# Cooperative Development Program

## Semi-Annual Progress Report

## January 1, 2002 – June 30, 2002

## Cooperative Agreement
## No. FAO-A-00-97-000012-00

**Submitted by:**

**NRECA International, Ltd.**
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**to:**

**The Office of Private and Voluntary Cooperation**
**Bureau for Democracy, Conflict and Humanitarian Assistance**
**U.S. Agency for International Development**
**1300 Pennsylvania Ave. N.W. 7.6 D**
**Washington, D.C. 20523**

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# List of Acronyms

**ADB** – Asian Development Bank
**AES** – AES Corp. of Arlington, Va.
**BANRURAL** - Banco Rural de Desarollo, S.A. (Guatemala)
**CFC** - National Rural Utilities Cooperative Finance Corporation
**CDP** - Cooperative Development Program
**CER** - Cooperativa Electrica de Riberalta (Bolivia)
**CRE** - Cooperativa Rural de Electrificacion (Bolivia)
**FEB** – Fundacion Energetica Boliviano (Bolivia)
**IDFC** – Infrastructure Development Finance Corporation (India)
**IDB** - Inter-American Development Bank
**IFC** - International Finance Corporation (World Bank Group)
**MDBs** - Multilateral Development Banks
**NDDB** – National Dairy Development Board (India)
**NRECA** - National Rural Electric Cooperative Association
**PSAS** - Private Sector Advisory Service (World Bank Group)
**REFC** - Rural Electrification Financing Corporation (Philippines)
**REC** - Rural Electrification Corporation (India)
**USDA** - U.S. Department of Agriculture
**WBREDC** – West Bengal Rural Electrification Development Corporation (India)
**WBSEB** - West Bengal State Electricity Board (India)

## EXECUTIVE SUMMARY

The purpose of NRECA's Cooperative Development Program is to promote electric cooperatives as the system of choice in the broader context of global electrification. Our basic CDP strategy is to develop institutional alliances internationally and in-country for improving and supporting the electric co-op model. Focus countries are Bolivia, Dominican Republic, Guatemala, India and Philippines.

### Global

Key objective and strategy: Build a working alliance with public and private agencies to promote, implement, and strengthen cooperative and consumer-based rural power programs.

Counterparts: World Bank/IFC, IDB/MIF, ADB/PSOD, USAID and other bilateral donors, private corporate foundations and funds, NGOs and potentially others.

Current status/primary activity: A proposal for a teaming arrangement is under discussion with the IFC's Private Sector Advisory Services group.

### Guatemala (Central America)

Key objective and strategy: Fill the rural electrification gap left by INDE's privatization by developing/ expanding an independent rural electrification financing system based on a revolving fund model similar to the financing system supporting rural electric co-ops in the U.S.

Counterparts: Municipalities, cooperatives and private investors, Ministry of Energy and INDE.

Current status/primary activity: The revolving fund, established under NRECA's direct ownership and operation under a trust contract with BANRURAL. Most of our effort during this reporting period focused on obtaining additional technical assistance support to build up the fund's project pipeline and promoting the revolving fund model in other Central American countries.

### Dominican Republic

Key objective and strategy: Reform, rehabilitate, and expand rural electric utility system working directly with local communities and in collaboration with investor-owned utilities and government.

Counterparts: Superintendent of Energy (GODR); AES Dominicana

Current status/primary activity: A national electrification plan is under development for GODR with USAID/DR funding support. We were successful in obtaining $4.6 million from a USDA monetization project to follow up. A contract will be negotiated with AES to use the southeastern region of its rural electric distribution system as pilot project. Activity during the first half of 2002 focused on developing a national policy and plan for rural electrification with the government.

**India**

Key objective and strategy: Strengthen the role of electric cooperatives in States' electricity reform programs and as part of the Union Government's rural electrification expansion program.

Counterparts: Ministry of Power, REC, IDFC, WBREDC and others.

Current status/primary activity: Work continued on a rural electrification institution-building activity in the State of West Bengal that is aimed at establishing an electric cooperative program to absorb the WBSEB's rural electric systems. A final report will be presented by the end of the year.

**Bolivia**

Key objective and strategy: Develop and implement a strategy for sustainable support for electric co-ops.

Counterparts: Ministry of Energy and several Bolivian electric co-ops.

Current status/primary activity: Work continued in supporting the electric co-ops in Riberalta and Santa Cruz. A new project was proposed to the USAID Mission to work with rural electric utilities in the Yungas region of La Paz, including one electric co-op, which was approved at a funding level of $6.9 million.

**Philippines**

Key objective and strategy: Establish an independent financial agency for electric co-ops as an initial step toward strengthening the internal institutional capacity of the co-op community to modernize and improve itself.

Counterparts: Rural Electrification Financing Corporation, Development Bank of Philippines.

Current status/primary activity: Work continued on readying the REFC for operational status.

## GLOBAL OVERVIEW

NRECA's cooperative development program (CDP) strategy is oriented toward promoting the rural electric cooperative model in response to electric utility sector reform in the developing countries. These policy changes have created new opportunities to introduce the concept of electric cooperatives in countries where privatization of para-statal electric utility agencies has not explicitly provided for rural electrification, traditionally a government agency function. Similarly, this new policy direction in the electricity utility sector overseas, incorporating principles of market competition and de-regulation, has made it necessary to develop stronger support systems for existing rural electric cooperative programs in countries where NRECA has already established the cooperative model. NRECA's CDP strategy is focused on developing new mechanisms and new funding sources for developing and supporting rural electric cooperatives in reform-trending countries where NRECA sees an opportunity to promote and/or expand the electric cooperative model, both in NRECA's CDP focus countries and in other countries and regions where new opportunities arise.

This strategy is being led by the following principles:

- NRECA will develop strategic partnerships with successor electrification agencies and groups in countries where privatization has occurred, and in particular with newly privatized electric distribution companies, private power producers, and the customers and communities they seek to serve.

- NRECA will seek to develop independent, permanent sources of capital funding, and leverage these resources with funds from traditional development agencies that "buy-in" to NRECA's strategic approach.

- In carrying out project activities, NRECA will work to expand the use of NRECA membership resources in its overseas programs, including personnel and surplus equipment.

- NRECA will re-orient its international programs to enable consideration of more operational roles in addition to traditional advisory and training functions.

With these principles in mind, NRECA undertook the following activities during the reporting period.

*Cooperative model promotion/alliance building:* NRECA continued to explore formats for partnering with multilateral and private-sector financing agencies as the basis for driving cooperative and consumer-based rural power investment schemes in countries where power sector reform is underway. As part of this, a proposal was presented to the World Bank/International Finance Corporation's Private Sector Advisory Services to team with NRECA in developing new organizational and investment frameworks for rural electric distribution management in countries where PSAS had responsibility for

implementing electric power utility privatization, beginning in Africa (see Attachment A). These discussions were continuing as of the end of June.

*NRECA membership voluntary assistance program:* Building on a recently completed development education grant from PVC, NRECA established a new program to engage NRECA member co-ops more directly in NRECA's international activities. The essential feature of the new program is a permanent network of NRECA International Foundation "ambassadors" to raise interest and resources from NRECA member co-ops and corporate donors on a regional basis around the country. The program also includes a discrete fund-raising component involving the sale of donated electric utility vehicles with a target of raising $665,000 during 2002-2003. Meetings were held at the NRECA annual meeting in March to present the plan to NRECA Board members and interested co-ops.

*New opportunities - Africa:* NRECA began working with a new alliance group, the Partnership to End Hunger and Poverty in Africa, set up under the auspices of Michigan State University to promote public-private alliances in Africa to further agricultural development. NRECA participates in the group's infrastructure task force. With this group's help, NRECA made a presentation to the Africa Bureau to request support for a new activity to devise innovative rural electrification investment strategies partnering with public and private agencies in selected countries. The Africa Bureau expressed interest and a concept paper provided by NRECA was distributed to several USAID offices including the USAID's central energy office for funding consideration (See Attachment B).

*New opportunities - Haiti:* We continued our attempt to establish an electric co-op development program in several locations around the country. Our focus has been in the town of Pignon, an important population center in the central plateau north of Port-au-Prince that has already gained notoriety for its independent action on meeting community services needs. NRECA-supported volunteers from a co-op in Minnesota donated equipment and labor to help build a new power generation plant along with distribution lines reaching into the town square. Institution-building and training assistance for the co-op was also provided (see Attachment C). Haiti may become a CDP focus country for NRECA in the future.

Additional detail on NRECA's CDP accomplishments in these areas is provided in the CDP focus country review below.

## CDP FOCUS COUNTRY UPDATES

### *Guatemala/Central America*

NRECA's CDP priority is to build up the private rural electrification fund that was established in Guatemala, both in the country and in the Central American region as a whole.

The fund in Guatemala set up in BANRURAL is doing well. Projects financed included line extensions to communities and farms in Tuila, Sepoc, and Champerico, a solar electrification project in Puerto Barrios, and various loans for productive uses machinery and improvements. Although successful, the fund must grow to reach a scale economy that can render it self-sustainable over the long haul. At about $2.5, million its capital remains at only 20% of the level needed to meet the required operating revenue threshold to be self-supporting. With this in mind, NRECA continued to market the fund concept with donors both in Guatemala and in other countries. We were successful in obtaining European support for new project development in Guatemala and continued to pursue programs in Nicaragua and Honduras.

Our plans for the remainder of this year is to make Central America a key target of our funding requests to USDA, and also as part of our global alliance-building effort with the multilateral banks.

### *Philippines*

Our priority activity under our fifth-year work plan is to complete the start-up phase of the Rural Electrification Financing Corporation (REFC). This initiative was launched under the NRECA/CFC CDP sub-activity to investigate and develop new private-sector financing programs for electric cooperatives overseas. Our stake in seeing this activity succeed relates directly to our overall CDP aim of building support for electric cooperative development among the major development agencies in particular the World Bank.

During this reporting period we began negotiating a formal participation agreement between NRECA and REFC. We also set up physical office space for NRECA and REFC on a shared basis, and transferred two permanent staff to the Philippines. A number of REFC's issues remain unresolved, including the determination of acceptable terms between NRECA and REFC, and also several operational considerations including REFC staffing, finalizing approvals with government agencies, and "selling" the REFC to prospective investors such as the IFC. In this latter aspect, IFC management have provided initial approval of the project provided certain conditions are met by REFC. The Private Sector Operations Department of the Asian Development Bank have established similar conditions. IFC and/or ADB's eventual participation in REFC will mark an important step forward in achieving MDB support the concept of electric co-ops as viable private-sector entities.

NRECA also presented a proposal to USAID/GDA through the local Mission for a project focused on the Muslim regions in southern Philippines that was not successful.

***India***

Our focus in India is to continue to develop a viable base in India for NRECA to re-establish electric cooperatives as viable business enterprises and an acceptable model under India's current plan to reform rural electric distribution in the country. The primary activity during the reporting period continued to be our work with the WBREDC, which is scheduled for completion at the end of the year. The preliminary results show that the program could be successful if appropriate political decisions are taken on reducing political influence and allowing electricity prices rise to meet costs.

NRECA also continued to develop a plan to partner with the IDFC and other Indian counterparts to implement an innovative rural distribution reform initiative based on cooperative development. Related to this initiative, NRECA explored the possibility of presenting a joint proposal with the NDDB as a partner under USDA's food aid programs to monetize surplus milk powder. Based on USDA's current policy directions this proposal may need to be deferred.

