From *supo* to chimney dryer: a pilot project to improve drying of fruits and vegetables for women farmers in Dadeldhura, Nepal

Lauren Howe, Bidhya Bhusal, Ganesh Raj Giri, Marjorie Haskell, Amanda Crump, Elizabeth Mitcham

Presenter’s email: acrump@ucdavis.edu • University of California, Davis • Suaahara

**Background and Need**

Nepal is a low-income country with concerning levels of malnutrition. Fruits and vegetables have great potential to reduce undernutrition and generate income for farming families. Postharvest losses of fruits and vegetables are estimated at 20 to 50%. Drying fruits and vegetables reduces losses and increases their availability. Women are the primary users of traditional sun-drying methods (e.g., bamboo containers like *supo* and *nanglo*) for crops like leafy greens, calafower, radish, taro, and balsam apple. Drying can also be done using improved solar dryers.

**Objectives and Methods**

Our research introduces an improved solar dryer, named the Chimney Dryer to farmers in Dadeldhura, Nepal. We measured the Chimney Dryer’s appropriateness and benefits.

This study utilized the USAID Integrating Gender and Nutrition Within Agricultural Extension Services (INGENAES) Gender Technology Assessment to explore the gender-related implications of the dryer, in terms of food quality, safety, and availability; time/workload, and income generation.

**Findings**

- The chimney dryer is faster (reducing spoilage risk), protected, hygienic, and preserves product quality (e.g., color and presumably nutrients) better than traditional sun drying.
- The dryer is easy to use, but may require skilled labor to build.
- Local materials are affordable, but any cost may deter use.
- Drying is a relatively passive activity, so food safety and nutrition advantages may be more important than time saved, though women will likely gain more from reduced workload.
- Farmers already know how to dry so good storage practices should also be promoted.
- Involving husbands and in-laws as heads of household is key.

**The Technology**

Chimney Solar Dryer

Developed by UC Davis researchers from the Horticulture Innovation Lab, the Chimney Dryer is an efficient, improved method of drying. Some of the benefits of the dryer include:

- Product is protected, making it more hygienic and sanitary
- Small-scale, affordable, and uses local materials
- Product dries faster because of large heat-collection area and chimney (which ensures constant airflow)
- A flexible design: size can be adjusted based on preference and availability of materials

The dryer has been built and tested in several countries, including Zambia, Guinea, Rwanda, Tanzania, Guatemala, Honduras, Thailand, and Cambodia.

**The chimney dryer is more efficient than traditional sun drying on bamboo like nanglo (pictured right). Faster drying reduces the risk of spoilage and mold growth, especially under cloudy conditions.**

**The chimney dryer is protected and thus more hygienic than traditional sun drying (e.g., on bamboo like nanglo, pictured right), which leaves food products exposed to contamination by elements like weather, animals, dirt and dust.**

Acknowledgements: Thanks to Bidhya Bhusal, co-PI research assistant/translator; the Suaahara, USAID staff; participants and communities across Nepal and Dadeldhura; committee members; Marjorie Haskell, Amanda Crump, and Elizabeth Mitcham; and team members at the Horticulture Innovation Lab

Funding Sources: Blue Center for Developing Economies, UC Davis Humanities Graduate Research Award, Sifter Environmental Fellowship (Robert’s Patricia Sifter Foundation); USAID-funded Horticulture Innovation Lab

This project was made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of the research team and do not necessarily reflect the views of USAID or the United States Government.