MOROCCAN RURAL ELECTRIFICATION PROGRAM: GLOBAL ACCESS TO ELECTRICITY CHALLENGE


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ESCWA’ Premises, Beirut.
SUMMARY

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V. SOCIO ECONOMIC OUTCOMES, FACTORS OF SUCCESS AND SOME LESSONS.
I. HISTORY OF RURAL ELECTRIFICATION IN MOROCCO
The decree of 14 April 1975 instituted an entity called “Special Fund”, dedicated to rural electrification.

The first phase of PNER was completed between 1982 and 1986 and led to the electrification of 287 villages, amounting to some 80,000 households. PNER I was funded by 50% by the Government and by 50% by local authorities.

The second phase of PNER, called PNER II, started in 1991 and was to spread over the entire decade (1991-1999). Its objective was to connect some 600 villages, totalizing 195,000 households. The budget allocated for this operation was of 2.6 billion DH. PNER II, financed at 100% by the local authorities.

Lunching of «Global Rural Electrification Program» (PERG);
Initial Objective: Generalization of the electrification by 2010.

Acceleration of the rural electrification

98% as rural electrification rate
35,396 villages electrified through the national electricity network & 3,663 villages electrified by PVs;

- 12 million citizens have benefited from this program;
- Investing more than 20 billion of MAD;
- Creating of 100,000 jobs
Given the scope of investment, and certain constraints in connection with the type of objective, the programs before 1996 were unable to ensure electrification of all the country’s households:

- A vision limited to programs that in no case could enable total electrification over a short period of time.
- Institutional programs were reserved to electrification by networks that in no case could meet the requirements of all households in the Kingdom.
- The scattering of financial efforts deployed for the various programs, unaware of the availability of monies and the injustice created by the different types of financing.
In 1995, after an assessment, ONE issued its findings: The PNER, in spite of its ambitions, remained insufficient with respect to the needs of the rural world, the electrification of which had barely reached 18%, this year.

ONE propose a new program called «Global Electrification Program» (PERG), approved in August 1995 and managed since that time by ONE

Upon start up in 1996, the PERG (Global Rural Electrification Program) was to be conducted over a span of 15 years, with the objective of bringing the rate of rural electrification to 80% by 2010. This objective led to the electrification of 1 000 villages, i.e. on average 100 000 households per year, with an annual budget of 100 million dollars.

During the first year of activity, ONE rose the initial objective and switched to a pace of 1 500 villages per year and annual budget of 150 million dollars. This was made possible thanks to concessional financing conditions at attractive rates, generally of no more than 3%.
II. GLOBAL RURAL ELECTRIFICATION PROGRAM (PERG)
CHARACTERISTICS OF PERG

• PERG has the particularity of being a participative program associated to funding by ONE, of the beneficiary households and communes.

• The general scheme of this distribution, with regard to electrification by the network, is the as follows:
  
  ➢ Local authorities partake at 2 085 DH per beneficiary household, an amount paid in cash or 500 DH per beneficiary household per year over a period of 5 years.
  
  ➢ The beneficiary household partakes in financing by 2 500 DH per household, payable in cash upon subscription or by 40 DH per household and per month for a period of 7 years.
  
  ➢ ONE finances the remainder, i.e. 55% of the global amount of the investment.

• Other partners can also participate in the funding of PERG. For example that is the case of village associations, development agencies and private companies.
CHARACTERISTICS OF PERG

• **Global territoriality:** PERG targets global electrification of rural households

• **Technical globality:** PERG integrates all the electrification techniques. It uses not only connection to the national network but also decentralized electrification methods.

• **Financial globality:** PERG mobilizes all the financial resources likely to be deployed for rural electrification.
III. MANAGEMENT AND PLANNING OF PERG, INSTITUTIONAL APPROACH, FINANCING METHOD
THE RURAL ELECTRIFICATION MASTER PLAN: AN ABSOLUTE NECESSITY

Prospecting campaign

Launched in the beginning of 1996, this campaign allowed to decipher more than 40000 villages, allowing thus ONE to have one of the richest data base on the rural world.

Technical means

ONE was equipped, in 1996, with a Geographical Information System (SIG). It allowed the projection of distribution networks, the situation of villages and the evaluation of the various phases of the PERG.

Methodology

All villages were considered as being likely to be electrified by interconnected network and the necessary investment for the electrification of each village was estimated. The electrification of a village by network required:

1. middle voltage network 22000 V allowing the connection of a village to the national network,

2. one or more post depending on the village in order to have a tension2 20/380V to be used by households.

