consumption down and the increases would be smaller in the immediate future.

The Cooperative has adequate capacity to serve the KWH and KW demand in the immediate future. However, they must begin immediately in order to acquire more KW capacity within the five (5) year period. I mentioned that the consulting engineer is now in the process of finishing an engineering study to proceed with the different alternatives; that is, obtain new capacity in the present substation, or begin building substations in the area with transmission lines to meet the needs.

This report was presented verbally to the Board of Directors and Manager, Freddy Arroyo. The Board is very active and

it is my feeling that their concern for the Cooperative will meet their future challenges. I recommended that in a few years they might look at their extension policy, with the possibility of reducing the present 100% requirement for extensions. It was mentioned by the Board that in future years they may consider the contributions as refundable capital.

COOPELESCA R.L.
COOPERATIVA DE ELECTRIFICACION RURAL DE SAN CARLOS R.L.

CIUDAD QUESADA
SAN CARLOS
COSTA RICA

APARTADO: 38
TELEFONO: 46-04-38

DETERMINACION COMPRAS DE ENERGIA

SERVICIOS	75	76	77	78	79	80	81	82	83
RURAL	3.072	3.615	4.307	4.975	5.691	6.572	7.213	7.639	8.065
COMERCIAL	492	694	761	866	920	982	1.036	1.082	1.128
INDUSTRIAL	171	194	298	330	408	491	569	642	715
ALUMBRADO P.	472	526	542	670	745	820	895	970	1.045
TOTALES	4.207	5.029	5.908	6.841	7.764	8.865	9.713	10.333	10.953

CONSUMO									
RURAL	80	75	85	90	95	100	105	110	115
COMERCIAL	319	358	387	396	426	456	486	516	546
INDUSTRIAL	1.813	2.158	1.759	1.735	1.750	1.765	1.780	1.795	1.810
ALUMBRADO P.	40	50	50	43	43	43	43	43	43

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E S T A D O S D E O P E R A C I O N E S

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	1978	1979	1980	1981	1982	1983
INGRESO DE OPERACION	5.666.308	7.008.881	8.371.957	9.623.204	10.751.271	11.915.456
COSTO DE LA ENERGIA	2.809.239	3.387.523	4.049.987	4.666.100	5.172.303	5.816.966
GASTOS DE OPERACION	337.723	336.539	392.792	433.602	478.764	519.948
DE MANTENIMIENTO	181.851	181.213	211.504	233.478	257.796	279.972
GASTOS:CTAS DE CONSUMIDORES	275.008	316.771	367.011	407.946	440.186	473.170
GASTOS:ADMINIST.GENERALES	825.025	950.314	1.101.033	1.223.838	1.320.557	1.419.508
TOTAL=GASTOS DE OPERACION	4.428.846	5.172.360	6.122.327	6.964.964	7.669.606	8.509.564 •
DEPRECIACION	575.923	679.746	807.247	919.675	1.017.635	1.121.894
INTERESES DEUDA	227.903	283.445	352.187	374.929	369.271	363.613
TOTAL	5.232.672	6.135.551	7.281.761	8.259.568	9.056.512	9.995.071 ••
EXCEDENTE	433.636	873.330	1.090.196	1.363.636	1.694.759	1.920.385 •••

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B A L A N C E G E N E R A L

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	1977	1978	1979	1980	1981	1982	1983
A C T I V O S :							
TOTAL PLANTA	16.495.604	19.859.423	23.439.516	27.836.100	31.712.945	35.090.868	38.685.996
- DEPRECIACION	-2.820.722	-3.396.645	-4.076.391	-4.883.638	-5.803.313	-6.820.948	-7.942.842
PLANTA NETA	13.674.882*	16.462.778*	19.363.125*	22.952.462*	25.909.632*	28.269.920*	30.743.154*
TOTAL OTROS BIENES	509.549	509.549	509.549	509.549	509.549	509.549	509.549
CAJA EN GENERAL	1.126.263	2.311.234	3.837.987	5.509.107	7.566.095	10.052.166	12.868.122
OTROS ACTIVOS	3.184.744	3.184.744	3.184.744	3.184.744	3.184.744	3.184.744	3.184.744
TOTAL ACTIVOS	18.495.438	22.468.305	26.895.405	32.155.862	37.170.020	42.016.379	47.305.569
P A S I V O Y P A T R I M O N I O :							
PATRIMONIO	8.253.575	8.687.211	9.560.541	10.650.737	12.014.373	13.709.132	15.629.517
DEUDAS A LARGO PLAZO	6.660.705	6.836.117	8.669.794	12.163.471	13.357.148	13.130.825	12.904.502
OTROS PASIVOS	732.885	732.885	732.885	732.885	732.885	732.885	732.885
RESERVAS DE OPERACION	76.846	76.846	76.846	76.846	76.846	76.846	76.846
CONTRIBUCIONES	2.771.427	6.135.246	7.855.339	8.531.923	10.988.768	14.366.691	17.961.819
TOTAL PASIVO Y PATR.	18.495.438	22.468.305	26.895.405	32.155.862	37.170.020	42.016.379	47.305.569

