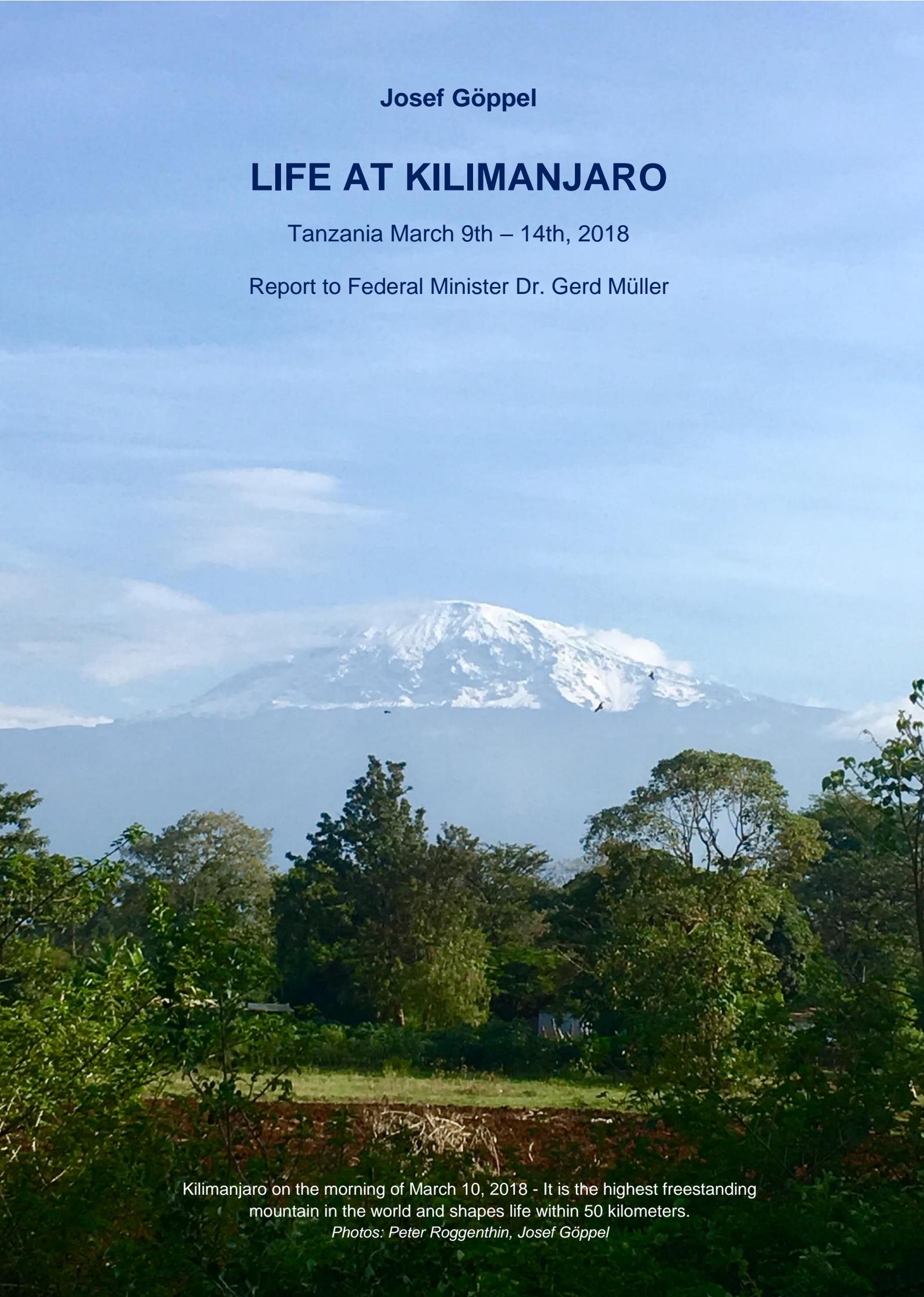


Josef Göppel

LIFE AT KILIMANJARO

Tanzania March 9th – 14th, 2018

Report to Federal Minister Dr. Gerd Müller



Kilimanjaro on the morning of March 10, 2018 - It is the highest freestanding mountain in the world and shapes life within 50 kilometers.

