

German students design Eco-Lodges for Tanzania

Five students at the University of Applied Sciences' School of Architecture in Erfurt developed different concepts to strengthen sustainable tourism in Serengeti National Park/ Tanzania. The task for the first semester in the Climate Adapted Design studio was to design different types of ecological lodges with the goal to participate at the International Summer School in Arusha 2015 to present their drafts.

In the beginning of the designing process, each student was challenged with the decision where the site of the project should be. This led to different types of settings, as for example on top of the Ngorongoro crater, at a river slope as well as in the open plane. Furthermore, for each lodge a business plan was developed and a special target group was defined. The main focus was on sustainability on different levels. Choice of materials according to their properties as well as well balanced energy and water concepts were developed within a process of various dynamic simulations. The farthest reaching goal for every concept was to make an impact in regards to community and enhancement. The entirety of all those complex requirements led to different kinds of atmospheric lodge designs – from backpacker hostel up to luxury hotel.

Right now, the 5 students together with their supporting professor are trying to organize a trip to join the International Summer School in Arusha in July 2015 to get help from local energy-related students to improve and acquire the renewable energy and water processing concepts.

At our cooperating university in Arusha, Tanzania, the Nelson-Mandela African Institute of Science and Technology (NM-AIST), a **SUMMER SCHOOL** for young African scientists on 'Renewable energies and their application' will be held from **July 13-18, 2015**. This summer school is organized by Technical University Ilmenau, Erfurt University of Applied Sciences and NM-AIST and supported by the African Network on Solar Energy ANSOLE e.V, with a funding of participation for African students only. The 18 students from the RED MA program intend to participate in the summer school and to demonstrate and discuss their elaborated model projects with students of NM-AIST and the summer school participants. This will be a great opportunity for the German students to make progress in application of RE, understand problems of implementation RE in African reality and for intercultural exchange and establishment of a network for future collaboration.



We are seeking **sponsors** for 23 students which will enable them to participate in the summer school on RE (**soon! 13. - 18. July 2015**) and the conference ANSOLE e.V.

Days in Tanzania and to establish a network on Renewable Energies into the African continent.
Each EURO counts!

The Logos of our sponsors will appear on the Reader and Proceedings of the Summer School!

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Innovative!
**Renewable Energies for Tanzania in an ecological-
technological-socio-economic Systems Design**





What we are about

The **Master Study Program Renewable Energy Design** at the University of Applied Sciences Erfurt, Germany, promotes interdisciplinary competences in designing and planning of renewable energy systems, their integration and implementation.

In the framework of a practical module with the subject "Rural electrification and development through renewable energy systems, with emphasis on drinking water supply", the students develop during one semester model projects for off-grid electricity supply in Tanzania.

New: the inter- and transdisciplinary approach combines a mixed, technical RE systems design integrated in devices for application of RE with an ecological and socio-economic approach - to improve livelihoods of the people, enhance agricultural production and processing and, thereby, to increase market chances, to provide drinking water, based – an important aspect – on the participation of the people, their involvement in establishment and maintenance of the system (capacity building), and, thus, their acceptance and benefit of the new technology system. Further income opportunities are provided through eco-tourism, selling of energy and?.... to be developed in further collaboration.

Seven scenarios were identified:

- 1 Very poor rural village, about 50 households (a 10 persons)
- 2 Rural village, about 50 households (a 10 persons)
- 3 Future scenario: village in 30 years
- 4 Eco-lodge: energy- autarque touristic complex with own ,ecological' food production
- 5 Rural region with 50 villages.....
- 6 Off-grid electricity for slums around Dar Es Salaam
- 7 Eco-lodge near the coast

MODEL PROJECTS of renewable energy systems FOR TANZANIA

1 Very poor rural village, about 50 households (a 10 persons)

Conditions: Close to a lake, scarce infrastructure, no electricity, no drinking water, low education

Suggestion: Supply with off grid system of electricity and water, technically well elaborated for efficiency and simplicity, storage facility;

Financing model: 'culture credit' programme, local handicraft production, marketing, tourism

2 Rural village, about 50 households (a 10 persons)

Conditions: Close to a river, some infrastructure, roads, close to town Moshi, banana and coffee farming

Suggestion: Hydroelectrical power station to generate electricity. Fog nets and a solar power disinfection to prepare drinking water. Water Pump before the hydroelectrical power station for agricultural irrigation. Installation of systems by the people, training for maintenance;

Financing: marketing of processed eco-coffee, support by Tchibo/Jacobs company, eco-tourism

3 Future scenario: Village in 30 years

Conditions: No electricity, no fluent water, water well

Suggestion: New technologies, organic photovoltaic – highly efficient and adapted to tropical conditions, biogas plant, electricity grid and waste water system, European standard of 2015, efficient use of electricity and water through digitalization

4 Eco-lodge: Energy- autarque touristic complex with own ,ecological' food production

Conditions: Site in Tanzania near a river

Suggestion: Ecolodge for about 120 - 150 tourists, adapted to the landscapes and ecological conditions; electricity through photovoltaics, small wind power station and water

wheel; using local resources mainly for the building process; growing eco-food in and around the building; involving the local people and businesses for e.g. tourist attractions (income opportunity for village people); model project for the region

5 Rural region with 50 villages

Conditions: Near a river, small dam

Suggestion: Hydropower plant, photovoltaic energy supply with storage capacity at strategic nodal point for agriculture, processing facilities (mill for cereals), central supply with drinking water from dam and from rain water harvesting (water bank school), supply of villages with cleaned drinking water, supply of central infrastructure (hospital, school) with electricity and water, use of water for irrigation and production of high value crops in greenhouses

6 Off-grid electricity for slums around Dar Es Salaam

Conditions: High density of population in combination with a low living standard and a not existing infrastructure

Suggestion: Adjusted, social integrative off-grid supply and disposal systems; masterplan connecting different solutions for practicable and easy network-independent applications: PV solar module as foil on roofs, mobile PV system for lighting made from old bicycle parts, waste & waste water system, recycling of electricity, heat, water; urban agriculture, mini-biogas for organic waste incl. mobile sanitary installations, gas storage in pressure flask or gas-backpacker (gender aspect), rain water harvesting, heating (60°) + disinfection as business model

7 Eco-lodge near the coast

Conditions: North of DES, ecolodge for 20 persons, coastal climate, near a village

Suggestion: Seawater desalination with RE - small wind turbine for electricity and drinking water supply, PV for light, battery storage, biogasplant for households, provision of electricity and water for the village, participation of village people in establishment and running of ecolodge