3. the realization of a low voltage network (220/380V) for the distribution of electricity inside the village.
Data analysis and Master Plan

The prospecting campaign, which is a preliminary stage for the elaboration of the master plan concerned 90% of the rural population of the kingdom.

The study of the technical and economic evaluation points concerned the following:

a. population scattering
b. regional equilibrium
c. cost per household
d. rate of internal profitability

The master plan is declined in projects at short and middle term for electrification by connection to the network. Short term projects were launched since 1998, either for their realization or execution studies.

Execution studies of middle term projects were to be launched in 2000. As for decentralized electrification, eligible villages were registered and the execution procedure of the plan was précised.
Method of Financing

- On the basis of studies achieved by ONE, the average cost per home is of 10,000 Dh.

- The financial capacity of the communes was estimated to be of nearly 200 million DH/year referring to their participation in the PNER.

- The average budget for energy expenditures of the beneficiary households was estimated to 100 DH per household and per month. The average electricity consumption of rural households hovers around 50 kWh at 50 DH/month. To encourage substitution in favor of electricity, the contribution per household is of 40 DH/month.
On this basis, the PERG financing was ensured as follows:

- **beneficiary households**: 2500 Dh in cash at the moment of subscription or 40 Dh per month for 7 years, i.e. 25% of the project amount,
- **the Local Collectivity**: 2085 Dh per household in cash or 500 Dh per year and per household for 5 years, i.e. 20% of the global amount of the investment,
- **ONE** pays the remainder, i.e. 55% of the global amount of the project.

The two (beneficiary households and the Local Collectivity) participations remained without change throughout the entire program, regardless of the phase and threshold of eligibility of the villages.

The threshold of eligibility of the villages was set at 10.000 DH per household for PERG1 and PERG2, at 14 000 DH for PERG3 and 20 000 DH for the first phase of PERG4 and 27 000 DH for phase 2 of PERG4.
INSTITUTIONAL APPROACH

- Prefectoral and Provincial Commissions are implemented for the technical and financial approval of the PERG.
- The Walis and Governors chaired Prefectoral commissions along with members composed of presidents of communes and provincial services.
- After validation, reports were submitted by the Provincial Commissions to the National Mixed Committee consisting of ONE and of the General Directorate of Local Authorities.
- The Mixed Committee classified the communes according to their financial capacity before validation of the list.
- Once all is valid, conventions are sign by ONE and the concerned Communes and then by the DGCL.
- Realization is then monitored by regional technic services.
### PLANNING

<table>
<thead>
<tr>
<th>Grid</th>
<th>36,330 villages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Period</strong></td>
<td><strong>Sections</strong></td>
</tr>
<tr>
<td>1996 – 2001</td>
<td>PERG1 &amp; PERG2</td>
</tr>
<tr>
<td>2002 – 2004</td>
<td>PERG3</td>
</tr>
<tr>
<td>2004 - 2006</td>
<td>PERG4 - Step1</td>
</tr>
<tr>
<td>2006 – 2011</td>
<td>PERG4 – Step2</td>
</tr>
<tr>
<td>2012-2015</td>
<td>Parachèvement PERG</td>
</tr>
</tbody>
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| Solaire | 3,663 villages | Over than | 99% |

Ministère de l’Énergie, des Mines, de l’Eau et de l’Environnement
**PERG FINANCING : GRID**

<table>
<thead>
<tr>
<th>Partners</th>
<th>Prefinancing Option</th>
<th>Cash Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households</td>
<td>40 Dh/month during 7 years</td>
<td>2250 Dh</td>
</tr>
<tr>
<td>Communes</td>
<td>500 Dh/year/household during 5 years</td>
<td>2085 Dh Per household</td>
</tr>
<tr>
<td>ONE</td>
<td>Complement</td>
<td>Complement</td>
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</tbody>
</table>

Ministry of Energy and Mines
REALIZATION PLANNING OF THE PERG:

Location of the villages/MV line

- Grouped Villages
- Grouped & Near MV
- Grouped & far MV
- Decentralised Grid
- MV line
- Grid
- PV Kits
- Disperse

Ministry of Energy and Mines
Realization planning of the PERG: Location of the villages/MV Network

