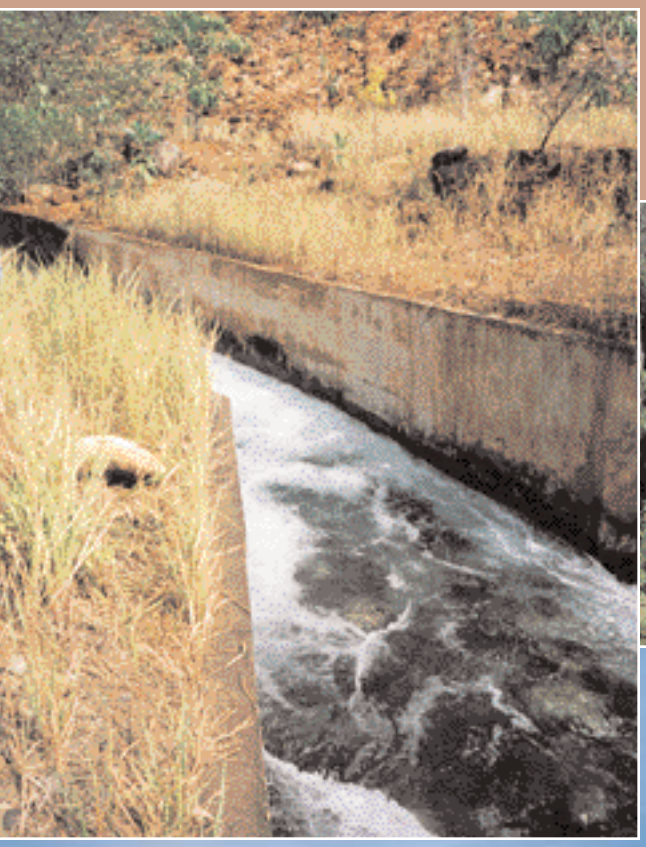
Social Trust Aspects of Rural Electrification



Social Trust Aspects of Rural Electrification

E7 Working Group Report

October 2000
Second Edition

Foreword

The E7 is implementing two rural electrification projects as a part of its contribution to global sustainable development. As electric power experts, E7 members are interested in contributing to society with our combined know-how and expertise. In implementing these projects, we have faced various difficulties and there have been numerous lessons learned. During 1999-2000, the E7 Social Trust Working Group reviewed the E7 rural electrification experiences and studied other rural electrification projects, primarily in Asia. These tasks were undertaken to learn more about rural electrification and to improve the implementation of future projects.

Rural electrification involves many stakeholders. Industry, however important, is only one of these stakeholders. Social trust concerns relationships among many different stakeholders who have many different connections to rural electrification projects. The E7 Working Group report provides an electrical industry perspective while keeping the broader development context as background.

The document proposes recommendations and suggestions for including social trust dimensions in rural electrification. In doing so, we must emphasize flexibility, since every situation is unique. It is our hope that this document will provide assistance for handling a variety of settings, stakeholders, and industry organizations and contribute to the improvement of future rural electrification projects.

The E7 encourages dissemination of its work and continuing dialogue on issues related to trust and the electricity industry.

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or contact

Secretariat
E7 Network of Expertise for the Global Environment
1010 St. Catherine Street West, 6th Floor
Montréal (Québec) Canada H3C 4S7
Tel.: (514) 392-8876 Fax: (514) 392-8900
E-mail: e7secretariat@hydro.qc.ca

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Introduction

The E7 report on social trust aspects of rural electrification explores the issues and trends associated with electricity supply in remote, rural areas and the role of social trust through the life cycle of rural electrification projects. Based on the more general proposals in the report on Social Trust and the Electricity Industry, specific recommendations and suggestions–emphasizing lessons learned–are proposed to include social trust in rural electrification projects.

The information in the report was developed from a literature review, consultation with key participants in E7 rural electrification projects, and the results of a series of E7 seminars. Electric power companies and government organizations in developing countries, NGOs, international financial institutions, academics in social and environmental sciences, and other experts in public involvement and collaborators participated actively in these E7 seminars.

