

# A SIMPLE SOLAR DRYER IN NEPAL

This dryer is a mud brick construction built close to the ground using low-cost materials for all its parts. It is easy to construct and use. It is effective and can meet the needs of the rural economy. This technology is basic but useful so even the most marginalised and vulnerable groups can use it, not only to improve food security but also to develop small-scale enterprises. The technology requires little capital and can be constructed in the backyard of a household. A one-time demonstration is all that is needed to show people the benefits of the solar dryer.

Practical Action Nepal has promoted this type of dryers in remote parts of the country. The solar dryer was a popular introduction because of its effectiveness, economic viability, simplicity and hygienic practice.

Its quality and therefore its cost depends on the materials used, its shape and size and, most importantly, resources that the users can contribute for its construction, use and maintenance. The basic construction is described in this brief.

## Materials required

The following basic materials are required for construction of SASTO Solar Dryer:

- Bricks or Stones – 150 - 170 pieces
- Mixture of clay and finely chopped hay or dust of wood or rice husks - a few buckets
- Bamboo or wood - for making the trays
- Nylon or wire mesh (non-corrosive) or mesh made of bamboo – 1.4m<sup>2</sup> or 15ft<sup>2</sup>
- Black paint – one litre
- Transparent Plastic Sheet (100 or 200 gauge) – 2m

## Construction details

A small piece of land about 1.8m x 2.4m or 6'x 8' receiving sufficient sun is prepared as a platform. Bricks or stones (whichever is locally available) are laid down to make the base of the dryer. The dryer is slanted by about 20 degrees from ground level facing towards the equator. Small bamboo pipes are placed at certain distances along the wall of the dryer as inlets for cool air or holes can be made during construction. Small windows or gaps on the top of



Figure 1: Putting vegetables into the dryer. Photo: E. Judge / Practical Action.



Figure 2: Laying out the groundwork for the dryer. Photo: E. judge / Practical Action.

the wall of the dryer are placed as outlets for hot air. Clay mixed with cow-dung and finely chopped hay or rice husk or sawdust is used as mortar and plaster. This mixture is used to avoid cracks.

Blackboard paint, which is non-toxic, can be used to paint the inside of the dryer, including the trays.

Wooden or bamboo trays with wire or bamboo mesh are used to hold the food materials to be dried. If mesh is not available, 'Nanglo' (traditional bamboo sieve) can be used for this purpose after making holes in it. Transparent polypropylene plastic with a wood/bamboo frame is used to cover the dryer.

The cover is made tight to prevent insects and pests getting in, and to minimise the heat loss from inside the dryer.

The size and capacity of the dryer can be varied depending on need; the bigger the volume to be dried, the bigger the size of the dryer. Normally, a 0.9m x 1.8m or 3'x 6' dryer is sufficient for one household with 4 to 6 family members. The trays are made to fit the size of the dryer and the depth should be limited to 7 to 10 cm or 3 to 4 inches.

**Precautions**

Care should be taken while handling the plastic cover of the dryer as it can be easily damaged. It may also be necessary to keep children away from the dryer to prevent damage. The plastic should be replaced every two months or when it is no longer transparent.

**Cost**

The cost is between US\$5 and US\$8 d in Nepal depending on the size of the dryer and the availability of local skills and materials as mentioned above.

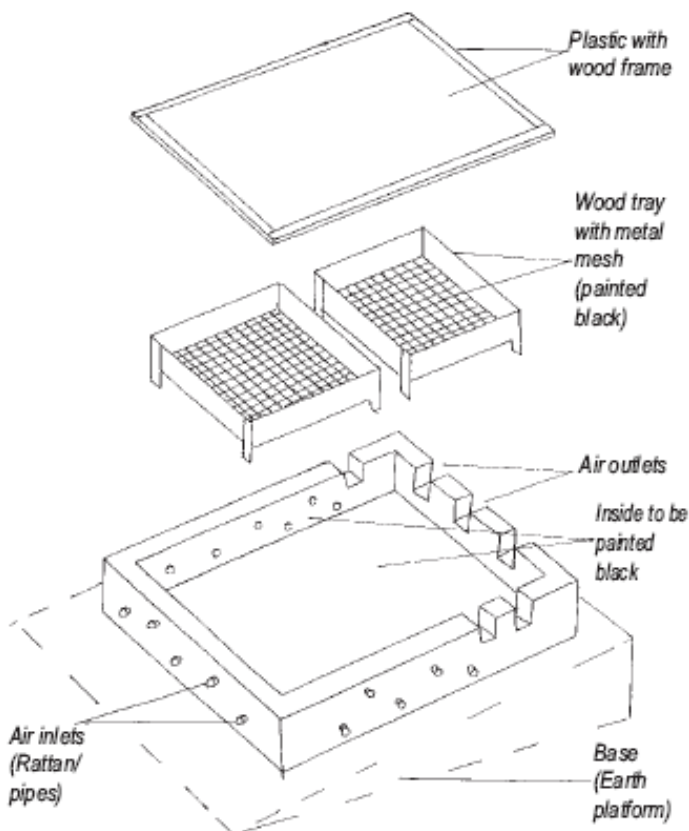


Figure 3: The layout of the dryer. Illustration: Practical Action.



Figure 4: Laying the bricks. Photo: E. Judge / Practical Action.

## References and further reading

[Drying Food](#) Practical Action

Technical Brief

[Solar Drying](#) Practical Action

Technical Brief

[Small-Scale Drying Technologies](#)

Practical Action Technical Brief

[Anagi Tray Dryer](#) Practical Action

Technical Brief

[How to Make the DRYIT Semi-](#)

[Continuous Tray Dryer](#)

Practical Action Manual

[How to Use the DRYIT Semi-](#)

[Continuous Tray Dryer](#) Practical

Action Manual

[Semi-Continuous Tray Dryer](#)

Engineering Drawings

[Setting up a Food Drying Business:](#)

[A Step-by-step Guide](#) Fabrice Thuillier, 2002, Practical Action Publishing, ISBN

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[Drying Food For Profit: A Guide for Small Business](#) Barrie Axtell 2002, Practical Action

Publishing ISBN 9781853395208

[Try Drying It! Case Studies in the Dissemination of Tray-Drying Technology](#), Practical Action

Publishing 1991

*Drying Foodstuffs* Jean François Rozis, 1997, Backuys Publishers

*Construction and Use of a Simple Solar Drier to Preserve Food for Off Season*

[HEDON](#): the Household Energy Network

*Producing Solar Dried Fruit and Vegetables for Micro- and Small-Scale Rural Enterprise*

*Development: A Series of Practical Guides*, written by the [Natural Resources Institute](#).



Figure 5: The finished dryer. Photo: E. Judge / Practical Action.

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technical brief