

RENEWABLE ENERGY IN THE FOOD SUPPLY CHAIN

I. ISSUE 2007



WISIONS

SUSTAINABLE DEVELOPMENT IS POSSIBLE

WISIONS is an initiative of the Wuppertal Institute for Climate, Environment and Energy, carried out with the support of the Swiss-based foundation Pro-Evolution, to foster practical and sustainable energy projects.

Sustainable development is possible. Numerous innovative and valuable contributions from different countries, fields and institutions have shown that an appropriate reconciliation of economic, ecological and social factors is not unrealistic utopia. We have made a promising start, but the greatest challenge still facing us in the 21st century is to learn how to use the world's resources more efficiently and in an ecologically sound and socially balanced way.

Progress is being made; however, fifteen years after the UN Conference on Environment and Development in Rio de Janeiro, many people, especially in developing countries, still lack access to resources, clean technologies, and education. At the same time, people's level of resource consumption and means of production remains unsustainable.

To meet global challenges like climate change, water scarcity and poverty, it is necessary to foster projects of potential strategic global importance by supporting them so that they can be implemented locally. Examples of good practice need to be actively promoted to a wider audience.

WISIONS promotes good practice in resource efficiency through its publication of relevant successful projects in its Promotion of Resource Efficiency Projects: **PREP**

WISIONS also provides consulting and support to ensure the potential seen in visions of renewable energy and energy efficiency can become mature projects through its Sustainable Energy Project Support: **SEPS**



Photo: PhotoCase.com

RENEWABLE ENERGY IN THE FOOD SUPPLY CHAIN

Household end-uses like cooking are among the main sources of energy consumption in developing countries. In rural areas of most developing countries cooking is usually done on open fires fuelled by wood. In cities, stoves are more common, fuelled by wood, charcoal or kerosene. In most regions, oil-derived fuels are expensive, and wood-based fuels are becoming increasingly scarce as rising demand leads to deforestation and



Photo: PhotoCase.com

therefore to decreasing supply. Cooking requires a lot of energy and about 50–70 percent of worldwide wood use is used for cooking. Next to household end-uses also food vendors, bakeries or breweries contribute to the consumption of fuelwood. Large positive effects may therefore be won with effective and successfully implemented measures regarding energy use in the food supply chain.

Improved cooking stoves are a first step. These would reduce the use of firewood drastically, as well as help reduce indoor air pollution. Another possibility is to use alternatives to traditional fuels, such as household devices that run on solar power or biofuels. Particularly in countries with a high solar radiation level, solar technologies can greatly assist sustainable development in communities. A further possibility would be to replace kerosene with biofuels.

In addition to cooking, there are other stages in the food supply chain that can run on renewable energy, such as storage devices or food dryers. Drying is the most widely used method for preserving foods for home use or for sale, yet it is very energy intensive. Using solar dryers would lower post-harvest losses and rural farmers would be able to sell their produce at market when prices are higher.

Cultural, architectural, climatic and economic factors play a primary role in what a household expects from its cooking, storage or drying system. When a device gains acceptance by households, the benefits of using renewable energy sources in the food chain are numerous: deforestation is reduced, health risks from indoor pollution are lowered, and local economic activities gain valuable support, which assists sustainable development.

In this brochure, **WISIONS** focuses on renewable energy in the food supply chain. **WISIONS** presents projects from Nigeria, Pakistan, Nicaragua, Cambodia and Kenya that have been successfully implemented, with the intention of further promoting the particular approaches used by these projects. Using a key number of internationally accepted criteria, the main consideration for the selection of the projects was energy and resource efficiency, but social aspects were also of relevance. The assessment of the projects also included the consideration of regional factors acknowledging different needs and potentials.

All projects that fulfilled **WISIONS** application criteria were independently reviewed, and five of them, with the potential to make a significant impact on global energy and resource efficiency, are published in the following pages. **WISIONS** is pleased to present

good practice examples from ambitious projects which have been successfully implemented on different continents. All of these projects are appropriate within their local context and have been developed to a level which meets **WISIONS** selection criteria. Although uniquely designed for a particular setting and problem, the projects presented can be adapted to different situations or can provide valuable information from their implementation phase. Links to the illustrated good practice examples shown in the brochure, as well as a couple of other issue-related good practice projects, are available on www.wisions.net.

