

# Malawi student developing a solar autoclave

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Malawi's University of Mzuzu final-year student pursuing a Bachelor of Science degree in Renewable Energy is developing a solar autoclave, the first of its kind in Malawi.



Grycian Massa: aiming to make a difference in Malawi's rural health clinics.

Malawi's Chief Medical Engineer, who is also the Head of the Physical Asset Management Division in the Ministry of Health, Dr. Lovemore Mkukuma, said that once the solar autoclave has been fully developed, it will be used for sterilising instruments in rural health centres, most of which don't have electricity.

The 28-year-old student, Grycian Massa, said he has been designing the machine for some time.

"I started with the practical aspect while in Lilongwe because it is closer to the industries," said Massa in an interview at his university campus, 370km from Lilongwe.

He said when he first tested it his lecturers advised him to develop a theoretical backing of the design. It took him three months – January to March – to design the machine.

There were problems, but "The biggest hurdle has been finances," he confessed.

Initially the university was supposed to provide K50, 000 (US\$357), a project administration fee which he was supposed to use for research, but "Now authorities are telling me that this money is for the supervising lecturer and not me," he says, disappointment written over his face.

Massa says he intends to use aluminium to cast the body of the autoclave that he has designed and will incorporate sockets

for solar evacuated tubes.

“For me to complete the whole project I need about K200, 000, (US\$1,428)” he declared.

Dr. Mkukuma has since pledged to assist the student with finances.

Because of financial constraints, Massa is currently doing research to establish how best he can modify autoclaves that use wood and charcoal to solar.

“These autoclaves are contributing to environmental degradation and we need to come up with something that is effective and environmentally friendly,” he says.

A number of problems have appeared, however.

He says since the charcoal or firewood autoclaves are round, it is difficult to connect the solar evacuated tubes into them in order to generate the needed heat.

What is required is a mechanism to produce heat of around 120°C but the first test only managed 90°C before dropping to 70°C.

“Now I have started research on another method using reflectors,” he says.

Massa started working at one of the country's three major referral hospitals of Queen Elizabeth Central Hospital in Blantyre in 2004 as a medical technician before studying for a bachelor's degree in renewable energy at the University.

Dr. Mkukuma said they began assisting Massa after Government realised that they had to turn to solar energy since it was clear that Malawi's health centres needed alternative energy. “Lack of electrical supply in the rural setting is adversely affecting our health delivery efforts,” he said.

Now about 15 technicians drawn from district hospitals are undergoing a three-week solar photovoltaic systems training course at the Mzuzu University.

The Japanese International Co-operation Agency (JICA) is funding the course, which is part of a four-year JICA/ Physical Assets Management Program and which ends in 2010.

Deputy Chancellor for the Mzuzu University Professor Landson Mhango observed that although health centres have power demand there is little to access it due to high costs of transmission and distribution.

“The ministry of health technicians have been asked to not only understand the complexity of the system but to also be able to design the system,” he said.

Professor Mhango bemoaned the big gap that exists between the knowledge gained by scholars and the transformation of such knowledge into practical use, which he said it is working against the objective of technology, which is to improve people's quality of life.

In Malawi, as in many other countries, the demand for energy surpasses supply and where a health centre has no electricity, storage of vaccines is difficult as is proper sterilisation of surgical instruments.

The Malawi government hopes to benefit greatly from Massa's initiatives to develop a solar autoclave, as it would help its health delivery services in the rural areas, home to 80% of Malawians.

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