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Files, reports and records of COOPELESCA - Years 1969 to present.

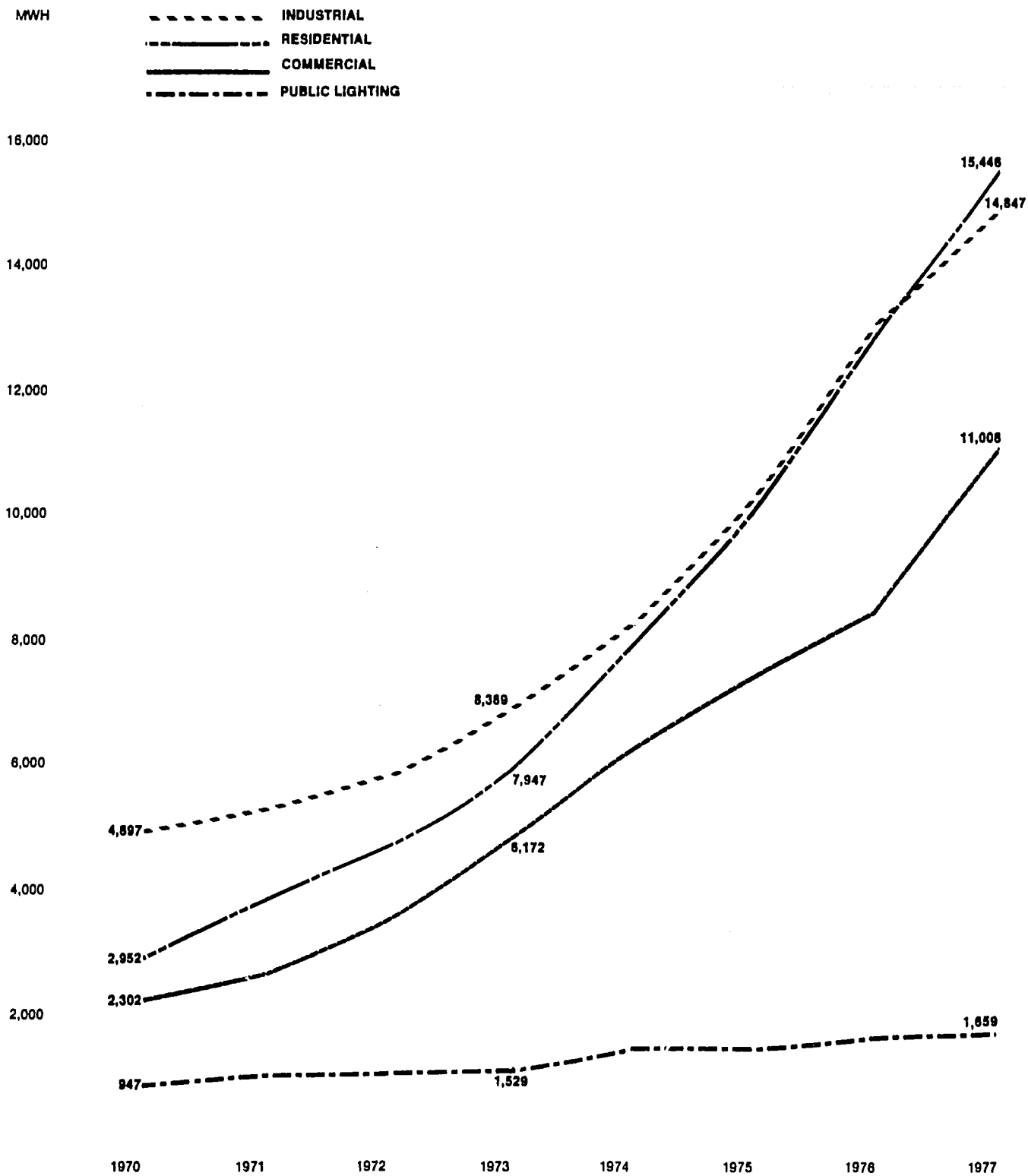
COSTA RICAN RURAL ELECTRIC COOPERATIVES

GRAPH #1

Coopesantos—Coopelesca—Coopeguanacaste