After this brief introduction, the first section of the report introduces issues and trends related to rural electrification. In Sections 2 and 3, the role of social trust in rural electrification is outlined and lessons learned in the last 20 to 30 years are briefly discussed. Social trust principles for the electricity industry are restated as the foundation for the development of specific rural electrification guidelines in the final section. General rural electrification guidelines are then proposed, followed by specific guidelines organized by project cycle: planning, design, implementation, operation and maintenance.

The report is an E7 contribution to a professional dialogue that acknowledges the value of electricity service in remote locations while recognizing the many barriers to providing service. Rural electrification can be defined as the task of providing a country's rural population with the electric power necessary to meet its needs. Electrification enhances economic growth, opens lines of communication, and improves literacy and access to information. However, developing electricity service encounters the same challenges (geographic distribution, social and economic conditions, natural resources) as providing other infrastructure improvements in such locations (roads, telecommunications, schools and hospitals). Recognizing the importance of a trusting relationship among the multiple actors involved in rural electrification could help move projects toward economic feasibility and equity; environmental sustainability; decentralized, institutional, and technological diversity; and adaptability to low levels of rural electricity demand, with greater roles for the private sector and local communities.

The document proposes recommendations and suggestions for rural electrification projects to facilitate greater social trust. Competence, commitment, and consistency are important for suppliers to earn and maintain the trust of their communities, customers, and other stakeholders. Fairness, respect, caring, and empathy characterize relationships that maintain and enhance social trust. From these seven trust components are derived representative guidelines, tools and techniques.

The suggestions in Section 5 are neither exhaustive nor precise enough to cover all situations and every organization working in the rural context. The successful implementation of a given guideline will depend on the specific geographic, cultural, social, economic and political context. Moreover, changes in stakeholder values and in the business context over time will require continuous adaptation of implementation approaches. It is expected that governments, energy providers, financial organizations, and communities will be creative in identifying alternative approaches to meet these guidelines. Unlike a cookbook with precise instructions, the document is offered by the E7 Social Trust Working Group as a road map that provides many pathways for operationalizing the trust components and for handling a variety of settings, stakeholders, and power system configurations.

1 Rural Electrification Issues and Trends

Rural electrification can be defined as the task of providing a country's rural population[1] with the electric power necessary to meet its needs. However, this "simple" definition should not mask the financial, technical and social complexities of the task.

In 1999, the World Bank estimated that two billion people do not have access to electric power. This sub-optimal level of electrification hampers development efforts, in particular for such services as water and sanitation, education, and health.[2]

This poor access to electricity is not offset by other energy sources, such as petroleum and gas, which, with electric power, amount to only one third of the energy consumed in rural areas.[3] Traditional energy sources, biomass (fuelwood, agricultural residue, animal waste) and human or animal labor supply 60 to 70% of energy demand in rural areas.[4]

The urban-rural energy gap is substantial. The concentration of infrastructure development projects in urban areas, where the economic market enjoys higher population density and easier worldwide access, limits the resources–including energy–available in rural areas.

Observations and studies have shown that lack of electricity and other modern sources of energy has the following impacts:

- The gathering of biofuels, while not necessarily an unproductive activity, takes time that could otherwise be devoted to more productive activities, such as farming.

- Biofuels give off smoke that can damage people's health. Levels of smoke inside dwellings often far exceed WHO recommended safe levels.

- Electricity is a key component for development, as many experiences have shown, and has a distinct positive effect on the quality of life. The introduction of electricity results in an enhanced sense of security and longer hours of work, education and recreation.

