

Solar-UZlesco in Sansibar/TANSANIA (Solar-UZI energy supply committee-company)

Project Goals:

- **Starting the electrification of the UZI Island in South West of Zanzibar/Tanzania by using Solar Energy.**
- **Creation of UZlesco (UZI electricity supply committee-company) by training of the villagers in regard of installation and maintenance of the new technology; training of economical structures and business plans to increase the number of customers.**
- **ZASEA (Zanzibar Solar Energy Association) for practical Training for the participants of the workshop “How to built a SolarHomeSystem” in March 2003 in Sanisibar**

Reason:

Since 2001 the Deutsch Tansanische Partnerschaft e.V., Hamburg, Germany runs an awareness campaign for solar technology in Zanzibar by spreading solar lantern renting stations to zanzibarian village schools. The introduction of the new and unknown technology by village schools was very successful. The use of the solar lanterns which are rented by the villagers through the schools became very famous. Till now 12 villages are involved in this programme.

The assembling and repairing of the solar lanterns SOLUX I are made by students of the secondary school in Kizimkazi Mkunguni who are taught by two German volunteers every year. To increase the knowledge of Solar technology for the project involved teachers and students a workshop < Namna ya kutengenza Umeme wa Jua Manyumbani> (How to built a Solar Home System) was practised in March 2003 together with the department of Energy and the Haile Selassie Secondary School. The whole workshop (theoretical and practical part) took place in Kisuaheli language. Dr. CZM Kimambo a lecturer of University of Dar es Salaam and Richard Magembe (Engineer of Dar es Salaam) translated all contents of solar technology from history to usage into local language for better understanding. Since that time the interest in solar technology increased quickly and also the demand of getting more knowledge.

During that workshop the director of the Department of Energy asked the Deutsch Tansanische Partnerschaft e.V. (DTP) to support the electrification of the islands UZI and TUMBATU by using solar energy

Solar Energy

October 2003 the school of UZI Island got a Solar lamp renting station from Deutsch Tansanische Partnerschaft, Hamburg, Germany. A donation of one 40 Watt panel and 15 lanterns.

The teachers of the school had applied for such a station after having seen it working in Kizimkazi mkunguni where the SOLUX I lamps are assembled.

After using the solar renting station one month the school committee of Uzi school decided to buy a second station with again 15 lanterns. All the lanterns are rented to the teachers and to the villagers of Uzi and Ng'ambwa who pay a monthly fee of 2000 TSh./lantern. These fees cover the costs of the second station.

Meanwhile the use of solar energy for lamps is well known in Uzi Island.

Ressources of Deutsch Tansanische Partnerschaft e.V.

Since the director of department of energy Zanzibar asked for help for the electrification of UZI and TUMBATU the idea of solar electrification was born. Basics of the project >Electrification of UZI by solar power< where:

1. Common requirements (study: Morocco, Brazil, Philippines and Thailand [gtz 1998])
1. Donations of DTP members
2. Panel gift from manufacturer of solar panels Juwi in Mainz

The conclusion of the above study was to create a project where the responsibility of the people comes to the most sensible part of the equipment which are the batteries.

The first input for the UZI project shall be: 10 panels and fitting of the first 50 households. The fitting should be made by ZASEA (Zanzibar Solar Energy Association) with the goal to make installation training for all who got the first training during the workshop "How to built a SolarHomeSystem" in march 2003 in Zanzibar.

Start of Solar UZlesco:

The DTP started to plan a solar electricity program for the Island UZI with support of financial aid and material donation of private doners in Germany. and together with ZASEA members and TASEA(Tanzania Solar Energy Association) to prepare a feasibility study.

In January 2004 the school of UZI was informed and a visit of three days appointed.

UZI Visit:

Visit of the Island UZI from January 29th to January 31st, two overnights included.

Participants: Mwalimu mkuu Saidi (Skuli ya Kizimkazi), Ana Karsten, Dr. Karsten (DTP), Joseph Kihedu (University Dar es Salaam), Jonas Oberbeck (DTP), Nils Hanik (DTP), Saidi Mustafa (Student of the Solar Workshop Kizimkazi Mkunguni).

Visit Goals: Point out the desire of electricity: Lamps, radio, television and the financial abilities. Preparation for the feasibility study.

UZI Island

Uzi Island in the West-South of Zanzibar has 3200 inhabitants which live in two villages.: UZI and Ng'ambwa. Uzi has 2200 and Ng'ambwa 1000 inhabitants. Access to the island is given by a stone built dam which is only for some hours per day free for transfer during low tide. Other wise by ferryboat on request. The western part of Uzi Island is a conserved area of Menai Bay the east side is Pete Inlet. The whole island is surrounded by Mangrove trees.

Between Uzi and Ng'ambwa there are the dispensary and the school which are shared by the two villages.

The dispensary has a staff of five people, one doctor and four helpers. Four rooms where two beds are available for the patients. No light, no cooler for medicines and only small medicine. In average 16 patients are attended per day.

The school has 733 pupils and 21 teachers, 12 classrooms, one headmaster office, one teachers room and one library. A new building for classrooms is started.

Economical basics

Uzi is a very fertile island. People get their incomes from agriculture for instance vegetables and fruits which are sold in town, fishing, growing seaweed Mwani for export, firewood and charcoal. Both villages together have 8 shops where the things for daily life are sold.

The water supply which is very good comes from Unguja Ukuu a village two and a half kilometers apart.

