Workshop de Investimento
Energia Sustentável na Guiné-Bissau
Guinea Bissau Sustainable Energy Investment Workshop

Apresentação da Mini Rede Solar Fotovoltaica de Bambadinca

Presentation of Bambadinca PV Mini-Grid

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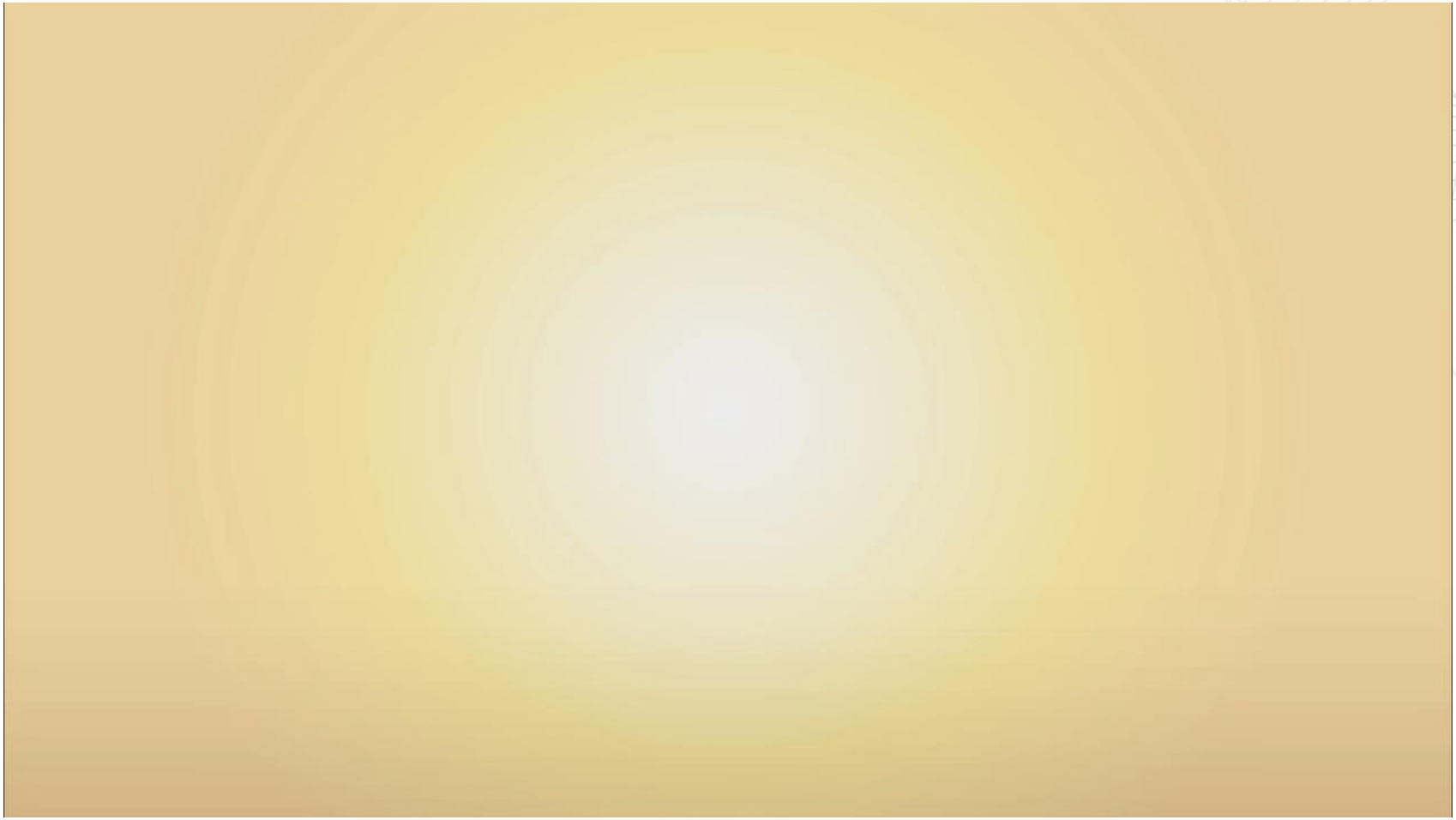
General presentation - video



https://vimeo.com/122013833

Bambadinca context overview

- Located in the region of Bafatá, Bambadinca has an estimated population of 6 500 inhabitants.
- Main economic activities: agriculture and trade
- 70% of the population below the poverty line (<2$/day).
- Since the decrease of the power capacity of Bafatá plant and theft of network cables, 95% had no access to electricity.
- Main energy sources: candles and batteries.

