



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

Dry Chain in Bangladesh

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UC DAVIS
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Solar chimney drying in Bangladesh





Main dried products and how they dried in Bangladesh

1. Chili
2. Fish
3. Pulses
4. Cereals
5. Mango
6. Ground nuts
7. Sunflower



Traditional packing and storing



Dried fish awaiting packing



Dried fish is packing for transportation



Dried chilled stored for house hold usage

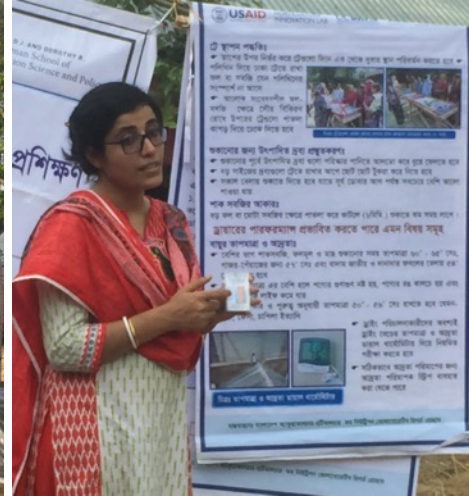
1. Color, scent and aroma are considered the primary determinant of proper drying
2. Palpability is also good indicator of drying for many products (chili,
3. Sometimes a sound (brittle sound when breaks) is also taken for a drying indicator

Project approach on introducing and implementing Solar Chimney Dryer

- 3 UC Davis Solar Chimney Dryers (1 for fish and 2 for fruit/vegetable drying)
- Shared by local communities of 3 upzilas of Barishal, Bangladesh



- Trained 40 people on building and drying in on chimney dryer
- Introduced dry card on determining proper drying



Perceived Benefits of Chimney Dryer

*“...is **easy to construct** with local materials, and **easy to maintain**, just need to change the plastics in few months time.”*

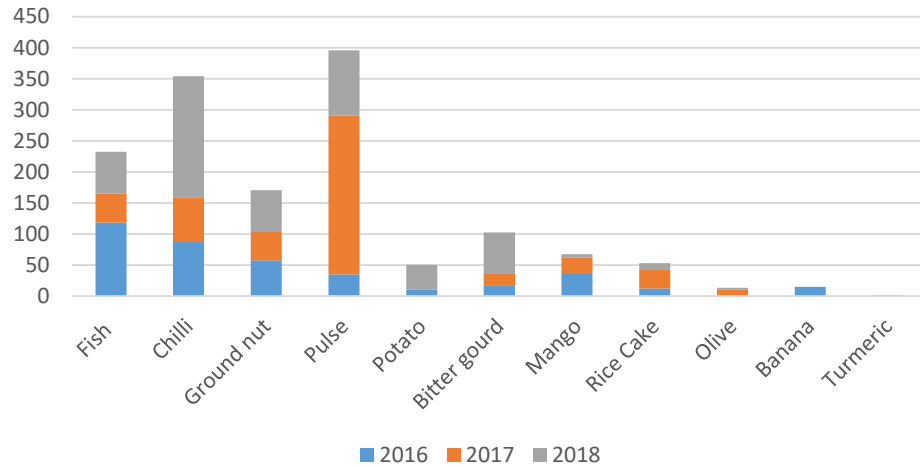
*“...can **dry faster** than traditional method. On clear sunny days, it used to take 5 days to dry, our fish, with chimney dryer, it takes 3 days.*

- *“...keeps food **safe, closed and protected** from dirt and dust, insects, rodents, dogs, cattle, mosquito eggs, etc.”*
- *“...gives **better color, smell and taste** of dried fish than the one dried using traditional method. No pesticides used during washing of vegetable products”*
- *“.....helps us get **better price**, almost double, for dried fish and vegetables. We **make good profit** selling vegetables and fish!”*