NRECA's on-going program in voluntary assistance under USAID funding was extended to allow more time for projects to be developed that can use the help of volunteers (e.g., WBREDC). We also proposed to include volunteers in our future CDP program activities as the discussions with IDFC, NDDB and other potential partners in India lead to projects.

Finally, NRECA prepared a background paper on rural electric cooperatives at the ADB's request that will be used in preparing a project plan to deal with India's electric distribution problems (see Attachment D).

***Dominican Republic***

Our CDP's primary objective in DR is to develop a workable strategy for incorporating electric cooperatives as part of NRECA's on-going program in rehabilitating and improving rural electricity service. Among other achievements, the new power sector law was drafted so as to permit the formation and operation of electric co-ops and a pilot rural electric cooperative in the coastal town of Boca de Yuma was established as part of this effort.

A significant achievement was our successful proposal to USDA for a $4.6 million monetization project which will provide funding to support NRECA's on-going work with AES, the US power company who are co-funding improvements in rural

electric systems with NRECA in their utility concession territory. NRECA also obtained funding from USAID to support a national rural electrification planning study.

An important future step is to schedule a workshop with key stakeholders including agencies of the GODR, the utilities, and local private groups interested in promoting a co-op approach to review the basic requirements for electric co-ops to be successful on a national scale. This event will be held once it is clear that there is sufficient interest among the key players.

***Bolivia***

NRECA continues to be interested in developing an independently-funded program of electric cooperative development and support in Bolivia. Progress was made on several fronts during the reporting period.

In particular our work with CRE and CER, two electric co-ops operating in the Departments of Santa Cruz and the Beni, respectively, continued to expand. Our focus with CRE is to assist in strengthening its political position with the government including regulators. CRE continues to be viewed as a model electric utility in Bolivia, if not the continent of South America. In Riberalta, our effort continued in helping CER to shore up its vulnerable power supply situation. We took on an interim role as operator of a 1 MW power plant that is providing a vital source of energy to the co-op, and began negotiations to make this a long-term arrangement. NRECA's work with both co-ops was funded primarily under direct contracts with the co-ops.

NRECA was also successful in establishing a new program in the Yungas region of the Department of La Paz where two electric distribution companies, one an electric co-op, operate. Implementation of a USAID grant agreement totaling $6.9 million was initiated to address counter-coca alternative development programs for which electricity service is an important component. NRECA will fund construction work to augment electricity service in the Yungas valleys and will also provide technical/institutional assistance to the distribution companies to improve their operating status.

Our work with all of these co-ops lays important groundwork for making a proposal to the government to establish a private rural electric power support agency that can begin to address similar rural electric supply problems all around the country, which will be the focus of our next semi-annual reporting period.

***CFC sub-activity***

The NRECA/CFC initiative continued to focus on the Philippines project, involving regular travel by CFC professional staff to Manila to work with NRECA and REFC staff on various aspects of the REFC start-up plan. Critical issues CFC is addressing include final negotiation of a mortgage sharing agreement with the NEA,

which has exclusive first-lien mortgage privileges with electric co-ops; establishing appropriate accounting and other operating procedures; and development of board policies; reviewing REFC staff recruitment and training needs, etc.

**ATTACHMENT A**

2. ***General approach.*** Over a two-year period, NRECA would provide expert personnel to work directly with PSAS on rural electrification policy and investment planning as part of its power sector reform and utility privatization services.

   PSAS and NRECA would select one or more countries where PSAS is presenting proposals for power sector reform/privatization services. NRECA would schedule staff to participate with PSAS teams in preparing country strategies, data collection and analysis, seminars and negotiations with government authorities, etc.

   An explicitly sought outcome would be a pro-active rural electrification implementation strategy and role for PSAS/NRECA in follow-on projects, to be carried out in parallel with the implementation of other aspects of the power reform program.

   NRECA would undertake to provide resources to cover its personnel costs and would coordinate with USG funding agencies regarding their prospective participation in funding the envisioned implementation efforts.

## B. Activity Scenarios

1. ***In a country that is planning to engage PSAS services to prepare and implement power sector reform.*** PSAS is negotiating to conduct power sector reform services in several African countries. One or two countries would be identified and approved by PSAS and NRECA as appropriate targets (e.g. Ivory Coast, Nigeria, etc.) in which to incorporate a specific rural electrification component within PSAS' Terms of Reference. The work scope will include rural electrification activities with milestones and deliverables for which purpose NRECA agrees to provide personnel to work with the PSAS team (for an equivalent LOE of 2-3 months per country over the course of implementing a country reform plan, including field work and HO work). A critical part of this work will be to develop and negotiate an appropriate set of technical, operational, regulatory and financial systems under a comprehensive framework that assures on-going rural electrification investment will take place. This will entail front-line responsibilities on the part of the rural beneficiaries and beneficiary communities, the government, and energy service providers (e.g., privatized utility company/ies), with support roles by bilateral and multilateral aid agencies and NGOs (e.g., private/corporate foundations).

   Acknowledging that rural electrification investment is not likely to occur without the impetus and oversight of a dedicated rural electrification agent, the PSAS/NRECA reform scheme would include the scope, methods, and means for mobilizing and empowering such an agent and will prescribe a continuing advisory and guidance role for the PSAS/NRECA team in an

initial implementation phase to support the agent. Part of the PSAS/NRECA team's responsibilities in formulating the rural electrification strategy would be to orchestrate contacts and discussions with multilateral & bilateral aid agencies and possibly also NGOs for the purpose of lining up post-reform implementation support including capital funds.

2. ***In a country that has already implemented a power sector reform program.*** PSAS has prepared power sector reform programs for several countries that have subsequently been implemented (e.g., Cameroon). Rural electrification provisions of the programs were overly modest or absent, and/or for various reasons the stipulated provisions for advancing rural electrification show little promise of occurring as intended. Recognizing this fact, based on discussions with key parties (e.g. government energy ministries, rural development authorities, power utility regulators, electric utilities, etc.), PSAS would approach bilateral and multilateral donor agencies about financing a follow-up effort in one or more of these countries to prescribe a more aggressive and proactive rural electrification policy and plan, with explicit arrangements for active PSAS/NRECA implementation support and oversight. (Intervention sequence same as in Scenario B1 above.)

**ATTACHMENT B**

**NRECA International Ltd.**
Your Touchstone Energy® Partner

4301 Wilson Boulevard IPD7-202
Arlington, VA 22203-1860
U.S.A.

May 22, 2002

Keith E. Brown
Deputy Assistant Administrator
Bureau for Africa
U.S. Agency for International Development
Washington, D.C.

Dear Mr. Brown:

NRECA International has a cooperative agreement with USAID's Office of Private and Voluntary Assistance (DCHA/PVC) that supports rural electric cooperative development worldwide. We are in the process finalizing the work plan for a two-year extension of this agreement, which we expect will add funding and also an opportunity for adding a new program focus area. We have been involved in a series of developmental activities in several African countries over the past two years and we see conditions maturing to the point where we believe there are some very good opportunities to undertake ground-breaking investment programs in rural electrification development. We write this letter in the interest of exploring whether USAID's Bureau for Africa would be willing to support a more serious level of engagement by NRECA under this agreement to add a regional initiative in Africa over a two-year period beginning July 1 2002.

An important feature of our strategy in Africa is to stress the role of private financial backing for new rural electric systems, and also for their ownership and operation, including for-profit enterprises involving private investors and cooperatively-owned projects based on local consumer groups. As you know, several countries are reforming their power systems and are confronted with a fundamental question of how rural electrification investment will be handled. We would like to make our expertise available in this aspect, working in partnership with all of the principal parties: government, utility system investors, the beneficiary communities themselves, and the official assistance agencies who are guiding and sponsoring power sector reform and privatization.

An illustration of our approach is a project that we have been pursuing in Uganda over the past two years. The World Bank has been helping the government of Uganda to elaborate a policy and assistance program with the objective of encouraging private

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initiative in rural electrification. In particular, we have helped to define this strategy, including regulatory and financial aspects. We have been assisting the International Finance Corporation of the World Bank Group and a local private investor, Industrial Promotion Services, to develop an innovative rural electrification project in Uganda. The IFC/IPS project will provide the opportunity to test the model. Our project will establish a new private rural electrification development corporation whose initial project could entail up to $23 million of investment in small hydropower plant and electricity distribution improvements, linked with the commercial operation of an electrification concession in the rural vicinity. The hydro investment is intended to generate profits from selling power to the grid to help finance the rural electrification program. Additional capital funding for the rural electrification investment will come from a special national electrification fund established with the help of the Bank to buy down the investment cost to a point where the electrification system is financially self-sufficient. The project is in the final negotiations stage.

We have a number of other candidate countries in which to pursue rural electrification efforts including prospective investment programs that we have worked on in Cameroon, Tanzania, and Ethiopia. Our plan at this stage is to pursue two or three collaborative relationships in the region, one with the IFC and potentially one or two others with private companies that are involved in energy development and/or electric utility investment in Africa.

Our implementation strategy for this would require us to make a substantial commitment of NRECA personnel over a sufficiently long time period, with the interim objective of producing effective enabling environments for private investment – including appropriate legal/regulatory and financing schemes -- for subsequent investment in viable projects. In order to achieve this strategy, we are prepared to contribute some of the funding from our anticipated funding increment from PVC but we will need to attract additional funding to meet a minimum threshold. Specifically, we are proposing to organize a specially-tailored team for our Africa initiative at a cost of approximately $600,000 over two years. We could envision contributing $100,000 of this amount from PVC without compromising our other obligations, which we would match with counterpart contributions from our partners. That would leave approximately $400,000 as the un-funded amount that would be the target of a proposal to USAID's Africa Bureau.

We solicit your reactions to this general idea, and hope that it will be of interest as a matter for your funding support. We will be pleased to work with your staff to develop this concept into an appropriate format so as to fit best with USAID's current objectives and plans for alleviating rural poverty and underdevelopment in Africa.

Sincerely,

Paul J. Clark
Vice President

cc: Tom Carter, USAID/DCHA/PVC
Tom Park, USAID/AFR
Ray Love, Partnership to Cut Hunger and Poverty in Africa

USAID

U.S. AGENCY FOR
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July 1, 2002

Mr. Paul J. Clark, Vice President
NRECA Internationl, Ltd.
4301 Wilson Boulevard
Arlington, VA 22203-1860

Dear Mr. Clark:

I have been asked to respond to your letter of May 24, 2002 expressing your interest in exploring whether the Africa Bureau would be willing to support rural electric cooperative development in Africa. Thank you very much for taking the time to write concerning this worthwhile idea.

USAID receives many unsolicited requests for support each year. We review each request to ascertain whether it advances our own objectives and to determine if we have funds available to support it. Unfortunately, while the goals of the request are important, we are not able to identify funding at this time.

We are forwarding a copy of your unsolicited proposal to our Office of Sustainable Development. My colleagues will review the proposal again. If funding is identified within the next year, we will contact you to inquire if you are still interested in USAID support and to discuss funding specifics.

If you have any questions or would like additional information, please contact me at (202) 712-0307.

Sincerely yours,

Nancy M. McKay

Nancy M. McKay, Chief
Program and Food Policy Division
Bureau for Africa

cc: A-AFR/SD, Mr. Wade Warren

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**ATTACHMENT C**

International Foundation

# Electrification in Haitian Village Close to Reality

*By Mike Callies and Ellen Hunt*

Residents of Pignon, Haiti are looking forward to something that at one time seemed impossible: electrification. Fueled by the dreams of pastor and school administrator Caleb Lucien and the efforts of many U.S. volunteers and donors, the hope of lighted streets and homes is slowly becoming a reality.