Composit Sales (MWH)—By Category

SOURCE: COOP & ICE Records

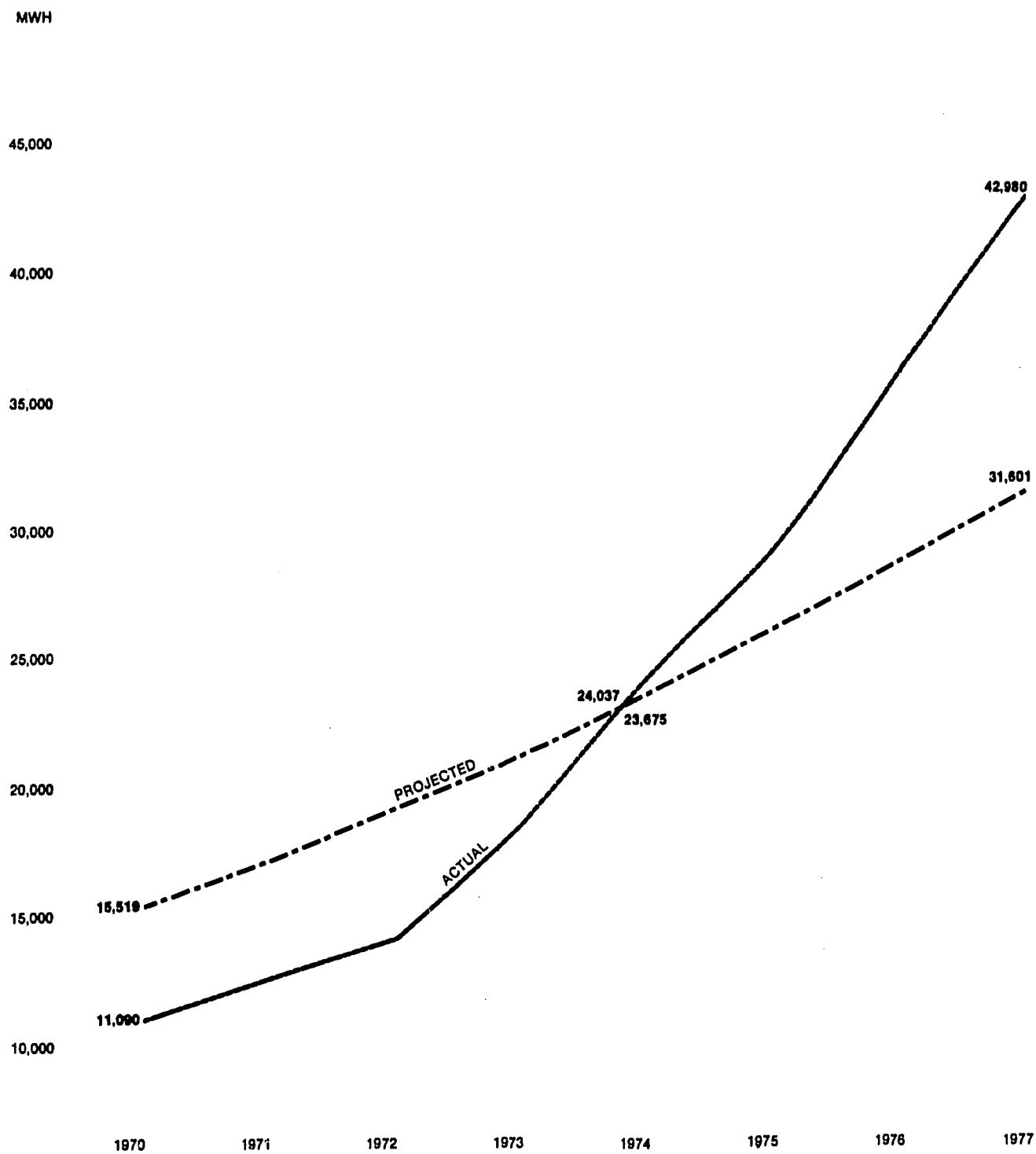


GRAPH #2

COSTA RICAN RURAL ELECTRIC COOPERATIVES
Coopesantos—Coopelesca—Coopeguanacaste
Projected and Actual Sales (MWH)—Gross