The selected projects are not intended to represent the only possible courses of action to take in the area of renewable energy in the food supply chain but they do demonstrate promising approaches.

The next **PREP**-brochure, following the same objectives, namely to collect, evaluate and promote good practice examples, will highlight the issue of sustainable energy's possibilities to reduce poverty.



Photo: aboutpixel.de

LOW COST BIODIGESTER FOR SUSTAINABLE COOKING

Location:

Nigeria

Project's Aim:

Introduce a better way of cooking in local communities and make a positive impact on the region's energy crisis

Technical Answer:

Create an energy system that combines farming with the production of biogas

Project's Duration:

November 2005 –
June 2006



Photo: ECODEV

In the project area, cooking is the most energy-consuming activity. As people rely on fuelwood for cooking, deforestation has become an increasingly serious problem. To improve this situation for the local population, Eco Conscious Developments (ECODEV) has developed an energy system that combines integrated farming systems with the production of low cost biogas. The biodigester used is cost-efficient and is made entirely from local materials. It is designed to help reduce the health risks and pollution associated with cooking, as well as to add value to livestock wastes.

The biodigester, which is the first to be used in this part of the world, is situated in the Osusuor-Nkpor community, in Ikom Local Government Area of Cross-River-State-Nigeria.

BENEFITS

The benefits are seen on both an environmental and a socio-economic level. Deforestation is one of the major problems in the region and, therefore, one aim of this project was to reduce the rate of deforestation due to fuelwood use. Additionally, the project reduces the levels of animal waste pollution, the management of which usually poses a significant challenge. With the installation of the biodigester, the animal waste is now converted into fertilizer which can be used by the farmers.

Since the implementation of the project, the time spent searching for fuelwood has been significantly reduced, and cooking associated illnesses and house fires are less common. Additionally, levels of exploitative child labour in the region (where children were

used to search for firewood) are decreasing. The women are also greatly relieved of the burden of having to spend several hours daily searching for fuelwood alongside the children.

The project developers also benefit directly from the project as they now have employment and a source of income

SUSTAINABILITY

To integrate the local population at all levels, households covered by the project were trained on all the construction stages of the biodigester.

Financially, the project is very sustainable. The fact that it is a low cost enterprise was one of the driving factors



Photo: ECODEV

for the project and this, combined with the acceptance of the local population, guarantees its continuity.

TECHNOLOGY

In order to make the system available for the local population, the technology for a low cost biodigester had to be developed. The result was a system with minimal production costs, made of local materials, that is easy to install and oper-

ate. Basically, plastic materials are used to build the biodigester with a size of 22 ft. in length and 6 ft. in width. The life span of the biodigester is about 4 years. Afterwards, major maintenance or even replacement will be necessary.

FINANCIAL ISSUES

As already mentioned, the biodigester used in this project is of low-cost technology. About 350 Euros are necessary to build one..

OBSTACLES

The biggest challenge was to design a biodigester that could be built entirely from local materials. Overcoming this obstacle was a significant achievement, as biodigesters usually rely on some imported components

REPLICABILITY

As the technology is low tech, low cost and made entirely from local materials, it is easy to replicate. There are already plans to replicate the project in as many households as possible. Several community members, who visited the project while the biodigester was under construction, have indicated their interest.

The low investment costs and readily available local materials are an advantage for the project's replication. The low cost design of the biodigester requires minimal investment and, therefore, the project could be recommended for the world's low income regions, although it need not be limited to these regions.



Photo: ECODEV

CONTACT

Eco Conscious Developments
(ECODEV)

Mr Tony Okpokam

e-mail: ecodevelopments@yahoo.com

URL: www.ecodev.freeservers.com



SOLAR DRYER FOR THE RIPENING AND DRYING OF DATES

Location:

Pakistan

Project's Aim:

Promote cottage industry in remote areas to improve the socio-economic condition of the local people

Technical Answer:

Develop solar dryers for the ripening and drying of dates

Project's Duration:

June 2005 – June 2007



Photo: PCRET

Agriculture forms the basis of Pakistan's economy, by producing large quantities of grains, fruits and vegetables. Improper, inadequate or even mishandling of post harvest care in produce causes about 20 percent to 30 percent of the yield going to waste. If solar dryers are used to remove excess moisture from the product before storage, the quality will not deteriorate during storage and insect infestation will be reduced. Similarly, large quantities of dates, which currently go to waste, could be used in the off season if they were dried in a controlled manner.

