MODERN SOLAR DRYING IN AFGHANISTAN

PROJECT'S AIM: TO TEST SMALL SOLAR TUNNEL DRYERS, DEVELOP CAPACITY BUILDING AND INTRODUCE HIGH QUALITY SOLAR DRIED PRODUCTS

Location:
Province od Logar, Afghanistan

Technology:
Solar Drying

Partners Involved:
International Solar Energy Society– ISES

(www.solarfood.org)

Duration:
12 months

PROJECT'S DESCRIPTION

The climate in Afghanistan is very dry, so the traditional method of preserving fruit and vegetables is to dry them outside. Usually the product is sliced and then laid out on the flat rooftops until bone-dry. The drawback is that the dust in the air and the clay from the roof sticks to the products and, in addition, there is no protection from birds or insects.

The project, which was implemented by the *Afghan Bedmoschk Solar Center*, aimed to produce higher quality dried foods by using modern solar tunnel dryers. As part of the ISES Solar Food Processing project, the objective was to promote the technology in Afghanistan and to develop a small solar food business. Another goal was to establish a training centre, targeting individuals, government departments, NGOs and companies. In July/August 2007 the first training sessions with villagers took place in the province of Logar as a starting point for a solar dryer project to help local farmers.

TECHNOLOGY, OPERATIONS AND MAINTENANCE

To test the technology under Afghan conditions, a model solar tunnel dryer was developed that is 2m x 1m in size – a smaller version of the 20m x 2m Hohenheim Solar Tunnel Dryer. The advantage of this small – but equally functional model – is that it allows farmers to test and evaluate the technology before investing their money and time.

The summer air is very dry in Afghanistan. Solar driers cannot speed up the drying process; their benefit lies in producing a higher quality end product compared to traditional methods.

6 solar tunnels driers were installed at the SFP workshop and these work like solar air collectors. A computer fan is driven by a 5W solar panel to force the hot and moist air out of the drier.

Start-up packages were offered to interested parties. The package was well received and included the small dryer, training that covered set-up, use and maintenance, packaging, storing and marketing and a set of packaging materials. A training curriculum in German and Persian was specially developed.

It takes around 3 to 5 days to reduce the weight of the produce from 7 kg to between 0.4 and 1 kg (e.g. for apricots or tomatoes). The air in Kabul is very polluted, so drying times would be slightly lower in rural areas. 200g packages were produced using locally available clear plastic bags. More durable plastic bags were imported and provided in the training sessions. Attractive labels in Dari and English were designed, which is important for selling products to foreigners.

In addition to the driers, Scheffler reflectors were installed for producing marmalade and jams. The same technology is used for baking bread and cake in specially designed ovens.

RESULTS & LESSONS LEARNED

Taking into account the political situation and security difficulties in Afghanistan, the results were positive. During the official project time, 42 model dryers were installed and training provided. There is real interest and potential for solar food processing in Afghanistan, because of the sunny climate, available raw produce and the potential market. Due to the tense political situation it was not possible to undertake a proper marketing campaign.

The technology is very useful for farmers who are in the business of drying fruit and vegetables. The high quality end product (cleaner and of a better colour) and the professional packaging demonstrated the advantages of modern solar drying.

However, the price of the solar dried vegetables was higher then acceptable for general sale in Kabul. The marketing must, therefore, target the high-end e.g. supermarkets and places where wealthier people and foreigners shop.

Economic feasibility and further dissemination could be achieved through larger scale production or direct use and marketing in rural areas. As the value per kilogram harvest increases, the transport costs could be proportionally reduced, leading to higher earnings for the farmers.

However, it was clear by the end of the project that the cost of the small driers was too high for the farmers, even with the higher priced end products. However, if the driers were installed in the villages it could be possible to increase their size and use, making them more economically viable.

Source: Final Report submitted to WISIONS by ISES