Projects and Financing Issues for Rural Electrification in the Developing Countries

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Abstract—When it comes to rural electrification projects in developing countries, financing and project development are two of the main obstacles that have to be resolved in order to sustain long term successful and productive outcomes. In this paper, a number of approaches related to project finance and construction have been analysed, mainly focusing on issues connected to the countryside. Also, a number of financial aspects, as well as financial institutions and organisations, with their resources and structures, have been discussed, whenever they are relevant to rural electrification projects. The broad analysis provided in this paper is for the purpose of exploring projects and their finance within the developing countries, specifically for the purpose of providing electricity where it lacks or shortage is the main development issue.

Index Terms—Construction, Developing Countries, Financing, Projects, Rural Electrification.

I. INTRODUCTION

According to the World Bank Independent Evaluation Group (IEG) [1], rural electrification projects do not receive priority allocation for funding in some of the developing countries, as these governments believe that there are other more urgent priorities, such as drinking water, health issues and roads which need to be addressed first. For this reason, and according to the same source, rural electrification projects, such as those implemented in Asia, have high cost with fewer benefits than the objectives outlined initially. The financing issue, therefore, is a major challenge in implementing and speeding the construction of rural electrification projects. In many parts of the world, rural electrification is mostly financed from the public funds, i.e. it is part of governmental schemes usually implemented via organisations such as rural electrification agencies and power utilities. In some cases, the private sectors provide the finance needed [2]. When it comes to the process of financing for rural electrification, a variety of different approaches have to be taken into account; mostly they are unrelated to each other in the context of operation, i.e. a project providing electricity will examine not just the availability and cost of energy resources but also the social, agricultural and infrastructural aspects of the rural community. This kind of diversity within the project scope can make it difficult to achieve overall satisfactory results. Financing rural electrification projects can have other negative aspects, in that the low population density of the rural community (i.e. low consumption), difficult terrain, low income and the need for subsidies make it an unattractive venture for investments. The process of obtaining project finance starts with the power utilities approaching an Aid Agency, usually via one of their governmental organisations [3]. The agency will examine the proposal and the initial approval will lead to the project evaluation. The money offered by the agency can be either in the form of a grant or interest free loan, or both at the same time. There are of course certain terms, conditions and guidelines which Aid Agencies and governmental organisations insist upon before such funding can be made available. Depending on the above conditions, the purchasing of the hardware can either be from the country where the funds originally came from and/or purchased locally in order to support the local economy. In most cases, the donor country will be the place for selling the plant equipment in order to support their own industries, while at the same time, the aid recipient will benefit from the proposed project [4].

II. PROJECT STRUCTURE

It is very well known that lack of electricity in rural areas can be linked directly and indirectly to a variety of problems, such as deforestation, health care, and scarcity of enterprises (leading to unemployment). In order to provide a platform for financial support to any project, but particularly for a rural electrification project, a sound structure should be in place in the form of practical steps alongside the launching of an application for financial support. To help achieve the above, the basic structural approach, can be summarised in the following points: 1. Availability and accuracy of various facts and figures related to the proposed location; 2. The type of primary energy source that will be used; 3. The importance / urgency of electrification for the local community; 4. Availability (or creation and/or development) of credit schemes; 5. Proposed phase plan and
III. PROJECT ASPECTS

The main headline of the proposed business plan can be summarised as follows:

A. Project’s identification: This is mainly related to the objectives, management and experience available.

B. Project Plan: i. An outline of the project and related technology; ii. Date of implementation; iii. Description of the service being offered; iv. Agreed location; v. Equipment needed and infrastructure of the project; vi. Human and local resources.

C. Aspects related to marketing: i. Overview of the market; ii. Customers market segmentation; iii. Promotional plan, and initial estimate of the service including present and future demand; iv. Possible present and future competition in the form of price and regular supply; v. Estimated power capacity and market share.

D. Financial Aspects: i. The overall total cost of the project; ii. Estimated fixed assets; iii. Estimated revenue from the project in term of sales and revenue stream sales; iv. Estimated internal rate of return; v. Risk assessment in the form of exchange rate, local and national regulations and policy, interest rate, and customers power contracts / agreement; vi. Estimated other types of sources of finances such as: grants - concessional and multilateral; vii. Estimated cash flow related to maintenance cost, possible future purchases, service, default of end-user payment and other uncounted aspects which may affect the cash flow.