This government funded project is a demonstration project for the date farmers, aimed at developing and establishing solar dryers for the ripening and drying of dates. 10 solar dryers of 500 kg capacity each have been installed in the date growing areas of Punjab (Distt Jhang, Multan, Muzafargragh and DG Khan, Sindh (Sukkur and Khairpur) Balochistan (Turbat, Punjgoor) and NWFP (Dera Ismail Khan). The basic aim

of the project is to promote cottage industry in remote areas to improve the socio-economic condition of the local people and to promote green, environmentally friendly solar energy. Restoration of the environment is a major concern throughout the world and various energy conservation measures are now being strictly applied to ensure supply of healthy food to citizens, which is also a priority of the Government.

BENEFITS

The project reduces environmental degradation caused by the use of fuelwood or fossil fuels for crop drying. Additionally, it can help to reduce the costs associated with these fuels and hence reduce the cost of the product.

During the implementation stage of the project, employment for twenty technical and non-technical persons will be generated and, on completion of the



Photo: PCRET

project, an additional twenty technical and non-technical persons will be employed.

Due to the solar drying of dates, the quality of the product will increase which may also lead to higher prices and greater revenue for the farmers.

SUSTAINABILITY

After two dryers were installed and were working well, the date farmers expressed an interest in financing the installation of this technology for themselves. A major motivating factor was that the traditional method of drying in the open air produces substandard dates. Although some moisture can be removed in this manner, the product becomes polluted with dust and crawling insects.

The applied solar dryer technology is well developed and can be used to process the drying in a controlled manner. Wide ranging implementation of the



Photo: PCRET

technology may mitigate the need to import large quantities of dates, as well as help to increase the export of high quality dates.

TECHNOLOGY

There is a technology gap in Pakistan due to the lack of available suitable processing techniques for agricultural products. The need for technical innovation is not limited to farm-level production, but plays an important role at all stages of the agricultural system. The challenge for this project was to develop solar drying techniques that are cost competitive within the prevailing environment and affordable for the end users (the small scale farmers).

So far, 1 dryer of 100 kg capacity installed and tested, three dryers of 500 kg have been installed and another seven will be install in the end of June 2007.

FINANCIAL ISSUES

The cost of 10 dryers of 500 kg capacity each was about approximately US\$ 83,000.

The project will ensure production of 30 tonnes per annum of quality dates in the date growing areas and revenue generation of US\$ 50,000 per annum. The payback period of one dryer is about 2 years.

This project is a public sector development programme by the Government of Pakistan for the dissemination of renewable energy technologies in the country, and is likely to continue into the next phase on a mutual funded basis.

OBSTACLES

Many date farmers are willing to install solar dryers for themselves but, due to



Photo: PCRET

financial restraints, they are reluctant to bear the full cost of the solar dryer.

REPLICABILITY

Most of the date farmers expressed interest in this technology and would be willing to finance the installation of solar dryers for themselves. The payback period of the solar dryer is short and the dryer can also be used for other fruits and vegetable in these areas. This is important as the date ripening and drying season only lasts for 30 days a year.

CONTACT

Pakistan Council of Renewable Energy Technologies

Mr Saeed Hussain

e-mail: saeed@pcret.gov.pk

URL: www.pcret.gov.pk



USING BIOMASS AND HYDROELECTRICITY FOR RICE PROCESSING

Location:
Nicaragua

Project's Aim:
To help improve living standards and to stimulate the production of rice

Technical Answer:
Establish a rice processing centre run by renewable energy

Project's Duration:
From 1994 (thresher), 2002 (dryer), still ongoing



Photo: ATDER-BL

The town of San José de Bocay, in the department of Jinotega, is located 75km from the capital city of Managua, Nicaragua. A locally owned and operated mini hydroelectric plant provides 260KW of electricity for the 800 families in this community and its surroundings.