PROJECTIONS: Benjamin Study

ACTUAL: COOP AND ICE RECORDS

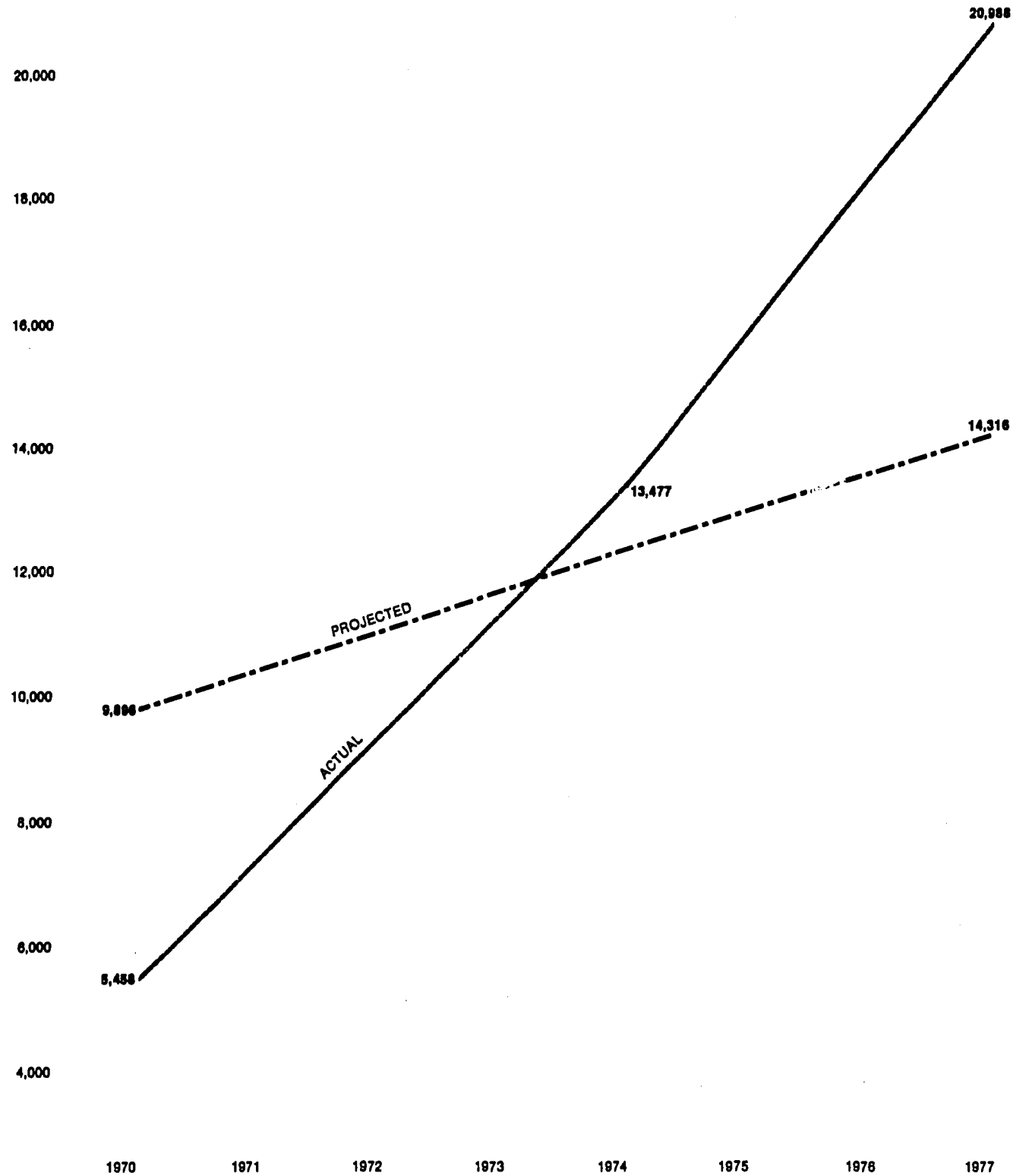


GRAPH #3

COSTA RICAN RURAL ELECTRIC COOPERATIVES
Coopesantos—Coopelesca—Coopeguanacaste
Projected and Actual Meter Connections