E. Technical Aspects: Deciding on the best option whether or not to use local/national or international devices / equipment; i. Is it possible to assemble components locally? iii. Factors and requirements for the installation; iv. New or second hand equipment, and if it is the later, then the operational history should be known; v. Availability of skilled human resources for monitoring the project; vi. Spare parts and maintenance requirements.

F. Operational Aspects: Method of charging for the service provided to the customer; ii. Costs related to transaction; iii. Relevant information for the end user and customer’s service guarantees/warranties; iv. Method of payment for the service provided; v. Standard level of payment; vi. Details of procurement and the way components need to be assembled; vii. Agreed policy on how to deal with defaults on loans and the conditions related to repossession; viii. Training local community on how to operate the proposed system(s); ix. Local ‘financial’ personal which can be used in dealing with customer finance; x. Method related to the sales, installation and service.

The above are basic outlines which can be applied to any project, as a mean of providing an estimate of the possible financial cost and how it can be adjusted during the process of implementation. Focusing on developing countries, around two decades ago, the published report ‘Electricity system performance: options and opportunities for developing countries’ [5] pointed out that a number of factors such as social, economic environment, financial and technical aspects should be dealt with in order to be able to measure any tangible result and performance of the electricity supply. The above factors can be still applied today, regardless of the percentage weighting of importance for each factor in a particular developing country, as well as regardless of how fast or slow these factors changes with time. The biggest obstacle to some developing countries providing faster structural development for the purpose of providing electricity is widespread corruption. Privatisation and corporatisation of the power utilities will be needed in order to reduce some of these obstacles, which are constantly hindering rural electrification progress.

IV. STAGES

During the early programme implementation course, seminars are important for reviewing issues connected to the proposed project model. The seminars should examine the challenges ahead as well as the opportunities and benefit which may arise during the work on the project. In addition to analysis of the programme management in general and financial aspects in particular, the marketing aspects (assessment) should be taken seriously throughout the period working on the project, and beyond, i.e. including the usage of data predicting future market situation and inclination. Detailed and well researched rural electrification policy should be completed before the actual starting of any large project in rural areas [6][7]. The initial steps taken, therefore, should lead to the eventual preparation of an indicative rural electrification master plan for the proposed project. Practical measures and stages may include the following [8]: 1. Collecting information on the current status of power supply and generation capacity in close by areas; 2. Identification of a rural area as a priority case; 3. Further research/study/survey of the location should be carried out to establish the priority needs of the local population; 4. Data obtained from point 3 above should be used to develop a plan for the construction and/or development (e.g. extension of on-grid and off-grid electricity supply); 5. Assessing sources of energy supply, including the capacity, the engineering and technical feasibility, the operation of the system and maintenance; 6. Assessment of possible future demand, including long term strategies for the classification and further progression of rural electrification nearby and/or in different parts of the country, if they are relevant to the present work; 7. Locating possible unforeseen needs/problems and strengthening the overall project capacity to make sure that there is a long term sustainable approach for the present and future electrification of the region; 8. The promotion of the private sector within the local community and beyond; 9. Risk analysis/risk mitigation; 10. Call for tenders.
V. THE PROCESS

A number of approaches, such as those mentioned above, have to be considered from different angles before a final decision can be made on the final allocation of the funds. This kind of diversity within the project scope, in relation to the special features of a rural electrification scheme, can make it difficult to achieve overall satisfactory results, in general, especially when trying to involve the private sector. As an example, India’s public finances, the Indian governmental source of finance and mechanism available for financing projects could follow either: 1. A traditional method where the state government provides the funding - either from the available development funds or 2. The state government may provide the finance via governmental official borrowing (Central Sector Projects). The above will be the starting point, in that the office of the government development budget, as well as the office dealing with the official borrowing, will deal with the financing aspects. The official borrowing office deals with multilaterals, bilateral, commercial banks and suppliers’ credit. Both methods will end up dealing with the power utilities, where a power project, among other projects, will be dealt with according to priority and cost. Therefore, a financing process may start with the power utilities approaching an aid agency, via one of their governmental organisations.

VI. TECHNICAL ISSUES (OFF-GRID SYSTEMS)

In a developing country, an off-grid system can benefit the village community in a number of ways, such as: 1. For varieties of purpose related to water pumping used within a village and/or farming environment; 2. Generation of electricity for lighting, heating and cooking; 3. For agricultural processing tasks winnowing, threshing, grinding and for getting rid-off saline water (pumping).