Photos: Peter Roggenthin, Josef Göppel

The Kilimanjaro

A report of East Africa cannot begin without referring to the Kilimanjaro. He is the highest free-standing mountain in the world. From all four directions it looks like a wide stored giant. Its gently rising flanks seduce the observer into suspecting a slight ascent. To look at the snow-capped peak, one has to put the head back and raise the eyes. It is the view into an otherworldly world: white shiny cool from the dusty and hot level. **Grandeur** assumes, but also something maternal. This vast, comprehensive being determines everything within 50 km. It provides churning water, fertile soils, fruits of all kinds and timber. The mountain is geologically young. Only 1.5 million years ago, the **volcanoes** erupted from the earth, which today form the massif of Kilimanjaro. The last outbursts happened at a time when people roamed the savannah. Today, the summit rises up to 5200 m above sea level of the plane level, which is in 700 m high.

The people of the **Chagga** tribe who live here are considered friendly and hard-working. Maybe that's because of the coolness the mountain gives them over and over again. Anyway, they tell the visitors that to whom Kilimanjaro shows itself are happy people, because many would not be able to see the summit even during long stays. Kilimanjaro showed itself to me on the day of my arrival and on the day of departure!

Visit to three farming families

One goal of this trip was to identify the most effective use of photovoltaics in agriculture. Still, 65% of the Tanzanian population works in agriculture. Arable land accounts for only 4% of the land area. 40% are pastureland

We visit three farming families in different growth areas. **Jacob Mushi** has chosen them, who is an agricultural advisor to the Evangelical Lutheran Church of Tanzania. He is a member of the Chagga tribe and has published a widely noticed scientific



Children of the village *Machame* at 1800 meters above sea level await us in front of the homestead of the village chairman *William Nyka*.

analysis of agriculture in the Kilimanjaro area. In addition, **Nelson Chami** is joining us, also Chagga. He is the founder of the self-help organization **Helping Hands** in Arusha. While driving across the country we see many people in the fields preparing the seeds just before the rainy

season starts. Their working equipment is the hoe. Only sporadically we encounter tractors with disc harrows

We drive at 1800 m altitude in the village of **Machame**, starting point four tours on the Kili-manjaro. There we meet the village chairman **William Nyka**. In 1972 he cleared an acre (4047m²), built a homestead and founded a family.

The house is encased in banana trees under which coffee bushes grow. We encounter cows and pigs as well as lots of chickens and rabbits. The whole animal's alimentation comes from the plants of the environment. Additional food would be too expensive. The house is built of concrete blocks and covered with corrugated iron. The farm buildings are provisionally made up of poles. The floor of the yard is uneven and slippery from the daily rain. The poverty here is striking, miserable teeth, lack of hygiene options, tattered clothes. I feel sorry for the



The house of village chairman *William Nyka* in *Machame*. He cleared the property from the jungle in 1972. On the roof a solar cell with 50x30 cm.



woman who has to look after her family under such circumstances.

The operating buildings of the village chairman *William Nyka*. Here are housed animals and supplies. The problem is the seal against regular heavy rain.



Battery of the photovoltaic system in the house of the village chairman *William Nkya* in *Machame*.

William has already experience with photovoltaic. Electricity comes from a solar system that he bought for € 330. He sold a cow for that. Before that he had another facility for which he paid 6 euros a month. But soon the company went bankrupt and no longer provided him with a password for further operation.

Nelson Chami says that William bought the new solar system overpriced. He himself paid € 150 in Arusha for a system of the same size that works perfectly.

The second farm is located on the slope in the village **Zarau**. The estate of the farmer **Paul Mboya** makes a better impression on the outside. *Jatropha* trees and mangos are in the home garden, including coffee and bananas.



Every house on the slopes of Kilimanjaro is surrounded by banana trees. Besides corn and beans, bananas are a staple food.



The farmer *Paul Mboya* in *Zarau* holds black and white dairy cows. For the stable, only a rain cover is needed. A cow of this relatively short-lived breed gives 10 liters of milk a day. This corresponds to one third of the milk yield of highly bred cows in Europe.

Paul holds six dairy cows, 26 goats and two dozen chickens. Beehives hang in the trees. From a cow he gets 10 l of milk per day. He has earnings from the sale of coffee, mango fruits, tomatoes, vegetables and honey. Honey has a high market value but is also laborious to harvest.



The soil on the slope of Kilimanjaro is littered with stones.



Only 10 percent of arable land is treated with tractors and disc harrows, while 90 percent is handled with a hand pick. For the use of the tractor, the owner of the field must spend a third of their future income.