- To the vast majority of rural households, electrification symbolizes their connection to the modern world and a hope for improvement in their daily lives and living conditions.[5]

The barriers to rural electrification are substantial and often stem from the social, economic and geographic characteristics of the rural areas. These conditions often mean that a rural electrification program must address:

- a wide dispersion of consumers and difficult access to certain rural communities;

- the high if not prohibitive cost of extending the grid to many communities even if it is technically feasible. The real cost of grid electricity supply to a rural user is higher than to an urban user, while the rural users' monetary income levels are often lower;

- low demand and low load factors due to the general state of rural underdevelopment;

- power losses in the transmission and distribution systems because of the longer transmission lines and lower load factors;

- the high cost capital of building and maintaining off-grid systems;

- a limited capacity to pay because of low levels of income in general and a lack of cash money;

- competition from traditional biomass energy sources (fuelwood, animal waste, straw, etc.) which, because of their ready availability and "free" access in monetary terms (not in human labor terms), are affordable to low-income households and are in many cases their only choice.

These limitations and problems point to the lessons learned in the last 20 to 30 years on rural electrification. These lessons call for what many analysts describe as a "new approach" to rural electrification, one that should be economically feasible and equitable, environmentally sustainable, decentralized, institutionally and technologically diverse, with greater roles for the private sector and local communities, and adapted to the low levels of rural electricity demand.[6]

2 The Role of Social Trust in Rural Electrification

What is Social Trust?

For the purposes of the energy industry, social trust can be defined as the quality of a relationship between a company and its stakeholders, where company policies, plans, procedures, actions, services, and information meet the needs, expectations, and concerns of all parties involved. Socially responsible companies work to achieve trusting relationships with their stakeholders. In a trusting relationship, the expectations of stakeholders are met in their encounters with the company. Therefore, stakeholders assume that their expectations are being met in other areas of the business where there is less public presence. Similarly, distrust based on the failure to meet expectations in one or more areas may lead to generalized distrust of the company as a whole. Social trust includes all parties in a social relationship; in the absence of trust, there is no relationship.

Trust can be diminished, maintained, or enhanced. It is incumbent on electric power companies and their stakeholders to behave in a way that reinforces and improves a trusting relationship. Good business is based on a good company-stakeholder relationship. What the stakeholders experience in their interactions with companies, and how the stakeholders evaluate these interactions, are of vital importance to the ability of electric power companies to fulfill their mission.

Social trust can facilitate and enhance the achievement of business objectives. A trusting relationship enables electric power companies to provide reliable electricity, operate efficiently, minimize risks, and fulfill legal, economic, environmental and social responsibilities with an efficient use of resources. It makes good business sense.

Importance of Social Trust for rural electrification

Many institutional, financial, social and technical factors have to be taken into consideration in rural electrification projects or programs. Social trust is not explicitly listed as a critical factor in the literature, but many projects stress the fact that trust is an essential component. The question of trust permeates many different aspects of rural electrification, as it does for social development issues in general. Social trust makes it possible for all project participants to work cooperatively to develop a viable project, for stakeholders to be effectively involved at all project stages, and for planned costs and schedules to be upheld.

Social trust binds the many participants who must cooperate to successfully plan, construct, and operate a rural electrification project. Typically a rural electrification project can involve national, regional and local governments; multilateral, bilateral or national finance or aid agencies; international, regional and local NGOs; government agencies responsible for rural and social development; local trade associations, industry cooperatives; villager associations and households.

Effective and realistic involvement of the beneficiaries and stakeholders is often identified as an important condition for the success of rural electrification projects, especially in the case of decentralized systems.[7] Mistrust among stakeholders can seriously impede effective public involvement.[8]

Social trust reduces costs and delays. It does so by encouraging the search for effective and creative solutions to two key issues: lack of investment capital and insufficient maintenance. Lack of capital or local capacity to fulfill investment requirements is arguably the main barrier to rural electrification. Insufficient maintenance–due to lack of funds or revenue, technical know-how or management–affects not only the financial viability but the sustainability of rural electrification programs and projects.

Both of these key issues illustrate the importance of social trust. Social trust enables electrical companies, beneficiaries and stakeholders to work closely in partnership to overcome the many barriers to rural electrification. Trust is a requirement for effective beneficiary and stakeholder involvement. Social trust is not only good business, but also a critical factor in successful and sustainable programs and projects

3 Lessons Learned and New Approaches

Electrification of developing countries is obviously not a new endeavor. Colonial powers started the electrification of many of their colonies in the late 19th and early 20th centuries. In many cases, rural electrification of developed countries was carried through well into the 20th century. It was achieved almost always through cross-subsidization of infrastructures. Many concerns, including environmental protection, technological diversification, and financial viability of rural electrification, appeared or were revived in the early 1970s.