The rice thresher began functioning immediately after the inauguration of the hydroelectric plant in San José de Bocay, with the objective of strengthening and diversifying the use of electricity and providing alternative work to the labourers and farmers in this municipality. A rice processing centre, which includes a rice thresher and a biomass rice dryer, provides a service to 220 small farmers who do not have the means, or the economic resources, to transport their products to larger cities for the rice to be processed. The services offered are drying the grain, threshing and storing the rice.



Photo: ATDER-BL

BENEFITS

This project has motivated farmers in the municipality to plant rice, as now, thanks to the rice threshing and drying centre, there are local opportunities to add value to the production and obtain a better price for the product at the municipal market. This has resulted in higher levels of income and additional employment. Locally processed rice is also less expensive for consumers, which improves the family economy and allows the entire population to consume rice, improving the diet of poor families.

To avoid the possible negative ecological side effects of rice cultivation (it is very demanding of nutrients and can lead to rapid soil depletion), ATDER-BL (Asociación de Trabajadoras de Desarrollo Rural-Benjamin Linder) supports communities in making the transition to organic agriculture and promotes sustainable practices such as terracing, reforestation, leaving an uncultivated border along streams and agroforestry.

SUSTAINABILITY

The implementation strategy was to manufacture or purchase equipment locally, train local operators and form a local organisation to manage the project in the long term. ATDER-BL planned, designed and constructed the hydro plant and the associated rice processing facility. The local organisation, APRODELBO (Asociación Pro-Desarrollo del Servicio Eléctrico Bocay) is a community organisation formed by ATDER-BL, which runs and manages both the hydro facility and the rice processing plant.



Photo: ATDER-BL

The rice thresher has been operational and self-sufficient for 13 years and the dryer for 5 years. Since the parts were manufactured locally, the equipment is easily maintained. Fees for the processing service contribute to the salaries of the staff who work at the processing centre and create a fund for maintenance costs.

TECHNOLOGY

Prior to the project, rice was processed in the traditional manner, i.e. by hitting the grain in a wooden trough. By that method, 1 quintal (100 pound bag) could be processed in 5 hours but now, by using the rice thresher based on small hydro power, 16 quintals per hour can be processed.

FINANCIAL ISSUES

When there was no rice processor, a quintal of rice cost the producer C 100 (100 Cordoba = EUR 4.24) taking into account the payment of services and the transportation from the farm to the closest rice thresher. Currently, the fees for the services of the rice processing centre include

- rice drying C7 per quintal
- rice threshing C30 per quintal
- storage of rice C2.5 per quintal

The Ben Linder Memorial Fund and Green Empowerment supported the project financially by funding the initial capital expenses.

OBSTACLES

The main obstacle for the project to overcome was of a technical nature; it was not easy to design an appropriate facility. To ensure that the design was appropriate for local conditions and materials, ATDER-BL custom-made the necessary parts in a local metal shop (which is powered by another micro-hydro plant).

REPLICABILITY

The project has already served as a replicable model for implementation in other communities. It is replicable due to the high demand for rice processing, its financial sustainability and the locally available materials.



Photo: ATDER-BL

Instead of selling the raw product to middlemen who transport the product for a high profit, local processing allows farmers and consumers to benefit economically from their crop. Therefore, there is great demand for the implementation of this type of project.

CONTACT

Asociación Pro-Desarrollo del Servicio Eléctrico Bocay

Mr José Luis Olivas Flores
e-mail: atder@ibw.com.ni

URL: www.greenempowerment.org/nicaragua.htm



PROVIDING SCHOOLS WITH EFFICIENT FUEL STOVES THROUGH A SCHOOL FEEDING PROGRAMME

Location:
Cambodia

Project's Aim:
Reduce the energy burden of the schools, the children and their families

Technical Answer:
Replace the old inefficient biomass-burning stoves with high efficiency (improved) stoves

Project's Duration:
February 2006 – May 2007



Photo: WENetCam

In Cambodia, the percentage of 6–14 year olds who do not attend school is high, about 35 percent. The majority of them are rural and poor children. Illiterate and low education is the main barrier for people to have access to employment and improve their living conditions. Contributing to address such a situation, the World Food Program of the United Nations (WFP) has implemented a School Feeding Program (SFP) to provide breakfast to around 570,000 kids at 1450 elementary schools across 12 provinces, with a main purpose of reducing their school drop and improving their education quality. To cook this breakfast, the schools use firewood supplied by the kids, their families and local traders. Recognizing the importance of reducing firewood consumption of the schools, WFP implemented this project in collaboration with WENetCam.