TABLE 1
Technologies for Distributed Generations Using Fossil and Renewable Fuels (Redrawn and edited from Ackermann T., et. al., 2000[8])

<table>
<thead>
<tr>
<th>Technology</th>
<th>Typical size per module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined cycle gas Turbine</td>
<td>1–100 MW</td>
</tr>
<tr>
<td>Internal combustion engines</td>
<td>5 kW–10 MW</td>
</tr>
<tr>
<td>Combustion turbine</td>
<td>1–250 MW</td>
</tr>
<tr>
<td>Micro-Turbines</td>
<td>35 kW–1 MW</td>
</tr>
<tr>
<td>Small hydro</td>
<td>1–100 MW</td>
</tr>
<tr>
<td>Micro hydro</td>
<td>25 kW–1 MW</td>
</tr>
<tr>
<td>Wind turbine</td>
<td>200 Watt–3 MW</td>
</tr>
<tr>
<td>Photovoltaic arrays</td>
<td>20 Watt–100 kW</td>
</tr>
<tr>
<td>Solar thermal, central receiver</td>
<td>1–10 MW</td>
</tr>
<tr>
<td>Solar thermal, Lutz system</td>
<td>10–80 MW</td>
</tr>
<tr>
<td>Biomass, e.g. based on gasification</td>
<td>100 kW–20 MW</td>
</tr>
<tr>
<td>Fuel cells, phosphoric acid</td>
<td>200 kW–2 MW</td>
</tr>
<tr>
<td>Fuel cells, molten carbonate</td>
<td>250 kW–2 MW</td>
</tr>
<tr>
<td>Fuel cells, proton exchange</td>
<td>250 kW–2 MW</td>
</tr>
<tr>
<td>Fuel cells, solid oxide</td>
<td>250 kW–5 MW</td>
</tr>
<tr>
<td>Geothermal</td>
<td>5–100 MW</td>
</tr>
<tr>
<td>Ocean energy</td>
<td>100 kW–1 MW</td>
</tr>
<tr>
<td>Stirling engine</td>
<td>2–10 kW</td>
</tr>
<tr>
<td>Battery storage</td>
<td>500 kW–5 MW</td>
</tr>
</tbody>
</table>

There are of course other applications which should be considered as well, in particular when there is the need for stable and regular energy supply to help local businesses and their local industries. Higher power of electricity output will be needed in situations like these, and consequently, the cost can be higher than the cost of the applications mentioned above.

6.1. Important Factors

From a large number of ‘distributed generation’ (DG) research project sources, the following points have been selected and summarised as the key factors which should be considered before and during the work related to any DG technology project in a rural area of a developing country:

1. Present and future level of energy need for the community; 2. Procurement cost and cost of maintenance; 3. Short and long term benefits; 4. Type of energy source required; 5. Type of DG technology needed; 6. Health issues; 7. Security issues (e.g. vandalism/theft); 8. Ownership; 9. Location; 10. Possible future connection to the main grid; 11. Main purpose for installing the system; 12. Mode of operation; 13. Rating of the DG system; 14. The socio-economic conditions in relation to the local population; 15. Training and skills needed for the system operation and maintenance.

6.2. Examples of DG Technologies

The rapid expansion and development of DG technologies (Table 1) has provided a wide variety of choice, regardless of the size of the project or the geographical location. Since some of the technologies on the market are still in their early stages of development, the quality and specific requirements is still far from certain. This is why data feedback from current and previous projects in this field is vital in further developing these devices in order to meet specific requirements, on long term basis. These developments can focus on those presently considered as a ‘complex system(s)’, such as a hybrid power system. Most of these systems, usually constructed in a rural area with limited resources, are in constant needs of new ideas, economical design approach and flexibility in regard to local resources and for the protection of the environment.

6.3. Problems

Apart from the problems related to geographical isolation, the following difficulties can arise during and after the operation of a DG system: 1. Lack of local technical help; 2. In many cases, there is no back-up system; 3. The high cost of repairing and/or device parts replacement; 4. The imported device standard may differ from the local/national device standard; 5. The time factor, i.e. it may take long time to send or receive new parts or replacing/repairing faulty parts; 6. Whether or not to choose national or imported equipment; 7. Price fluctuation (e.g. fuels, devices, labour, engineering and technical support); 8. Needed financial support may not be available for the local community during the life-span of a system; 9. Installing metering system (or pre-paid metering system) can be important for the success of the project and will reduce problems (and save time) with the local customers in
relation to payments for their electricity usage.