The radio is running in the house, so there has to be electricity. Paul, too, has had bitter experiences. His first solar system was offered cheap for € 3.50 per month. After three years, it was supposed to become his property. As this time approached, the company presented him with either continuing to pay or no longer having a password to work with. Nevertheless, photovoltaic in the household is now a self-run. But people would like to buy from someone they know and can turn to directly.



The farmer's parents *Francis Semi* in front of the house of his estate. Also on this roof, several small solar panels are mounted, which provide power for a lamp and two sockets.

When leaving the farm, he gives us some of his most valuable possessions - honey, which he has harvested from the trees! We drive with him to his field in 2 km distance. He has the right of use for 3 acres. The soil is stony. Manioc and sorghum grow mainly on the area. Paul does not own a car. He has to rent a vehicle every time to transport the harvest to his yard. But this is subtracted from the yield, as well as plowing with a tractor.

The groundwater is here at a depth of 10 m. Jacob Mushi says the most effective help is the use of **solar power for irrigation**. There is a traditional **furrow irrigation** on both sides of the rivers, which is cooperatively operated by the farmers. One could tie this up. Mushi is convinced that the consolidation of harvests during the dry season has lever action on Tanzania's development.



One of the few public wells in the Massai steppe. The water comes out via a pipe from the 35 km distant mountain village *Machame*. 20 Liters can be taken for 1 euro cents.



Farming and traditional grazing of the Massai are now competing for land. On the southern slope of the Kilimanjaro, the government tries to avoid conflicts through clear spatial boundaries.

At our third goal, this is immediately brought to our attention. We drive into the tree savanna to about 10 km south of the road Moshi - Arusha. The village of **Tindigani** with the farmstead of the farmer **Francis Semi** is still in the area of volcanic soil, although we are here more than 50 km away from the Kilimanjaro peak. On the way out onto the fields, the loose black earth falls on a humus forest floor similar to that in Central Europe. Women and men with hoes prepare seed furrows. The individual field pieces are only about 20x 20 m in size.



Under the turf of the tree savanna hides a humusous and very fertile soil - if it gets enough water. The field pieces are small parceled and are still processed with the hand pick.



Business-savvy companies are tempting farmers to buy their pesticides, arguing that fertile and irrigated soil is particularly vulnerable to pests. They risk losing their entire crop if they do not use the insecticides. Often this leads to success.

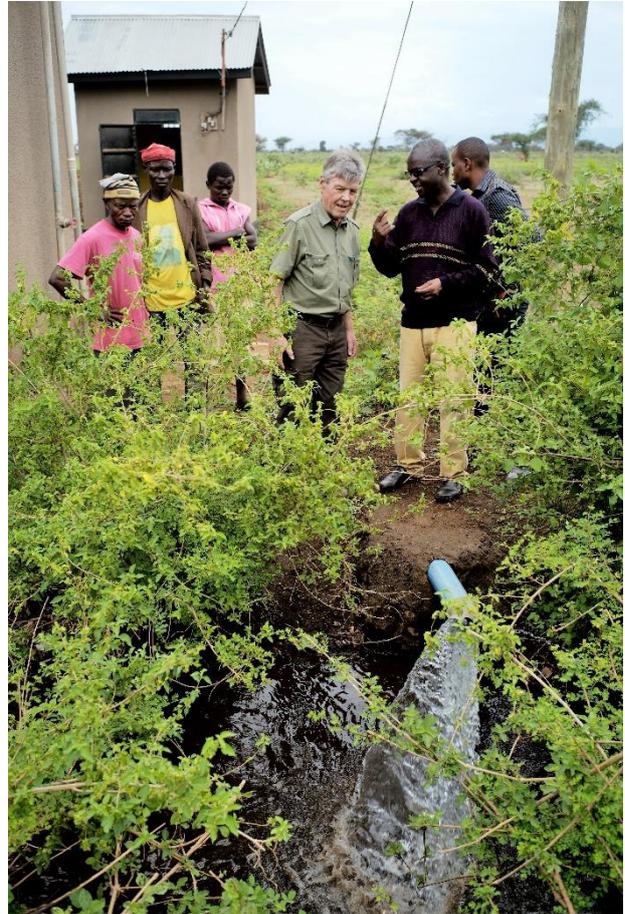
The picture is a bit reminiscent of Asian rice cultures. There is water in the ditches. I realize now that Tindigani is a famous model project. In 2011, a 66 m deep well was created with funds from



the World Bank. 100 acres, equals 40 ha, can now be safely supplied with water. The costs for the farmers are not low. For one irrigation, they have to pay between 7 and 36 € per acre depending on the distance from the well. Nevertheless, it's worth it.

