



CASE STUDY: The Global Mana Foundation's Breadfruit Economy Initiative

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Global Mana



Global Mana is...

Connecting ideas, people and solutions for a **sustainable** future.

Socially-conscious & economically-viable solutions that enable true **environmental stewardship**.

A new model of **economic development** in concert with the *UN 17 Sustainable Development Goals*.

An **integrative, connected** whole systems approach, bridging ancient knowledge with modern science and technology.

A Pioneer Project:
Breadfruit Economy Initiative
Climate Resilient Food, Water
and Energy Security



Global Mana



Breadfruit Economy Initiative



Breadfruit Economy Initiative

An integrated solution for food security, economic development, community resilience, social and environmental impact

- Empower island communities to lever agricultural access to boost food security and sustainable economic development
- Produce healthier products for human and environmental health: gluten-free foods, clean energy, biochar organic fertilizer



- Increase perennial agricultural productivity and enhance soil health

Why Breadfruit?

- Abundant in climates where 85% of the world's hungry and impoverished live
- Easy to grow, robust and productive (up to 700lbs of fruit all year round)
- All parts of the tree provide valuable resources: gluten-free food, bioplastic, animal feed, organic insect repellent
- Nutritional powerhouse high in Vitamin C fights cancer, boosts healing, immune and neurotransmitter functions
- Low glycemic index helps deter diabetes



Why Breadfruit?



Huge potential in global gluten-free market (estimated at 15.6 billion in 2016).

Provides solutions to resolve the problems of our world:

- Food security
- Clean energy needs
- Community resilience and empowerment
- Human and environmental health
- Social and economic development
- Global climate change challenges...

Why Breadfruit?



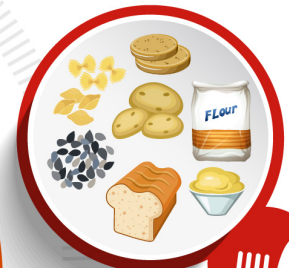
These multipurpose trees can provide construction materials, medicine, fabric, insect repellent, and animal feed. The leaves, bark, and latex sap are all used medicinally. It's sticky white latex sap has even been used for glue, caulk, and even chewing gum.

Breadfruit can be roasted, baked, fried, and boiled plus substitute for an array of starchy foods such as potato, pasta, flour, breads & baked goods. It is high in energy from carbohydrates, low in fat, and a good source of fiber. Even the seeds are edible with a nutty flavor.

MATERIALS



FOOD SOURCE



The trees improve the soil conditions & watersheds, support for sustainable agriculture, provide food security and are integral to plant pollinators and seed dispersers such as honeybees, birds, and fruit bats.

AGROFORESTRY



Breadfruit is highly sought after due to its medicinal properties including curbing diabetes, preventing digestion-related diseases, resistance against infections, dental health, reduces blood pressure, encourages new cell growth, treats skin diseases & cures skin infections.

Packed with Anti-oxidants, Carotenoids, B-Complex, Vitamin C, as well as:



HEALTH



Why Breadfruit?

Nutritive Value per 100 g. (USDA)

The % of RDA is based on a 2,000 calorie a day diet.

Principle	Nutrient Value	% of RDA
Energy	103 Kcal	5%
Carbohydrates	27.12 g	21%
Protein	1.07 g	2%
Total Fat	0.20 g	1%
Cholesterol	0 mg	0%
Dietary Fiber	4.9 g	13%

Vitamins	Nutrient Value	% of RDA
Folates	14 µg	4%
Niacin	0.900 mg	6%
Pyridoxine	0.100 mg	8%
Riboflavin	0.030 mg	2%
Thiamin	0.110mg	9%
Vitamin A	0 IU	0%
Vitamin B6	0.100mg	5%
Vitamin C	29 mg	48%
Vitamin E	0.10 mg	1%
Vitamin K	0.5 µg	<1%

Electrolytes	Nutrient Value	% of RDA
Sodium	2 mg	0%
Potassium	490 mg	13.5%

Minerals	Nutrient Value	% of RDA
Calcium	17 mg	2%
Copper	0.084 mg	9%
Iron	0.54 mg	3%
Magnesium	25 mg	6%
Manganese	0.060 mg	2.5%
Phosphorus	30 mg	4%
Selenium	0.6 µg	1%
Zinc	0.12 mg	1%

Proteins & Amino Acids	Nutrient Value	% of RDA
Protein	1.07 g	2 %
Cystine	0.009 g	
Isoleucine	0.064 g	5 %
Leucine	0.065 g	2 %
Lysine	0.037 g	2 %
Methionine	0.010 g	1 %
Phenylalanine	0.026 g	1 %
Threonine	0.052 g	5 %
Tyrosine	0.019 g	1 %
Valine	0.047 g	3 %