Pignon is a remote village located in the central plateau region of Haiti, the poorest nation in the Western Hemisphere. The Cooperative Electrique de Pignon was recently formed with the goal of providing electricity to the surrounding area's residents. To assist with their effort, several shipments of donated materials from NRECA member co-ops were sent with the help of NRECA International Foundation. U.S. volunteers from Minn. Valley Electric Co-op aided the construction of a generation facility early this year. Soon a half-mile of line will be constructed to Pignon's village square, where lights and businesses will become the first loads served by the Co-operative. Future loads include the local airport, school and new businesses, with hopes that electrification will spur the economy and provide much needed jobs.

*Downtown center, Pignon, Haiti with one generator in town.*

In addition to helping electrify his hometown, Pastor Lucien is providing vocational education classes for interested citizens. With electric sewing machines and light, the tailors of Pignon will be able to produce clothes of increased quality and quantity. With electrically driven pumps and agroprocessing equipment, value can be added to local agricultural produce.

In the last shipment to Haiti, three 175 kVA transformers were included from Freeborn-Mower Electric Cooperative in Minnesota. Oil circuit reclosers came from Carroll EMC, and lightning arrestors and insulators came from Florida Keys Electric Assn. Once again, Carroll EMC came through with the cable needed. Okefenoke EMC, Georgia consolidated all of these donations and loaded and sent off the container to be retrieved by Pastor Lucien and his volunteers. □

*Mike Callies is an engineer for Minn. Valley Electric Co-op and Ellen Hunt is NRECA's International Foundation Logistics Coordinator.*

# *SAIL Sets Sail*

*By Ellen Hunt*

Larry Thomas, NRECA International Programs Caribbean Training coordinator and lineman safety trainer, launched the first Sponsor and International Lineman (SAIL) training program on August 10. The purpose of SAIL is to upgrade technical skills of linemen from developing countries in training courses at U.S. co-ops. A co-op sponsors a lineman for the short training and Larry Thomas works with the trainees, along with other instructors, who are volunteers.

Habersham EMC and Sawnee EMC, both in Georgia, will sponsor two linemen from Dominica, West Indies for training at the Georgia statewide safety training center in Smarr, Georgia. The two linemen selected, Mr. Ossie Laurent and Mr. Francis Jervier, have already received some training from Larry Thomas over the past year. In fact, on June 12 the country's first hot line work was performed in Dominica by one of the crew foreman. Ossie

*Ossie Laurent*

# Experiences in Cooperative Rural Electrification and Implications for India

## -- Background Paper --

**Submitted to:**

**Samuel Tumiwa**
**Asian Development Bank**
**Manila, Philippines**

**By:**

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**June 2002**

National Rural Electric Cooperative Association
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# Introduction

This paper was prepared by NRECA International, Ltd. at the request of the Asian Development Bank to offer a general overview of international experience with the rural electric cooperative model in the context of selecting institutional strategies for improving the performance of rural electrification investment in India. As an institutional scheme, the cooperative model for conducting rural electrification has had mixed success. The paper addresses the salient features of the model and also probes at some of the reasons for the success and failure of the cooperative model. The paper is not intended as a guideline for applying the model, but rather it attempts to discern the reasons why some cases were more successful than others and to highlight the conditions needed for rural electric cooperatives to be successful. Similarly, the paper delves into the broader question of what goes into designing successful rural electrification programs. The paper attempts to illuminate the role that cooperatives can play in a long-range rural electric expansion program and to identify the conditions and complementary measures that they require in order to become effective agents in this role.

NRECA has been active for some forty years in testing and developing the rural electric cooperative model worldwide based on the U.S. rural electrification system that was designed and launched under the so-called "second New Deal" of Franklin D. Roosevelt's presidency starting in the mid-1930s. This paper focuses primarily on this experience, although electric cooperatives and similar forms of rural electric consumer associations were also developed in Europe[1] and in the Southern Cone region of South America dating back to the early part of the 20th Century. The electric cooperative model did not flourish in Europe as it did in the U.S., where today 70% of the land area is exclusively served by cooperatively-owned and operated electricity distribution systems representing a cumulative investment to date of approximately $45 billion. In total, 871 electric distribution cooperatives exist in 46 states,[2] which collectively own and operate 2.3 million miles of distribution lines and 35,000 MW of generating capacity. Counting the generation and transmission assets of G&T co-ops,[3] the total asset value of NRECA's electric co-op members was $76 billion in 2000.

## The U.S. Electric Cooperative Program

The U.S. rural electrification model was not initially envisioned as a rural electric *cooperative* development program but more as a financial/technical assistance program targeted to a variety of potential borrowers, including cooperatives and also private, investor-owned electric utilities who were at the time serving primarily the urban areas of the country. When the Rural Electrification Administration (REA) was formed as an independent agency located within the U.S. Department of Agriculture under an executive order signed by Roosevelt in May 1935, only 11% of US citizens living outside of the urban areas of the country had electricity. At the time,

[1] Notably, Germany and Sweden began their rural electrification through the formation of cooperatives that were later merged into larger electric power entities. NRECA credits the original basis of the electric cooperative program in the U.S. to the origins of the cooperative movement: the Rochdale Society, established by a group of weavers in rural England in 1844 for the purpose of selling agricultural products.

[2] Co-ops exist in every state except Massachusetts, Rhode Island, Connecticut and Hawaii, although a new co-op has been formed on the island of Kauai, Hawaii, to buy out the incumbent investor-owned utility company.

[3] Generation and Transmission Cooperatives, owned exclusively by regional groupings of electric distribution cooperatives who are required to commit to "all-power-requirement" contracts. There are currently 61 G&T co-ops in the U.S.

privately-owned electric utilities did not believe that people living in the farm areas would make effective use of electricity service, and with low population densities as a further disincentive, they declined requests of rural communities to extend their lines, except to close-in farms and rural-based industries. When approached by the REA, a private utility group offered to take the entirety of the REA's funding in exchange for electrifying about 250,000 farms. REA's mandate was to electrify 5 million farms, and this offer was not accepted. Instead, REA sought to develop rural power districts and/or work through "consumer mutual companies." The latter entities emerged as a unique form of electric utility organized as democratic, 100% consumer-owned cooperatives, in some states termed "electric membership corporations." USDA was well acquainted with cooperative organization in the agriculture sector, so the new REA leadership soon adopted the cooperative format as the standard implementation vehicle for its rural electrification mandate.

The electric cooperative format that emerged under the REA's lending program had the following characteristics:

- An electric cooperative is a consumer cooperative and a private business owned by and operated for the benefit of the users of its electricity services.
- The cooperative's members contribute equitably to, and democratically control, the capital of their cooperative; individuals serving as elected representatives on the cooperative's board of directors are accountable to the membership.
- Ownership is 100% vested with the users under a system of open and voluntary membership with democratic governance, whereby each member/consumer has an equal voting right to elect directors irrespective of energy requirement or usage.
- Other benefits, such as the right to receive operating surpluses (termed "patronage dividends" or "capital credits"), are distributed equitably on the basis of service usage. A cooperative's return to member capital is limited, except to meet a prudent operating margin.
- Electricity service is provided at cost, where management's obligation is to achieve cost efficiency and service quality for the consumer/owners in lieu of profit.

Other cooperative principles that have been adopted by NRECA's membership relate to assuring their autonomy and independence from political and other entities; a commitment to member education and operational transparency; cooperation among cooperatives through the development of local, national, regional, and international associations in order to achieve economies of scale through aggregation; and concern for local community development and welfare.

The REA electric cooperative program model was further defined by the following eligibility guidelines:

- REA financing assistance was granted only to borrowing entities who were duly incorporated under the prevailing statutes pertaining to electric cooperative association laws and who otherwise met all federal and state statutory and regulatory requirements. Also, REA loans were available only on the condition that the borrowers agreed to provide service to any and all consumers within their designated service territories on the principle of "area coverage."

- REA borrowers were required to meet an established set of technical and operational standards including engineering and construction standards that were specially developed by REA, consistent with principles of least-cost design, system durability and reliability, uniform system of accounts, and standardized operational benchmarks.

- REA borrowers were required to prepare a set of rigorous analytic and planning studies as part of loan applications and were also required to submit, in a standard reporting format, a range of operational and financial data used by REA for evaluating the performance of against its operational benchmarks set forth in loan covenants (see Attachment B-1).

- REA retained authority to approve borrowers' electricity rates based on cost-of-service calculations in order to assure the co-ops' ability to meet their REA loan contract requirements.

REA deployed a rank of permanent representatives throughout the countryside to inform the communities on the REA program, principles and procedure; to assist existing and new cooperatives in becoming eligible for REA assistance; and—after loan disbursement—to carry out a wide range of project supervision tasks and to provide advisory services to the co-ops. An example of the latter function was REA inspection of line materials, including inspections of wood poles purchased for constructing lines, to ensure quality, long-lasting materials were used. REA also collaborated with other rural development and farm agencies including "land-grant" colleges who educated farmers on ways of using electricity to increase crop production, incorporate value-adding post-harvest enterprises, and diversify economic activities. In the event of new electric co-ops being formed, rural electric organizing committees were formed to prepare the necessary documentation and most important, organize a grassroots sign-up effort requiring each consumer who wanted electricity service to make an initial membership payment of five US dollars ($5).

One of the critical tasks given to the nascent electric co-op community in most states was to push through enabling legislation in the state legislatures based on a standard "electric cooperative act" drawn up by REA and distributed to local committees through REA field staff. The legislation established the legal operating basis for electric co-ops as special-purpose vehicles and went through several versions; most states adopted a version dating from the late

1940s (Attachment B-2).[4] Cooperatives that were formed then came under the regulatory authority of state utility regulators, to differing degrees in different states.[5] For the most part, the REA, under its own enabling legislation and rigorous set of design and operating standards and procedures[6], served as the virtual legal and regulatory authority for the cooperatives, exerted through the covenants of the loan agreements. Several laws passed by Congress over the years relating to REA (re-named in 1993 to "Rural Utilities Service" to reflect the expansion of REA borrowings into other services) included provisions for cooperatives, starting in 1936 with the Rural Electrification Act, the federal law that made the REA permanent, along with a revolving fund to which Congress appropriated additional funds as the program expanded over the years. However the basic legal jurisdiction is vested with the individual states—as is the case in India—who retain the majority of the legal power to determine electricity commerce in the country.

From the early stages of their establishment, the electric cooperatives had to deal with various needs for ancillary services to perform essential common functions, and over time—as they evolved from rural electrification projects into permanent functioning electric utilities—to become viable in the public service utility marketplace. Beginning with the establishment of NRECA in 1942, the co-ops began to address these needs by organizing themselves into a common association to obtain insurance, employee benefits, and political representation in Washington, among other common services. NRECA's eventual service functions spanned many different areas. However, perhaps its most important role has been to provide the co-ops with a strategic viewpoint of their developmental progress and changing requirements and to lead them through the development of a series of interrelated business associations to serve a variety of evolving needs. Many of these service entities were created to take over functions that had been served by the REA, as government gradually reduced its role and the New Deal's rural electrification development program evolved into a distinct segment of the commercial electric utility sector of the U.S. This aspect of the U.S. rural electrification experience has very important implications for the success of similar electric cooperative efforts in developing countries, namely, to develop strategies for transferring functions and responsibilities from government administrators and supervisors to the co-ops themselves.

