

Saving lives while cooking lunch

The work of Practical Action



A haze of smoke from cooking fires hangs over a Nepalese village

Traditional cooking stoves burn fuel and produce a lot of smoke. This smoke is a major cause of pollution which causes problems locally for the people using the stoves and also globally as a probable cause of retreating glaciers. One project by charity Practical Action aims to alleviate these problems.

In developing countries four million people worldwide die each year from smoke pollution generated by cooking over open fires, according to statistics published by the World Health Organisation. In global terms this makes smoke a bigger killer than malaria. Most of those dying are women and children under five who contract lung cancer and other lung diseases as a result of exposure to the smoke.



Cooking over an open fire exposes the whole family to the hazards of inhaling smoke.

One way of helping to prevent these deaths is to develop an improved cooking stove which produces no smoke and uses less firewood, which is a scarce resource in many communities. To do this, Practical Action is working with universities,

companies and governments around the world to design a stove which is fuel-efficient, affordable and easy to use.

One of the countries Practical Action is working in is the Himalayan country of Nepal. Here many rural homes rely on traditional energy sources such as wood for cooking and heating their homes. Because of the problems caused by smoke, the Nepalese government has said that they want everybody to use a smoke-free cooker by 2017.

To help meet this target Practical Action has been working with the Universities of Nottingham and Kathmandu to develop a new stove called the Score stove. This combines fuel efficiency with state-of-the-art technology to change sound waves into electricity.



A Score stove. It can also be used to charge mobile phones as it also generates electricity. This makes the stove more appealing as it has more than one use.

Producing electricity means that, as well as cooking, the Score stove can be used to provide lighting in the home or charge mobile phones. In a country like Nepal this is crucial because cooking is seen as women's work but men still control the family finances and decide how the money is spent. So, in contrast to other stoves which can only be used for cooking, market research has shown that the Score stove is highly valued by both men and women and therefore is more likely to be bought.

The stove is approximately 60 cm square and 70 cm high and is attached to a specially shaped pipe. It generates electricity by the heat causing dozens of thin metal sheets with tiny holes to vibrate and produce powerful sound waves. The sound waves travel into a speaker and cause it to flap up to 70 times a second, moving an alternator which in turn creates electricity.

The technology is the brainchild of Paul Riley and Chris Cook, both engineers from the University of Nottingham. They have now developed a working prototype which takes into account the local fuels and pots and pans used in Nepal. Tests are continuing on this new design to increase both its fuel efficiency and energy output.

The key to getting the Score stove distributed widely throughout Nepal is for it to be produced locally at an affordable price. Although it is still at the design stage it is hoped that when mass manufactured a stove will retail for around £60. The Score stove will also incorporate slight design modifications in each different area of Nepal so that local materials can be used.

To date, field trials in Nepal of the stove, sponsored by the energy company Alstom, have been very successful. In addition the charity Engineers Without Borders is supporting four students to further develop the design at Kathmandu University.



Simon Trace of Practical Action serves lunch cooked on the SCORE stove.

To help promote the Score stove in Nepal, Practical Action have recruited the help of the Queen's Gurkha Signals regiment based in Warwickshire. (Many Gurkhas come from Nepal.) They recently tested the stove for themselves by successfully cooking the regiment lunch on it in front of a VIP audience including the Vice Chancellor of Kathmandu University, the Nepalese education minister and the chief executive of Practical Action, Simon Trace.

When it goes into production it is hoped that the Score stove could save tens of thousands of lives every year not just in Nepal but in developing countries around the world.

Nicholas Milton is a media officer with Practical Action.



The Gurkhas cook lunch for their regiment on the stove to demonstrate how well it works. The electricity generated by the stove lights the LEDs.



Look here!

Practical Action's website: practicalaction.org
 For another example of science working for solutions for developing countries see this CATALYST article about solar disinfection of drinking water: bit.ly/1m4TLWE