

Cook fireless with enthalpy, not fuel.

The most efficient method to deplete deforestation and desertification.

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Prior coming to the description of the problems and the solution, some example statistics must be made aware to recognize the brisance of this tender subject:

- 300 million metric tonnes of trees (300bn kgs) are cut down in Africa annually.
- 7000 trees are cut down every day to feed the city of Nairobi.
- Countries like Haiti or Madagascar are completely devastated, just to produce charcoal from wood.
- In Africa, the average carbonization ratio is 6.6 to 1 (6.6 kgs of wood are charred to obtain just 1 kg of charcoal).

More than 100 years ago, the American success-author Margaret Mitchell (*Gone with the Wind*) wrote the "Fireless Cook Book"¹. During World War I and II and the years after the wars, fireless cookers were widely in use throughout Europe due to the interrupted energy supply infrastructures. A meal was brought to boil in the morning by any kind of traditional energy, for instance a fire. The pot was inserted into an insulated container such as a hay box or a basket and has been wrapped with several layers of blankets or other textiles. The obtained heat of the food (enthalpy) was prevented from escape thanks to the insulation. The meals continued to cook. When the family came home after school or after work, the food was ready cooked and still hot.

The fireless cookers take over the so-called simmering phase of the cooking process entirely.

A multitude of heat retaining items have been invented since, but are not applicable in the developing countries for 2 essential reasons, which restrain the dissemination:

1. They are too expensive (thermos flasks, electric cooling/warming boxes with peltier elements, etc.).
2. A lack of energy (electricity, gas, etc.).

For these and some other reasons, the fireless cookers technology had to be improved to match the needs of the developing countries.

¹ Mitchell, M., *The Fireless Cook Book*, 1909, Doubleday, Page & Co., New York

A fireless cooker for application in developing countries must be

1. Cheap and easy to make.
2. Easy to understand.
3. Easy to handle and apply.
4. Safe.
5. Nice looking.
6. Capable for multi-purposes applications.
7. Match with the local pot standards.

NAREWAMA, together with many NGOs throughout Eastern Africa, works for several years on the development of fireless cookers and established by surveys and constant monitoring activities in cooperation with local women groups, a standard which is widely accepted:

- The cover is a basket.
- Crude cotton or shredded rags serve as insulation material.
- The other textiles are cotton cloths.

The fireless cookers were introduced to women throughout the country, in rural and urban locations, by seminars. The seminars took about 4 to 6 hours each, depending on the cooking method to heat the meals up to boiling temperature, like solar cookers, gasifiers or other energy sources.

It turned out clearly that the participants understood the process right away. Monitoring the users over several years showed that they continued the application of fireless cookers.

It's a cooker, it's a warmer, it's a cooler.

A fireless cooker continues to cook with the enthalpy of the food until the temperature decreases to below 80°C (176°F). This takes between 3 and 4 hours, depending on the insulation factor and the accuracy of fabrication. Every water-based meal can be prepared in fireless cookers (e.g. rice, potatoes, stews, etc.) during this time. Large beans must be soaked in water for some hours, though. Baking and frying is not possible, because the operating temperature of fireless cookers is limited to 100°C (212°F).

A fireless cooker keeps food warm. The food can be prepared in the afternoon and be served late in the evening. Also, water for personal hygiene purposes can be kept warm all night long. The pasteurization status is held for 6 or more hours.

A fireless cooker can keep any food cool, due to its insulation capabilities. Yoghurt can be processed in a perfect manner.

These multi-purpose abilities, in combination with a very low price and the easy-to-understand operation make a fireless cooker the perfect item for every household in the developing countries.

A fireless cooker can take 50 per cent of the daily cooking tasks – or even more.



Production of fireless cookers by a local women initiative in Kisumu, Kenya, Sep. 3013.
Photo: Bernhard S. Müller.