It is helpful to review lessons learned in the last 20 to 30 years and consider the new approaches that have emerged more recently. The sections below focus on aspects of rural electrification that are related to social trust. The information was compiled from a literature review, consultation with key participants in E7 rural electrification projects, and the results of an E7 workshop held in Hong Kong in June 2000.

Technology

There are two main technological options for rural electrification: grid extension and decentralized systems. Both have their merits, and the choice depends largely on specific conditions. The following section emphasizes mainly the contribution of decentralized systems.

Very little energy is supplied by decentralized renewable energy systems. For example, in most Asian countries, "renewable" energy accounts for less than 1% of the aggregate energy produced.[9] The lessons learned in the last 20 to 30 years point to a renewed interest in decentralized renewable technologies and a new relationship between these and conventional technologies.

Decentralized renewable energy systems are comparable with centralized conventional systems in terms of economic, social, and environmental factors. Under certain conditions, decentralized renewable energy systems perform well economically against centralized conventional energy options. Furthermore, if the social and environmental costs of centralized energy systems are taken into account, the competitiveness of decentralized renewable energy systems is enhanced.[10]

The interest in decentralized renewable energy systems is also increased by the global warming debate. The extent to which decentralized renewable energy systems contribute to climate change reduction is in the process of being evaluated by many interested parties.

So-called "mini-grid" power systems, based on renewable energy sources, are an alternative to expanding the main grid, and have become an increasingly attractive option for several reasons:

- decrease in price of new renewable technologies;

- difficulty of expanding the main grid due to low load, low demand and dispersion of customers;

- increased willingness of international agencies to support electrification of rural areas according to the real needs of the local situation;

- greater political sensitivity to the "energy" gap of rural communities.

The advantages and disadvantages of different scenarios involving the adoption of renewable technologies and the development of mini-grids and/or central grid extensions are hotly debated. Many questions related to technical, social and economic considerations remain to be answered. The available experience in large-scale integration of the "new and improved" renewable technologies is still limited and tends to be interpreted in favor of one or the other previously chosen option.[11]

There is a growing consensus that the electricity needs of the community should drive the supply solutions and not the other way around. This calls for an adequate evaluation of electricity needs, future economic growth prospects and subsequent increase in demand, and the advantages and disadvantages of technological options for the local communities.

In order to meet community needs and be sustainable, the choice of technology and type of facilities must be carefully assessed. The following practical considerations should be taken into account in the assessment:

- The choice of the most appropriate technology should take into account the natural resources readily available such as water, wind, sun, or biomass.

- Since assisting parties will not always be present at the site after construction, local people must take over operation and maintenance at a certain point. However, if sophisticated facilities such as those in developed countries are constructed, expert engineers with high technical knowledge and expensive spare parts are required for facility maintenance. This could result in abandonment of the facilities since local people cannot keep bearing such costs in many cases.

- The generating equipment and distribution facilities should be easy for local residents to operate and utilize. Detailed design should be carried out by local engineers.

- Local materials and labor should be utilized in order to carry out construction within a limited budget and to facilitate easy repair.

- Domestic products should be favored for construction. If engineers must be called in or if spare parts must be imported for every problem however small, the facilities cannot be considered sustainable.

- The best quality available of local products and materials should be favored. The notion and benefits of quality in local construction and maintenance should also be promoted.

Public participation

The voluntary involvement of local communities and households in the planning, design and implementation of development efforts in general, and rural electrification in particular, has become crucial to rural development.[12] Meaningful public participation should be encouraged. Many studies have in fact shown that voluntary participation by local people enhanced the projects' rate of success and long-term viability.