Although the depletion of forest resources is of major concern in Cambodia, firewood remains the main source of cooking energy, representing 96.3% of national fuel consumption. Rapid population growth and the associated increase in wood consumption have led to deforestation, putting further pressure on natural resources and biodiversity. The total firewood

demand for cooking energy was estimated at 4.5 million tonnes in 2004.

At this pilot stage, 1064 efficient stoves have been allocated to around 420 schools across six provinces, mostly located in the area where firewood is scarce or only available at extra cost. 12 network organisations working in the project area and 29 local people were selected as partners and stove builders.

BENEFITS

As well as the environmental benefits, the project helps around 260,000 children to improve their quality of life by lessening the time they spend collecting firewood. In addition, more than 1,200 cooks also benefit from less hardship in their daily work and lower exposure to the health risks that wood smoke carries. The schools that had to purchase firewood can now save this money for other necessary activities. As the new stoves are soot-free, levels of food hygiene are also better. Previously, the cooks had to stay close by to the old stoves in order to fuel them, but now they have more time to concentrate on the preparation of food.



Photos: WENetCam

Additionally, the project provided job opportunities for 50 rural people to generate extra income through the construction service. This can earn the workers around US\$ 5 per day, a rate that is twice as high as the average wage.

SUSTAINABILITY

With good maintenance, the stoves can last at least 3 years. Maintenance costs are almost negligible, as the schools can undertake the maintenance themselves using local materials. Technical training was provided to 14 people from the local partner organisations and to 29 selected local builders. They will be able to construct and repair stoves for schools for as long as the schools need to cook for the children.

Skills and service that are easy to access at low cost exist at local level. There are 20 teams of 50 skilled builders in different districts across 6 provinces that provide construction services for Institutional Stoves, and 22 production centres located in 10 provinces produce New Lao stoves. The Institutional Stove is made of materials available in the local area; therefore the users only pay building costs and spend little on the bricks and chimney. The stove can be also made of concrete, which is more durable but also more expensive.

TECHNOLOGY

The technologies used in this project are the twin burner Institutional Stove and the single burner pottery large size New Lao Stove. The Institutional Stove is made of mud clay, fibre materials (rice straw and husk) and zinc sheeting for the top part of the chimney, all of which are locally available. The New Lao stove is manufactured and transported to the schools.

The Institutional Stove and the New Lao stove save 25–29 percent and 32 percent respectively in firewood, compared with the traditional Drum stove commonly used by the schools. By replacing traditional stoves with efficient stoves, the project can reduce the yearly consumption of firewood by 718.9 tonnes and reduce total yearly CO₂ emissions by 1181.9 tonnes.

Each school is provided with 2 to 4 burners depending on the amount of food they cook. The total number of stoves to be provided amount to 481 Institutional Stoves and 102 New Lao stoves. To date, 440 Institutional Stoves have been constructed and 102 New Lao stoves have been purchased.

FINANCIAL ISSUES

The schools collect the necessary clay and fibre materials, while the builders are responsible for other construction equipment and materials. Most schools were able to collect the clay cost-free from nearby deposits; other schools paid US\$ 8–12.5 in transport costs for the material for each stove.

For the builders the purchase cost of the materials is between US\$ 2.5 and US\$ 4 and transportation costs amount to between US\$ 5 and US\$ 15 per stove. The project pays the builders US\$ 35 per stove plus US\$ 4 for transporting mould from school to school, and provided 40 sets of mould (each at a cost of US\$ 83.5) to them. On average, the builders spend 4–6 man days and make US\$ 15–25 profit from building each stove.

OBSTACLES

Obstacles included a lack of cooperation and participation of the schools in preparing the construction materials and



Photo: WENetCam

kitchen place, which delayed in stove construction. This was overcome by active communication with the schools, by showing successful examples and by rescheduling the implementation plan.