6.4. DG Barriers

By investigating three main important aspects, barriers to DG can be reduced. These three main points can be applied to DG regardless whether they are connected to the main grid or not: 1. Technical barriers; 2. Business practice barriers; 3. Regulatory barriers.

The technical barriers are related to the need of uniform standards, interconnection and power control. The business practice barriers are related to the need of adopting standard commercial practice, business terms for interconnection, and tools to determine the value and impact of distributed power at any point on the grid. The regulatory barriers are related to tariffs and utility incentives to match with DG, conditions/terms to interconnect, regulations compatible with DG for competitive and utility market and the establishment of dispute resolution for DG projects. DG can be a threat to the current business model, i.e. the increase of DG penetration means decrease in revenue for existing main power stations and that in itself is a barrier for the expansion and/or the development of DG network systems.

VII. Financing Issues and Barriers

Financial institutions, especially the large multilateral and bilateral development banks, can be complex to deal with, hence, the following barriers associated with these institutions can be summarised in the following points [9]: 1. Obtaining finance from some of the development banks can be a complicated and long process; 2. Financing institutes may view the majority of the projects as small in size and, at the same time, face high transaction costs for investment preparation and financing; 3. Many of the large international finance providers deal only with national governments (or their representatives) and/or with projects where the national government is involved; 4. The majority of the financial institutions have their own set of conditions, regulations, and guidelines which should be met before the proposed application for finance can be processed fully; 5. If the system or technology used in the proposed project is not fully accepted/established (e.g. unfamiliarity with the technology/high risk) by the present market and/or not yet fully proven, then the financing may not be possible; 6. Future returns on the loan and high profitability may not be an incentive to the lender if the requested finance is not large enough; 7. In certain situations, competition to obtain a grant or loan from limited funds could make the process for project financing much harder, especially if not enough research and preparations were done before presenting the case for finance to a public and/or private financial institution. In addition to the above, there is another obstacle in accessing finance for rural electrification in that potential customers expect their electricity supply to be similar to those in urban areas, i.e. similar to those obtained from a centralised electricity supply, which, of course, may not be the case. This kind of expectation has been confirmed by the UN Department of Economic and Social Affairs (Division for Sustainable Development) in their report titled ‘Case Study of a Successful National Energy Programme/Strategy: Rural Electrification from Renewable Energy and from Other Sources’.

VIII. Solutions

The solution to the barriers mentioned in the previous section can be outlined in the following points: A programme which can deal with structural adjustment and energy reform; 2. Privatisation of public energy utilities; 3. In certain cases, the removal of subsidies. However, when it comes to the laws and regulations of a particular developing country, there are a number of points which should be dealt with within the board of management of the project. At the same time, these points should be also raised in relation to project finance and implementation [10] [11]: 1. Funds for the rural electrification should be regulated within the legal framework of the country where the proposed electrification project will be implemented; 2. More effective and wider responsibilities for the government ministry (or ministries) in charge of energy issues; 3. Representations from various governmental, private agencies as well as from those offices dealing directly and indirectly with the proposed project should be included within the financing approach; 4. In addition to being accountable and transparent in their day-to-day function, their work itself should be accomplished on a commercial basis rather than institutional/governmental rules; 5. To attract funding, project operational tasks should be fully in the hand of the chief executive of the project (this kind of procedure will make it easier in obtaining further funding for the proposed project); 6. International laws and regulations should be an essential part of the policy and financial implementation; 7. The private sector and local institutes/organisations should be involved, in particular when aiming for a long term solution; 8. Active financial cooperation between the public and the private sector is necessary; 9. Financing for renewable energy (RE) projects should be considered on the basis of the size and the requirement related to the project, i.e. in some cases, large to medium size projects are usually connected to the main grid, where commercial companies (or independent power producers) operate. 10. Financial risks noticed by the investors for projects are in the form of credit record, which these new projects do not posses; neither they have experience in the field, compared to well established larger power suppliers (credit guarantees by the government, in such cases, will be needed as part of the solution to attract further funding); 11. Concessions are necessary from the local and national government to private investors and cooperative organisations - in order to encourage investment in small projects – which can in the form of tax relief, according to the amount of financial investment provided and the actual implementation for each stage of the project. 11. Introducing reliable long term RE/Off-grid national and local policy by individual countries will make investment in the above field more attractive and less risky; 12. Political stability (in regard
to what has been termed as fragile states) in developing countries is vital for attracting the finance needed, as well as for the purpose of implementing and developing rural electrification projects successfully in these countries [12].