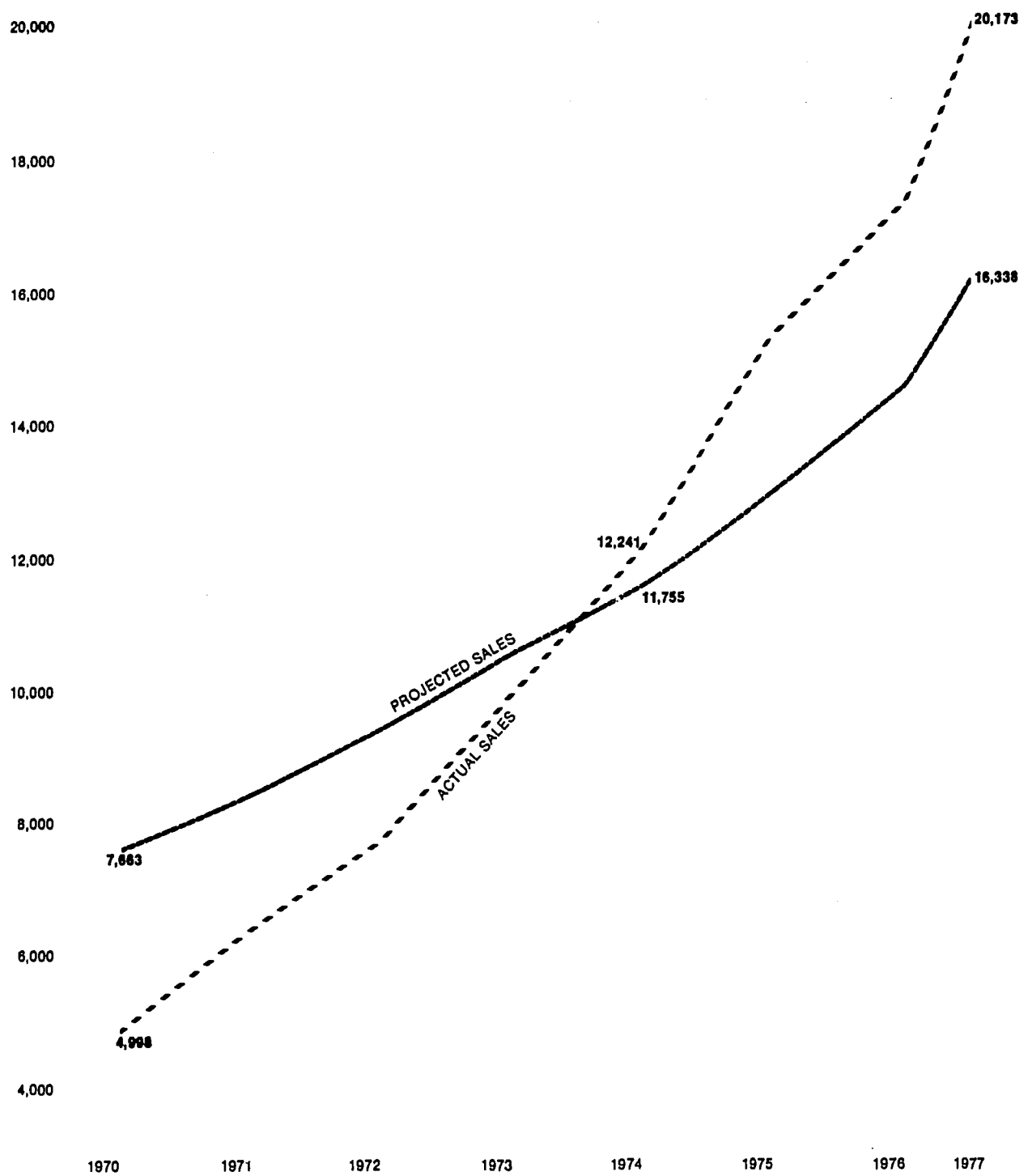
PROJECTIONS: Benjamin Study 1963-1964

ACTUAL: COOP AND ICE RECORDS—1970-1977



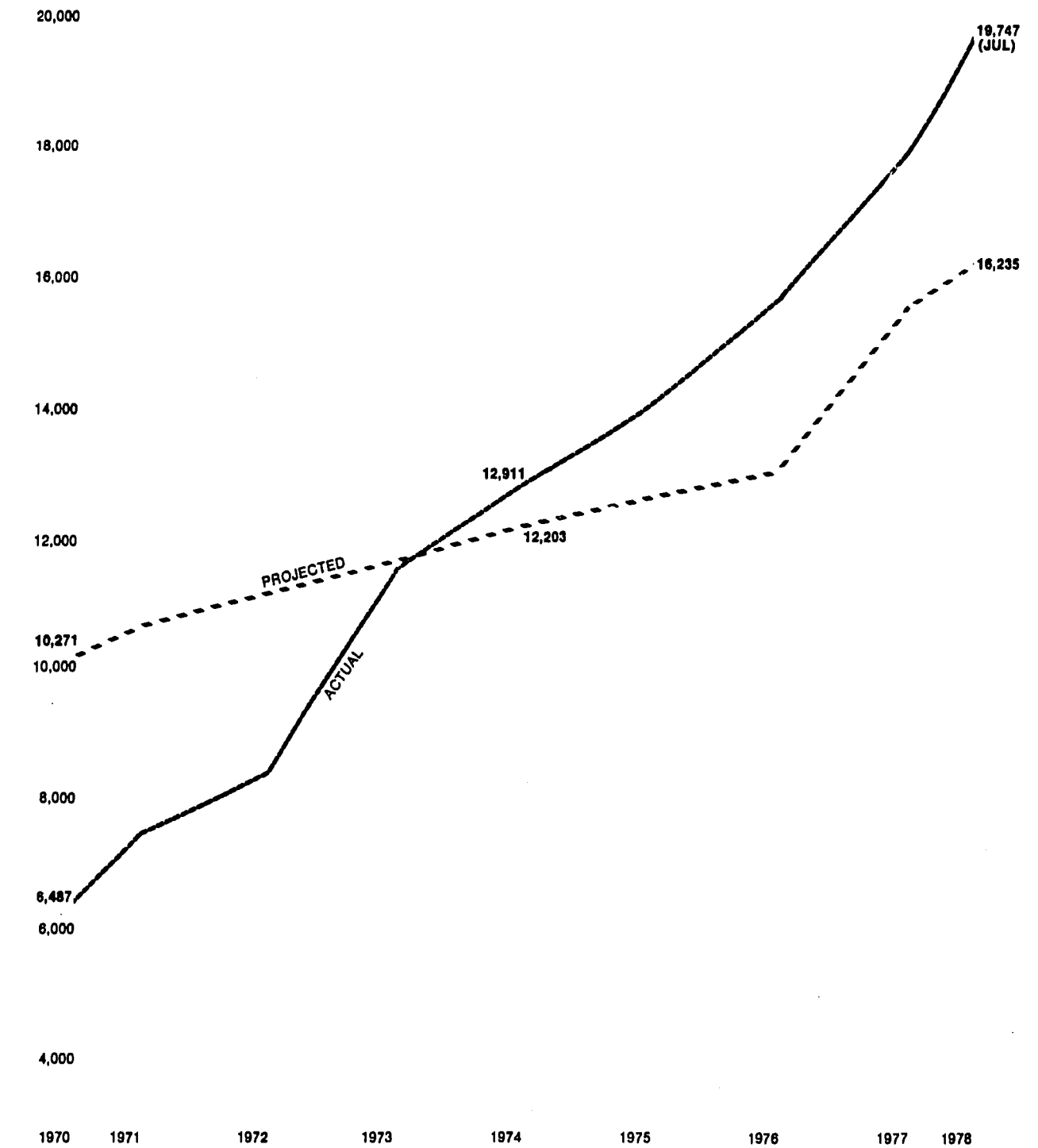
GRAPH #4

COSTA RICAN RURAL ELECTRIC COOPERATIVES
Coopesantos—Coopelesca—Coopeguanacaste
Projected and Actual Consumption (MWH)
Residential and Small Commercial
PROJECTIONS: Benjamin Study
ACTUAL: COOP AND ICE RECORDS