Meaningful public participation is not without sizable challenges in rural electrification. There are important lessons learned and conditions that need to be respected so participation can be beneficial to all and enhance social trust:

- A top-down approach where participation is mandatory is not conducive to a sustainable and effective organization. Attainable, realistic objectives must be set for participation and planning of the necessary resources (time, money and personnel) for participating institutions (communities and parties involved in the effort).

- Voluntary provision of labor and other resources should be encouraged. By helping local residents better understand their potential to provide electricity by themselves, we can expect their cooperation in various aspects such as water rights, land acquisition or construction.

- When a project succeeds by its merits in convincing local communities and households that their quality of life will significantly improve, the prospect of achieving meaningful involvement by these communities and households will be much greater.

- Participation does not work or becomes inequitable if it is not based on pertinent local social structures and customs.

- Already existing and working frameworks should be used as much as possible before considering the creation of a new structure for public participation.

- Mistakes and errors by parties involved may occur. Therefore, projects should be open to modification.

- Transparency and full disclosure of the project are most important, as is adapting to cultural and educational backgrounds when communicating this information.

- Monitoring by local authorities and experts and technical assistance by third parties contribute to the sustainability of the project.

- A sustainable project should include a clear point in time where the local organization should be autonomous and left to its own social, technical and financial resources.

Institutional framework

Favorable institutional conditions are necessary to facilitate sustainable rural electrification projects–or even to make them possible, in some instances. Well-organized institutional networks, e.g. tax system, local laws, and clear administrative procedures, are central considerations to developing a good relationship between the electricity providers, the beneficiaries and other stakeholders.[13]

Project acceptance and support from local authorities is another key component. To be effective and in any way meaningful, public participation and local organization require a healthy "enabling" political environment.[14] Good governance is important. Lack of government or agency commitment to support a participatory process and a particular approach tailored to community needs is a major impediment, even a barrier to establishing the trust relationship required.

Trust between stakeholders

Trust between stakeholders can become essential. This is particularly the case when public participation is a key component in the success or failure of a program or project. Stakeholders will not willingly and fully participate if they do not trust the other stakeholders and/or the legitimacy of the process.

The very nature of rural electrification projects means that the customer and supplier are working in very close proximity, making mutual trust an extremely important issue, perhaps even more crucial than in developed countries. In rural electrification projects, electrical companies, beneficiaries and stakeholders must work closely "in partnership" to overcome such barriers as lack of investment capital, capacity to pay for services, and high maintenance costs. A good relationship between stakeholders will reduce both costs and delays.

Mistrust is often based on previous experiences. Solutions to mistrust depend on specific circumstances. They can involve small gestures of good faith to progressively instill trust, visits to successful projects, information and education, and repeated interaction to improve mutual understanding. When mistrust is deeply rooted, intermediaries can be used to bridge the gap by organizing joint meetings and discussions and other incremental steps to progressively build trust.[15]

The previously presented conditions for effective and meaningful public participation also boost trust between stakeholders or help dispel mistrust. The following practical considerations specific to trust-enhancing lessons and conditions are of first importance:

- Consideration of local residents as important players in electrification projects, encouragement of local involvement from the early stage, and gaining understanding while building cooperative relationships step by step.

- Necessity of discussion with local residents on tariff issues and the importance of gaining their acceptance and understanding of tariffs.

- When community services are involved, such as school lighting, public consultation must be adapted to allow discussions and agreements with the local community on how to share costs and ensure maintenance.

- Educating local residents on safety matters and rules for dealing with unpaid tariffs following completion of facilities.

- Gaining local residents' acceptance and understanding of the need to reserve funds for maintenance and repairs.

- For the operation and maintenance of facilities, a cooperative organization should be established with the local residents. Transparency is important in managing this cooperative, and to maintain transparency, reporting to third parties such as local government can be an efficient method.

- Training for operations, maintenance and financial management should be set up in the course of construction.

Rural electrification as part of rural development

Rural electrification not only enhances economic growth, but also opens lines of communication to local people, improving literacy and access to information with substantial social and educational benefits. Electrical energy use can serve to enhance

- agricultural machinery
- water pumps for farming irrigation and household needs
- household lighting and cooking
- household telecommunications
- medical resources

However important these benefits are, to be economically sustainable, rural electrification programs and projects generally need to be part of a rural development plan for other infrastructure, equipment and resources.