Additionally, some builders were insufficiently skilled and built stoves of poor quality. Therefore, technical follow-ups, monitoring and revision workshops were carried out to control the quality of the stoves, to provide more training and to collect feedback.

REPLICABILITY

This stove technology can be replicated by other people and/or in other places, because it fits the local need and practice of cooking large amounts of food, as required by cottage industries and institutions.

The project also attracts the interest of other users. Several pagodas and many food processing industries have already built and used these stoves, and there is still more demand from these users.

CONTACT

Center d'Etude et de Développement Agricole Cambodgien (CEDAC),
Wood Energy Network of Cambodia (WENetCam)

Ms Chanthiang Tong
e-mail: wenetcam@online.com.kh
URL: www.wenetcam.net



SUNNY SOLUTIONS – PROMOTING AFFORDABLE SOLAR COOKERS IN EASTERN AFRICA

Location:

Nyakach, Kenya

Project's Aim:

To complement traditional and improved cooking stoves

Technical Answer:

Introduce and distribute affordable solar cookers

Project's Duration:

June 2002 – July 2008



Photo: Solar Cookers International

The increasing scarcity and rising cost of cooking fuels threaten family and community self-sufficiency, particularly in rural areas. Solar systems can save money, time and labour currently used for purchasing or collecting fuel wood. Solar cooking has great potential in many sun rich and fuel scarce regions of the world.

In 2002, SCI began a ten year initiative to promote affordable solar cookers far and wide across eastern Africa, starting in Nyakach, Kenya. The project is entitled Sunny Solutions and its objectives include, for example, the introduction and distribution of solar cookers in the community with the aim of at least 4,000 households owning solar cooking kits by June 2008. Additionally, cooperation with other local groups and agencies should be fostered to ensure broad access to solar cooking technology. This technology should be produced and sold by local small businesses.

The timescale for the project was specified as June 2002 – July 2008; the justification for the project taking this length of time is that technology transfer can be a lengthy process as it requires a change in attitudes and old habits. The solar cookers serve as a com-

plement to traditional and improved cooking stoves and as a cost effective water treatment method.

BENEFITS

Achievements so far include the following: 98 percent of the population is now familiar with solar cookers; 65 percent is able to set up and use the solar cookers, either to pasteurise drinking water or to cook their food; and 25 percent of the total number of households has bought solar cooking kits.

The reliance on wood based fuels is reduced; experience of past projects show that a reduction by one third is possible. Another benefit of the reduced use of fuelwood is that shade trees, fencing and cow-sheds now remain intact. Additionally, the project has given a positive boost to an agroforestry programme by improving the success of tree planting efforts in terms of tree survival rates.

Solar cookers reduce the burden to women while simultaneously improving family health, nutrition and economics. The project improves human health via solar water pasteurisation, reduction of exposure to indoor air pollution from smoky cooking fires, a



Photo: Solar Cookers International



Photo: Solar Cookers International

decrease in related fire accidents and relief from the physical demands associated with fuelwood collection. A study in 2004 showed a reduction in the incidences of diarrhoea amongst families who solar pasteurised their water.

Through the operation of local micro enterprises ranging from the direct sale of solar cooking kits, the sale of baked goods and the use of solar cookers in small eating places, women contribute to the household income and benefit from enhanced self-confidence as a result of learning leadership skills, having a new source of income and the public recognition of their ability to teach others.

SUSTAINABILITY

As more people continue to suffer from cooking fuel scarcity, the need to find alternative ways of cooking their food and pasteurising their drinking water is increasing.

Sustainability of the project is possible through the participation and acceptance of the local community as beneficiaries and promoters, the support of local authorities such as schools and development agencies, and through capacity building amongst the women, who are the most affected by cooking energy shortages. Community education is the key tool in ensuring that the necessary

skills and knowledge are assimilated by both adults and young people

TECHNOLOGY

In 1994, volunteers from Solar Cookers International (SCI) developed a new type of solar cooker, a reflective panel called "Cookit" that offers the combined advantages of both parabolic and box-type solar cookers. The Cookit is adaptable, lightweight and foldable, which makes it easily portable. It can be easily handmade or mass produced at a cost of US\$ 3–5 in most countries. Accompanying skills training includes instruction on the use of locally available materials and on how to make the cookers.