IX. FINANCIAL SCHEMES

Financial schemes differ from one country to another, as does the percentage of adult population who are able to have access to financial institutions. More than half of the population in some countries, such as Mexico, China, Brazil, Egypt, India and Indonesia does not have access to financial services. Russia, Korea and Thailand, have access to financial services between 40% - 50% of the adult population [13]. This, of course, could depend on the ability of the potential customers in meeting their bills, the availability of the credit schemes such as banks and indigenous organisations and the availability of soft loans and/or grants. According to IEA, (2004) [9], financing for off-grid projects can be made via main three different sources of finance: 1. International concessionary financing; 2. National development financing; 3. Commercial financing.

Point 1 - covers a variety of international financing multilateral development banks, where loans or grants can be made available for rural electrification projects and other areas of national and local development, mainly for the purpose of reducing poverty. Loans can be provided in the form of 'soft' loans, subsidised or loan offered at a commercial rate. The above banks can also provide guarantees where other venues of financing have been approached. Point 2 - A budget allocated for national and local funding can be the source of finance for new and established development projects. The majority of development projects, including rural electrification projects, can be financed wholly or partly from the above budget. International funding institutes may contribute to finance as well, in partnership with the local and/or national government. Point 3 - Sources of finance can be obtained from commercial banks if and when convincing presentations have been made to the bank for future high profit return. These banking institutions with large financial resources can be available at various levels, i.e. locally, nationally and internationally.

X. FINANCING STAND ALONE (OFF-GRID) SYSTEMS

Generally speaking, the off-grid lending programme in developing countries can only be successful if there is an established partnership between the energy business and the lending body (e.g. microfinance institution). There are hesitations (or even outright rejection) from various lending organisations when the issue is raised concerning borrowing money for an off-grid electricity project. This is because the project may not be a familiar thing to the financing body concerned and, consequently, a negative response can be the norm. For this reason, other supporting incentives should be in place when approaching a lending institute, e.g. guarantee or partial risk guarantee should be offered to the lender in order to reduce possible risk [14]. Referring to the Indian financing approach mentioned previously as an example, the focus of Special Projects Manual - according to MME, 2009 [15] cited IEA1, 2010 [16] - those alternative electricity sources, i.e. other than from fossil fuels, receives 85% of the electrification costs, i.e. grants, while the rest (15%) will be financed by the company providing the electricity. The total funds released are in accordance with the timeline. In regards to renewable energy off-grid projects, there are additional difficulties for obtaining finance when renewable energy projects are discussed, despite the fact that there is little difference between financing a project for rural electrification where fossil fuels are the main source of energy or renewable sources. This is due to three main reasons associated with: A. Policy; B. Finance; and C. Institutional issues.

According to Siegel J., 2006 [17], the financial aspects related to RE can range from limited access to equity, lack of bankable projects, transaction costs, and availability of local banker lending for RE, as well as the difficulties in obtaining grants from donors/countries when RE projects are discussed. At the same time, according to the same author, there are other aspects influencing financing RE projects, such as institutional issues, i.e. the lack of capacity to develop, implement and operate RE projects, in addition to the energy links to other sectors. Siegel also mentions policy issues, such as policy bias toward fossil fuels, artificially low end-user prices by utilities, inappropriate or absent regulatory frameworks, the deregulation of energy sector and lack of policies for supply to rural areas.

