Bangladesh Aquaculture-Horticulture for Nutrition Collaborative Research

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USAID FROM THE AMERICAN PEOPLE
HORTICULTURE INNOVATION LAB
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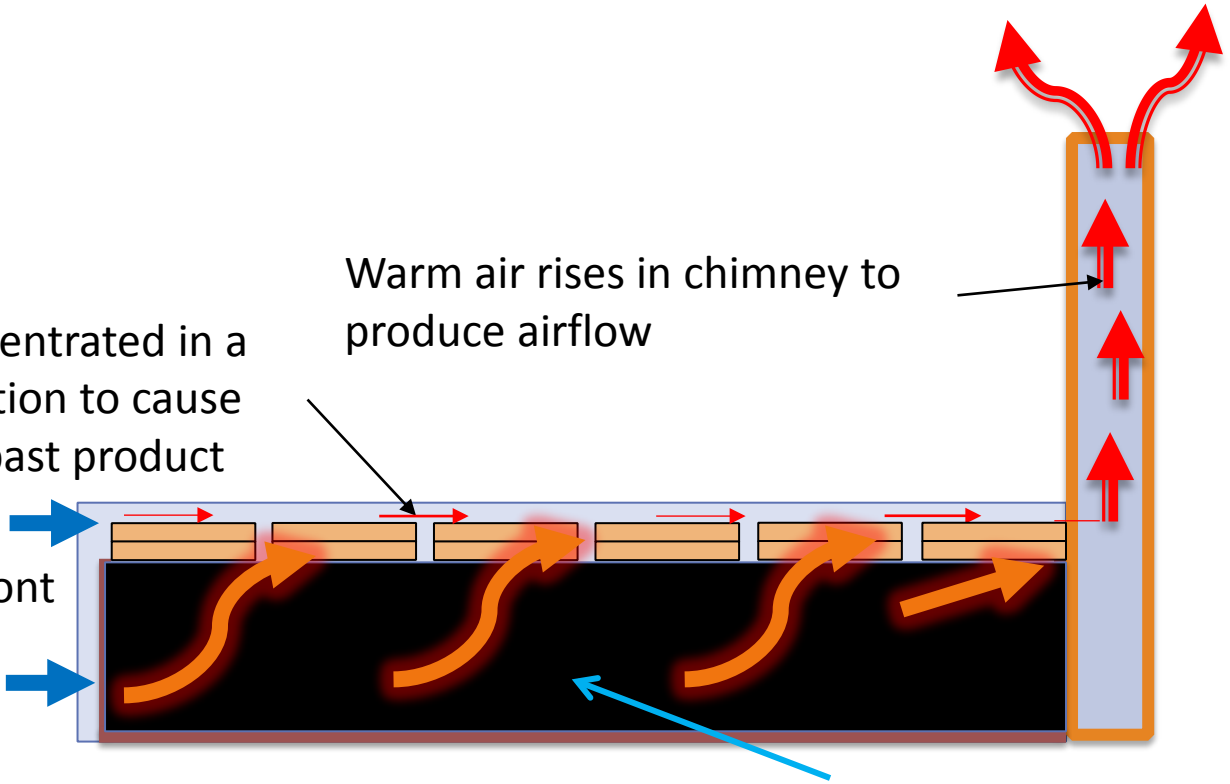
Study Objectives

- Collaboration with Tufts Nutrition Innovation Lab
- Examine the effect of implementing new technologies on the income, nutrition and health of households.