Recent energy supply

Both villages are not connected to the national grid and also it is not included in the electrification program of NORAD because the coasts are high by connecting them by sea cable. Some less households use battery driven or fuel driven applications like

- Radios and torches are driven by batteries sold from shops within the village. AA and D batteries are mostly in use. The price is between 100 and 250 Tansanian Shillings.
- Three houses are using car batteries to drive Television, Radio and lamps. The batteries are charged at Fuoni (24 km apart) and Unguja Ukuu (2,5 km apart) at a cost of 500 TSH/charging fee.
- Under the three Televisions one is coloured and is driven by fuel-generator without inverter. To run this coloured TV the generator consumes four liters of fuel in six hours.
- The battery capacity used for the both black/white TVs are 50 Ah or 70 Ah. Usage of 18 days is available for black and white TV. Radio only covers more than a month. The normal lamps consumes more energy but it is not known how much exactly.
- There are also two cooler boxes from Coca Cola in between two of the shops. They use two to seven liters of fuel per week.
- Cooking and warm water are prepared by firewood in traditional three stone fires or with charcoal. The environmental impact of cutting firewood is low because there are big woods around.

Project-transpose:

Preparing dialogue and analysis of demand and finances 29th to 31st January UZI

First meeting 29th January 2004 4'clock p.m. to 6 o'clock p.m.

Twelve peoples called by the teachers attended this meeting in school. The idea of the project described and discussed and first questions answered.

Questions like:

- How many users are required for establishment on the project?
- The amount of money required for recharging fees?
- costs of fitting?
- costs of panel?
- battery capacity?
- criteria of the election of the first people to be connected to the project?

The participants suggested that the criteria should not be based on special groups of inhabitants like teachers or relatives.

Are the charging fees

- for the villagers?
- for Deutsch Tansanische Partnerschaft e.V.?
- or others?
- If someone buys a battery and is ready to pay charging fee can he be assured that he will get the service?
- When is the beginning of the project expected?

Second meeting 30th January 2004 4'clock p.m. to 7 o'clock p.m.

The second meeting was participated by more than sixty people of both villages Uzi and Ng'ambwa. A painting at the blackboard showed a structure of the first project steps.

Always one house shall become a panel which charges one battery in one day. Around this house four other houses are able to charge their battery in the first house. Important was to

avoid long distances to carry the batteries for charging. That means the houses with the panels have to be scattered around the both villages.

Uzi should become 6 panels and electricity for 30 households and Ng'ambwa 4 panels for 20 households.

The first donation belongs to the panels and the fitting of the houses. Batteries and charging fees have to be paid by the households. The charging fees must include the renewing of bulbs and broken things also for the progress of the project. They have to run it like a private enterprise.

Very important is an introduction in battery use and maintenance of the systems. One electrician lives in the village. All the people who run a charging station has to be educated in measurements and charging of the batteries.

Two committees – two companies:

On the Island of UZI two villages are situated: UZI and N'Gambwa. Uzi has 2200 inhabitants, N'gambwa 1000. The idea is to give every village the chance to create their own electricity supply by using solar energy.

Every Village (UZI and N'gambwa) has to found a committee for promoting the solar electrification in both places. Two committees seems to be better because every village has its own behaviour and also it seems better to come into competition between the villages.

The model:

- One house becomes one 110-120 Watt Panel and a battery charging station with charge controller.
- Around this house four other houses take part at the charging station in the middle. The panel will be large enough to charge one battery in one day
- Five houses will be fitted for one charging unit.
- Every house gets fitting for three bulbs, radio and TV (two plugs) and one inverter of 250 Watt (Modell local production: Ennea Electronic Arts, p.o. Box 60549 Mwenge, Dar es Salaam). Normal saving bulbs can be used. Till now in Zanzibar special DC solar bulbs are not available.

There are public needs also:

These needs are till now not included into the plans but they are also very important.

1. Dispensary light and fridge
2. School light for classrooms and teachers rooms
3. Lights and loudspeakers for three Mosques
4. Koran school

Estimated donation input of Deutsch Tansanische Partnerschaft e.V. an JUWI:

- 10 Panels 110 -120 Watts (6 panels for Uzi-village (30 households) and 4 panels for N'gambwa (twenty households),
- Fitting of 50 households with wires, switches, plugs, bulbs, chargecontroller,
- ZASEA (Training and labour charge)

Participation of users:

- The batteries (normal car batteries between 35 and 100 amps) are from the beginning in the responsibility of the users. They have to buy their own batteries and also to care for their batteries and to renew them when they are finished.
- Second the renewing of the bulbs is in the responsibility of the users.
- Third participation is the charging fee. The fees depend on the capacity of the battery and should be ten times high like the number of amps. Par example: a battery of 50 amps costs $50 \times 10 = 500$ TSh. plus repayment fees.

Repayment fees:

The donated installation has to be paid back in a period of 20 years. The income of this repayments should be used to enlarge the number of houses, which are fitted and later to enlarge the number of panels. That means the profit/repayments would be returned into the project again for investigations till all houses are supplied. Every village has to become its own supplier in dependance of the income from the charging fees.

Timetable:

1. Dialogue between the implemented institutions (DTP, JUWI, TASEA, ZASEA, February – May 2004
2. Feasibilitystudy: TASEA, Februar – May 2004
3. Establishment of the committee in both villages
4. Period of installation 50 households December 2004 – January 2005
5. Demonstration/Monitoring till March 2005

01. February 2004