SOLAR FOOD PROCESSING – NETWORK AND SUPPORT

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ABSTRACT

Solar Food Processing offers many advantages for users and the environment. While many dissemination attempts are on-going at the grass-roots level, in the last few years small scale activities are being observed for income generation and money savings from using free and clean energy, namely the sun. More and more solar food products are entering the market and the variety is growing.

The Solar Food Processing Network aims to support this initial impact in order to boost solar food processing activities around the globe.

Keywords: Solar Cooker, Solar Food, Network, R & D, Dissemination, Food Processing

1. INTRODUCTION

Solar food processing is an innovative and multi-faceted technique capable of addressing various problems faced by people in the developing world. The implementation of technologies for food processing and conservation using solar energy can indirectly help to reduce poverty, improve health conditions, create sustainable local economic opportunities, and limit environmental damage by promoting the use of clean and renewable energy sources. This project targets developing countries with a high solar radiation potential, in particular those countries in need of unique and sustainable development assistance and ideas that relate to solar food products.

The project aims to extend and develop efficient methods of solar food processing for the following activities:

- Conservation of fruits and vegetables
- Drying crops
- Roasting different kind of nuts
- Pasteurising juice, fruits and vegetables
- Baking bread and cake.

Objectives:

- Improvement in the quality of food;
- Creation of local jobs and income;
- Demonstrating environmental benefits (with high potential for CO2 emissions reduction)
- Involvement of local personnel and local resources
- Creation of a new market and encouragement of economic competition in this field.

The project consists of three phases:
Phase 1: Setting up a network with interactive website and conducting a workshop, providing training (2005/06)
Phase 2: Developing and implementing solar food processing technologies (2006 – 2008)
Phase 3: Dissemination of results (2008/09)

2. BACKGROUND

Solar cooking and processing technologies are relatively unknown. While projects have been mostly small-scale, the potential for large scale implementation exists.

In many rural areas of developing countries, biomass in the form of wood is the traditional form of energy for cooking. However, wood is becoming more and more scarce, and overuse is leading to deforestation which has more drastic effects on the environment. Biomass is being used unsustainably when consumption is higher than the natural replacement rate.

By using the sun to provide energy for cooking, precious wood and forests can be saved. Moreover, human energy and time that it takes to collect wood can be reduced. In rural areas, women can spend several hours a day collecting and carrying fuel wood with loads of 20 kg or more in order to meet the demand of a private household. Institutions, such as school kitchens providing food or cooperatives producing sheer butter for example, burn tons of firewood during a year.
For the implementation of this project, ISES is in a unique position to draw together the experience and expertise of its international members and contacts to assist in developing this field of solar utilization and improve the knowledge and visibility thereof. In addition, the ISES scientific projects unit has the required experience in planning and implementing projects with a regional or international focus. Phase I (May 2005 – July 2006) of the Solar Food Processing project is financed by WISIONS.

The project coordinator, Rolf Behringer, has 15 years of experience in this field, and has developed excellent contacts internationally.

At this stage the network consists of 44 members from 27 different countries listed on the project website. Members are NGOs, Small and Medium Enterprises producing solar food processing devices or producing solar food products for a market, consulting agencies, R & D institutes and individuals.

The network supports exchange of information through the website. On one hand it is aimed to raise more awareness and attention for solar food processing by providing an international platform where project examples and ideas can be shared by everybody who is interested or active in the field of solar food processing.

Fig. 1. Screen shot of project examples on www.solarfood.org

3. THE POTENTIAL OF THE PROJECT

The implementation of solar food processing and conservation is an activity that will primarily be implemented at a local level by local actors. However, this project can approach people and organizations from an international perspective in order to support local implementation. As such the network members aim to encourage international exchange of information and experiences, and help to identify issues for basic standard development to increase the effectiveness of the available technologies.