In the modern era, many NRECA member co-ops have "opted out" of the REA, marking the end of their dependency on government-assisted financing in exchange for greater independence. Starting the 1990s, electric co-ops were granted incentives to pay off remaining debts to REA. This development coincided with federal budgetary pressures which have tended to restrict RUS lending programs and also with the rise of alternative co-op financing sources, notably the

[4] In recent years, U.S. electric co-ops have responded to public utility de-regulation by expanding their business activities, requiring amendment of the original electric co-op enabling legislation. NRECA has been working with member co-ops in a number of states to assist them in this process, described in the 1999 paper on electric co-op diversification (Attachment B-3).

[5] Wholesale power commerce falls under the authority of the Federal Energy Regulatory Commission; however, most of the laws and regulations pertaining to electricity distribution (low voltage systems) are established at the state level. The majority of states where electric co-ops exist exempt them from some aspects of electricity regulation, primarily electricity pricing, on the grounds that cooperatives are democratically governed by their consumer/owners and therefore not subject to additional consumer protection oversight (see Attachment B-4).

[6] REA issued a comprehensive set of guidelines ("bulletins") to its borrowers ranging from design standards to reporting requirements and methods. These guidelines have been augmented and amended over the entire 65-year span of the U.S. rural electrification program and has served as a useful resource for international rural electric development (see Attachment B-5 for a list of bulletins and a sample. REA bulletins are accessible at REA's website: www.usda.gov/rus/electric/bulletins.htm).

National Rural Utilities Cooperative Finance Corporation (CFC), a private financing agency established in 1969 by rural electric cooperatives, rural telephone cooperatives, and rural telephone companies which today represents $15 billion in assets and a growing percentage of U.S. electric co-op financing. CFC was one of the major steps that the U.S. electric co-ops had to take in order to achieve a viable scale as independent businesses.

## International Experiences with Electric Cooperatives

NRECA's experience with electric co-op development in Asia included projects in India as well as Philippines, Bangladesh, Vietnam and Indonesia. Two of these projects—Philippines and Bangladesh—developed into national-scale electrification programs that provide helpful indicators of the effectiveness and limitations of the co-op approach to carrying out the electrification of rural areas.

### Philippines

Asia's first and largest rural electric cooperative program was in the Philippines. Initiated in 1968 with NRECA's technical assistance and USAID funding support, the program was modeled in many respects on the U.S. rural electrification model, starting with enabling legislation modeled on the RE Act of 1936. The blueprint for the National Electrification Administration (NEA), which was formally established by an act of the Philippines Congress in 1969, was the REA. Like its predecessor the Electrification Administration (EA), NEA had the authority to grant electric service franchises. However, unlike its predecessor, it worked exclusively through the new concept of rural electric cooperatives.[7] Under NRECA's guidance, a pilot phase involving the formation of two co-ops was followed by a national program launched with a loan from USAID and part of Japan's war reparations. A long-term NRECA advisory team was sent to the Philippines to work with counterparts in the NEA during the 1970s. The team was scaled down over time and departed altogether at the turn of the decade.

NEA provided similar types of financial and technical assistance to its co-op borrowers much in the manner that REA did. Boards were elected locally, managers put in charge with NEA's assistance, and a presumption was given that the co-ops would prosper as independent entities as membership grew and economic development ensued. As a government program designed to widely distribute throughout the rural population an important social and economic benefit, the NEA's program was an unqualified success. Today, there are 119 electric cooperatives scattered throughout the Philippine islands, with a combined 5 million service connections that provide electricity to some 30 million people or 85% of the rural population. As in the U.S., cities are predominantly served by investor-owned utilities, and cooperatives predominantly serve the rural areas.

[7] The EA granted 217 service concessions between 1962 and 1969 but the systems were poorly constructed and many failed. The franchisees were typically one of the wealthier families in the area, and they provided irregular service at high prices. Customers got in the habit of stealing electricity and many of the franchises defaulted on their government loans.

The early success of the program led to a rapid build-up in the program with the help of various donors. Newly formed co-ops took over from weak or defunct private concessionaires. However, loans were not made to the co-ops. Rather, NEA built the systems and then obligated the co-ops to generate the revenue to pay back loans. NEA depended on the success of the co-ops in a financial sense, since payments from the co-ops were needed to cover NEA's operating budget. An NRECA review conducted in 1981 found that the cooperatives had sound organizational structures, including active training programs, and that directors and managers were highly motivated and dedicated. Credit for the program's success was attributed to the strong oversight provided by NEA, which saw to it that co-op personnel abided strictly by rules and procedures.

However, during the political and economic crises that struck the Philippines starting in the mid-1970s and continuing throughout the 1980s, the program began to draw criticism. A World Bank project performance audit in 1985 found a growing degree of corruption, weak oversight, and dramatically worsened performance in billings and collection rates. By the end of the 1980s, average bill collection rate among the co-ops had dropped to 52% and NEA had effectively become bankrupt. The report also noted that the co-ops were used by directors and managers as stepping stones to political power and that appointments were sought and granted for this purpose. In some cases, co-ops' funds were diverted to political or personal ends leaving them deep in debt. Much of the blame was put to the Marcos era when democratic rule was virtually suspended, and without having to face the electorate, the political leadership resorted to various means to obtain and hoard the fruits of power. During the period, the report indicated, NEA's strong leadership and oversight role was subverted by the worsening political environment and by its "politicization."

However, a number of the co-ops appeared to be immune to this trend. The report found that 22 of the co-ops were operating as well-managed commercial entities, and this was attributable to the presence of dedicated professional managers. In the late 1980s, donors rallied to save the program, led by USAID, the World Bank, and Japan's OECF. USAID brought in NRECA to prepare comprehensive restoration plans looking at both the physical infrastructure and at institutional and management issues. This was followed by over $200 million in donor loans to implement vast rehabilitation programs of the distribution networks, reduce energy losses, and reform NEA and restore its former professional demeanor. The government absorbed much of NEA's bad debt and intervened to remove much of NEA's direct day-to-day operational control of the co-ops. By 1998, co-ops' revenue collection efficiency had reached 93 percent, NEA's own financial status was restored, and some 70 co-ops had achieved an "A" rating under NEA's new performance rating system.

## Bangladesh

This program was also modeled on the REA system. Initiated in 1976 with funding from USAID, NRECA conducted a feasibility study and implemented an initial stage involving the construction of thirteen pilot co-ops sited around the country, including one co-op located on the outskirts of Dhaka. The hub of the initial project was the Rural Electrification Board, an autonomous government agency under the supervision of the Power Ministry. As in the case of the NEA,

REB was modeled on the technical and organizational features of the REA. NRECA helped to draft special enabling legislation covering both REB and the cooperatives (rural electrification societies called Palli Bidyut Samities, PBSs), which was based on the U.S. model as well. In practice, REB operated more like a parastatal utility organization than REA, with departmental jurisdictions that directly manage the construction of lines, supervise PBS personnel including training support, and control the financial operations of the PBSs. PBSs are not independent private business entities as are the U.S. electric co-ops, and among other things, they do not retain or control their operating margins. The program has been financed under official development assistance loans through the government, supplemented by technical assistance grants from USAID. PBSs collect revenues and pass them to the REB, who repays debt to the government and retains margins. The loan repayment terms are generous, with subsidized interest rates and five years' grace periods, supplemented by operating subsidies during the start-up period. REB's policy has been to gradually withdraw operating subsidies as individual PBSs achieve full cost recovery (which has been more a function of demand-side factors—energy demand growth, system load patterns and resulting revenues—than internal performance measures). REB appoints the PBS managers, but the PBS boards are elected by the local consumer members. REB adopted the basic U.S. rural electrification construction standards and project implementation procedures that were developed by the REA in the U.S. Through its continuous technical assistance since the program inception, NRECA has assisted REB and the PBSs in updating their technologies and procedures. As in the U.S., local engineering consultants are hired to prepare master plans and technical studies for the PBSs. REB's policy is that, over time, the more established PBSs are to be weaned away from REB's management control and assume more direct financial accountability to their members.

By most measures, the REB has been extremely successful. REB has established and "energized" 67 PBSs to date, constructed over 125,000 kilometers of line, and made 3.8 million service connections giving electricity to over 15 million people. The program serves only 20% percent of the country's rural population, but new construction is proceeding at the rapid pace of 350,000 new connections a year. At the PBS level, the results are also quite impressive. There have been no defaults on debt, and bill collection rates have remained in the range of 97% throughout the program (government users are least compliant). Average system losses including technical and non-technical are 16%.

Bangladesh's success with the use of cooperatives has prompted the government to begin transferring distribution assets owned and operated by the country's state-owned utility system to nearby PBSs. The initial results of this effort have been encouraging. System losses declined from as high as 50% to below 20% range within a year's time. More recently, this policy was modified to begin a process of converting electric distribution systems into new PBSs.

Key questions about the eventual success of the rural electrification program in Bangladesh generally have to do with the long-term prospects for "graduating" the PBSs from a system of top-down management to becoming independently governed and managed as going private concerns. Whereas the REB program has been highly successful as a rural development and rural electric construction program, the ultimate measure of success will be whether, as an integral part of the country's electric power utility sector, it can avoid the problems of state-run

utilities and produce healthy, vibrant, private, cooperative service utilities. REB's current PBS graduation policy is quite limited. It incrementally grants increased operational independence to PBSs who achieve certain performance criteria, but this does not include independent authority over financial decision-making and funds management. The goal of such a policy would be to reduce the program's burden on government financing for expansion and replacements at the more established PBSs. But in order to make PBSs viable in private commercial capital markets, they will have to be seen as viable, independent private businesses, including having a credible performance record in successfully running their financial operations. This phase will involve a delicate and professionally led transition process for transferring meaningful authority from REB to the PBSs, a number of whom show all the hallmarks of being viable entities. One of NRECA's major tasks as the institutional and technical advisor for the REB program is to help steer this process. Part of this strategy will require developing mechanisms for transferring the REB functions to PBSs on a viable scale (e.g., arranging financing, procurement of materials and equipment, and various other services and functions that each PBS requires but which cannot be done economically by individual co-ops).

## India

Electricity is distributed in rural areas by the State Electricity Boards (SEBs), electric cooperatives, and to small degree, urban-based investor-owned companies. Rural electrification statistics for India indicate that electricity service is widely available in most areas of the country, as measured by the percent of communities where utility lines exist, but penetration rates are still quite low, as measured by the percent of rural population served. The government estimates that 85% of villages are "electrified;" however, only 31% of the population in and around these communities has electricity in their homes. A recent rural household energy survey in six states showed that, of total residential energy use, electricity accounts for only 2%. The reasons are largely due to economic and financial barriers; however, there is also an issue of the utility's motivation and the disappointing results of rural electrification programs to date. This is significant in the context of electric cooperatives since one of the basic principles of most cooperative-oriented electrification programs around the world has been "area coverage"—the cooperative's intrinsic requirement to offer universal coverage in the cooperatives' designated service territories. This principle, while not strictly mandated as in the US, appears to apply in India to some degree as well. A nationwide sample showed that the household connection rate in a cooperative-served village in India is four times greater than a typical SEB-served village. While there are pros and cons to the area-coverage principle, the key point here is that a cooperative system tends toward being more inclusive than selective, as a deliberate policy and *raison d'être*. Accordingly, a co-op, unlike other public utility forms, tends to be proactive in its efforts to increase its membership, and therefore, to increase electricity access within a community.

