



Abstract

About 2.4 billion people around the world cook over fires made of wood, animal waste or charcoal because they lack sustainable fuel (solarcooker.org). In doing so, they inhale the smoke and soot that is known to cause serious health problems. In the Democratic Republic of Congo about 98% of the population of the city of Lubumbashi uses charcoal as primary fuel for domestic cooking. This has implications on health and environment. During the lecture this will be illustrated by means of detailed examples.

The “Solar Cooker for All (Sc4all)” project aims to co-create solar cookers with the most vulnerable communities in Lubumbashi, Democratic Republic of Congo (DRC) and further strengthen the knowledge gained. These stoves use free solar energy, allowing people to breathe clean air and drink clean water while saving the environment.

The specific objective of the project is to design low-cost solar cookers for domestic use. Solar cookers are commercially available but are most often imported and very expensive. Moreover, they are not necessarily adapted to local needs of potential users in middle- and low-income countries. Therefore, an important requirement of our project is that the newly developed solar cookers are made locally from recycled materials and that these cookers meet local needs. At the same time, a business plan for local small businesses will be developed so that the final product can be manufactured locally and distributed at low cost, benefiting the most vulnerable families.

To produce these low-cost solar cookers, the project has started a multidisciplinary research and development line at the University of Lubumbashi (UniLu, DRC), in collaboration with Hasselt University (UHasselt), to test new prototypes. To achieve this, the interdisciplinary expertise of many different faculties present at both universities will be integrated to enable maximum exchange of expertise. This project will be considered a success when the UniLu team achieves international recognition in solar cooker R&D, with the help of the UHasselt team. We are confident that our low-cost prototypes will be suitable for small businesses to produce and sell anywhere in the DRC, Africa, or even in the world. Finally, the Sc4all project will train a new generation of students to propose innovative solutions for many of UNO's strategic development goals, ensuring the sustainability of the project.

Over the last two years UHasselt students have built an electronic weather station for testing the performance of prototypes. They also tested the reflective capacity of recycled materials to investigate their applicability in two prototypes. During the months of July 2023 and 2024, a team of students from both universities have collaborated in designing and testing several low-cost prototypes in the Democratic Republic of Congo. In this lecture the results of the Sc4all-project will be presented.