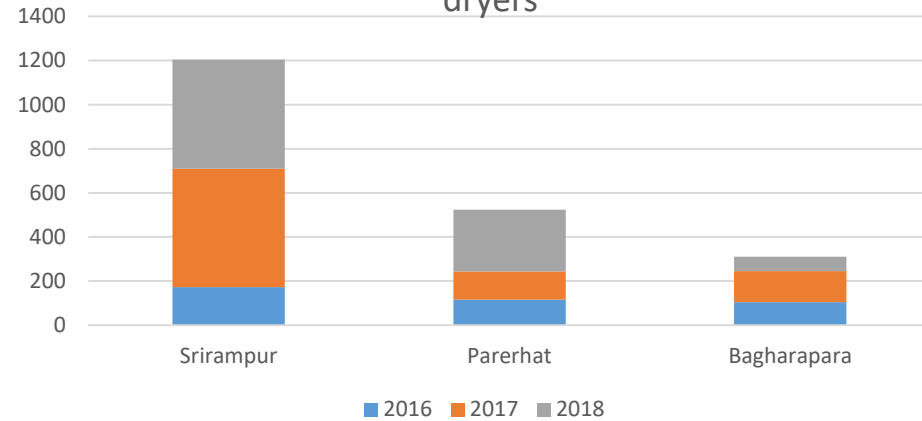


Total amount of product and price difference between fresh and chimney dried products

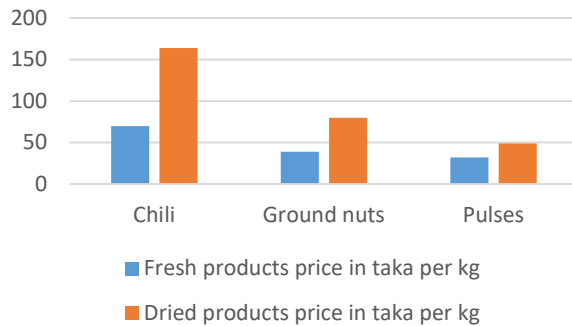
All products dried (Kg) in chimney dryers



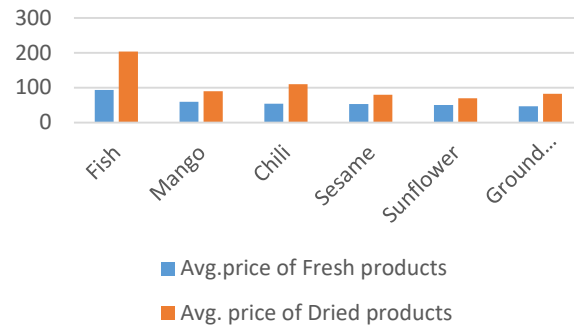
Site wise total products dried (Kg) in chimney dryers



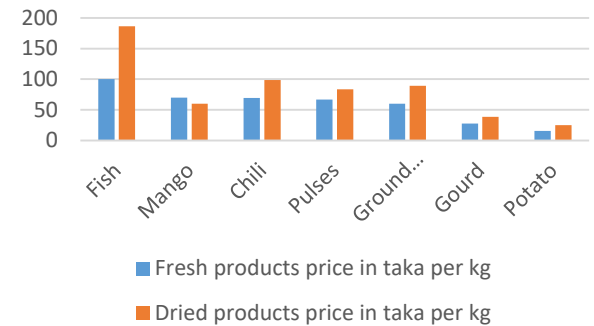
Market price in 2016



Market price in 2017



Market price in 2018



Challenges

Before implementing

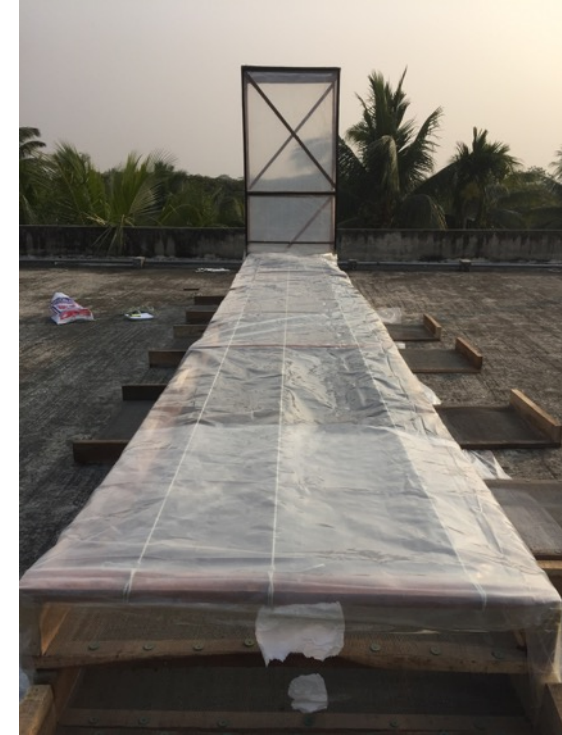
- Make people understand the technology
- Make carpenters/people understand the design (didn't have any handy manual back in 2015)
- Finding the sized and seasoned wood and good quality plastic