Rural electric cooperatives constitute a very small portion of India's overall rural electrification program. Started initially with NRECA's assistance in the late 1960s, there were only 41 cooperatives at the high-tide mark several years ago, and today there are 33 that still operate as cooperatives. Most of these were set up by the State Electricity Boards and generally operate in a top-down manner. The Rural Electrification Corporation, formed in 1969 and

headquartered in Delhi, provided most of the financing support for rural electric co-op start-up, but this has accounted for only about 1% of REC's total rural electrification lending. Most REC financing goes to the SEBs.

In 1966, USAID tasked NRECA to carry out a pilot electrification project involving start-up support for the REC and the establishment of pilot electric co-ops in several States. The project was implemented from 1966-1972, but did not result in the development of a large-scale standardized rural electrification program, not even at the State level. Cooperatives that were established with NRECA's assistance in Maharasthra, Karnataka, Andra Pradesh and Uttar Pradesh have survived and, in general, have fared better than co-ops set up by the States. Other co-ops were formed in these and other States; however, they have not reached the performance standards of electric co-ops in the U.S. and in other countries.

Recent commentaries on the long-term effectiveness of NRECA's original group of cooperatives provides useful insight why some co-ops have proved more successful than others.

### ***"Hukeri" Cooperative (Karnataka)***[8]

Success of cooperatives as business enterprises clearly depends in large part on the business philosophy and operating culture under which they are established. A trip report by a power - sector reform team who visited the Hukeri electric cooperative in Karnataka State last year indicated that other co-ops formed in Karnataka have not measured up to this co-op established in Karnataka as part of NRECA's project. The following is an excerpt:

> "...[State] officials expressed to us considerable negative feelings about co-ops, and we would agree that grafting power distribution effort onto existing poorly managed co-ops would be a mistake. However, there are alternative co-op arrangements that we think deserve serious consideration. The Hukeri Co-op was started with the help of NRECA. Based on a site visit in July 2001, it appears to be very well-run and well-respected as a service provider. Collections are 95% of billing. Theft is almost nil. Technical losses are 17%. Customer trust is high and cooperation is good—customers turn in people stealing power. Service outages are responded to in the same day. There is no vandalism against equipment and no hooliganism. Technology and labor are procured locally, and capital expenditures are funded out of cash flow. Though they never said this, Hukeri is implementing the rules for successful co-ops as described by NRECA. According to Hukeri management, the success of co-ops is based on: (1) trust of customers; (2) independence—no government intervention; (3) good management; (4) God-fearing psychology of [the co-op membership]."

[8] From email communication between NRECA and Karnataka power sector reform consultant Daniel Potash in August 2001.

### ***"Lucknow" Cooperative (Uttar Pradesh)***

The Co-operative Electric Supply Society (CESS), serving areas outside the capital of the State of Uttar Pradesh (Lucknow), was the first electric co-op to become operational under the NRECA project. It also has compared well with SEB rural electrification systems. A case study funded by the Stockholm Environment Institute in the mid-1990s examined the CESS's performance as an illustration of the electric cooperative model and found that the co-op was more interested in providing better and more expanded service than the SEB, but also noted that a threat to the co-op's future success was political interference. Some excerpts from the report:

> "Despite the modest number of rural electrification cooperatives in India, this form of local organization has proven to be a relatively successful approach in India. Statistical data reveal that, relative to targeted goals, the cooperatives have been more successful in their performance than other REC-funded schemes, both in terms of service released per village and density of load in relation to the infrastructure created by them.
>
> "There are some government policies with negative impact on the rural electrification cooperative activities in India. National and political interests determine the direction of the rural electrification programme, what areas to be electrified and what type of organization should manage the rural power distribution systems. This does not leave much freedom of action for local initiatives on this matter. The tariff is set by the SEBs. . . . this is commonly pointed out as a problem by many cooperatives, as they do not reflect the capital and electricity supply cost.
>
> "Notwithstanding the progress of the rural electrification cooperatives, there are still a number of challenges facing a majority of them in the quest for sustainability and economic viability:
>
> - They do not have any say on the tariffs, as they are obliged to supply power at the rates decided by the states for the SEBs' customers;
> - The fundamental cooperative principle is missing in the operation of rural electrification cooperatives. They are created through top-down actions—a cooperative is constituted through a departmental effort and the cooperative entity inherits the existing consumers. None of these are prima facie members of the cooperative, nor have they constituted themselves into a cooperative society;
> - Successful cooperatives (sugar, dairy, etc.) in India have bottom-up formations at the time of formation and implementation.
>
> "The CESS co-op in Lucknow basically manages the entire power system, including line extensions, meter reading and billing. In terms of quality of service and financial soundness, the co-operative manages well, much thanks to several years of on-the-job training. CESS has a fairly balanced economy and almost all initial loans are paid back. No external technical or financial

> assistance is required anymore. The leaders are relatively diligent and committed to the cooperative's activities. The quality of power service is also quite satisfactory. The only major problems have been of political character. Many powerful politicians interfere in the day-to-day work of the cooperative which has caused some disputes and delays of the power supply activities. A difficulty emerging from top-down control has been [to dampen the involvement of] the consumers in the cooperative's activities. One result has been lack of attendance [at the cooperative's] general meetings. . . Since December 1994 a new Chairman is steering the Board. To some extent, his commitment to the cooperative has changed people's attitudes in a positive way. During 1995, additional members have turned up at meetings."

The Government of India has indicated an interest in utilizing the cooperative model for increasing the reach of rural electrification as part of the current 10-year programme; however, this should be under a modified scheme that could promise better results than what have been achieved by most of India's rural electric cooperatives to date. Some states have also indicated modest interest. For example, the state government in West Bengal, where at least one cooperative was formed without any notable operational success, is developing a strategy with NRECA's assistance that would be based on developing electric cooperatives using lessons from the program in Bangladesh. In this case, as in others, there are fundamental issues relating to tariffs and the role of government that must be addressed in order for any type of co-op system to work effectively.

## Characteristics of Successful Rural Electrification programs

Successful broad-based RE programs around the world have been found to share a number of common features. In order to implement viable programs, these features should already be present in areas to be electrified; otherwise, interventions are required to put them in place. Some of these interventions require a considerable level of effort and may only be cost-effective to implement if broad, country- or state-wide rural electrification programs are being considered.

Table 1 summarizes conditions that lead to the development of viable RE programs. The order of placement of these conditions in the table does not reflect a ranking of relative importance; they all pay an important role in ensuring viable programs.

**Table 1. Summary of conditions encouraging successful RE programs**

| |
|---|
| 1. Long-term government financial and institutional commitment to supporting an effective rural electrification program |
| 2. Creations of utilities that focus on meeting unique needs of electricity distribution in rural areas, subject to particular conditions and constraints found there |

| |
|---|
| 3. Introducing electrification in a milieu that encourages its productive use and income generation |
| 4. Developing and adopting cost-effective technical designs and standards |
| 5. Load and load mix to ensure efficient use of distribution infrastructure and adequate revenue generation |
| 6. Program planning based on transparent economic criteria, eschewing political interference |
| 7. Assured reliability of power supply to ensure revenue stream |
| 8. Design and implement tariff structure required for project viability, with enforcement and carefully designed subsidies where necessary |
| 9. Facilitating consumer connection to electric service |
| 10. Active consumer participation in their own electrification |

## Sustained government financial and institutional commitment

Given the dispersed nature of the electric load in most cases, rural electrification is a costly undertaking, requiring a significant initial capital investment.[9] At the same time, given the relatively small initial demand for electricity among rural households and the low levels of disposable income of potential consumers, financial returns on this investment are small. With proper planning, these should increase over time, but for a period of several years, the infusion of funding is required, until the system load matures sufficiently to generate the required revenues.

As with any development efforts, a long-term commitment of program implementers to staff training and institution-building to encourage and support such efforts will be necessary. Where there are overlapping jurisdictions, this commitment should extend to actively encouraging all government departments to facilitate the resolution of overlapping issues that may arise as the rural electrification program evolves. In order to ensure that investment resource use is maximized, those implementing a rural electrification program must make their best effort to integrate in their planning efforts all those government departments—public health, education, business development, etc.—that can benefit from the application of electricity to increase their effectiveness and development impact in rural areas as well as to generate the income necessary to support a sustainable rural electrification program.

Because of the size of the investment required to mount a major RE program, a program must be efficiently implemented and the benefits that can be derived from this investment maximized. In order to achieve this, a government commitment to address all the areas noted

[9] Construction costs for rural electric systems typically range between $500 and $1,000 per connection, although both higher and lower costs have been encountered.

above is therefore essential either by its direct or indirect intervention. If the government is not ready to make such commitment and carry it out, then there is good reason to question whether a country should embark on a broad-based rural electrification program.

Such a commitment could involve the formation of a new, non-political department or agency focused on overseeing the implementation of a program specifically for the electrification of rural areas by existing para-statal or private utilities or by a newly formed private utilities or cooperatives. This new department would provide the necessary guidance to ensure an effective program and could perform such tasks as:

- Developing suitable designs and standards specifically for use in rural areas;
- Awarding loans for system development, extension, and rehabilitation;
- Providing oversight on utility activities to strengthen compliance with loan requirements;
- Drawing up enabling policies and regulations for rural electrification;
- Maintaining program oversight to ensure adherence to construction and operations standards, in order to promote financial integrity;
- Designing and applying rational tariffs necessary to ensure the utilities' viability; and
- Overseeing quality control programs to guarantee the use of durable, quality materials and equipment to ensure the long life of this investment.

Such agencies include the NEA and the REB. Others not specifically oriented to co-op development include Ireland's Electricity Supply Board and the Office of Rural Electrification within Thailand's Provincial Electricity Administration.

## Focus on unique aspects of rural distribution

Traditionally, electric power distribution companies have been vertically integrated, with a single company responsible for the entire range of activities, from generating electricity to transmitting it from its source to the major load centers around the country to distributing and retailing it to industrial, commercial, and residential consumers at the end of the line. Focusing on this entire range of activities makes it more difficult to focus effort and resources on distribution, the most time- and labor-consuming of all these activities. Thus, rural electrification entities should focus initially on the distribution of electricity and promoting its productive and efficient use by consumers.

Furthermore, electric power companies have traditionally been responsible for serving the entire market, both urban populations with their industrial loads as well as rural populations. Since each of these two markets has its particular characteristics, focusing simultaneously on <u>both</u> segments of the market makes it difficult to adequately address the unique, more challenging requirements encountered in specifically serving rural populations.

Historically, the urban areas with their energy-intensive industries and dense residential populations were the first to have access to electricity. These consumers represented a relatively large, concentrated market for energy and had an adequate ability to pay for both the energy consumed as well as the end-use appliances and equipment required to make use of the energy. The small geographical scope of the areas served permitted easy access for construction and repair of the system and for interacting with the consumers. These characteristics are found in urban areas throughout the world and, consequently, designs adopted from urban areas in the West were generally found suitable for whatever city in which one found oneself. The costs incurred in urban electrification and the efficiency of operation of these systems were less a concern because the loads were sufficient to generate the necessary financial returns.

On the other hand, rural areas are characterized by low population density and thus the infrastructure tends to exhibit a higher capital cost per consumer than in urban areas. Operating an expansive rural system, extending lines, and locating and repairing faults are more difficult, and the remoteness of these systems, with difficult access, discourages qualified manpower from working there. Furthermore, the average consumer has considerably less disposable income than have their urban cousins and consequently consumes small quantities of electricity, which, while highly valued by rural households, generate little revenue for the utility.