Bafatá region and Bambadinca maps

Bambadinca Sta Claro Project

In order to deal with lack of energy and poverty, based on socioeconomic studies, **TESE** conceived and implemented the **Community Program for Access to Renewable Energy - *Bambadinca Sta Claro***, which consisted in creating a community energy service capable to manage a hybrid PV mini-grid.

Project identity:

- Time schedule: October 2011 – March 2015
- Capital providers: European Union (ACP-EU Energy Facility); Portuguese cooperation; UNIDO (GEF project)
- Public Organizations: DGE - National Energy Direction / DREB - Regional Energy Office (GB); UL - University of Lisbon (PT)
- Local Partners: ACDB – Bambadinca Community Development Association; DIVUTEC

Main results:

1. Public-communitarian management model created & implemented
2. Local population aware on Safety and Energy Efficiency
3. Electricity via Decentralized Energy System

Bambadinca sta claro

Project logo

Technical Solution

The mini-grid of Bambadinca is based on a Hybrid Photovoltaic Power Plant, composed by 3 identical groups and using batteries as well as diesel generators, in order to guarantee electricity 24h/day. The main technical characteristics of the power plant are:

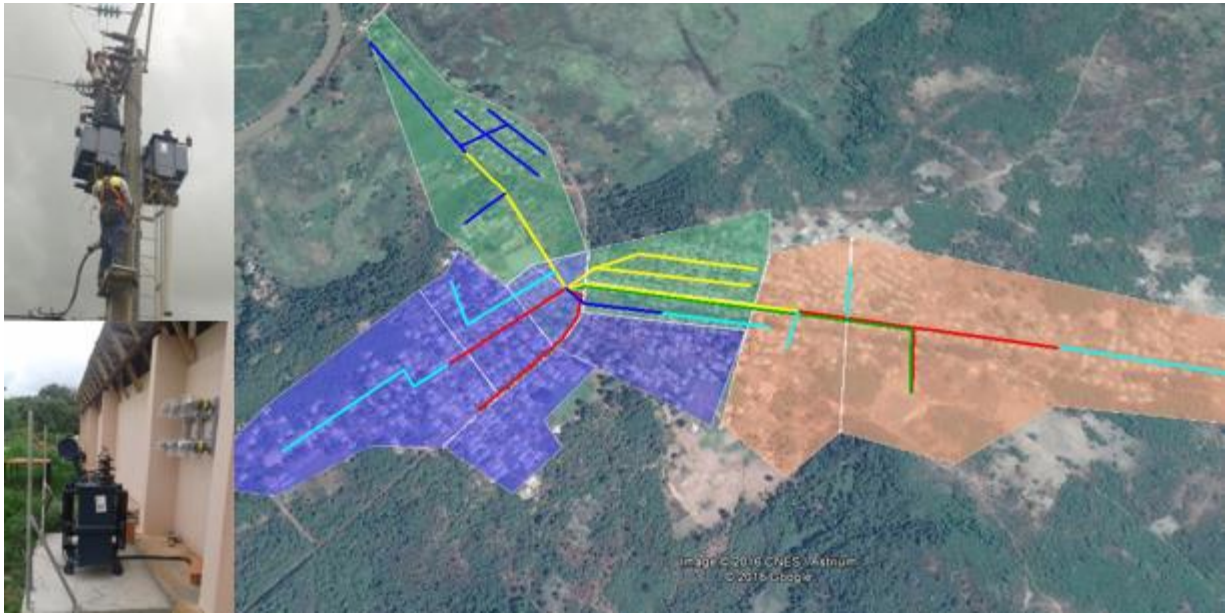
- Total power capacity: 312 kWp
- Total genset capacity: 240 kVA
- Battery bank: 1 101 kWh

Hybrid PV power plant

Technical Solution

The electricity distribution network was restored and expanded in order to cover all main parts of Bambadinca. Each one of the three groups serves a specific area, while the network is composed by LV lines and MV for distant areas.