Strategy

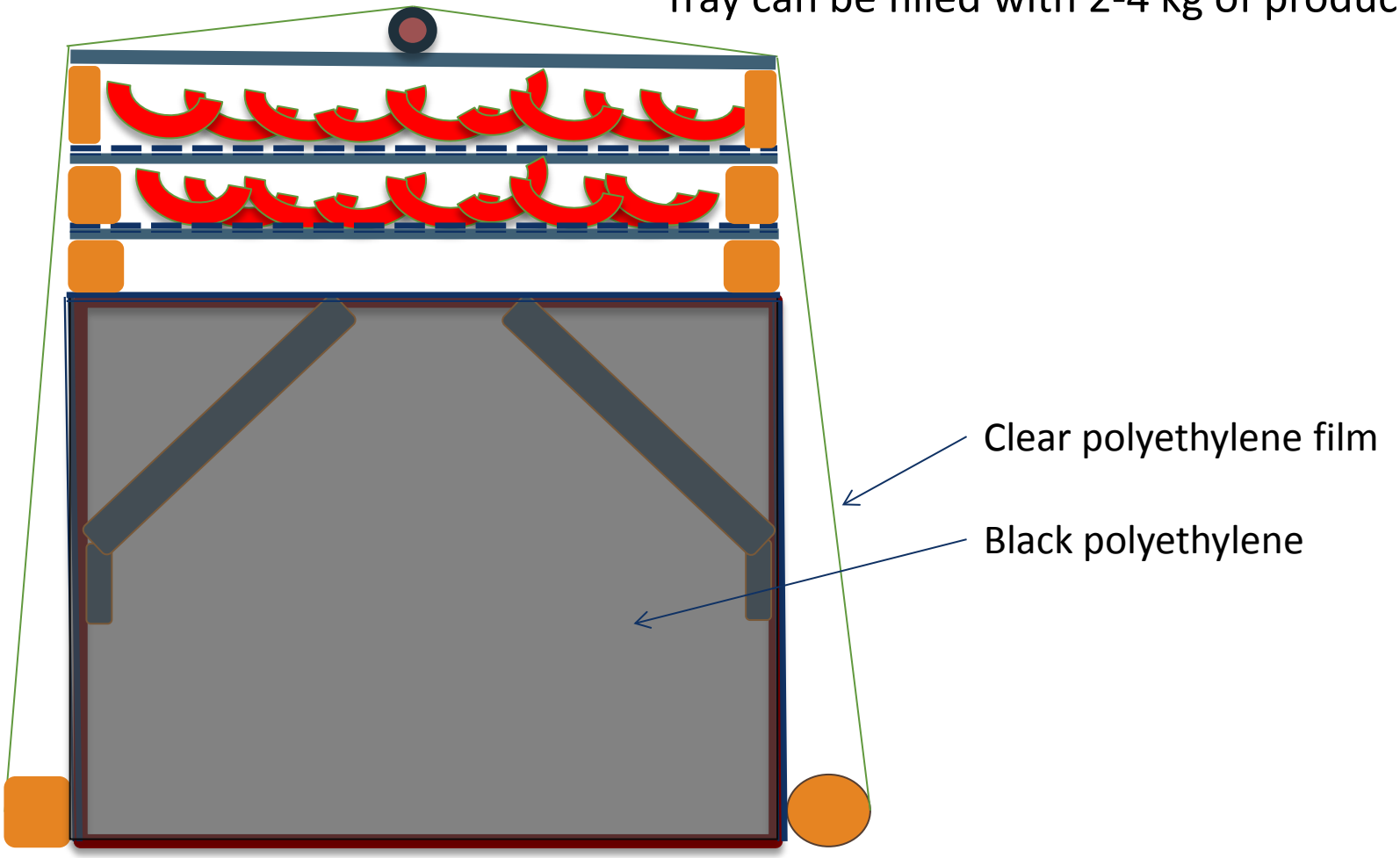
- Baseline survey of horticulture/aquaculture practices and consumption patterns
- Technology implementation
- Post-intervention survey

Drying - UC Davis Chimney Dryer



Drying - UC Davis Chimney Dryer

Tray can be filled with 2-4 kg of product



Drying - UC Davis Chimney Dryer

- Efficient and cheap!

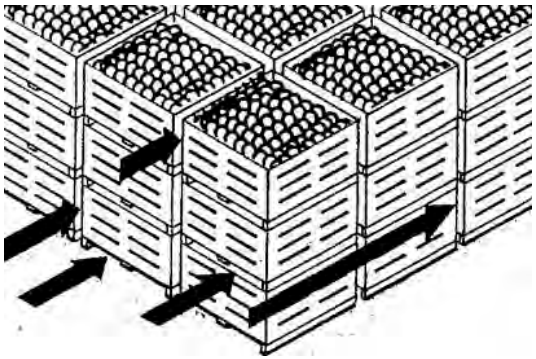
	Chimney Dryer	Cabinet Dryer
Material costs ($)	38.93	58.84
Fruit capacity, fresh weight (kg)	4.5	2.25
Time to dry fruit to 10% MC (11h days)	2.0	5.5
Cost per drying capacity ($/kg-day)	7.33	26.66
Average air temp. leaving dryer – ambient (°C)	15.2	9.3
Air velocity past fruit (m/s)	0.63	0.11