Therefore, the differences between urban and rural contexts in which electrification is to be carried out and the implications of these on construction and maintenance costs, complexity in meeting logistical demands, and level of revenues generated in rural areas must all be recognized. In order to implement a successful rural electrification program, the utility responsible for such a program should be dedicated to the mission of extending service to outlying areas. This is to prevent energies and resources being diverted from the challenge of rural electrification by the vocal, day-to-day demand of the urban population that is best met separately. After the focus has been redirected to addressing specific needs of rural areas subject to their constraints, new and more appropriate technical, institutional, and financial designs to resolve the specific issues affecting the viability of rural electrification then need to be developed and adopted if rural electrification programs are to be successfully implemented.

## Introducing electrification in an enabling milieu

Rural electrification programs should be implemented under conditions that encourage maximum use of electricity for promoting socio-economic development. This would not only benefit the local population but is also crucial for the utility to be able to generate the revenues and develop plant utilization characteristics that are necessary for it to develop into a healthy business.

But experiences worldwide have illustrated that the introduction of electricity into a rural area does not to automatically yield economic benefits through the establishment of local industry and commercial activities. It has been found to contribute to a region's economic development only to the extent that it is accompanied by other critical interventions, such as improved

transportation and communication infrastructure, availability of rural credit, developed markets, local availability of technical and management skills, and access to appropriate and affordable equipment to make use of the electricity.

Rural electrification should therefore be introduced in areas where there is already a potential demand for electricity-using services—areas with agricultural production, availability of raw materials, rural businesses, and sufficient disposable incomes. The presence of industrial or commercial consumers already relying on alternative energy sources, such as diesel engines, is another indication that some of these necessary take-off conditions are present, especially if electricity promises to reduce the cost of energy for these consumers.

If significant undeveloped potential for additional productive end-uses is still apparent in the service area, several interventions are possible. One is to implement an active end-use promotion program that increases the awareness of both residential and commercial consumers of the beneficial end-uses possible using electricity. This could be achieved by displays of end-use equipment and their use in local agricultural shows. Demonstration vehicles fitted out with a range of equipment and appliances could tour the countryside showing how equipment might be used in the local content. Different types of informative publications—brochures, cartoons, or posters—could be prepared describing specific end-uses, their cost, their availability, etc. The electric cooperatives in the U.S. excelled in this regard, and also provided micro-loans to their members in good standing on electricity bill payments to help them purchase appliances and productive machinery.

Another way of increasing the benefits attributable to electrification is for the utility to initiate an ongoing dialogue with all government offices and non-governmental organizations working in the area to broaden their awareness of how using electricity could contribute to increasing their effectiveness and impact in the field and facilitate their work. This was a critically important feature of the REA experience in areas such as the Tennessee Valley and the "dust bowl" regions of the Midwestern U.S. during the early years of the program.

## Appropriate technical designs and standards

The general tendency of electric utilities is to adhere to conventional engineering designs that have evolved in meeting the needs of urban areas. Because of the significantly larger geographical area covered in rural electrification and the increased cost that this implies and the more modest demand for power, every effort must be made to reduce the cost—both materials and labor costs—incurred in building and operating rural lines, while ensuring use of quality, long-lasting materials and equipment.

This could include such interventions as adopting a higher medium voltage; broader use of single-phase distribution; use of small distribution transformers and less extensive low-voltage line; sizing components more in accord with consumer needs; introducing quality control programs to ensure the cost-effectiveness of poles and line hardware over their expected life; standardized construction units to facilitate design, procurement, inventory control, and project

costing; greater reliance on local manpower rather than labor imported from the urban centers; and alternative metering approaches.

Some consider that solar PV systems (e.g., solar home systems or SHS) should be considered as a more appropriate alternative to grid extension because these represent a least-cost approach in cases where households are too distant from the existing grid. But while the latter may be the case, several points should be kept in mind:

- Least-cost does not equate with affordability. Going further from the existing grid generally brings one into more remote areas where households typically have even less disposable income. At some point, electrification in any form may simply be too expensive. In this case, it might be more cost-effective to encourage dispersed households to gather into somewhat larger communities so that they could be more efficient served, not only with electricity but with such services as potable water, wastewater disposal, and educational facilities.
- Furthermore, while SHS provide limited quantities of energy, primarily for lighting and entertainment—which most families find very appealing—it does not provide the power necessary for development activities and employment which help in generating the income needed to cover the costs of electrification.
- It does not permit the economies of scale as in a common "grid" system. In the case of SHS, only the wealthier households can afford this option.

## Adequate load characteristics

Rural electrification is a costly undertaking because of the size of the distribution network required to serve rural consumers scattered over a large geographical area. One program focus should therefore be on reducing this cost—such as by objective project planning, adopting appropriate designs and standards, and involving the local community. But for the sake of project sustainability, a parallel effort should focus on increasing financial returns from this large investment in infrastructure.

This can be a severe challenge because rural residential consumers initially have very limited disposable income and few compelling needs for electricity, even though they highly value this service. Furthermore, residential loads are largely comprised of lighting and entertainment loads (radio and perhaps television) in the early evening hours, with the power capacity of the distribution system largely unused the remainder of the day. Therefore, residential loads make inefficient use of the installed infrastructure and generate little of the revenues required to cover its costs.

On the other hand, rural industrial loads provide considerably more scope for income generation. But while rural industrial loads do generate larger revenues with less distribution infrastructure—because they consume considerably more energy—these loads are usually daytime loads, with capacity of the distribution infrastructure often unused at night.

In serving rural areas, the optimum loading to generate the required revenues in these areas is mix of loads, both in terms of their size and scheduling. Unfortunately, urban utilities tend to pick up revenue-generating commercial and industrial loads by extending their lines into rural areas strictly to supply these larger loads, leaving behind the residential consumers for others to serve. In cases such as Philippines where new retail competition rules will soon apply, the electric cooperatives cannot afford to lose these larger productive loads without major consequences to the costs of energy for smaller users. This is one of the flaws in some of the recently popular theories regarding electricity commerce—"open access" may provide cost benefits to a few, but result in weakening the basis for rural electrification serving the majority.

Addressing this issue requires that policies and regulations provide relatively protected service territories for rural electric utilities that seek to serve a wide range of users in a specified area, including all types of users—residential, industrial, and commercial. In the U.S., most states continue to give electric cooperatives the sole responsibility of serving these areas. Where "customer choice" has been provided, there have been no cases where existing co-op customers have opted out of the co-op service. To the contrary, groups of customers served by other types of utilities have sought to opt into the co-op system.

## Objective program planning

Many households in rural areas around the world aspire to obtaining electric service in their homes and neighborhoods and to benefit from the numerous end-uses that are then possible. Consequently, politicians, eager to win votes and influence, commonly hold out the promise of electrification to their electorate. Once in government, they may follow-through with their promises, designating their electorate as target areas to be recipients as the next tranche of funds for electrification becomes available. But this approach leads to the haphazard evolution of a rural electrification effort, with long electric lines serving electorates randomly scattered around the countryside; an inefficient use of financial and manpower resources; and excessive costs.

If the government has certain socio-political priorities, these must be made explicit at the outset. For example, in Thailand's rural electrification program, the five regions of the country were first prioritized, with each 5-year plan focusing in one area. Those regions that were economically and politically the most backward and unstable received the highest priority. But after a region had been designated as the focus of activities for a 5-year period, cost-effective implementation of the RE program was ensured by selecting the specific areas within that region based on a transparent ranking system established on clearly defined economic criteria, without further political interference. This ranking was based on a prioritization of areas which were the least costly to electrify while at the same time generating the most revenue. The system was expanded in the order of priority, as funding became available.

But in the case of Thailand, provision was still made to accommodate those politicians or other parties eager to provide additional funding to increase the electrification ranking of their villages. In these cases, this funding adds to the resources available for rural electrification, but all the revised construction plans are still in accord with the overall 5-year plans.

As with energy subsidies for special groups of consumers that are passed into law but given to the utilities to absorb, such political decisions must be accompanied with the funding resources needed to meet them. A more appropriate method would be for the government to provide block grants to communities to determine their best use, including providing grants-in-aid-of-construction to the utilities' partial offer to extend electricity service. This would allow a form of resource maximization to occur, reflecting the collective will of the community to set its priorities. In the U.S., electric co-ops typically require individual members who demand service beyond the reasonable limits of the existing network to make such contributions.

## Assured reliability of power supply

While those implementing an rural electrification program must focus their efforts on distribution activities rather than on generation or transmission, a successful rural electrification program relies heavily on a reliable source of quality power. Commercial and industrial consumers, whose participation is critical to the sustainability of rural electrification projects, must be satisfied with the quality and reliability of the electricity supply if they are to sign on as consumers. Otherwise, they are likely to continue relying on their own generating plants which, though usually more costly, are under their control.[10] Residential consumers tend to be more flexible and view power cuts merely as an irritant (although it may be an excuse for not paying their electric bills); for commercial and industrial consumers, it can be a question of economic survival.

Consequently, although the focus of rural electrification activities should be on distribution, the importance of reliable power should not be overlooked. Certainly, any properly constituted electric cooperative would not remain in business very long without the ability to assure its members of reasonable standards of electricity service quality and reliability. While the distribution company may itself not be involved in power generation (or be permitted to be so involved), it is incumbent on planners to ensure that adequate capacity is, and will be continue to be, available. Planning for distribution system expansion without an adequate supply of electricity is a recipe for failure. Consequently, any distribution system planning should be undertaken in collaboration with the power generation authority in the country. If a shortfall in generating capacity is foreseen, then the distribution company must either consider alternative power supply options or moderate its expansion plans.

## Establishing suitable tariffs, the role of subsidies, and collection enforcement

Around the world, it is not uncommon for governments to establish the tariff on the basis of what it believes is affordable or acceptable to the consumer. But if this tariff is inadequate to cover the cost of service, electrification is not sustainable.

Long-term viability of rural electrification programs is dependent on a rational system of cost recovery through the tariff. Utilities must therefore have the authority to establish a tariff

[10] It may well be the case that even when an electricity supply is first brought into their areas, industrial consumers are likely to continue using their own power plants for a period of time, until the new distribution system has established a satisfactory operating record.

structure that will ensure the financial viability of their rural electrification program. This tariff should take into account the cost of the capital investments, the level of local contribution, the number and density of consumers, likely demand for electricity, and the willingness and ability of the population to pay. In theory, this tariff should cover the full cost of the generation, transmission, and distribution of electricity as well as operational and maintenance costs. In addition to covering the cost of constructing the original system, it should also cover the cost of system expansion and improvement over a sufficiently long time horizon (at least 20 years from program inception).

At times, subsidies may be necessary to offset the high cost of rural electrification, encourage long-term sustainability, and broaden the impact of electrification on the nation. For example, a low lifeline tariff broadens the benefits to the poorer segment of the population—improved quality of life and reduced energy expenditures. But these subsidies should not be used to cover operating costs, because doing so would imply a tariff that requires continuing subsidies into the future—either from the government or from outside donors. This is risky because there is no way of ensuring their continued availability, and their termination could ultimately place the rural electrification programs themselves in jeopardy. Rather, any subsidies that are necessary should be used to reduce the initial capital cost of electrification. This funding can be provided under a system that allows the resources to seek their best competitive use in a contribution-in-aid-of-construction format, thereby avoiding need for a long administrative "tail" as the REA revolving loan system required.

Establishing a tariff structure to cover the costs of electrification is meaningless, of course, without the rigorous enforcement of bill collection. Consumers must be made to understand why bills must be paid, and a disconnection policy for non-payment must to be enunciated and firmly enforced. It may be in this aspect that the cooperative format has particularly proved its worth in India and other countries. Peer pressure can be a powerful influence even in areas where electricity theft has been prevalent in the past (e.g., Bangladesh).

