This is Behind the Leaf Coffee team member Nan Saung. It's the beginning of rainy season, finished making all of the bedding and getting some of our first harvests of vegetables. The picture is taken by Preston Kunz @prestonkunz

COFFEE INNOVATION
Behind-the-Leaf Bunk Beds

Dual-Use Drying Beds Enhance Coffee Quality and Revenue Off-Season
Coffee drying takes up a lot of space, and compacts soil so as to make it unsuitable for other uses in the off season. Coffee waste is generated by coffee processing is also usually not used optimally. Labor is difficult to find during coffee harvest because of seasonality and labor migration for better pay.

**COMPANY DESCRIPTION**

Lilypad Co., Ltd., established in 2006 in Pa-O villages, Pin Laung township, provides business solutions to benefit the community. Lilypad is developing low-cost, replicable technologies in areas of water, agriculture and construction.

**COSTS BENEFIT ANALYSIS**

**COSTS**
- EUR 130 FOR ONE COMPLETE "BUNK BED" SET

**EFFECTS ON REVENUE**
- COFFEE PRICES STABLE
- EFFECTS ON YIELD TO BE DETERMINED

**PREPARATION**

**TIMELINE**
- ONE MASON CAN BUILD ONE BOTTOM BUNK IN ONE DAY AND ONE WELDER CAN BUILD TWO TOP BUNKS IN ONE DAY

**STAFFING REQUIREMENTS**
- ONE WOMAN CAN MANAGE 10 BUNK BEDS
- EXPERTS: MASON, WELDER, COFFEE PROCESSING SPECIALIST, AND NATURAL FARMING CONSULTANT

**MATERIALS & EQUIPMENT**
- RECTANGULAR METAL TUBING
- WIRE SCREEN 48X180X2IN
- WELDING ARC
- MESH BED SHEETS
- RAINPROOF COVERING
- CEMENT AND CINDERBLOCK
- BED POSTS (6 PER BED)
- INTERLOCKING COMPRESSED EARTH BLOCKS

**LESSONS LEARNED**

**CHALLENGES**
- Sufficient space for the drying beds
- Sufficient water for coffee processing
- Lost buyers from COVID-19

**TAKEAWAYS**

After observing the tables in use and with quantified results from the production available in the bottom bunks people will be more ready to adopt them. We will also accompany that with training on how to produce crops like ginger and mushrooms in the bottom bunk. Spending time to make the soil for the bedding was a lot of time and labor but good investment.
RESULTS

As a result of Behind the Leaf’s trial,

- **1,028** Farmers and 32 HA of land impacted, 152 new farmers trained
- **3,800** Coffee seedlings distributed; 25 beds used as “bunk bed” nursery
- **32** Hectares of land
- **152** New farmers trained

Quality increased, volume of quality processed increased. BTL anticipates a reduced running cost

This picture is of a few BTL “Bunk Beds”. One person is saving salad seed from the garden bed and the other three are drying coffee on the top bunk.
The picture is taken by Atalie Bale @ataliebalaphotography
IMPLEMENTATION

DECIDE SIZE OF BEDS
Decide on the size that you want for the beds and the drying area. The BTL “bunk beds are 4 feet wide and by 15 feet long. Size can vary depending on preference and space available. It’s also important to keep in mind dimensions of the local materials you will use so you can limit waste when cutting.

DIG & POUR FOOTER
Dig and pour a concrete footer that outlines the footprint of the bed. The footer should be slightly longer and slightly wider than the final outside dimensions of the finished table. The footer should be poured so that it produces a level surface to make the blocks easier to lay.

BUILD THE BASE
From the footer you begin laying runs of block to make the bottom bunk. We used Interlocking Compressed Earth Blocks for our tables. Continue up with layers of block enclosing the bottom bunk to a depth of to approximately two feet. Just ensure that at the shallowest part of the bottom bunk there is at least 1 foot of depth. If the soil is too shallow in places it will inhibit the ability for plants to grow well in the bottom bunk.

CREATE THE LEGS
After the bottom bunk is at an appropriate depth, at each corner and in the middle of the long lengths continue up with a column of blocks. These short columns will create legs for the drying tables. The legs should be approximately 1 foot high, enough space to create a good airflow underneath and be an appropriate level for workers to reach and turn the cherries.
IMPLEMENTATION

FILL THE BED

Soil, compost, and manures can be added to the enclosed area of the bottom bunk. The garden bed material depends on what you have available (coffee waste, soil, compost) and what you want to grow. Coffee nursery bed material is different from bedding used for growing vegetables.

CREATE THE TOP BUNK FOR COFFEE DRYING

The top bunk is a porous metal table that rests on the six legs of the bottom bunk. We created a frame from metal hollow tubing and then applied 1 inch screen mesh to the frame. Attention should be given to use materials and sizes sufficient to create a rigid frame. The frame should not bend and deflect when loaded with wet coffee. Under load it will create low places on the table where the coffee will be deeper and will not dry as well. A rigid surface for the table allows the processor to create a uniform layer of coffee that will dry more uniformly.

COVER MESH TABLE WITH SHADE CLOTH

Over this metal frame a layer of shade cloth or agricultural cloth is applied. Again, there is opportunity for variation with this material. Whatever material is used it should be resistant to UV decay, sufficiently closed to keep coffee from falling through any holes/openings, and sufficiently open to allow air to come through the material to dry the coffee from the below. The mesh should not be fastened down because it is useful when compiling the coffee for night rest and for collection when dry.

INSTALL RAIN TARP

The final piece for the top bunk is a tarp that will cover the coffee at night and during rainy conditions to prevent rewetting of drying coffee. Plastic or any water repelling material can be used. The material should not be transparent. We were able to buy a black parachute-type material that is both waterproof and tear-proof.
ANNEX

BEHIND THE LEAF BUNK BEDS

**Coffee** being sun-dried on top of table during coffee drying season.

**Shade Cloth**, Agricultural Cloth: option for variation with this material. Material used should be resistant to UV decay, sufficiently close to keep coffee from falling through holes/ openings, and sufficiently open to allow air to come through the material to dry the coffee from below. The cloth should not be fastened down, useful when compiling the coffee for sight rost and for collection when dry.

**Metal Table Top**: constructed out of 1/4" metal hollow tubing, 1/2" screen mesh welded to frame. Sizes and types of materials for this frame could vary from place to place based on availability and on the size of the beds to be constructed. Accretion should be given to use materials and sizes sufficient to create a rigid frame. The frame should not bend and deflect when loaded with wet coffee. Famous metal table rests on six legs extending up from bottom bunk bed. See page 61 for more information.

**Waterproof Tarp**: plastic or any water repellent material may be used. The material should not be transparent. Tarp hangs during the day along the side of the bed, then wraps and covers coffee during night rest and rainy conditions. We are able to use a black parachute-type material that is both waterproof and tear-proof.

**Concrete Block**: Concrete block below grade, compressed earth block above. See Page 61 for details.

*Block Type A:* (2) Two Sides Open “L” Shape "GTY (22)"

*Block Type B:* (3) One Side Open “Row Ending” "GTY (12)"

*Block Type C:* (2) Two Side Closed “Stark above” "GTY (15)"

GTY of blocks produce 4’ x 18’ x 6” table
COFFEE INNOVATION FUND
Developed and funded by the German Federal Ministry for Economic Cooperation and Development (BMZ), and implemented by GIZ.

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.

For further information:
Lilypad Co., Ltd. (Behind the Leaf Coffee)
Melanie Edwards
behindtheleafcoffee@gmail.com
www.behindtheleafcoffee.com