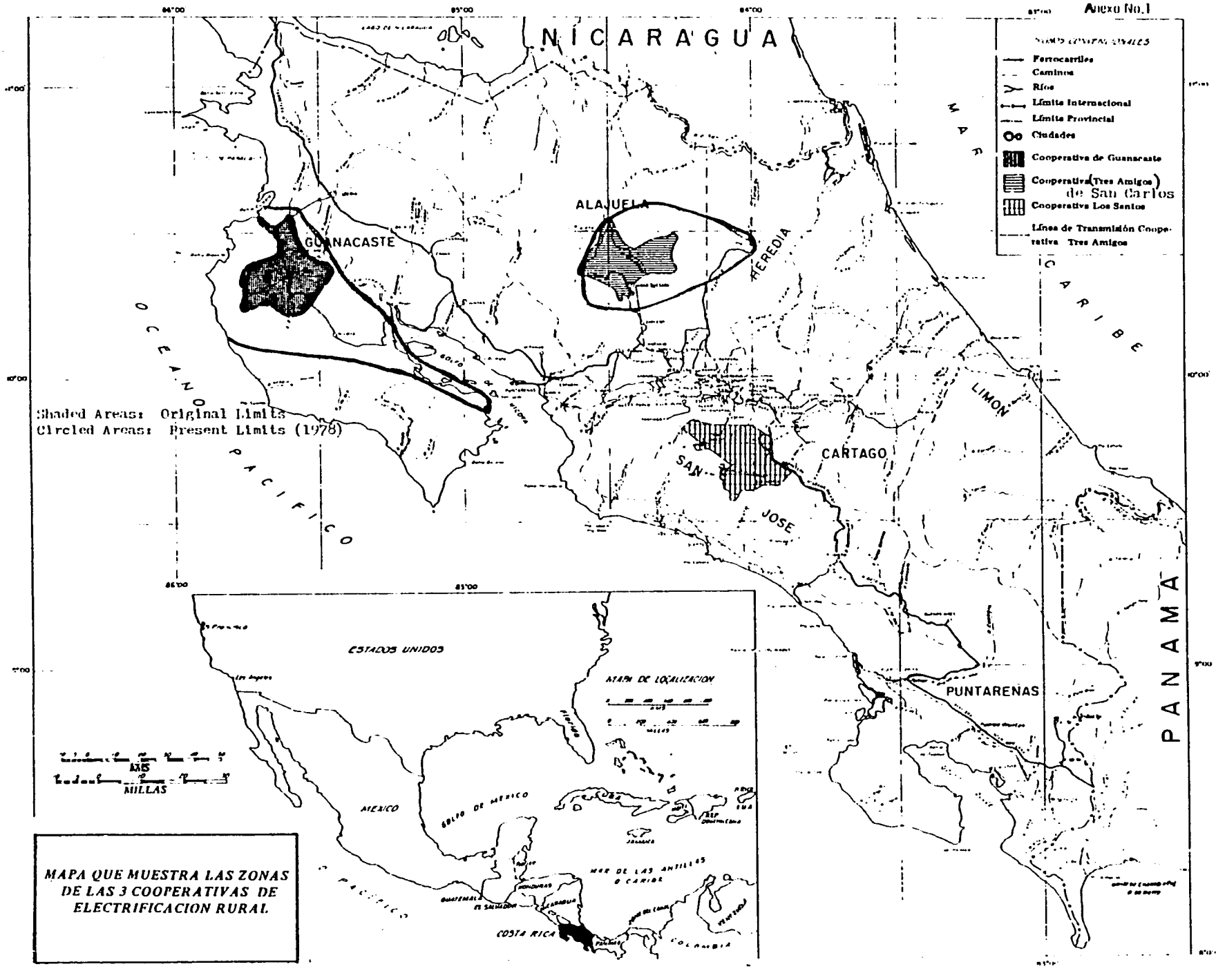


COSTA RICAN RURAL ELECTRIC COOPERATIVES
Coopesantos—Coopelesca—Coopeguanacaste
Projected and Actual Consumers
Residential and Small Commercial
PROJECTIONS: Benjamin Study
ACTUAL: COOP AND ICE RECORDS

GRAPH #5



Anexo No.1



MAPA QUE MUESTRA LAS ZONAS DE LAS 3 COOPERATIVAS DE ELECTRIFICACION RURAL

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