## Facilitating consumer connection

A major impediment to electrification in rural areas is the high fee charged new consumers to get connected up to the low-voltage line down their street. Various approaches have been used to set this connection fee in countries around the world, with connection fees at times exceeding $1,000. This fee proves a major obstacle to getting electric service to households that, at least initially, would typically only pay a few dollars per month for basic service.

To maximize both the impact of electrification on those living within electrified areas as well as the financial return to the utility, as many household as possible should get access to electricity. For this to occur, a realistic connection fee must first be calculated, and financing options should then be available to cover that fee. This could, for example, involve financing the connection through an amortized connection fee added to the monthly electricity bill, so that this fee can be covered over perhaps a three-year period. Another way of reducing the effective connection fee would be to permit one service drop (with meter) to serve several

households within a family compound, with each household contributing to the connection fee. Or a subsidy could be used to cover a portion of the connection fee.

Another related expense is the cost of house wiring which is typically the responsibility of the consumer. In this case, the cost could be bought down by one of the approaches mentioned above. However, before this is considered, every effort should be made to reduce the cost of house-wiring through alternative low-cost designs.

## Consumer participation

A critical ingredient in every successful rural electrification program is the presence of natural incentive on the part of the primary implementing agent. Public sector programs—e.g., SEBs in India – are driven largely by political policies, and rural electrification investments are implemented and operated by underpaid and poorly motivated staff. They tend to focus on supplying the easier-to-serve loads concentrated in urban areas, where energy demand and financial rewards are greater, and are subject to financially corrupting political influences. With the government backstopping them financially, there is often little real incentive to operate in an economically efficient manner. This, compounded by logistical demands encountered in serving the more dispersed population in rural areas, has discouraged utilities from supplying these areas, as this would further aggravate their often tenuous financial situation.

More recently, worldwide trends have been toward the privatization of utilities to remove that burden from the government and encourage institutional and technical designs that are financially more sustainable. But the chief motivation for involvement of the private sector is not so much to serve the broad population—one of the ostensible rationales for government involvement—as it is to meet the expectations to their investors who are seeking a return on their investment. Given the need to generate adequate returns on the one hand and the limited disposable income of those living in rural areas on the other, rural electrification appears even less attractive to private utilities.

Under both scenarios, the needs of most of the rural population are relegated to a secondary priority, with little prospect for their getting access to the benefits of electrification over the near-term. It is not unusual that even those who do get access receive an unreliable supply of poor quality. The consumers have little stake in the system and, perceiving that outside investors or the government are imposing tariffs that are not justified, they have few qualms about stealing power, further compounding the problems facing the utility.

One of the explicit advantages of the cooperative format is that the issue of agent incentive is inherently addressed:

- By having a stake in the system, the consumers are motivated to operate it properly and efficiently. If they do not assume and exercise this responsibility, the service eventually fails or becomes overly costly—both generally unacceptable outcomes for those eager to tap the benefits of electrification. The consumers are responsible for maintaining control over losses by being alert to incidents of theft, for reporting acts of vandalism, for ensuring prompt payment of bills by all, etc. This control is

generally lacking when the government or private sector assumes responsibility for rural electrification.

- Buy providing local manpower for construction and operation of the system, the cost of electric service is reduced. This cost is further reduced if cooperative management is adopted, as there is then no need to further increase tariff to generate a profit for investors. In the case of cooperatives, as noted earlier, any financial margins obtained over the year is eventually returned to the consumers.[11]
- This approach harnesses the energies and motivation of rural populations who are eager to access electricity and may even contribute financially to their own electrification. Otherwise, they are beholden to the whims of the national government and politicians and likely to wait for some indefinite time into the future for the normal chain of events to run their course.
- Success in working together to provide themselves electricity empowers the community to get involved in initiating other development activities—such as access to water, roads, and schools—on its own, without waiting for the government to get around to doing it and perhaps even spurring their government to act.
- Local management of the electric system keeps money and jobs within the local community and contributes to developing expertise and skills locally.

## Evaluating the Cooperative Model

Except for the ownership/non-profit financial system and the "community good" ethic embedded in a consumer cooperative's intrinsic business principles, electric cooperatives are operationally not very different from other types of privately owned utilities. Boards are elected democratically by the owners of the corporation's equity and are accountable to them for hiring and supervising a professional management team. As electric utility businesses, directors and management use similar performance measures to guide performance, aiming at cost efficiency reflected in ratios such as consumers per employee, cost per kWh, net revenue per asset unit, and also various measures of customer satisfaction such as outage hours per year. The performance of management and staff are driven by similar types of employee incentive programs involving annual goal setting, performance reviews, and rewarding achievement.

Electric cooperatives almost certainly put more weight on service quality than do the for-profit private utilities, which is reflected in the employee performance review systems of many co-ops that stress communication and service skills and habits. Recent customer surveys conducted by NRECA indicate that issues such as response to outage problems and the idea of local consumer control rank higher in customer loyalty indices than do electricity cost considerations. A key finding of the customer surveys over the past several years, conducted among consumer groups served by co-ops as well as by other types of electric utilities, was that the term

[11] During the initial period of operation – for a decade or more following the operational start-up – Boards of Directors of U.S. co-ops elected to retain margins as a way of reducing borrowing costs for new investment, but allocated these to consumers as future obligations to be paid to the consumers, hence the term "capital credits." However, it is also important to begin paying out these credits in order to strengthen a stronger ownership attitude among consumers.

"cooperative"—and the local, consumer ownership concept, in general—has strong appeal with a wide range of residential and industrial consumers in the U.S. This finding led NRECA and its members to develop a national brand campaign around the cooperative concept as part of their response to the recent trend toward electric service retail competition.[12]

Cooperatives do not own every advantage, however. Generally found in rural areas, energy cooperatives suffer from competitive disadvantages such as low relative consumer density and low average electricity use, hence relatively poor revenue ratios and other profitability indicators. As individual businesses, they are relatively small and have poor economies of scale. Financially, they are fundamentally tied to the economic welfare and growth levels of their rural surroundings. Particularly in developing countries, such conditions tend to mean financial difficulties for co-ops, including access to new sources of investment capital. Also because of their rural character, they are relatively risk-averse and director turnover tends to be low. Thus they tend to be resistant to change and innovation. Attracting new, youthful membership to co-ops boards of directors is an abiding priority in the U.S.

The basic strategy for overcoming such disadvantages is achieved through the cooperative principle of cooperation among cooperatives. Indeed, an essential reason for the success of the U.S. electric co-op program has been the success of a number of initiatives taken by the co-ops to aggregate their interests in common-service ventures that have performed well in areas of management services and training, obtaining low-cost financing, arranging for wholesale power supply, investing in technology R&D, and carrying out political and public information activities to assure their common interests in the political and public awareness arenas, and to expand the range of electric co-ops services into other services such as telecommunications services (satellite TV, etc.). All of these functions, and others, are being provided for by independently operated and self-financed associations and corporations that have been founded by the co-ops over the past several decades. As small, individual, and typically rural business concerns, cooperatives would undoubtedly lack the attributes of sophisticated market intelligence, strategic planning, technological adaptation and innovation, and other competitive advantages of large successful businesses today if they had not created these critically important common resource entities. But since they can readily homogenize their common interests into common action, U.S. electric cooperatives are able to muster unrivaled scale economies in many fields that keep them competent, competitive, and forward-looking.

As practiced in developing countries, electric cooperatives have exhibited a variety of different advantages and disadvantages. One apparent advantage is that the cooperative model adapts readily to traditional rural cultures and norms in many countries and settings. Tribal and village cultures typically exhibit many of the principles of cooperatives—self-help, community effort, universal participation, and faithful adherence to "group" rules and procedures. The high bill collection rates that are consistently found among properly constituted electric co-ops in many countries is evidence of this. Another advantage is the virtual absence of alternatives for identifying and tapping motivated agents in poor rural regions of the world, where low profitability and financial risk limitations are obvious disincentives for private participation.

[12]Touchstone Energy© advertises nationally through various media and sponsors major sports events carried on network TV. Electric co-ops obtain rights to use the logo through their financial participation.

Moreover, the dispersed character of rural population, often fragmented by difficult terrain and poor infrastructure facilities, call for decentralized management and methods of mobilizing local human and physical resources, including distributed power generation technologies. But clearly, the major impetus for the success of rural electric co-op programs is the keen interest and enthusiasm of the potential beneficiaries when given the opportunity to achieve their dream of electricity service by simple virtue of joining a cooperative. Thereafter, it is up to the structure and culture of the cooperative to determine how the dream is achieved. To have lasting and full effect, the cooperative must establish and maintain a strict code of obeying the cooperative principles of equitable and transparent sharing of responsibilities and benefits along with the other basic operating principles that served well the goal of rural electrification development in the U.S.

The disadvantages and problems with the cooperative model—that is, in cases where the true cooperative culture fails to mold—relate almost entirely to the political nature of cooperative movements in some countries and the role of government. Where cooperatives are controlled by political interests, or as in many cases are created and/or managed by government agencies under top-down control schemes, they usually exhibit little or no active participation on the part of consumers and show many of the same characteristics that plague state-run utilities: corruption, low revenue collection, and poor service quality.

In sum, the primary conditions for rendering a cooperative institutional approach for rural electrification successful can be summarized as follows:

***Impetus for being: bottom-up or top-down?***

The impetus for the formation any successful cooperative is to create economic gain for its members, either directly or indirectly. This basic tenet applies for all kinds of cooperatives: producer co-ops, consumer co-ops, insurance and credit co-ops (including credit unions). It might be said further that the *degree* of success in the operation of a cooperative enterprise is proportional to the degree to which its members derive value from it and believe that they have a stake in its affairs. Logically, then, cooperatives themselves are fundamentally the product of initiative taken by peers seeking a common purpose and benefit. Herein lies the crux of the mystery why some cooperatives do better than others; invariably, those that have not taken root and perform their intended purpose were most likely not the product of the members' initiative at the outset, or just as likely, they were to some degree later on subjected to the influence of outside forces that did not participate in the mutually shared interests and responsibilities of the membership.

In India, for example, this negative influence has been the result of the government's interference; it has also manifested itself by the influence of politicians in the on-going governance and management of co-ops that were otherwise properly constituted as member-oriented businesses. In many parts of India, the laws relating to cooperatives do not protect them from government influence; they *mandate* government involvement through ownership of equity and direct participation in their governance and management. The laws, or how the laws are administered, in fact, prevent private citizens from associating themselves to conduct business as cooperatives. Many critical attributes of private independent businesses are

prohibited or otherwise denied by the government oversight agencies ("registrars") for long periods of time, such as the right to have member-elected boards of directors, independent authority to recruit staff or determine employee pay and benefits, and the right to self determination in most other aspects.

In the U.S. and Europe, cooperatives operate as independent businesses, even though government assistance initially provided them "a hand up" at inception or provided special benefits and protections after start-up in order to assist them in reaching a viable and stable market posture. That is quite different from appointing government officials to co-ops boards and management positions, as happened in India starting in the mid-1950s under Nehru. He sought a wider role for cooperatives in India's development by launching a major increase in direct government support which instead spawned a massive and lasting government intrusion into the sector and its effective strangulation.[13]

Needed in India, as in many developing countries today, are enabling rather than restrictive laws for cooperative enterprise that allow cooperatives to come into being as private and independent entities. In the case of electric cooperatives, special provisions are needed to allow them to operate effectively within the legal and regulatory framework of public service utilities as protected entities operationally independent from the SEBs and/or government rural electrification agencies. Even cooperatives established under NRECA's assistance program have representation on their boards from the SEBs, the entities with whom they "negotiate" power tariffs.

