

Integrated cooking in Chad

Slide 2

Integrated cooking, which combines the use of solar cookers, fuel efficient stoves and retained heat cookers has dramatically reduced fuel consumption in refugee camps and elsewhere in the developing world.

Slide 3

Read slide

Slide 4

Thousands of female Darfur refugees in Chad

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like millions of women and children around the world, make long trips on foot every week and face possible attack and rape, in their search for firewood.

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And yet, a significant proportion of those who still cook over wood, dung and charcoal live in parts of the world that are rapidly being stripped of trees and ground cover, while also being blessed with abundant sunshine..our planet's most powerful source of energy.

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as you can see from this solar insolation map produced by the U.S. National Aeronautics and Space Administration.

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In 2005 Derk Rykjs of the Dutch Kozon Foundation working with an NGO in Chad introduced into Iridimi refugee camp, inexpensive, locally manufactured solar cookers and hay baskets. He combined their use with fuel-efficient stoves initially provided by GTZ. The goal of this program was to dramatically reduce fuel consumption and the corresponding need for trips outside refugee camps to forage for wood by teaching the women how to manufacture and use solar cookers and hay baskets.

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The model introduced was the Cookit....

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a simple panel solar cooker made of cardboard and aluminum foil and developed by Solar Cookers International.

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Thanks to the more than one and a half million dollars raised by Rachel Andres, Director of the Solar Cooker Project at Jewish World Watch, this project has now spread to Toulom and Oure Cassoni camps in eastern Chad.

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To date, the women in these three camps have manufactured and distributed more than 31,000 solar cookers.

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Initially, Dr. Rikjs and Tchad Solaire introduced the concept to the elders of the camp including the president of the refugees and the president of the women refugees. Once the camp leadership indicated their support for solar cooking, a team of committed refugees was trained to work with the Solar Cooker Project.

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The alliance of Kozon, UNHCR, Jewish World Watch and Solar Cookers International has provided the technology, people power, organizational skills and funding to make this project a success.

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Supplies were brought into the camp to allow the women to manufacture CookKits on site. To extend the effectiveness of their solar cookers, women were also taught to weave hay baskets, which allowed them cook a second meal with their solar cookers in the afternoon and keep it steaming hot for consumption after dark.

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A manufacturing plant and store room were built and materials transported into each camp. Materials include: cardboard, foil, glue (gum Arabic), supplies to make the carrying bags and.....

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... heat retention baskets, which you can see at the center of this photo. Refugee employees began to manufacture the cookers, while others served as trainers to educate the women and girls in the proper use of the cookers. After the entire camp was trained, a maintenance program was instituted to repair and replace cookers as necessary.

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Distribution began with each family receiving two cookers (more for larger families).

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Iridimi is home to 18,800 refugees and has been fully equipped with 15,000 solar cookers since the end of 2007. 4,500 women have been trained to use the solar cookers. Toulom has 23,400 refugees. 5,000 women have been trained and 13,000 solar cookers have been distributed so far. Oure Cassoni houses 28,000 refugees and is the newest camp to be adopted by the Solar Cooker Project. 25 auxiliary trainers are teaching the women of that camp at a rate of 800 per month. 3,000 solar cookers are currently in use.

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Through a five day evaluation process involving 121 refugee interviews (119 women and 2 men) and 10 qualitative and quantitative questions, the solar cooker evaluation team discovered that the women were using from one to three cookers to meet the needs of their families (an average size of three to eight).

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The evaluation team included representatives from Kozon, Jewish World Watch, UNHCR, Tchad Solaire, Solar Cookers Intl, Care Intl. and BCI Chad.

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The team found that women were developing their own modifications to the Cookit to cope with the desert winds.

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Because the Cookit can be set up and safely left untended to cook for several hours, it gives women increased time for other activities. Small children can be left to guard the solar cooker without fear of smoke, fire or burning. The reflectors do not heat up. Only the pot gets hot enough to cook the food. Handicapped people can use the Cookit on a table without fear of burning the table top or any cloth or papers on the table since paper will not burn at temperatures below 451 degrees F or 233 C. and the Cookit never

exceeds 300 F. Solar cookers also allow mothers to purify drinking water for their children without wasting precious solid fuel.

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Preliminary findings of the October survey revealed that prior to the introduction of solar cookers and hay baskets, all the women interviewed left the camp to collect firewood at least one day per week, with 71% leaving camp 3 or more days every week to gather wood.

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After the introduction of these devices, there was an 86% reduction in trips outside the camp to search for firewood and 53% of the women surveyed said that they no longer had to leave the camp at all.

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60% of those surveyed used the cookit two times each day.

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How long do the cookers last? According to the October evaluation, they were lasting three to six months, but the sponsors are constantly improving the quality and design of the solar cookers with input from the women. With the new wind and rain protection that includes grommets and waterproof binding, the solar cookers are expected to last up to one year. More durable and expensive materials can ensure that the solar cookers will last even longer like these Cookits made in Kenya by Margaret Owino of Solar Cookers International's Sunny Solutions project... They use a heavy duty foil and last for more than two years.

