

## Project report Dareda/Tanzania

In July 2020, Jenny Nöding-Bühler, a midwife from Heidelberg, completed the only construction course we were able to hold in the first year of coronavirus. Jenny is in charge of a drinking water project run by the organisation ped-world e.V. (<http://ped-world.de>), which is located in the Dareda region, approx. 200 km south-west of the city of Arusha. At the beginning of 2021, Jenny packed 3 SK14 and 3 WSS (wood-saving stoves) into a container from ped-world to Dareda.



The materials warehouse for the construction of the fog nets (cloud fisher) is located in the building complex of the Vocational Technical Centre (VTC) Dareda. The solar cookers and wood-saving stoves were installed by students at this vocational school and presented to the school staff. After a short test phase at schools (with fog nets), 2 solar cookers and the wood-saving stoves were taken to the nearby highlands at an altitude of over 2000 metres.



The VTC in Dareda was built over 30 years ago by "AMREF flying doctors". The Roman Catholic diocese of Mbulu took over sponsorship in 1989. The school has space for around 250 pupils. The site also has accommodation for pupils, a kitchen for catering for the pupils, a public canteen and a guest house.



In the initial phase, 11 technical professions, 5 commercial professions and hotel and tourism were taught. Currently, a total of 35 students still attend the VTC Dareda.

(Source: google maps)

In Tanzania, there is no dual system like ours; theory and practice are taught in full-time classes. There is not much left of the original modern equipment. In the metal department there were still 2 bench vices and an electric welder.

A large lathe has not been operational for a long time due to a defect in the electronics. In autumn 2022, EG-Solar therefore packed used machines and tools (lower customs fees) for basic metal training and sheet metal processing with a purchase value of around €25,000 in boxes and added them to a container with fog nets, gutters, bicycles, etc. from ped-world.



The teachers and maintenance of the school are financed by school fees. Due to the low number of pupils, the 13 teachers have not been paid since May 2023.

A pupil has to pay 1,000,000 TZS (Tanzanian shillings - approx. €385) in school fees per year. A vocational school teacher with a degree earns a gross salary of TZS 500,000 per month. The majority of families in rural areas cannot afford these fees. That is why we arrange school sponsorships for young people with potential.

Although the school is now in a deplorable state and the hygienic conditions in the toilets and washrooms are unacceptable, the church sponsor has not yet made any significant contribution to equipment and maintenance. With financial support from ped-world and the teachers, renovation work began in the autumn and has now been completed.

### Construction course for solar cookers and wood-saving stoves

At the beginning of the last week of July 2023, we prepared the workshop for the course.

The machines were mounted on the mobile workbenches, the prefabricated drilling templates were hung on the wall, the 1:1 scale construction plan was mounted on a board, etc. Finally, the course could start in the afternoon.



There were 8 registered participants and eventually **19 (!) people** attended. Not only teachers and pupils from VTC Dareda came, but also from neighbouring vocational schools in Nangwa and Babati.



We simply brought some of the workbenches outside, as the temperatures in the Tanzanian winter at almost 1700 metres above sea level were quite pleasant.

In the afternoon, we cut and deburred the material for

2 solar cookers and drilled and punched some of the holes.



On the second day, we were able to produce all the bent parts with the angle bender and the rings with the roll bender in the original size according to the constructional drawing.

During the pre-assembly (the parts were painted later) of the two SK 14, all the parts fitted together perfectly. **The guys did a very good job!.**



Thursday and Friday, the course participants made 5



more solar cookers, mostly independently in small groups. Katharina, the sewing workshop teacher, showed the course participants how to operate and clean the solar cooker.



On Saturday, we cut the parts for 7 basic WSS (wood saving stove) and completed a prototype together. On Monday and Tuesday, the course participants produced the remaining 6 basic WSS and 6 WSS.

Of course, the wood-saving stoves also had to be tested. We built a simple, very inexpensive clay stove for comparison.



Christopher Kellner's LILO stove consists of a mixture of clay, sand and sawdust, which is pressed into wooden moulds when wet. The dried parts are assembled and fired during the first cooking process. The sawdust burns and a porous, fireclay-like structure is created, which provides good thermal insulation. The stove therefore reaches very high combustion temperatures and burns very cleanly.

All 3 stoves burn smoke-free after firing up and, depending on the model, save at least 60% on firewood compared to an open 3-brick fire.

Incidentally, the stove in the middle does not emit any smoke, it is water vapour. The new clay pot was not yet watertight.

### The firewood situation in the country:



In Tanzania, around 90 % of households cook with firewood or charcoal. In the larger cities, charcoal is predominantly used, which is made from wood at a ratio of 1:7. Every year, 500,000 - 600,000 hectares (1,200 - 1,500 acres) of forest are destroyed; since 1964, Tanzania's tree population has declined by 50%.