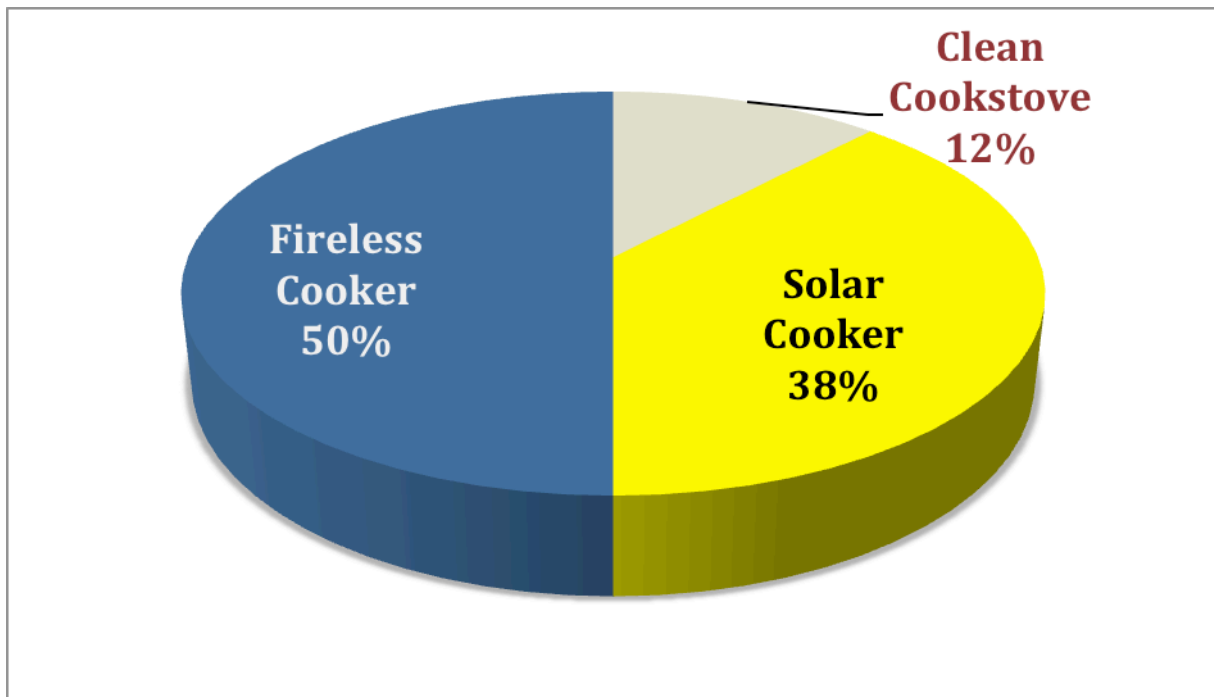
Faustine Odaba explains fireless cookers to Radha Muthiah, secretary general of the Global Alliance for Clean Cook Stoves – GACC (left) and the wife of Kenya’s vice-president, Ms. Ruto, during a conference in Nairobi, Nov. 2013. Photo: Allan Zulu.

The semi-governmental German development aid organization gtz (now: GIZ) ran a pilot program “Solar Cooker Field Test in South Africa” in co-operation with the South African Department of Minerals and Energy for several years. In their conclusion paper “Final Workshop, 4. Nov. 2003 in GTZ”, Dr. Rolf Posorski of GTZ stated: *“Field tests have proven that where people have solar cookers, they use them at least once a day 38 per cent of the time. These results and extensive market studies confirm a substantial latent market demand for solar cookers.”*

This excursion to the topic “solar cookers” has been inserted intentionally. With 50 per cent of all cooking tasks solved by a fireless cooker and 38 per cent by a solar cooker, just 12 per cent remain for a conventional cooking method. This can be a 3-stone-fire, a gasifier, a charcoal stove or a LPG oven. In more arid areas, solar cookers can achieve higher considerations than 38 per cent.

Although the promotion of LPG gathers increasing pace – the GACC is supported by the Shell Foundation – liquefied petroleum gas can definitely not be considered as a sustainable solution of energy scarcity in developing countries. Also, transportation of LPG can crystallize to become a problem, especially in remote areas. LPG emits CO₂.

It should also be considered, that so-called “clean” cook stoves are not clean. It is a dazzling word, which rather describes cleaner solutions. Clean, in the honest meaning of the word, are solar cookers and fireless cookers only.



Just 12 per cent of traditional cooking fuel is necessary for cooking purposes, if fireless cookers and solar cookers are used, whenever possible. Source: „What if the sun does not shine?“, a PowerPoint™ presentation by Faustine Odaba and Bernhard Müller. ²

Fireless cookers complement all known cooking methods, except baking and frying.

Considering the beginning of this paper, this leads to the results, that the cut down trees in Africa can be reduced from 300,000,000 tonnes per year to 36,000,000 tonnes. 7,000 cut down trees just for Nairobi per day could be replaced by just 840. Already devastated countries like Madagascar or Haiti will have time to reinstate forests and healthy soils. Also, the widely spread child labor could be reduced drastically by 88 per cent. Indoor air pollution can be reduced by exactly the same ratio.

Despite the fact, that fireless cookers are an accepted technology in the developing countries, leading organizations in the industrial countries continue to ignore them. For this reason, the dissemination occurs with a certain viscosity. The NGOs in Eastern Africa are desperately searching for funds to accelerate their efforts. Due to the circumstances that rural people just speak their local dialect and that a part are even analphabets, the publication of seminars and transportation to the places of the events cannot be paid by the NGOs entirely. Also, specially trained personnel with knowledge of the local tradition and habits needs to be hired. All of that is too costly for the NGOs.

To reduce deforestation, desertification, CO- and CO₂-emissions, child labor, indoor air pollution, fuel transport and other negative impacts by 88 per cent, there is a solution: Fireless Cookers. The rate of acceleration of the dissemination is up to you.

² PowerPoint is a registered Trade Mark of the Microsoft Corporation.