<table>
<thead>
<tr>
<th>Geographical location</th>
<th>Electrification option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grouped village located near the MV network</td>
<td>Grid connection</td>
</tr>
<tr>
<td>Dispersed village regardless of the location / MV network</td>
<td>Stand alone PV Kits</td>
</tr>
<tr>
<td>Isolated grouped village, but far from the MV network</td>
<td>Decentralised Grid</td>
</tr>
<tr>
<td>Distant villages with grouped habitat</td>
<td>Grid connection</td>
</tr>
</tbody>
</table>
EXPÉRIENCE MAROCAINE EN ÉLECTRIFICATION RURALE

IV. REALIZATIONS
12 million citizens have benefited from this program;
Investing more than 20 billion of MAD;
Creating of 100,000 jobs
V. SOCIO ECONOMIC OUTCOMES, FACTORS OF SUCCESS ET SOME LESSONS.
Socio Economic Outcomes

- PERG had several impacts on the processes of rural electrification realization of which notably, the acceleration of the rhythm of realizations, since we progressed from 18% in 1996 to practically 98% of the Rural Electrification Rate at the end of 2012. The created market of electrification allowed the introduction of big multinationals and thus, the creation of new jobs and the stimulation of competitiveness of state-owned companies in this sector.

- Beyond the figures of the realization of villages, the Global Rural Electrification Program modified the economic and social data of the Moroccan rural environment. The electrification has, globally on the economic plan, an impact on the development of the craft activities requiring the use of productive electric devices where it is notably perceived in term of extension of the working time.

- It has besides, a significant impact notably in term of development of commercial activities in villages. The number of business surely grows with the introduction of electricity.

- Intensification of the impacts, by the other sectors occurring in the field of basic infrastructures, health, agriculture, crafts and industry.
SOCIO ECONOMIC OUTCOMES

- A widespread access to appliance equipments:
  - TV (24% in the past while 90% after 10 years);
  - Fridge (15% in the past while 70% after 10 years).

- Trading: set up of small businesses, higher incomes, extension of working time (activity no longer ends at 6pm it ends at 10pm from now and on), new activities start to emerge.

- Agriculture: more wells are connected to electricity;

- Creation of jobs: 18,000 to 22,000 permanent jobs.
SOCIO ECONOMIC OUTCOMES

- Small manufacturers reach higher incomes and work longer with a better performance;
- Craft: not a very significant impact on the traditional craft (tapestry, weaving for example);
- Rural exodus mitigated and stabilized to the rate of 5%;
- An increase in the reverse exodus. The rural population that has chosen to return back home has increased by about 1.5%.
FACTORS OF SUCCESS

- A continuous Government support;
- A reliable financing package:
  - Financial contribution: ONE(55%) – Municipalities(20%) – Customers(25%);
  - The commitment of both ONE and Municipalities through conventions;
  - An effective involvement of municipalities during the validation process and at the definition of the scope of projects.
- Demonstrated expertise and Presence across the whole national territory:
  - Rural electrification is one of ONE’s priorities under the widespread access to electricity strategic orientation;
  - A good grasp of rural electrification technology which is relatively stable with rare sophisticated improvements;
  - Strong experience since 1985;
  - Presence in the whole national territory.
- Consultation and involvement of industrial partners:
  - Professionalism of partners;
  - Consultation and sharing.
SOME LESSONS

- A pragmatic approach advocating consultation, mutual understanding and continuous improvement;

- Simplicity as a key principle behind all of our work;

- A supplier-customer relationship between ONE and Municipalities up to professional standards.
RURAL ELECTRIFICATION REFERENCES IN SENEGAL

2008: first concession covering St-Louis, Dagana and Podor countries:

- Consistency: electrification, distribution and operation.
- Goals: electrification of more than 550 villages. Households to be electrified during 3 years time are around 20,000, including:
  - 14,000 households via the electricity network;
  - 5,800 households through individual PV.
- Duration of concession: 25 years.
- Creation of SPC "Compagnie Maroco-Sénégalaise d’Electricité de Saint Louis S.A " (COMASEL), with IFC partnership (16.6% of capital).

2009: second concession covering Louga, Kébémér and Linguére central northern countries:

- Consistency: electrification, distribution and operation;
- Goals: electrification of 372 villages. Households to be electrified during 3 years time are around 11,800;
- Duration of concession: 25 years;
- Creation of SPC “COMASEL de LOUGA” with IFC partnership (19.9% of capital).
Thank you for your attention