Including rural electrification in rural development involves a series of practical considerations. For example, infrastructure development efforts have a better chance of being successful in communities or areas where where economic development has already taken off and infrastructure is adequate, or where these conditions will emerge within a relatively short time.[16] The development and electrification of income-generating activities such as the construction of certain components of the electrical system (poles for example), maintenance enterprises (Energy Service Companies [ESCOs]), household shops and rural enterprises clearly identified and built into the project design are also increasingly common.

Until recently, rural electrification policy was closely linked to that of rural development and was strongly influenced by social development and welfare objectives. In keeping with the desire to ensure the basic energy needs of rural communities, governments stressed social rather than financial or economic criteria in assessing the feasibility of rural electrification programs and projects. However, rural electrification has not always performed well–even with subsidized rates–insofar as it tends to favor those with greater financial means and impinges upon the welfare of the local people who are less well off financially.

Today the question of electricity pricing is still being vigorously debated, and the balance between social development and economic objectives is not easily reached.[17] A "lifeline" rate offered to low-income consumers who consume minimal amounts of electricity is also generally considered a possible strategy. However, that rate should not go beyond the project budget for financial sustainability.

Economic and financial sustainability

For rural electrification to be financially feasible and sustainable, electricity prices and/or the financial set-up should cover at least infrastructure maintenance and reconstruction costs. This usually means higher tariffs than currently in effect. Costs need to be reduced by new designs and a closer collaboration between stakeholders.

Tariffs that match the economic capabilities of the local people have become a central component of electrical infrastructure sustainability. Projects need to be examined more closely to determine whether a decentralized approach is more feasible than expansion of the existing grid system.

Environmental sustainability

Environmentally sustainable rural electrification should mean that appropriate locally available energy resources are taken into account and compared against main-grid extension. Some capital subsidies for the most recent environmentally friendly (renewables such as wind, micro-hydro, solar) and decentralized technologies are generally considered appropriate. Utilizing locally available energy resources is often a more feasible option than importing fuels into local areas.

Decentralized management

Decentralized management of rural electrification systems can be important in order to be able to adapt to local circumstances. There are many decentralized schemes which use greater or lesser involvement of rural communities in the design, implementation and management of the electrical infrastructure. Voluntary and meaningful involvement of local communities has many advantages.

In general, rural electrification projects are relatively small and do not benefit from economies of scale. Electricity companies and private business entities are less likely to be interested in these types of projects. Therefore, local communities may be responsible for operating rural electrification schemes, but they may not be equipped with the necessary experience and know-how. The way in which the decentralized system is organized is key to the success of rural electrification.

The introduction of additional stakeholders such as local cooperatives and NGOs and the growing presence of private utilities have influenced recent approaches to rural electrification. Cooperatives and private companies need training and financing or financial guarantees which in many countries can only be obtained from the state or with the latter's financial support. Government sustained efforts to support these bodies and acceptance by governments of rates that cover the full cost of quality service and expansion are core issues to future development in rural electrification.

4 Social Trust Guidelines for Rural Electrification

In this last section, suggested guidelines for social trust dimensions of rural electrification are provided mostly in bullet form.

Social trust principles for the electricity industry are restated as the foundation for the development of specific rural electrification guidelines. General rural electrification guidelines are then proposed, followed by specific guidelines, tools and techniques organized by project cycle: planning, design, implementation, operation and maintenance and replacement.

The guidelines are meant as recommendations and suggestions for including social trust aspects in rural electrification. In doing so, we must emphasize flexibility, since every situation is unique. The successful implementation of any single guideline will depend on the specific geographic, cultural, social, economic and political context. It is our hope that this document will provide assistance for handling a variety of settings, stakeholders, and industry organizations and contribute to the improvement of future rural electrification projects.