FINANCIAL ISSUES

As expected, the initial start-up costs of the project were high. The costs are gradually reducing as some of the sales



Photo: Solar Cookers International

revenue is ploughed back into the project. Total average annual costs are around US\$ 60,000.

Finance for the project came from a variety of sources: SCI head office, individual donors, the Alternative Gifts Institute and from the community who bought the cookers at cost. Nyakach Community Development Association (NYACODA) is the partner on the ground, assisting in easy access and helping to educate the community. They also offered initial office space and storage.

OBSTACLES

The greatest challenge was in raising appropriate funding, as well as in organising the follow-ups to ensure skills and knowledge transfer.

REPLICABILITY

Many of the processes described above were first tested in a refugee camp situation between 1994 and 2002 and were transferred with ease to settled free communities i.e Nyakach. SCI has already begun two other Kenyan projects, in Kajiado amongst a nomadic community and in Kadibo, a semi-urban settlement.

In particular, the use of local materials and the ease of assembly of the cooker, even by cooks on site, mean that the project can be easily replicated.

CONTACT

Solar Cookers International (EA)

Ms Margaret Owino

e-mail: sci@iconnect.co.ke

URL: www.solarcookers.org,

margaretowino@solarcookers.co.ke



FOOD PROCESSING AND CONSERVATION THROUGH APPROPRIATE SOLAR ENERGY TECHNOLOGY

A PROJECT SUPPORTED BY **SEPS**

The implementation of technologies for food processing and conservation using solar energy can help reduce poverty, create local economic opportunities and improve health conditions, while simultaneously reducing environmental damage. In countries with high solar radiation potentials, appropriate solar technologies can, in particular, assist the sustainable development of rural communities.



Photo: Deepak Ghadia-Frying potato crisps with an 8 sqm Scheffler-cooker

The purpose of this solar food processing project, implemented by the International Solar Energy Society (ISES), is not to target individuals to use solar stoves, but to lobby organisations and companies to influence the food production market. This project looks at solar food processing not only as useful technology for the poor, but also as a means of changing food production methods in a sustainable and affordable way. Using solar energy for food processing is part of the wider concept of solving energy scarcity and reducing the speed of climate change, while strengthening local structures at the same time.

The main aim of this project is to establish a global network of interested parties (NGOs, politicians, farmers, cooperatives and experts) to gather information and knowledge for the further development and promotion of efficient methods of solar food processing and conservation. An internet platform for solar food (www.solarfood.org) has been established to support the network, where participating projects are presented and information is exchanged. At this stage

of the project, the website provides a unique platform with information and good practice examples.

In addition to the website, an additional communication tool in the form of a brochure in five different languages (English, French, German, Chinese, and Spanish) has been developed. The brochure illustrates encouraging good practice examples and, therefore, motivates others to produce food by using clean energy.

In order to realise the goal of influencing the food production market, it is essential to identify reliable and high quality products. At the same time it is vital that local experts can manufacture the necessary technology. Therefore, the Solar Food Project also includes technical training and marketing strategies in its remit. Organising workshops and practical activities are also very important for demonstration and promotional purposes.

The first phase of the Solar Food Processing Project has been a significant success in terms of helping to spread the concept of integrating solar energy into commercial food processing. Though the whole process is still in an early phase of development, the target group has acknowledged the network and most of the important international players have already become members. Interested individuals, organisations and companies are invited to join this network, to share information and to develop existing activities and standards. More information about how to join the network can be found at www.solarfood.org

CONTACT

International Solar Energy Society (ISES)

Mr Rolf Behringer

e-mail: behringer@ises.org

URL: www.solarfood.org / www.ises.org



SEPS — SUSTAINABLE ENERGY PROJECT SUPPORT

Realistic concepts and visions of effective sustainable energy projects do exist, but the much needed implementation sometimes fails. **SEPS** — the related field of action that **WISIONS** undertakes in addition to PREP — aims to bridge this gap.

The key objective of **SEPS** is to identify projects with the real potential to be of strategic importance in the renewable and efficient use of energy. By providing technical and other forms of support, **SEPS** seeks to overcome existing barriers and will help clean and efficient energy become commonplace.

