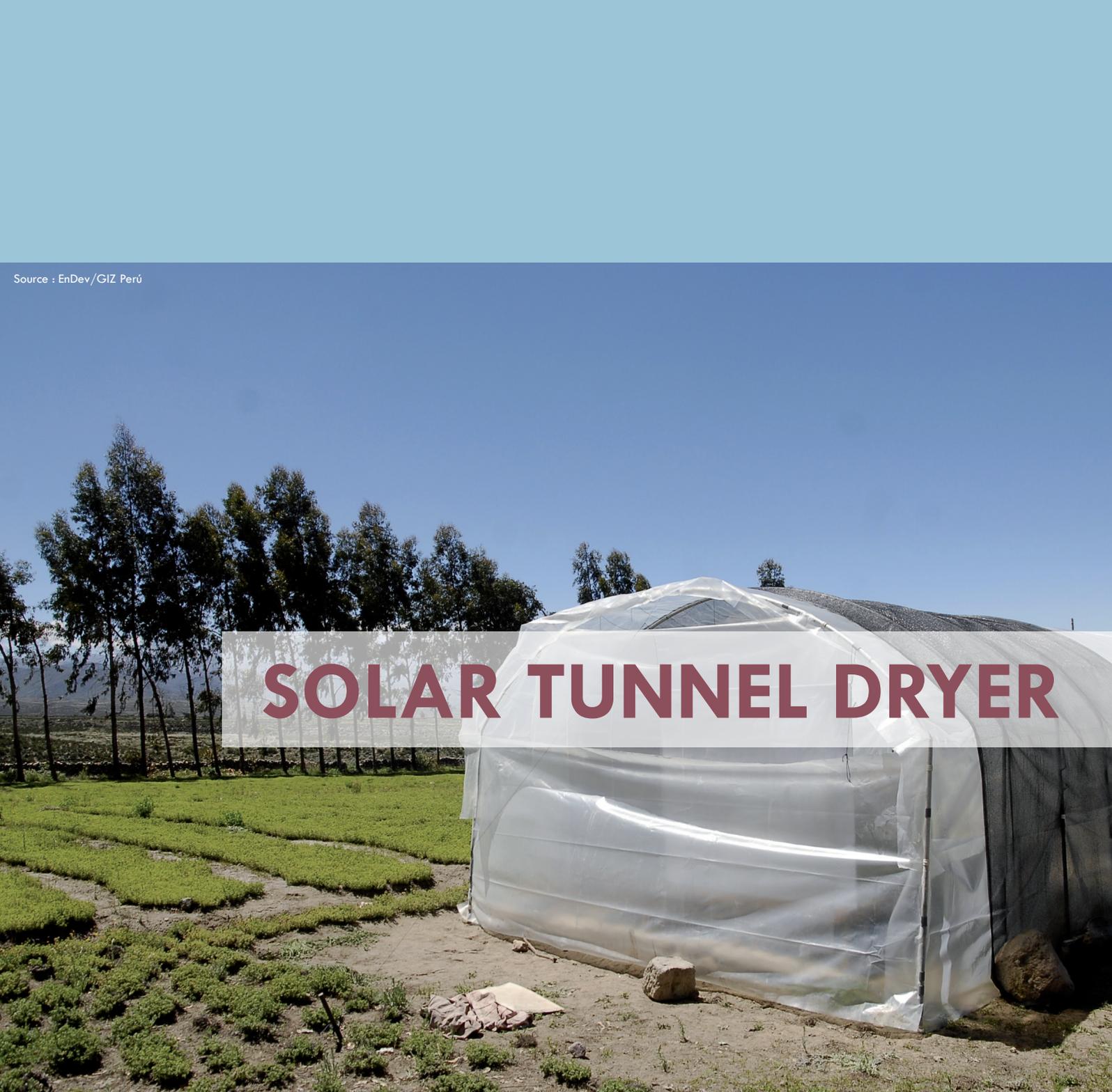


Source : EnDev/GIZ Perú



SOLAR TUNNEL DRYER

Product Catalogue - 2015

Prepared by MicroEnergy International GmbH
with the collaboration of Davide Forcella (CERMi-ULB)



EUROPEAN
MICROFINANCE
PLATFORM

NETWORKING WITH THE SOUTH

e-MFP ACTION GROUP
ON MICROFINANCE
AND ENVIRONMENT

Description and Working Principle

Solar tunnel dryers utilize the energy of the sun and wind to dry agricultural products, preparing them for proper storage, processing and export. The crop is spread in an even layer on tables or drying racks inside the tunnel. The air below the semi-transparent collector is heated by the sun and spreads throughout the tunnel. The increased temperature decreases the relative humidity of the air, thereby allowing the air to more efficiently dry the crop.