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What kind of food can be made? All traditional foods refugees eat including la boule (traditional millet or maize-based meal). When cooked over a wood fire, the boule needs stirring so it won't burn, but it cannot burn in the solar cooker and cooks like polenta. If the women want it fluffy, they stir it rapidly as soon as it is removed from the solar cookers. Even without stirring the taste is the same.

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This photos shows women in Iridimi serving solar cooked bouilli, tea, peas, grains and sauces.

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Solar cookers can also cook millet porridge, wheat, beans, yellow peas, sweet potatoes, eggs, sauces and tea. Solar cookers provide an energy efficient way to prepare slow cooking legumes which would otherwise consume a great deal of firewood.

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Meat and fish also cook well in solar cookers as shown in this pot of piping hot solar cooked chicken on my dining room table in my home near Washington DC.

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An important part of the Solar Cooker Project is the income generating aspect. Rather than sending the assembled cookers straight to the camps, women are hired to manufacture them using the component parts. Jobs include cutting the cardboard,

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gluing foil to the cardboard, sewing heat retention bags,

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and painting the cooking pots black to absorb infrared light.

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The manufacture of various types of solar cookers is creating sustainable, green jobs for people around the world.

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This integrated solar cooking project in Bolivia, under the guidance of David and Ruth Whitfield's CEDESOL, is teaching hundreds of Bolivians how to build and use solar box cookers when the sun is shining along with retained heat cookers and fuel efficient stoves at nights and on cloudy days.

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Solar Cookits with Hot Pots in Mexico.

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Currently some of the African Union troops in Darfur and in Chad are being PAID to escort refugee women who must leave their camps to search for wood. Unfortunately these women are harvesting wood and trees that belong to the permanently settled communities near the camps. This money could be better spent providing these women with solar cookers, hay baskets and fuel efficient stoves.

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This unsustainable practice, which now threatens the energy security of local populations, is taking place under the blazing African sun—our planet's most abundant and barely tapped source of energy. The introduction of new cooking technologies into traditional societies will require long term training and attitude adjustment, as well as government-sponsored public service and education programs to convince people that their failure to switch to energy-efficient cooking methods will eventually destroy their environment and eliminate their last source of fuel.

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The principles of integrated cooking acknowledge the intrinsic importance of all three methods of cooking,

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Just as modern cooks choose among several methods to use the least amount of energy, : a toaster oven, a coffee pot, a stovetop or a microwave,

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the evaluation of the Iridimi project has demonstrated that a population in a humanitarian and energy starved setting can be taught to manufacture and use simple integrated

cooking devices to cook food and heat water. The CEDESOL project in Bolivia and other integrated cooking projects in Turkey, Niger and Mexico have demonstrated this as well.

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We all know that cooking over an open fire poses health risks, many of which are addressed by fuel efficient stoves. Solar cookers go one step farther. They use the free energy of the sun, they produce no smoke at all and they can slow cook foods and retain many of the nutrients that are lost when food is boiled over a fire.

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New ways to use these technologies have also been developed by the users in many parts of the world. Here a box cooker is serving a dual function both as a solar cooker and a hay basket by stuffing it with an insulating material as soon as the cooking is complete to keep the food hot for three to four more hours.

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In other parts of Africa and the developing world people are manufacturing and using other types of solar cookers, to meet their cooking needs

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sometimes even using parabolic, panel and box solar cookers in combination to fry, bake and stew food and boil water.

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There are safe, durable, small scale models for family use.

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There are large scale systems like this one in India developed by German NGO Solare Brucke which feeds 30,000 people per day.

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and powers a modern steam kitchen.

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There are small scale versions of the Scheffler cookers that allow cooks to prepare food indoors using reflected sunlight

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There are small scale versions of the Scheffler cookers that allow cooks to prepare food indoors using reflected sunlight

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And even smaller systems such as this one used by a single family.

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There are even solar cookers that provide heat for nighttime, indoor cooking such as this Scheffler model that heats a block of iron during the day.

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When the block is rolled indoors at night it heats the house and provides a cooking surface for hours after dark.

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Hundreds of thousands of Chinese-made butterfly solar cookers are used to keep pots of water boiling throughout the day.

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Tea shops that burn many kilos of wood and charcoal should all be equipped with this simple parabolic solar cooker that will allow them to keep their pot boiling all day saving their precious fuel for use at night and on cloudy days.

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The Iridimi project in Chad has shown that the introduction of simple solar cookers and intensive training in the practice of solar integrated cooking can dramatically reduce fuel consumption and the total destruction of our precious environment.

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We must work together to teach these methods in combination and empower people to tap into their most abundant source of free energy---the sun.