The variety of research conducted on how to implement and develop RE in rural areas in developing countries and the citation of social, technical, economical and institutional factors, indicate that the main major obstacles for the RE is the lack of finance in backing RE projects; insufficient acceptance of RE, lack of standard and capacity, i.e. not many businesses operate electricity systems with renewable resources; lacking of needed infrastructure; majority of entrepreneurs do not have the necessary skills, the high initial costs of photovoltaic systems which can make it beyond the financial capability of the poorer section of the community; the unavailability of technical and related information concerning renewable energy sources such as the absence of reliable solar radiation data, as well as the scarcity/availability of RE hardware on the market; no formal technical standards, in particular for photovoltaic equipment and components, nor the availability of instructions for installing and maintaining photovoltaic systems; lack of instructions on basic operation and maintenance and, finally, lack of project developers in this field [18]. However, the following points can accelerate the financing prospect for renewable energy rural electrification projects: 1. Financial incentives in the form of grants, tax relief / exemption, subsidies, project priority consideration / allocation and support; 2. Financing and making available RE hardware in the local market; 3. Financing training schemes for the local population for various aspects connected to RE, including awareness raising programme; 4. Creating, supporting and monitoring local credit schemes directly
involved with RE projects. In general, the question is how to finance a rural electrification project, in particular RE projects. According to Kalra, et.al, 2007 [19], the main funding for rural electrification can be sourced from: A. Corporation specialised in rural electrification projects; B. Plan allocation to the states; C. Direct Funding from government (e.g. in the form of loans or grants); D. Commercial banks; E. International finance institutes.

In regard to point C, steps should be introduced for a host of financial incentives, as was the case with the Indian government recent policy as a way to encourage companies and local population using RE sources and systems. Some of these incentives are summarised in the following points [20]: 1. During the first year of system installation there will be 100% accelerated depreciation for tax purposes; 2. Lower import tariffs for remaining hardware and parts; 3. There is a five-year tax holiday for power generation projects; 4. Power where generated via RE system and fed to the grid, the government will provide ‘remunerative price’ under alternate power purchase policy; 5. Banking facility plus wheeling of power; 6. Subsidies and/or financial incentives for expensive renewable energy devices.

XI. SOURCES OF FINANCE FOR RURAL ELECTRIFICATION

11.1. UN (United Nations)

Despite the constant UN budget deficit, UN funds for rural development contributed to various development projects, including those connected directly and indirectly with rural electrification. In fact, the majority of UN departments in one way or another contribute to poverty reduction in the form of financial schemes, mostly allocated to developing countries. These financial schemes include funding for rural electrification projects. Financing tools and approaches to fund and support RE projects by the UN have been presented in various forms, such as the Sustainable Energy Finance Initiative (SEFI) by UNEP.

UN sources of possible finance for rural development projects may include: A. UNCDF (United Nations Capital Development Fund); B. UNDP (United Nations Development Programme).

11.2. The World Bank

As a service provider for the developing countries, the World Bank usually functions in the following banking fields: 1. International Bank for Reconstruction and Development (IBRD); 2. International Development Association (IDA); 3. International Finance Corporation (IFC); 4. Multilateral Investment Guarantee Agency (MIGA).

The IBRD usually works with credit-worthy poor countries, as well as with middle income governments. Part of the IBRD service is to provide loans, guarantees, analysis, and advisory services. The IDA provides grants and interest free credits by working with a number of governments in underdeveloped countries (around 81 countries). The IFC provides loans on a long term basis as well as advisory services, risk management and guarantees. The bank usually works with the private sector in the form of investment in the poorest countries. The MIGA provides insurance (e.g. political risk insurance) as a protection related to noncommercial risks for the qualified foreign investors, as well as for the commercial banks for the purpose of investments in these countries. The World Bank provides financial support related to a variety of renewable energy projects around the world. For example, two renewable energy projects in South East Asia to provide electricity for more than 10 million households in Indonesia; and electricity for more than half a million people in Bangladesh [21]. In a similar way, the World Bank has provided financial help in the forms of loans to finance a number of projects, many related to the energy sector in general and rural electrification in particular, such as those projects connected to RE sources [22].

11.3. Cooperatives Organisations

A variety of different types of services are provided by cooperative organisations. These services can range from housing, agricultural, health and social, consumer, worker, and financial services. The financial services provided by cooperative organisations are prevalent across the globe, in that the developed and developing countries find this kind of organisation a source of important services provider to their communities. Generally speaking, financial cooperatives are locally based and privately owned, i.e. the association is the property of the cooperative members. The voting rights are based on membership, instead of the value of the shareholding. Also, as the set-up of the cooperative is based on a group of people working together, the benefit is only to their own members, rather than the customers. According to the World Bank [23], financial cooperatives within the developing countries were not always successful. One of the reasons is attributed to political influence, as these organisations are used by governments ‘for their own purposes’. However, financial cooperatives within the rural areas in the developing countries have managed to operate successfully, regardless of the origin of support they have received, i.e. governmental or donors support [23]. Cooperative organisations around the world have large market shares, for example, in Western Europe there are around 11,000 cooperative banks, with 56,000 branches and more than 33 million memberships [24]. These kinds of figures contrast with the cooperative financial organisations in the developing world, in particular in rural areas where these financial services are badly needed. The structure of cooperatives and their formation usually born out as a result of lack of interest from investors (public and private), i.e. the need by the local community for a service (or services) has provided the momentum to form cooperative organisations. This is exactly what had happened in different parts of the world. For example, during the first quarter of the 20th century, many of the electric utilities were not interested to invest in the countryside to provide power supply for the local population in the USA. As a result, cooperatives were formed for the purpose of providing electricity for every home in the rural areas. As a result, the ‘Rural Electrification
The above organisation cooperated with the local population for the purpose of forming ‘Electric Cooperatives’ for a wider plan, i.e. to provide electricity for the whole of rural USA.