Technical Characteristics

Size	4m x 8m x 1.7m
Usual weight	120 – 200 kg
Fuel type needed	Solar insulation
Usual temperature range	Up to 60 °C
Product life time	10 years
Capacity	250 kg

Ease of Distribution, Installation and Maintenance

Considering the volume of the system, transportation vehicles are usually needed. However, the modularity of the system allows it to be packed in batches and transported with smaller vehicles. A solar tunnel dryer is usually characterized as maximizing drying capacity while minimizing physical footprint, and they are relatively easy to install and disassemble so that the land remains usable. Drying racks can be built by the users themselves. However, usually, locally trained craftsmen build the drying racks and conduct the installation of the solar tunnel dryers. A solar tunnel dryer will work without any major supervision and requires only a small amount of maintenance, which can generally be conducted by the end-user.

Typical maintenance work:

- Proper storage of semi-transparent collector
- Digging of canals to prevent water ingress
- Periodic replacement of collector
- Cleaning of collector

Technology Options

The product is easily adaptable to the local environment and locally produced crops, such as varying the dimensions of the dryer, particularly height, and adding different types of plastic foils to simulate multiple drying effects when the product requires it. It is also possible to use a fan to induce forced convection when required.

Price Range

These systems require semi-transparent collectors, and metallic and wooden structures. A complete set-up cost starts from around USD \$700. However, according to the type of crop drying and the scale of the project, it can vary regarding to the specifications required, reaching a cost around USD \$1500.

Type of Financing

Microfinance loans and financial microleasing can be provided to both individual farmers and to farmer cooperatives depending on the magnitude of the project. The collateral for the loan can vary from the equipment itself to the land of the farmers.

Economic and Social Impacts for End-users

Solar tunnel dryers offer an improved drying method for small and medium holder farmers. A typical solar tunnel dryer reduces the time required to dry the products from 1 to 5 days depending on the crop, can increase the productivity of the harvest by reducing the amount of product lost to moisture and reduces the amount of labor involved in drying products. Moreover, during the high season where the productivity level is high and the probability of decomposition is higher in which the farmers will have to sell their products at low price. The solar food dryer will decrease the financial losses as the crops could be stored without any decomposition for a longer time after the drying process.

Example: Solar tunnel dryers considerably change the process of drying crops compared to the traditional open-air method. High economic benefits of the dryers are incurred due to the improved efficiency and the decrease in required labor. As a technology aimed at productive uses, the payback period is related to the seasonability of the product harvested which can vary from 1.5 to 5 years.

Benefits for the MFI

By increasing the income and reducing the labor force which affects mainly the operational costs of the drying process, the farmers will be more reliable when it comes to loan payments. In addition to that, the farmers will act as a passive marketing channel where they can attract new clients by sharing their practice. Furthermore, the MFIs could provide loans through other channels by collaborating directly with agriculture syndicates, organization or cooperatives.

Environmental Benefits

Environment: Solar tunnel dryers could reduce pressure on forest and biodiversity due to the smaller area required to dry crops; they reduce waste, thanks to a more efficient drying, and they reduce pollution if they offset the use of mechanical dryers. Climate change mitigation: Reduction of greenhouse gas (GHG) emission if they replace mechanical dryers.

Climate change adaptation: The possibility to dry foods can help households to adapt to change in weather seasonality due to climate change. Storing food can protect against weather extreme events and food price volatility, and it can be used to establish climatic insurance in kind. It can also help households to access better markets improving their position in value chains.

Potential positive synergies with: Training in agroforestry, certifications for organic production¹.

References

- HUMANA Spain, <http://www.humana-spain.org/quienes-somos/comunicacion/noticias/300-pequenos-agricultores-de-cabo-delgado-incorporan-tuneles-solares-de-secado-de-alimentos/en>
- EBR Energy, <http://ebr-energy.com/pakistan/>

¹ For further information on potential synergies check the other product catalogues for EE and RE technologies.



Source: Humana Spain



Source : EnDev/GIZ Perú

European Microfinance Platform

The European Microfinance Platform [e-MFP] was founded formally in 2006. e-MFP is a growing network of 120 organisations and individuals active in the area of microfinance. Its principal objective is to promote co-operation amongst European microfinance bodies working in developing countries, by facilitating communication and the exchange of information. It is a multi-stakeholder organisation representative of the European microfinance community. e-MFP members include banks, financial institutions, government agencies, NGOs, consultancy firms, researchers and universities.

e-MFP's vision is to become the microfinance focal point in Europe linking with the South through its members.

e-MFP Microfinance and Environment Action Group

e-MFP Action Groups facilitate synergies among e-MFP members and encourage them to implement activities together, thus contributing to the advancement of the microfinance sector.

The aim of the e-MFP Microfinance and Environment Action Group is to bring together microfinance practitioners to discuss and exchange experiences in dealing with environmental issues and to create new practical tools to advance environmental microfinance. The Action Group is also intended to act as a think tank that disseminates its results among e-MFP members and the microfinance sector at large with a view to increasing the awareness of and commitment to act on these issues. It is meant both as an internal knowledge-sharing and external awareness-raising platform that serves as a reference in the microfinance sector.

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