General Guidelines

Based on the previous sections' review of issues, trends, lessons learned, and new approaches, the following general social trust guidelines for rural electrification are proposed:

- Provide training in technical and interaction skills with beneficiaries and stakeholders involved in rural electrification.

- Encourage and sustain learning activities aimed at drawing on-going lessons on rural electrification and disseminating them through workshops, meetings, etc.

- Make sure clear and impartial rules are set for providing electricity (payment, repairs, etc.).

- Provide project beneficiaries with adequate information to allow them to fully understand and support the rules.

- Approach each project with equal fairness and transparency.

- Establish impartial procedures of conflict resolution and compensation.

- Promptly identify and address the concerns of those potentially affected.

- Demonstrate a willingness to modify project components to accommodate local needs, priorities and cultural differences.

- Be sensitive to local customs and existing activities when planning the project's different activities (information, participation, etc.).

- Encourage voluntary and meaningful stakeholder involvement.

Additional Guidelines for Project Planning

- Establish transparent site and community selection criteria based on national policies and programs.

- Identify development objectives and priorities together with stakeholders.

- Encourage local community and stakeholder involvement in establishing project goals and choosing the appropriate technology.

- Involve stakeholders and potential beneficiaries in assessing needs and priorities as well as the willingness and capacity to pay.

- Discuss tariff issues with local residents and the importance of gaining their acceptance and understanding on tariffs.

- Transparency and full disclosure of the project is most important as is taking into account cultural and educational backgrounds when communicating this information.

- Provide adequate information as early as possible to local communities and stakeholders about the project, eligibility criteria, and required procedures.

- The role, responsibilities and obligations of the electricity provider, the beneficiaries and other stakeholders should be considered.

- Mistakes and errors by parties involved may occur; projects should therefore be open to modification.

- Foster partnerships with stakeholders and local communities to maximize project benefits and integration with existing rural development strategies.

- Provide the assistance and training needed to enable local communities to participate in project design, construction, administration, operation and maintenance.

Additional Guidelines for Project Design

- Design the project to maximize local involvement and benefits.
- Tailor the project to the regional context and community needs.
- Take into account stakeholders' concerns and incorporate them in the design wherever possible.
- Keep communities and stakeholders informed about decisions throughout the project.
- Seek local community and stakeholder support and approval to design a sustainable project.
- To be effective and equitable, local community participation must be based on pertinent local social structures and custom.
- Existing frameworks should be used before considering the creation of a new structure for public participation.
- Make sure that the final project design is consistent with the needs and priorities identified by local communities and stakeholders.
- Local engineers should be entrusted with the detailed design.
- The generating equipment and distribution facilities should be of a type that is easy for local residents to operate and utilize.
- Choose proven, robust and easily available technology that allows maximum local input in construction and maintenance.
- Develop stakeholder partnerships that foster a better understanding and agreement of each party's responsibilities and obligations.

Additional Guidelines for Project Implementation

- Support local development projects and measures.
- Develop local capacity through project construction.
- Voluntary participation through labor and otherwise should be encouraged.
- Domestic products should be favored for construction.
- Use local materials for construction.
- Award contracts through a transparent, clearly defined procedure.
- To maintain the sustainability of the project, on-the-job training at the onset of construction is recommended.
- Inform stakeholders and communities of the rules, rights and obligations of each party.
- Assure site monitoring and establish a contingency plan.
- Assure on-site health care for workers as well as a safety training program.
- Maintain environmentally sound construction practices.
- Make sure that contractors are aware of company policies towards communities and stakeholders.
- Monitoring by local authorities and experts and technical assistance by third parties contribute to the sustainability and fairness of the project.

Additional Guidelines for Project Operation and Maintenance

- Maximize local involvement in long-term maintenance and operation.
- A sustainable project should include a clear point in time where the local organization should become autonomous.
- Develop a clear fade-out plan, and implement it with local community and stakeholder involvement.
- Encourage, when appropriate, the creation of a cooperative organization with local residents for the operation and maintenance of facilities.
- Inform the local residents of the benefits of reserving funds for maintenance and repairs.
- Inform the local residents about tariff matters after the completion of the project.
- Make the local residents aware of safety matters.
- Involve stakeholders in an assessment of the project's performance: technological, maintenance, operations, management and financial viability.
- Assess beneficiaries' satisfaction, payment compliance and adaptation to the introduction of electricity.
- Discuss and agree with stakeholders on necessary adjustments and their implementation.
- Provide follow-up training for capacity building as needed.

