# Improving health & study possibilities for outcast adolescent mothers in Tanzania

**The Tumaini Open School in Tanzania aims to give vulnerable young mothers a second chance. These women, who are often expelled from school and excluded from society, are offered a safe space to regain their education. Reliable access to clean energy will be a helpful tool for quality education and well being.**

Imagine being a single adolescent mother trying to finish your studies in a country where the sun sets around 19:00 every night. What do you do when you have put your baby to sleep? That's right, you turn on the lights and start studying for your exam. Unfortunately, power outages are a common problem in Tanzania, so an alternative solution for reliable electricity is very much needed.

*Solar panels at St. Ann Catholic Mission Hospital in Tanzania (Lovisa Magnusson Ericsson, 2023).*

In addition to this, most cooking is still carried out using charcoal and firewood, even in big school kitchens. This is reducing the health of those women working in the kitchen, and should be a practice of the past. In the days of climate change, sustainable development goals and cheap renewable options, small-scale solar photovoltaic (PV) systems and biogas production are a more viable solution than ever, especially in developing countries.

As a part of our master thesis we have made a Minor Field Study (MFS) to Tanzania and the Tumaini Open School, through Engineers Without Borders - Sweden. During our field trip we conducted interviews and a survey, made study visits to solar and biogas plants and investigated the local conditions for these technologies. We learned which electricity services are most important to them and when they are in need of electricity. Our results showed that a combination of solar energy and electricity from the main grid would be the most reliable and energy efficient solution, despite not being the most economical option. A standalone PV system with batteries can cover the most vital services as the main grid electricity is very unreliable. The main grid can rather be considered as a back-up system and to cover the less important services for the school.

To increase the health of the women cooking at the school, biogas production for cooking purposes is a feasible alternative according to our study. Several available biomass material sources and biogas plants would be needed to cover most of the cooking fuel demand. The recommended biomass sources at the school are animal, human and food waste.

If the school is to implement these modern technologies, proper knowledge and training on how to manage and operate the systems are essential. Also, the environmental and social benefits of cooking with biogas, as well as using the waste product as fertiliser, needs to become more well known.

*Gas kitchen from Sikonge Folk Development College in Tanzania (Lovisa Magnusson Ericsson, 2023).*

The members of the Tumaini Open School are ambitious to achieve good health and well-being for the students, along with access to affordable and clean energy as the Sustainable Development Goals 3 and 7 aspires towards. Their great passion increases the chances of a successful sustainable energy system.

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