***Access to markets and resources***

Cooperative laws and programs in the U.S. were generally aimed at accelerating the pace of agriculture's modernization and industrialization through the development of economies of scale. Individual farmers could not hope to attain the production and marketing skills, technologies, and market position that groups of farmers could achieve. For example, access to electricity is a non-starter without organizing some form of demand aggregation.

The same principle applies in the sense of aggregating the interest of individual electric cooperatives into consortia that can be established to provide common services for all of the participating co-ops in functions that strengthen their common ability to provide competitively priced, commercial-grade electricity service. The electric utility industry involves frequent technological change, large amounts of capital, and with today's fast-moving and oft-changing power-sector reform, increasingly sophisticated levels of market know-how and business innovation, including the capacity to diversify and accept greater risk. These have appeared awesome demands on relatively small groups of electricity users in the rural U.S. They can be utterly daunting requirements of rural folk in developing countries.

Urban-based utilities have the scale and sophistication to meet these needs, but co-ops must innovate to create access to technology, technical assistance and institutional development

[13] Conversation with Tom Carter, director of USAID's cooperative development program in Washington, D.C. (USAID/DCHA/PVC, email address: ThCarter@usaid.gov).

services, capital financing and other financial services, public communications capability and political support, etc. One of the strengths of co-ops is their facility in associating to achieve common needs. A weakness has been the tendency toward insularity and relative lack of sophistication within the rural co-op communities, meaning that, starting out, co-ops must be willing and able to seek outside expertise in planning and filling such needs in the initial stages of developing these strategies. One of the common errors of electric co-ops has been their tendency to "bootstrap" such initiatives, in order to avoid expense or the intrusion of outsiders. Lacking the know-how to start and already under the influence or control of government agencies providing such functions, this approach rarely succeeds in developing countries and can lead to weak, sometimes corrupt, agencies that, for example, manage bulk procurement or provide access to financing. This tendency may be facilitated by the subtle transference of the faulty operating culture from the incumbent agency under the guise of implementing assistance.

Government can help cooperatives to attain these functional capabilities, but the help should be enabling rather than direct or even directive. "Technical, financial and policy support, carelessly conceived, designed and delivered can lead to dependency and, when the support is withdrawn, to decline. Support from governments has often led not only to dependency, but to control."[14] The solution is for government, with the specific encouragement and help of donor agencies, to fund technical assistance through third-party experts with specific goals and organizational plans to devise programs that can meet needed operating standards under participatory, cooperative-style formats that are acceptable to the cooperatives. A current example is the support of USAID and NRECA in assisting the electric cooperatives in Philippines to establish a private financing company to provide long-term loans for capital improvements and system expansion. A starting point would be to have the responsible government agency require the cooperatives to begin to take responsibility for meeting their common functional needs as soon as they are financially and organizationally able to do so. This is a difficult first step and can be met with internal resistance and subtle interference from such agencies whose loss of such functional responsibilities means the loss jobs, patronage, etc. Expert intermediaries can help to buffer against bureaucratic obstacles and political interference. An alternative approach, in a country starting out with a cooperative electrification program, is to devise institutional, financial, and organizational strategies with such third parties working directly with the nascent cooperatives to provide directly for various institutional and technical functions as independent operating intermediaries.

### ***Quality of leadership***

As noted, a key factor in the success of nascent co-op programs has been the attitude and role of government. As was clearly illustrated in the U.S. and Philippines cases, where the government established a strong nurturing environment and a professional management structure that provided strong leadership during the early stages, co-ops have performed well. As also seen in Philippines, however, where this protective environment is withdrawn or replaced by political interests, system deterioration is not far behind, unless co-ops have been able to grow their own insulating culture. The World Bank's 1980s review of the Philippines

[14] 2002 USAID Report to the U.S. Congress on international cooperative development, (DCHA/PVC).

program noted NRECA's early influence in seeing that the implementation agency, NEA, maintained high standards and integrity in performance and decision-making. It concluded that the various pressures—not the least of which was sky-rocketing energy prices which dramatically undercut the financial performance of the co-ops—were too much for the still fragile organizational framework to bear and brought on the program's decline.

Another important factor in the success of co-ops is in the selection, training, and supervision of co-op managers. Managers set the basic tone for the entire performance of the co-op, including staff and directors, as is true in most businesses. However, in the case of the rural electric co-op, it is generally the one and only opportunity to inject a professional bearing and know-how into the co-op, which is typically governed by farmers, ranchers and small-town business people, and staffed largely with technician trainees, all of whom have little understanding of an electric utility's business operations. In particular, it is essential that the selection process be based strictly on merit and professional qualifications, and that they become well trained and acquainted in the critical factors for managing the co-op's business to meet specified performance targets that lead to success. This is where the role of a qualified and politically immune guidance agency is vital.

## Conclusions and Recommendations

India's central government has adopted a policy of achieving 100% village electrification within a decade. To attempt this goal without addressing prevailing conditions of overwhelming system losses, unsustainable subsidies, and related service quality problems with the existing rural electric distribution systems would lead to further waste of resources. As Government has acknowledged, the major responsibility remains with the state governments to address this priority need, but that they in turn should consider a role for electric cooperatives.[15]

As for the matter of devising the best institutional vehicles and the potential role of cooperatives in this, the potential role of the private sector requires sober consideration. India's prospects for rural electrification development in the current era of power sector reform involving the sale of public utility concessions such as was attempted in Orissa, suggests that private utility investors' interest in the long-term investment proposition of rural electrification is no greater today than it was when the REA was created in the U.S. Removing state utility monopolies and thereby creating "open access," in terms of fostering rural electrification development, would be the equivalent of arriving at the pre-New Deal conditions in the U.S., where access was wide open yet electricity would have remained beyond the reach of most rural areas had REA had not come along. At best, private companies would selectively serve larger and industrial customers, leaving the vast majority of the rural population on the outside. The better roles for the (for-profit) private sector to fill could be in areas of power supply and system rehabilitation, as opposed to distribution and retail operations.

[15] A policy manifesto issued by the BJP had this to say on the topic: "The frequent breaking down of transformers and distributors in rural areas causes havoc with agricultural operations. SEBs, though, don't have the money to replace these assets. The Government will encourage farmers' (and other users) to form cooperatives to install, maintain and charge for these rural electrical equipment. Loans from the Rural Electrification Corporation will be given for this."

There is very clear evidence that the electric co-op model can serve as an effective implementing agent for rural electrification in India, based on the experience of NRECA's group of pilot co-ops. This goes for treating dysfunctions in existing electric distribution systems, as well, considering for example, the success of PBSs in Bangladesh in territories previously served by the state utility.

On the other hand, the fundamentally damaging effect of government's influence in India's cooperative sector suggests the need for a different approach from the REA model, except perhaps, in its role as standard-setter and conduit for donor assistance. The question is not whether electric cooperatives can succeed in India, but how to nurture them to become professionally proficient while minimizing the risk of political infection. Specific interventions are indicated, in order to set the groundwork for developing and supporting a workable electric cooperative development program:

- An essential first step is to reform the underlying legal basis for the formation of electric cooperatives. Some states have undertaken to make these changes, notably Andra Pradesh, Bihar and Karnataka.[16]

- Second, comprehensive technical-financial packages are needed at the state level, accessible by qualified implementation agents (not the SEBs, typically), to implement least-cost, long-life, and theft-resistant overhauls of the lower-voltage distribution networks. Cooperatives may not be successfully formed to make such improvements, but they can join with competent private third parties to participate in implementing improvements.

- Third, government and donors need to devise appropriate mechanisms for providing flexibly-priced capital financing (through co-ops) to extend electricity service, possibly based on density or other criteria. There are various established methods for providing sliding capital subsidies[17] and a variety of agencies exist that could administer them.

- Looking at the medium-term, a critical step is to begin to address the wholesale/ retail tariff fiasco. There are no simple answers to this; however, cooperatives may offer an explicit advantage over other schemes in allowing a transitional program to succeed. Cooperatives are based on the principles of equitably sharing responsibilities and benefits. In this case, cooperatives can be formed to obtain a variety of benefits based on the common adoption of a set of operating procedures

[16] The Cooperative Development Foundation headquartered in Hyderabad is the leading authority on legal and regulatory reform in India and spearheaded the adoption of a model new co-op law in A.P. in 1995 (contact information: M. Rama Reddy, President, CDF; email address -- cdf@hd1.vsnl.net.in). See Attachment B-6 an informative CDF publication on the " Andra Pradesh Mutually-Aided Cooperative Societies Act."

[17] Although the state governments are key to the tariff and legal/regulatory issues, the central government can play a leading role. A possible strategy would be to adopt a policy of rewarding states who undertake a comprehensive range of organizational, regulatory, and financial initiatives needed to make rural electrification a viable enterprise, along with necessary provisions to allow the formation of truly viable cooperatives and/or through other implementation agents. The union government's recent offer to make grants available to cover the capital cost of viable rural electrification schemes is a step in the right direction.

that requires uniform adherence, including full payment of monthly electricity bills and gradual phase-out of subsidies. Some of these benefits could include: better electric service (higher ranking in load shedding), low-cost financing for connections, house-wiring, and even purchase of appliances and equipment. These benefits result from rendering energy use more efficient and productive, providing direct financial benefits to consumers and counterbalancing the effect of subsidy phase-out.

- A related issue is altering the economically flawed electricity pricing system relative to industrial and residential users. A declining block rate system to lift the disincentive on industrial use of the public utility system, possibly linked with lifeline rates financed over a transition period with the financial returns from line loss reduction investments, could be workable. This would be targeted to existing users who join co-ops.

- Looking at the longer-term, efforts should get underway immediately to form viable apex agencies that can provide professional support services to cooperatives in areas of engineering services and technical assistance, procurement management, private-market financing access, training and employee certification programs, etc. These efforts could be initiated with at least some of the existing cooperatives.

In sum, resolving India's rural electrification challenge, particularly overcoming entrenched dysfunctions in the existing electricity distribution and retail system, will entail simultaneously addressing a variety of deficiencies and issues. Successful implementation of these measures must precede any major new investment in extending new service beyond the existing grids; otherwise, such investment will only increase the dimensions of the country's on-going power sector crisis. Adding new high-cost energy into a leaky distribution network obviously does not make sense. The policy should be to devise and demonstrate successful models for distributing and retailing electricity service based on more efficient distribution technology, improving service quality and reliability, reducing power theft and increasing bill collection rates, and eliminating or at least transferring tariff subsidy mandates from the financial obligation of the electric distribution utilities to separately administered benefit packages aimed at inducing change in basic utility performance areas. There is certainly clear scope for including some form of cooperative development for the purpose of engaging the consuming public as part of this effort.

## APPENDIX A. Bibliography

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## APPENDIX B. Attachments

B-1 REA "Form 7" Annual Operating Reports

B-2 Rural Electric Cooperative Enabling Law Template (U.S.)

B-3 "Electric Cooperative Diversification on a Cooperative Basis"

B-4 State Regulation of Electric Co-ops Survey Compilations

B-5 Index of REA Electric Bulletins (Sample: Long-Range Planning Guide)

B-6 "Cooperatives in a Changing Economic Environment" (India)