Notes

1 The definition of "rural population" varies from one country or organization to the other: in some cases it refers to villages and households in agricultural regions, and in other cases to villages of 1000 inhabitants or less. For the purposes at hand, we will not try to define what constitutes the "rural population" in each case.

2 For a discussion of needs, see below.

3 World Bank Internet document, Rural Electrification Guidebook.

4 Kamani, Reddy, Islam, ed., "Rural energy planning approach to rural electrification" (Asian and Pacific Development Centre, 1995), Introduction, p. 3.

5 Ibid.

6 Industrial and Energy Operations Division, Country Department III, East Asia and Pacific Regional Office, "Indonesia Second Rural Electrification Project" (World Bank, 1995), p. 10. These hopes have to be tempered by information in some projects-for example, in many photovoltaic programs-because the limited capacity of such equipment does not permit all of the community's needs and aspirations to be met.

7 World Bank Internet document, "Rural Energy and Development for Two Billion People" (1999).

8 K.V. Ramani, "Rural electrification and rural development" in Rural Electrification Guidebook (Asian Institute of Technology, 1992).

9 J.R. McCracken, ed., "Participation in Practice," (World Bank, 1996).

10 Kamani, Reddy, Islam, ed., "Rural energy planning approach to rural electrification", (Asian and Pacific Development Centre, 1995) , p. 136.

11 K.V. Ramani, M.N. Islam, K.N. Reddy, "Rural energy systems in the Asia-Pacific. A survey of their status, planning and management," Regional Overview and Country Profiles (APDC, 1993).

12 A good example of this is the debate during the UNDP-ESMAP. See "Rural energy and development roundtable," Report #202/98 (May 1998).

13 World Bank, "Report on World Development 1994."

14 D.M. Freemna, M.L. Lowdermilk, "Middle-level organisational linkages in irrigation projects" in Putting People First (Oxford University Press, 1991).

15 D. Narayan, "The contribution of people's participation evidenced from 121 rural water supply projects" in J. Rietergen-McCracken, ed. "Participation in Practice," World Bank Discussion Paper #333 (1996).

16 ESD, World Bank, "The World Bank Participation Sourcebook" (World Bank, 1996), Preface, pp. 129-130.

17 "Rapport sur le developpement dans le monde, Une infrastructure pour le développement" (World Bank, 1994) and "Rural energy and development roundtable" UNDP-ESMAP, Report #202/98 (May 1998).

In practice, these conditions excluded many rural regions. A more socially inclined strategy would involve the development of (limited) electricity capacities even in economically marginal communities. The argument is that this step can "unlock" the social and economic development of these communities and permit them to reach a situation where viable infrastructure improvement is possible. It is the familiar "chicken and egg" dilemma, i.e. does infrastructure create development or is it economic development that allows infrastructure. It seams clear, however, that this socially inclined strategy involves more risk and longer lead times to attain levels of development that allow a sustainable rate of return on the power facilities–rates that at least pay for equipment maintenance and replacement. The risk should not be so great as to drain the utilities' capacity to develop the more economically developed communities, respond to the increase in demand in the already electrified regions and reach acceptable rates of return.

18 The heated debates at the UNDP-ESMAP roundtable are a good indication of the present uncertainty around this question. See UNDP-ESMAP, "Rural energy and development roundtable," Report #202/98 (May 1998).

For further information please contact:

Secretariat
E7 Network of Expertise
for the Global Environment
1010 St. Catherine Street West
6th floor
Montréal (Québec) Canada
H3C 4S7

Tel.: (514) 392-8876
Fax: (514) 392-8900

Email: e7secretariat@hydro.qc.ca

Web: www.e7.org

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