



Photo by Sau Nhung



# COFFEE INNOVATION

## Sau Nhung Solar Drying Coffee

Small Scale Solar Domes Increase Income from Coffee and Other Products



## CHALLENGE

Traditional drying in the open leads to unequal moisture content, and contamination with dirt, microorganisms and yeasts. Later it makes the roasted coffee unstable in terms of quality. Current drying methods also lead to high post-harvest losses reducing the profitability of farmer households and limiting the scope for investments into quality improvements as any potential gain in terms of premiums is thwarted by post-harvest losses of 30 to 50%.

## INNOVATION

### QUALITY & CONSISTENCY

The proposed innovation concerns the introduction of solar dryer domes (SDD) to Vietnam coffee farming. It is a greenhouse-like shelter made by super – durable polycarbonates to dry coffee, allowing sunlight through while keeping away rain and it cuts the wastage and losses arising from the traditional methods and as such has the potential to substantially increase the incomes of the coffee growers. An additional benefit and source of income will result from the use of the domes for drying other fruits grown by the farmers when not occupied by the coffee harvest.



## COMPANY DESCRIPTION

The Sau Nhung Coffee Production Cooperative was established in 2012 with the aim of supporting its members to improve the quality of their coffee production, and to eventually transition to organic farming practices. The 113 members joined together to assure the sustainability of the household coffee production and achieve higher profitability through access to higher quality markets.

### NUMBER OF STAFF

15 FT

113 COOPERATIVE MEMBERS



## COST-BENEFIT ANALYSIS

### COSTS

EQUIPMENT: 60,000 EUR

LABOR: 17,000 EUR

PRODUCT DEVE: 1,200 EUR

SALES: 2,000 EUR

### EFFECTS ON REVENUE

INCREASE

### EFFECTS ON YIELD

NONE EXPECTED



## PREPARATION

### TIMELINE

ABOUT 4 WEEKS FOR PLACING ORDER, DELIVERY, CONSTRUCTION AND ASSEMBLING

### STAFFING REQUIREMENTS

TECHNICAL 1 FT

PROCESSING WORKER: 3-5 FT

SEASONAL PRODUCTION WORKER: 3 FT

MARKETING: 2 FT

### MATERIALS & EQUIPMENT



- POLYCARBONATE SHEET MADE OF 100% MARKKOLON RESIN, UV COATED, 2100\*11500MM\* 6MM, 2 LAYERS, LIGHT TRANSMISSION 87%, HEAT TRANSMISSION 60.3% (10 YEARS SUPER DURABLE)
- FULL STRUCTURE OF GARVANIZED STEEL
- CLAMPINGS
- VENTILLATION SYSTEM OF SANYO FAN
- SOLAR PANEL 110W, CHARGER AND BATTERY
- METAL SHELVES AND TRAY
- HEAT TRAPPED FLOOR
- FRONT DOUBLE LAYER DOOR



## LESSONS LEARNED

### CHALLENGES

Delays in delivery of products and disruption of sales pipeline from COVID-19. Cooperative had difficulties mobilizing co-funding

### TAKEAWAYS

The decision of selecting qualified service providers with international reputation like Covestro will help to reduce the risks and ensure successful implementation. Guidelines and SOP are needed to optimize use of dome for different products

## RESULTS

As a result of Sau Nhung's trial with Covestro,



Photo by GIZ Vietnam.



**146 farmers  
impacted**

113 DIRECT BENEFICIARIES &  
33 SUPPLY AGRIPRODUCTS TO  
THE COOPERATIVE



**50%**

INCREASE IN DRYING  
EFFICIENCY



**25%**

INCREASE IN FARMER  
REVENUE



**10-15%**

LESS PRODUCT LOSS WHEN COFFEE BEING  
DRIED BY THE DOME, AS THE DRYING  
PROCESS IS LESS AFFECTED BY THE  
WEATHER CONDITIONS



**15-17%**

HIGHER PRICE FOR SOLAR DOME DRIED  
COFFEE THAN PRODUCTS DRIED BY  
TRADITIONAL METHOD

## IMPLEMENTATION

*Construction for assembly of the domes are provided by the supplier and should follow the standard guidelines from Covestro, including both safety and technical guidelines to ensure the efficient operation of the equipment.*

1

BEFORE DRYING, CHECK THE DOME FOR DIRT AND DAMAGE

2

PREPARE DRYING RACKS

3

PLACE THE COFFEE ON THE DRYING RACKS

4

ROTATE TRAYS AT LEAST ONCE PER DAY, MONITORING THE HUMIDITY INSIDE THE DOME AT NIGHT TO PREVENT MOISTURE FROM RETURNING.

5

AFTER REACHING THE DESIRED HUMIDITY, TRANSFER THE SHELVES/COFFEE TO A SHADY AREA TO LOWER THE TEMPERATURE, AVOID BURNING, AVOID COLLECTING MOISTURE ON OUTER SURFACES.

6

SWITCH ON AND TEST FUNCTIONALITY OF THE MACHINES BASED ON CERTAIN INDICATOR SETTING (TEMPERATURE AND HUMIDITY)

7

IF NOT PACKED RIGHT AWAY, PLACE THE DRIED PRODUCT IN A SEALED CONTAINER, SHAKE DAILY TO HELP DISTRIBUTE MOISTURE.

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**For further information:**

Inventor: Siplakorn University, Thailand

Manufacturer: Covestro Thailand Co., Ltd

Exclusive Distributor of Covestro in Vietnam: Post-Harvesting and Consulting Construction Company (PCC)

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**MISSION**

The Fund's objective is to increase profitability of small-holder coffee farmers, and foster greater, more equitable value distribution in the supply chain through promoting innovative farming systems, transparent and inclusive business models, and access to new markets.

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