- Group 1: South (LV)
- Group 2: Northwest (LV, MV)
- Group 3: North (LV, MV)



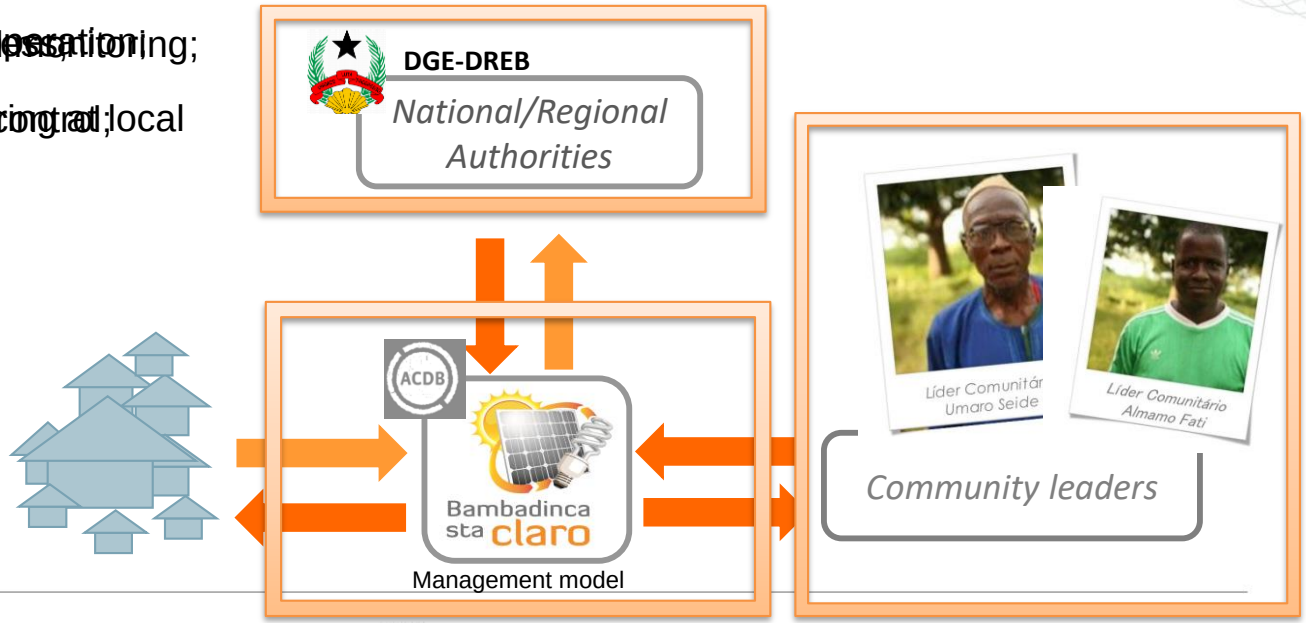
Network of Bambadinca mini-grid

Management Model

Taking into account the lack of means of the public institutions and the absence of private stakeholders, the selected management model was tripartite **Public-Community Partnership** developed between ACDB, DGE-DREB and local community leaders, with separate responsibilities:

Community leaders:

- Technical and financial operation;
- Technical assistance.



Management model

Training sessions

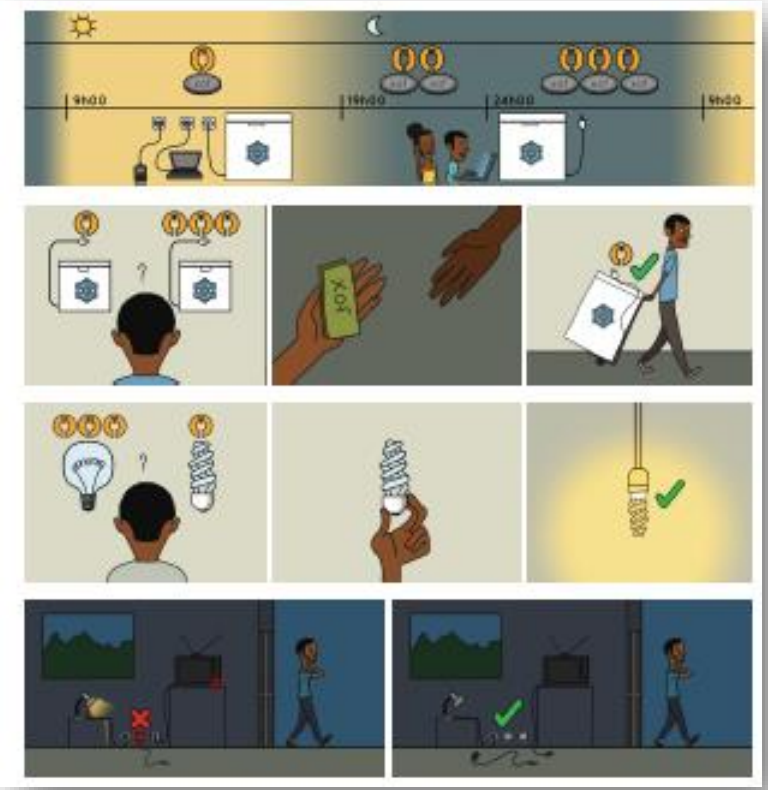
During the creation of the utility service and the implementation of the management model, training sessions were organized to enhance technical and institutional capacities of the DRE/DREB and ACDB.