11.4. Micro-Financing

Microfinance started during the 1970’s in Bangladesh as a means to provide for the poorer community, who may be excluded by conventional financial institutions, financial services, such as loans and saving facilities (Minimal appraisal of borrowers and no collateral demand) in addition to advice and consultations. Microfinance has been established as one way in dealing with poverty alleviation. One of the reasons which made microfinance a successful financial organisation, in particular within the developing countries, is that the established financial institutes can only reach around 25% of the average population, while the rest will find it difficult, if not impossible, to benefit from the services offered by the above institutes, according to a World Bank report dated back to 1995. The basic principle for microfinance is to lend a small loan which can be repaid over a period of time (usually longer than traditional lending businesses) with an interest rate lower than the lending local market. The money is used mostly for self-employment, to start a small business, to develop an already existing project/business within a local community or simply it can be used for basic household needs. In regards to Africa, according to Avila M. and Gasperini L., 2005 [26], the new microfinance institutions reached only a small number of people, in addition to this, the main products of those members of the microfinance institute are not well suited for short and/ or long term agricultural output.

In a recent report cited at the National Bank for Agriculture and Rural Development website [27], the following general factors have contributed to the success of the microfinance banking: 1. Microfinance can play an important role in rural areas of the developing countries in that it can directly reach those who are in need for financial services; 2. Each individual microfinance operate in a specific small location, which means a better understanding of the local community needs and their environment; 3. Flexible working hours and flexibility in the approach provided by Microfinance leads to wider acceptability among the local community. The success of microfinance in Asia has not been reflected in the same way as in some parts of the African continent, despite the fact that microfinance had been established there. The survey by the Consultative Group to Assist the Poor (CGAP) has found out that around 79% of microfinance funding in the Sub-Saharan Africa originate from donors while only 21% from financial investors [28].

11.5. Consultative Group to Assist the Poor (CGAP)

The CGAP was established in 1995 with funding of £30 million for three year period from the World Bank [29]. Housed and associated with the World Bank, the mission for CGAP, as defined in its charter, is to facilitate access to financial services to the poorest section of the society. As a research center and policy maker aimed at the alleviation of poverty, the CGAP obtain its support from a variety of private organisations and development agencies. Areas of research/services range from market intelligence/solutions to advisory services provided to various institutes and governmental organisations. As CGAP support financial schemes exist in a number of underdeveloped countries, the microfinance system constitutes an important part of its work. The above support helps in various ways to speed-up the local development including rural electrification projects.

XII. CONCLUSION

By fully understanding rural electrification projects and the mechanism of the financial market from various approaches, i.e. internationally, nationally and locally, the overall view of financing and developing a local community project will be a simpler task. The conclusion from this paper should be taken with the view that electrification, in essence, should be a private enterprise, even if the funds and planning have been originated from governmental sources. In some cases, direct governmental intervention of local electrification projects would be unnecessary and unhelpful, where bureaucracy, delay and corruption are the norm in a number of developing countries. Competition is a vital aspect in improving the service and reducing prices.

Sections of this paper dealt with the project structures in order to lead to the project aspects and project stages. This kind of approach is a way of examining the general basic outline of a project with the provision of possible solutions, before commencing on the main issue, i.e. the actual financial aspects for rural electrifications. International, continental and national organisations and their procedures, whenever they are applicable to the rural electrification financing aspects, have been looked at as a possible source of finance for rural electrification. Out of all the organisations examined, the microfinance was the most applicable approach for the majority of the developing countries as it can be one step towards helping further the development of rural electrification projects.

REFERENCES

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