After implementing

- Food habit : no practice and demand of dried fruits (Banana, pineapple, jackfruit) vegetables (Tomato, Cabbage, Bitter gourd)
- Too much dependency on project support
- Shift back to alternate (traditional) easy way when it comes invest
- Lack of concern on food hygiene
- Unprecedented weather condition
- Periodic repairing
- Capacity for commercial drying

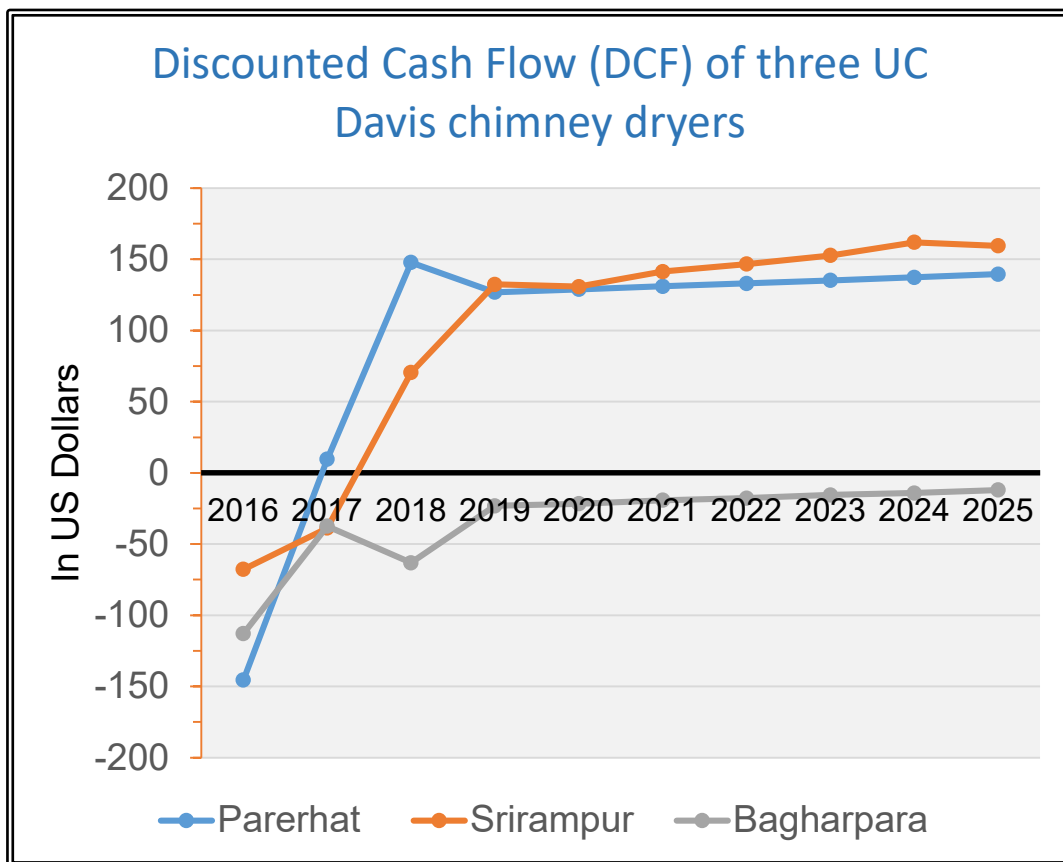
Successes & Opportunities

- One community built a second dryer for extra capacity by their own (started making and then completed with the project support)
- Prototype higher capacity for fish drying: PSTU and Hort. Innovation Lab team has tested higher capacity (40 kg) chimney dryer
- WorldFish scientists saw opportunities for fish drying and built 7 dryers in local communities near the sea
 - Technology scaling: 3 dryers built in Kolapara and 4 in Nidrachar (in 2017)
 - Trained farmers that built dryers have been hired by WorldFish to provide construction, repair service, and training
- Recently WorldFish secured fund a from WFP for making 26 dryer for the host community in Cozxsbazar to face the Rohingya crisis



Prototype higher capacity chimney dryer

ECONOMIC ANALYSIS - CHIMNEY DRYERS



- ❖ For dryers at Shrirampur and Parerhat, the revenue generated from dried products surpassed costs starting in the second year
- ❖ The dryer in Bagharpara was used to dry low value crops – cabbage, gourd, mango and banana. The revenue stream never surpassed the costs.
- ❖ ***Economic performance of technologies like the chimney dryer varies significantly depending on the products being dried (high vs low value crops, as well as the product unit prices.***



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Thank you

Questions?



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