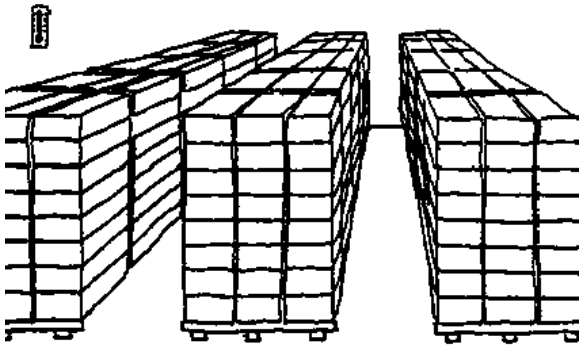
Drying fish

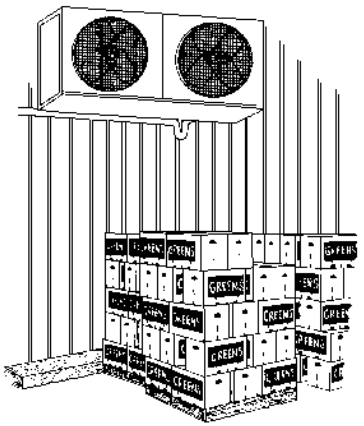
- Traditional drying is on racks or trays
- Insecticides or repellents are used to prevent fly damage
- The chimney dryer is a healthy alternative
  - More rapid
  - Flies do not smell the product (air flow)

Cooling - The CoolBot Coolroom

- Essential for reducing food losses
- Reduces rates of respiration and deterioration
- Reduces water loss
- Reduces growth of fungi and bacteria
- Allows farmers to consolidate product and/or profit from changes in market price







CoolBot equipped cool room

The CoolBot cool room

- Domestic air conditioner
  - Window or ‘Split unit’
- CoolBot controller allows it to achieve low temperatures
- Lower electricity cost
- Low construction cost compared to commercial rooms

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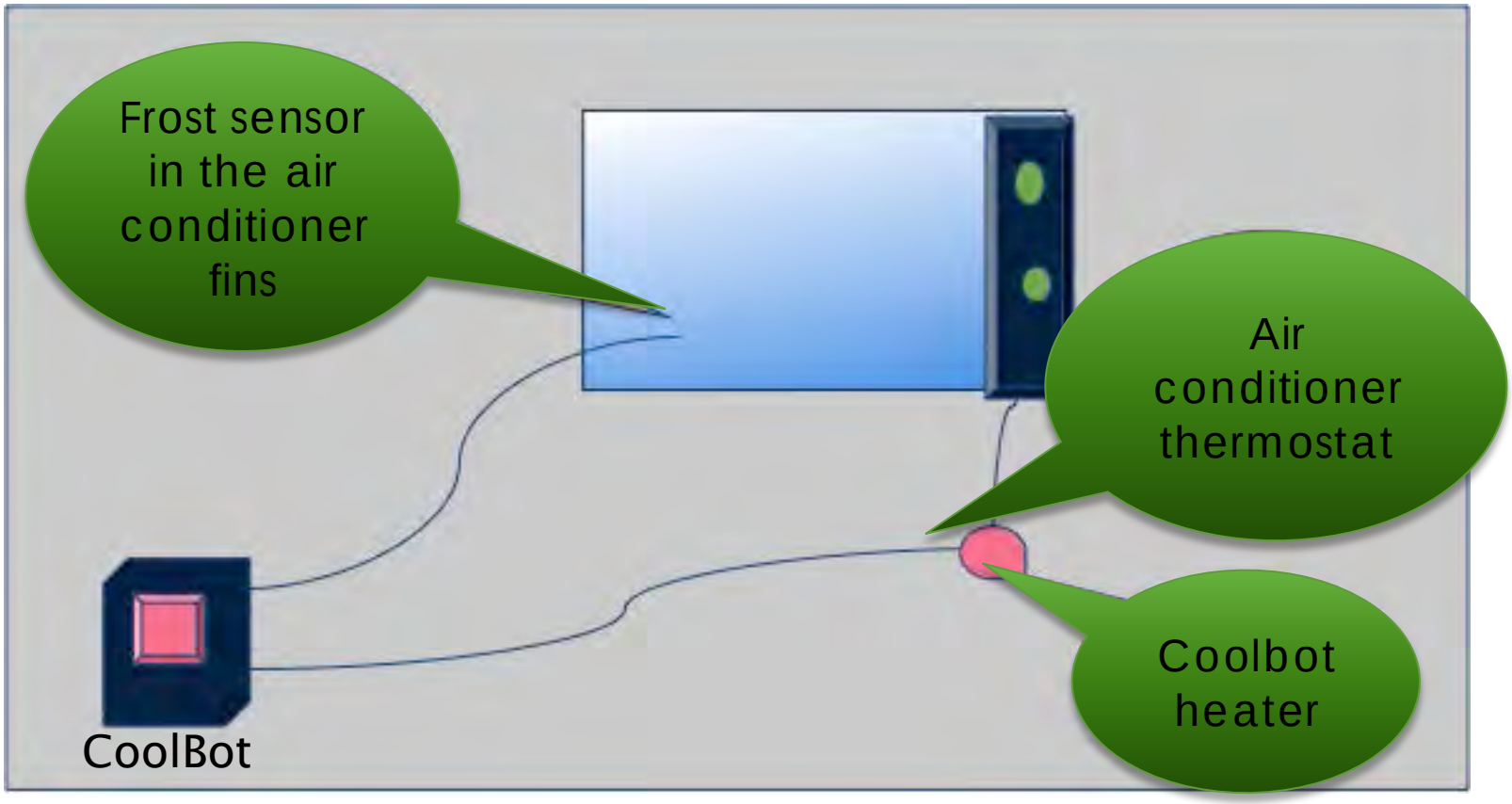
How does it work?