The price of charcoal for a family in Dar es Salaam for one month has increased more than tenfold in 20 years and currently stands at around 70,000 TZS (27 €) - equivalent to the monthly income of a domestic help, for example. Gas is even more expensive, and electricity is hardly affordable.

The population of Tanzania has grown by 25 million to 65 million in these 20 years.

### Situation in Dareda:

Firewood is felled on the nearby mountain slopes. The bush and forest stands have also declined considerably here.



**EG-Solar e.V.** \* Neuöttinger Str. 64 c \* 84503 Altötting \* Tel. (0 86 71) 96 99 37

E-Mail: [eg-solar@t-online.de](mailto:eg-solar@t-online.de) \* Homepage: <http://www.eg-solar.de>

Sparkasse Altötting-Mühldorf IBAN: DE55 7115 1020 0000 0493 38 BIC: BYLADEM1MDF



At the schools, firewood is used to prepare what is usually the only hot meal for the pupils.



Larger wood-saving stoves are currently being built at the vocational school to hold 60-80 litre pots.



In the restaurants and street pubs, most cooking is done with charcoal. A large bucket cost 4,000 TS (~ € 1.50) in summer.

In general, it can be said that the staple foods of sweet corn, beans and rice are cheaper than the energy needed to prepare them.

An old, poor woman in the neighbourhood cooked her meals with a mixture of biomass waste and collected plastic bottles over acrid smoke.

#### **Presentation of solar cookers, wood-saving stoves etc. from VTC Dareda at the trade fair in Arusha.**

The road to Arusha between the Tarangire and Lake Manyara National Parks also leads through the Maasai settlement areas.



In this region you can see what the lack of rainfall and merciless overgrazing can do.

The largest trade fair in Tanzania, "nanenane", is an agricultural fair with a trade show and a large bazaar.

The main aim of the VTC Dareda's presence at the fair was to present the school to a broad public and to attract new students for the coming school year. During my stay, some of the vocational school's teachers programmed their own homepage (<https://vtc-dareda-tanzania.com>) and designed a flyer.



We also offered our solar cookers and wood-saving stoves as well as washable, environmentally friendly napies and sanitary towels from the sewing department for sale.

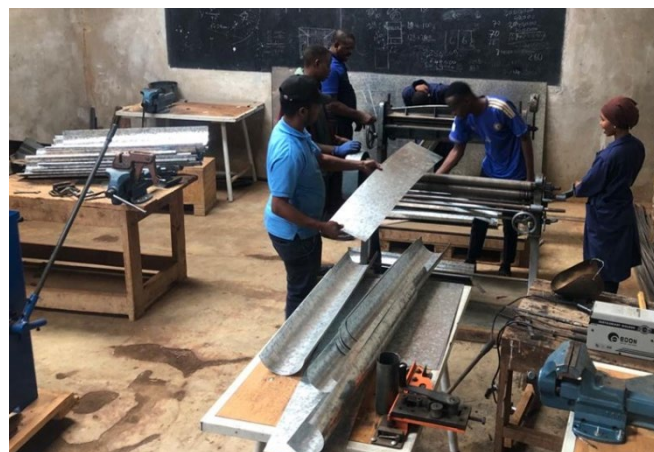
The selling price of a SK14 solar cooker made in Dareda is the equivalent of € 130. Unfortunately, only very few people can afford this amount. EG-Solar e.V. takes over the reflector plates for social organizations, which reduces the price to € 80.



**We hope that the numerous western NGOs that support schools, kindergartens, health centres, etc. in Tanzania will help us here. Incidentally, we have a delivery centre in Arusha for the products from Dareda.**

#### **Conclusion:**

I was impressed by the enthusiasm and motivation of the course participants. They worked every day from 8.00 am to 6.00 pm with a one-hour lunch break. The school now has a well-equipped metal workshop. This is certainly an incentive to start an apprenticeship at VTC Dareda and thus increase the number of students again.



These pictures reached me a few weeks ago. Gutters for the school buildings are made in the metal workshop. The huge roof areas have so far turned the area around the buildings into a muddy surface during the rainy season. The rainwater is also collected and stored in cisterns for dry periods.

Wood-saving stoves and solar cookers are also being built in small series.



Hans Michlbauer EG-Solar e.V. 01/2024

**EG-Solar e.V.** \* Neuöttinger Str. 64 c \* 84503 Altötting \* Tel. (0 86 71) 96 99 37

E-Mail: [eg-solar@t-online.de](mailto:eg-solar@t-online.de) \* Homepage: <http://www.eg-solar.de>

Sparkasse Altötting-Mühldorf IBAN: DE55 7115 1020 0000 0493 38 BIC: BYLADEM1MDF