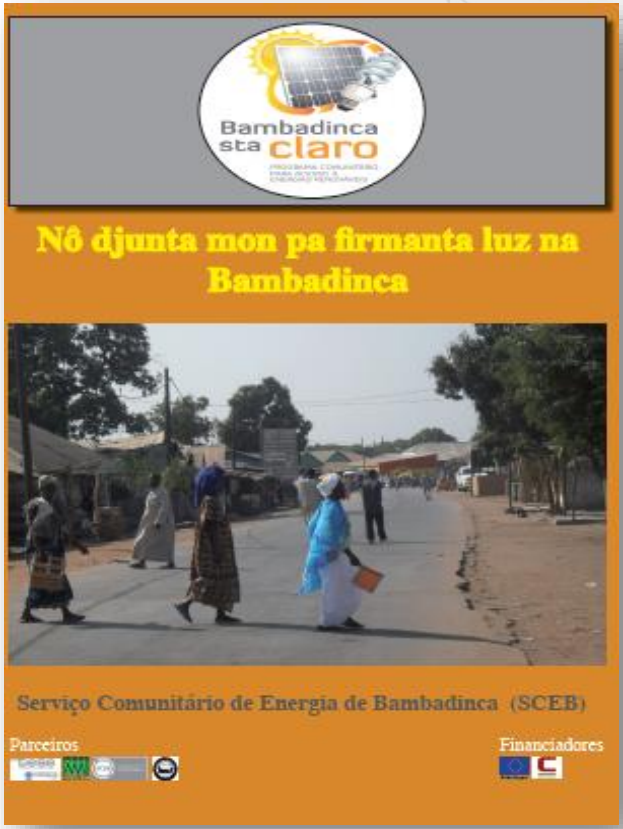
Further training sessions were organized for local electricians and technicians regarding good practices for electricity connections in households and commerce.

Training sessions

Raising awareness

To guarantee the sustainability of the project as well as the involvement of the local community, awareness actions were organized about energy efficiency, electricity safety and principle of *customer pays*.





Awareness posters

Results and impact

On 2015 the project was completed, being the first PV power plant and the first modern mini-grid infrastructure to be implemented in Guinea-Bissau.

- ✓ 625 actual clients with access to electricity;
- ✓ 650 clients, professors and students trained about energy topics;
- ✓ New income-generating activities have emerged.

Panoramic view of the power plant

Challenges

Bambadinca Sta Claro was a pilot project in Guinea-Bissau, and various challenges were arisen during it´s implementation and it´s actual operation.

Implementation phase:

- Political instability (coup of 2012) and duty delays impacted the risk notion of suppliers and the project´s timetable.
- The tariff definition process, with public authorities and through participative sessions, was a challenge, taking into account high local expectations, absence of subsidies and price variety between Bissau and the interior.

Operating phase:

- Technical problems impede optimal operation of all groups.
- Internal conflicts stall general operability of the utility.

Recommendations

Recommendations are mainly focused on the methodology of implementation and sensitive issues to be considered by project developers:

- Involvement of the community and local authorities;
- Collection of consumption profile and data;
- Dimensioning and selection of an adapted technical solution;
- Definition tariffs taking into account socioeconomic reality;
- Identification of an adapted management model.

Replication possibilities

The success of the *Bambadinca Sta Claro* project demonstrated the advantages and benefits of mini-grids for rural electrification in Guinea-Bissau, especially in areas that the future national grid won´t reach.

With the support of UNIDO, TESE implemented in 2015 a socioeconomic and technical study in the islands of **Bolama and Bubaque** (Bijagós region) in order to design replication models, of 360 kWp and 651 kWp respectively.

Bolama and Bubaque map

Thank you for your attention

Questions?

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