Experience in Bangladesh

- Construction takes time
- Electricity connection a major hurdle
- Load shedding demands generator backup
- Long-term storage possible
- Short-term storage more feasible for summer vegetables and fruit

Cost in Bangladesh

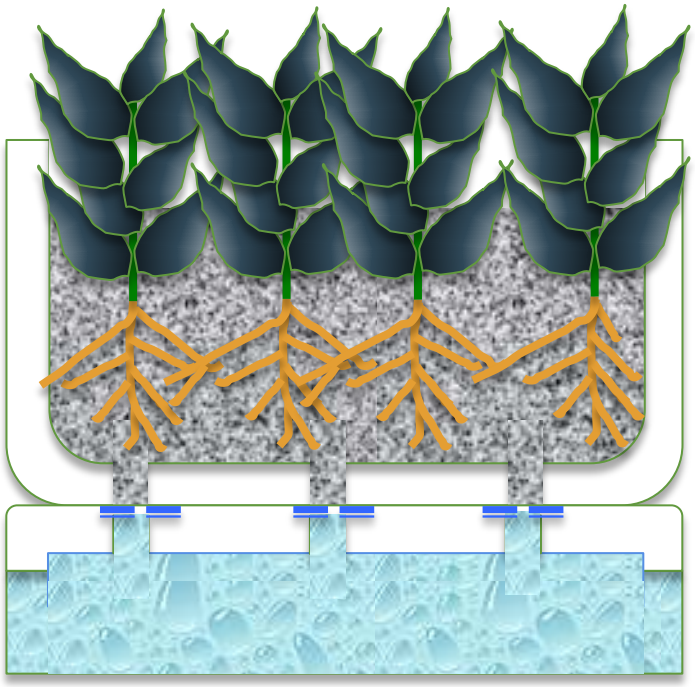
Concrete slab:	$400
Insulation panels:	$5,000
Inverter A/C:	$800
Generator:	$2,000
Electricity connection:	$250–650
TOTAL	**ca. $9,000**
Electricity cost/year:	$300–500

Solar power for cooling

- Expensive - getting cheaper
  - ca. $5,000 (mainly batteries)
- A/C with DC-inverter technology
- Challenges during rainy season in BD

Floating Gardens - Rationale

- Bangladesh: tradition using water hyacinth floating gardens during annual floods



Materials and Cost estimate

Item	USD
Bamboo	19.3
Bamboo Fence	6.4
Vermicompost	6.4
Coconut coir	10.3
Net	2.6
Rope and Nail	2.6
Container	19.3
Labor	25.7
Total w/ labor	**$92.6**
Total w/o labor	**$66.9**

Bamboo Floating Garden

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