Specific countries will be selected to initiate or extend implementation activities. At this stage the following countries are under consideration and others might follow:

- **Burkina Faso,** solar roasting of peanuts, production of shea butter, solar drying, production of solar stoves, scheffler cookers and SF 14 (since 1998 ongoing)
- **Namibia,** baking and selling bread, roasting peanuts, solar catering, production of solar stoves, cooking demonstrations (since 2000 ongoing)
- **Tanzania,** production of solar stoves, cooking demonstrations, roasting peanuts (since January 2006 ongoing)
- **Gambia**, selling solar bread and cake, traditional food, solar stove production in preparation (since November 2005 ongoing)

- **Paraguay,** production of solar stoves, scheffler cookers, solar-hybrid dryers, production of marmalade, pasteurizing fruit juice, bread and drying plants and fruits (since 1998 ongoing)
- **Afghanistan,** production of scheffler cookers and dryers. Development of solar tandur stoves for traditional bread (since April 2005 ongoing)
- **India,** production of scheffler community kitchen, SK 14, food processing research and development

The results will show useful examples and motivate many people in other countries and the replication potential is regarded as very high for several reasons:

- The applications are very practical and useful for a wide range of actors.
- No high level of expertise is required to apply these technologies.
- The technologies are affordable and most of the time local materials can be used to build the products.
- Material will be developed and presented in four languages in different formats (electronic and printed media).

The importance of involving local actors, with local infrastructure and local materials, is central to the success of this project. As such the development and presentation of useful material – both for awareness-raising and training – will be done in cooperation with local experts, for local actors.

Targets:

- Primary targets - users:
  - Small and Medium-Sized Enterprises (SMEs)
  - Farmers and rural communities
  - Women collectives and groups
  - Technicians (from North and South, who also need training)

- Secondary targets - support network:
  - Food experts
  - Ecologists / marketers
  - Economists
  - Development NGOs

- Other:
  - Government departments and officials involved in rural development supporting the development of new SMEs

Several media forms are used to reach a target audience as it is possible with limited financial resources:

- Brochures and posters in four different languages
- Radio & TV
- Local newspapers and magazines
- Public project website supporting the network of experts
- Demonstration of technologies and results:
  - Through local implementation
  - Presentation at local trade fairs

Fig. 2. Solar cooking demonstration at a local market in Tansania, Moshi January 2006

Through dissemination of information about solar cooking we expect great interest and involvement of local participants.

Despite all the positive arguments and benefits of using solar energy for cooking, we must keep in mind that other back-up forms of energy are still required. However these can also be other renewable energy sources such as biomass or biogas.

4. CONCLUSION

The International Solar Energy Society (ISES) has identified a need to raise awareness in the field of solar food processing and the wide range of RE applications for small-scale production. We experienced that potential users have to see the technology in operation and test (taste) the products. By placing a product in the local market the technology becomes much more interesting than targeting only private households. In Namibia we observed that private households became interested after they have seen solar stoves regularly used to produce bread, cake and peanuts for the local market.

To succeed in disseminating solar food technology on a larger scale several aspects are of importance:

(1) Implement quality standards by cooperative technology transfer and training

Photo courtesy of Rolf Behringer, ISES
Except Fig. 4 by Deepak Gadhia, India

Fig. 3. Solar Cooker Construction workshop. Tansania, Moshi, January 2006

(2) Provide a visual platform for technical and solar food products

Fig. 4. Pilot plant for testing, India 2005, Gadhia Solar

(3) Exchange information globally to speed up the development of a solar food technology through

- Networks such as Solar Food Processing or Solar Cookers International
- Conferences and workshops focussing on solar food processing and income generation
- Media campaigns

The project website www.solarfood.org is the most important network tool. Members are individuals, SMEs, research institution and development NGOs from many countries across the globe. It is regarded as a strong potential to have manufacturers of solar food processing devices, researchers and solar food producers. A coordinated action could help to increase quality, effectiveness and use of products.