The most promising renewable and energy efficiency concepts are selected using transparent analysis based on internationally recognised criteria. The selection process is carried out via an annual call for applications. Once a project is selected, **SEPS** can provide additional guidance and support, for example:

- potential financial support to assist with project implementation
- practical expert advice and knowledge transfer for effective implementation
- promotion to relevant institutions, decision makers and scientists
- publication on www.wisions.net

BACKGROUND

Energy is essential, whether for cooking, lighting, or industrial application. However, people have yet to learn how best to use natural resources. Sustainable development depends on the efficient use of resources, and specifically on the widespread use of clean and renewable energy.

The widespread use of fossil fuels threatens climate and health because of dangerous emissions, leading to high social and

economic costs. In addition, there are still more than 2 billion people today who do not have access to sufficient energy.

As the global population rises and an unequal distribution of wealth continues to be maintained within the world economy, the challenges will also increase. This will particularly be the case if we simply continue with, or copy, conventional approaches.



Photo: FHNW, Institut Energie am Bau — Straw bale building in Kyrgyzstan

Therefore intelligent, sustainable energy projects of strategic global importance need to be implemented and promoted.

CRITERIA FOR OBTAINING SEPS SUPPORT

SEPS has a set of criteria used in selecting appropriate sustainable projects and relevant forms of support. The following 5 criteria are obligatory:

- technical viability of the project
- economic feasibility
- local and global environmental benefits
- marketability and replication possibilities
- implementation strategy

ADDITIONAL CRITERIA

As the goal of sustainable development requires an integrated approach, additional criteria are also applicable:

- social aspects
- inclusion of local population/structures
- employment potential
- cooperation with other stakeholders

SO FAR ...

In its first three years **SEPS** launched three rounds to find innovative and promising projects to support. In response, we received over 200 applications from all around the world illustrating high quality and well-motivated projects based on sound concepts, but which also needed additional support.

The project proposals have demonstrated a wide range of ideas: from the use of solar energy for food conservation in developing countries to energy efficient lighting in Europe. So far, 25 projects have been selected for financial support covering a broad array of innovative sustainable energy solutions in more than 16 countries. In order to contribute to the implementation of more intelligent energy projects, **WISIONS** makes an annual call each spring for **SEPS** applications.

Further information about **SEPS** can be found on www.wisions.net/pages/SEPS.htm

CONTACT US:

More information about **VISIONS**, application criteria for **PREP** and **SEPS**, as well as prior **PREP**-issues are available at

www.wisions.net

Wuppertal Institute
for Climate, Environment and Energy
Doeppersberg 19
42103 Wuppertal
Germany

e-mail: info@wisions.net
Phone: + 49 (0) 202 . 24 92 252



© Wuppertal Institute 2007. All rights reserved

PRIOR ISSUES

- | | |
|-----------------|---|
| I. Issue 2004 | Resource Efficient Construction |
| II. Issue 2004 | Water and Energy – Precious Resources |
| I. Issue 2005 | Sustainable Transport – Solutions for Growing Demand |
| II. Issue 2005 | Sustainable Tourism – Combining Holidays with Local Needs |
| I. Issue 2006 | Microfinance and Renewable Energy – Investing in a Sustainable Future |
| II. Issue 2006 | Energy in Schools – Energy Education and Projects for Reducing Energy Demand in Schools |
| III. Issue 2006 | Corporate Energy and Material Efficiency ... Makes Good Business Sense |
| IV. Issue 2006 | Sustainable Biofuel Production and use Options for Greener Fuels |

IMPRINT

Publisher: Wuppertal Institute for Climate, Environment and Energy
Editorial Staff: Wuppertal Institute: Carmen Dienst, Dr. Manfred Fishedick, Manuel Lutz
triple innova: Maike Bunse, Prof. Dr. Holger Wallbaum
Photos: All images in this publication have been reproduced with the knowledge and prior consent of the participants.
Lector: Katherine Penker, Perthshire, Scotland
Layout: VisLab, Wuppertal Institute
Printing: Offset Company, Wuppertal
100% Recycling paper „Öko-Art matt“