At the end of the visit, the farmer *Francis Semi* in *Tindigani* gives his guests the most beautiful watermelon he found in his field..

The use of the fertile soil during periods of drought has given this village community more self-confidence and future prospects!



For the village of *Tindigani*, the World Bank financed in 2011 a model fountain with electricity. It collects water from a depth of 66 meters and can irrigate 40 hectares of arable land during dry seasons. This connects to the traditional furrow irrigation, which was co-operative on both sides of rivers.

The village chairman, under lively cheers from the other men, reminds me that the village commu-



nities can be recipients of direct project assistance. That does not have to be operated by the government in Dar es Salaam, they say.

Farmer *Francis Semi*'s daughter in the village of *Tindigani* with one of her children. 95 percent of women in rural areas work after finishing elementary school in the household of the extended family.

The artisan school in Hai

The specifications of the Energy Commissioners of the BMZ for Africa begin with the sentence "The task is to support the development of decentralized, renewable energy in civilian life in Africa". Where do you start? **Federal Minister Dr. Gerd Müller** deliberately chose a sustainable, long-term path for the strategy "Green Citizen Energy for Africa":

1. Germany supports the **job-related training** of young professionals in the field of energy.
2. The purpose of this is to **create new companies** that operate the end-customer business with renewable energies in their own economic environment. "Medium Business" the Chagga call such a middle class.
3. African actors are given **personal partnerships** with German organizations to learn from each other and to build a network of direct human relationships.

A well-functioning example of this is the **artisan school** in **Hai** at the foot of Kilimanjaro. There are 230 young women and men in seven different professions on a par with the level of the German apprenticeship exam. The school fee is € 468 per person per year - almost too much for an average family with several children. The Evangelical Lutheran Church of Tanzania gets no support from



the state. To maintain the business, a **partnership** with the deanery of Rothenburg ob der Tauber in Franconia contributes significantly. The couple Reiner and Barbara Kammleiter run the school since 1994.

Everything here breathes German thoroughness.

How does photovoltaics work? - Teaching in electrical engineering at the *artisan school Hai*. Some of the graduates will start businesses that operate the business of solar technology in the regional radius of their own economics. Personal partnerships with German organizations should then lead to lasting cooperation.

But also on the school grounds the supply of water is a problem. It has to be pumped up from 100 m depth. The most cherished wish of the school is therefore the installation of a solar field to operate the well pump. An estimated cost of € 12,000 is on hand, but without financial help from Germany, this is not affordable. Here, I realize how important a **flexible small-scale project fund** for decentralized citizen energy in Africa is.



Master tailor *Elishukuru Pallangyo* (right) teaches a student how to make a cut.

The school is also looking for a senior expert who can guide the **construction of a windmill** on the site. There are enough assistants.



The sign above the entrance gate to the artisan school in Hai at the foot of Kilimanjaro. "Elimu kwa vitendo" - "Education through practical action" is the motto of the school. Unlike German vocational schools, students produce salable products that help finance school operations.

In contrast to German vocational schools, Hai is **actually operating economically**. The students produce furniture, clothes and even church organs, also they carry out contract work in metal. "Elimu kwa Vitendo!" stands above the large entrance gate of the school - "Education through practical action!"

Fitting in German politics

The strategy "Green Citizens for Africa" meets a great need in the rural areas of Africa and on the other hand a great willingness to cooperate with Germany. When fitting into the existing development structures of German development cooperation, we should be guided by the goals we pursue with the strategy:

- Future prospects for young people in rural areas of Africa
- Pushing value creation chains through renewable energy
- The broad productive use of energy by local farms and cooperatives.

Overall, it makes sense to build on existing programs to use trained procedures. For example, EnDev, GET FIT, Powering Agriculture or GET-Pro.



A solar shop in *Moshi* at the foot of Kilimanjaro. Meanwhile for the electrical power is now photovoltaik power supply a self-run. However, all three farmers said they wanted to buy from a local dealer they know.

The core of a program for citizen energy would also have to be a **fund for the promotion of training and technical projects** of German and African institutions. It must be possible to flexibly promote exemplary projects, even in individual cases.

In German the name could be „**Lebensenergie für das Land**“.

In English perhaps „**Energizing rural development**“.

In Kiswahili it has a wonderful sound **NISHATI YA MAISHA KWA NCHI!** – Energy for Life from the Land!