Fatty Acids	Nutrient Value
Omega 3 to Omega 6 Ratio	0.38
Omega 6 to Omega 3 Ratio	2.67
Total Omega 3s	18mg
18D3 Linolenic	18mg
18D3CN3 Alpha Linolenic(ALA)	~mg
20D3N3 Eicosatrienoic	~mg
Total Omega 6s	48mg
18D2	48mg
18D2CN6 Linoleic(LA)	~mg
18D2CLA Conjugated Linoleic(CLA)	~mg
18D3CN6 Gamma-linolenic (GLA)	~mg
20D2CN6 Eicosadienoic	~mg
20D3N6 Di-homo-gamma-linolenic (DGLA)	~mg
20D4N6 Arachidonic (AA)	~mg
22D4 Adrenic (AA)	~mg

Phyto-nutrients	Nutrient Value
Carotene-β	0 µg
Crypto-Choline-β	99.8mg
Lutein-Zeaxanthin	22 µg

Food Tasting



Taste Test & Production Potential

Breadfruit flour has an edge over others

- Gluten-free, high nutritional content, huge market potential (with social impact wins)
- Kansas State University study found breadfruit flour to be preferred in blind taste tests and perform better than other gluten-free flours in several food applications: bread, cake, cookies, snack bars and sauces



Popular products that can be made using healthier breadfruit

- Bread, noodles, crackers, ice-cream, chips, cereal, hashbrown patties, veggie burgers, "milk," pancake mix, cookies...



The Market



Market & Potential



Market Size

- The global gluten-free foods market was estimated at \$15.6 billion in 2016.
- US gluten-free and free-from food market is projected to be \$23.9 billion by 2020.

Market Advantage

- Better tasting food products, higher nutritional value, social impact.
- Gluten-Free, Organic, Non-GMO appeal to larger consumer market with the added win of free-trade
- **Significant market potential:** breadfruit provides a unique source of gluten-free flour considered to be “superior in taste, nutrition, and structure to any other gluten-free flour alternative available.”
- **Other advantages:**
 - free of corn, rice and nuts
 - provide lower glycemic index, higher nutrition, lower allergen risk product that can cross-over to the free-from foods market.



Market & Potential



Market Strategy

- Established global distribution channel partner with reputable food retailers
- Government research and institutional backing with FDA approval
- Marketing and awareness campaigns building over past few years



One Problem With This Wonderful Tree:

fruit ripens and spoils within days. So we've developed an agricultural dryer that lets local farmers cache the bounty for food security and engage in commercial production.

The Solution:
**The EcoMana
Agricultural Dryer**



Complete Food & Economic Security System

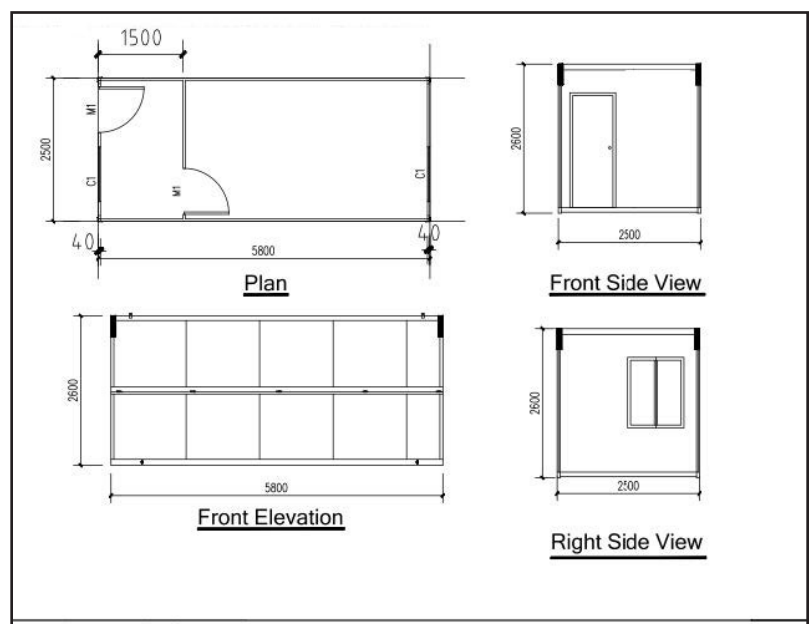
The needed edge to boost food security and economic benefits. This advanced food processing unit lets individual families and communities lever agricultural excess of quick-spoiling foods to cache nature's bounty and capture profits lost to waste. The compact container toolkit comes complete with industrial-grade food drying and processing equipment, automated controls and electronic sensors for advanced food and economic development.

Powered by Renewable Clean Energy

Abundant free solar energy provides off-grid flexibility for food production in rural, remote and island regions. Tandem clean-burning stove with heat recycling lets you use waste materials like skins and shells to power zero-waste production.

Automated Control for Quality Standards

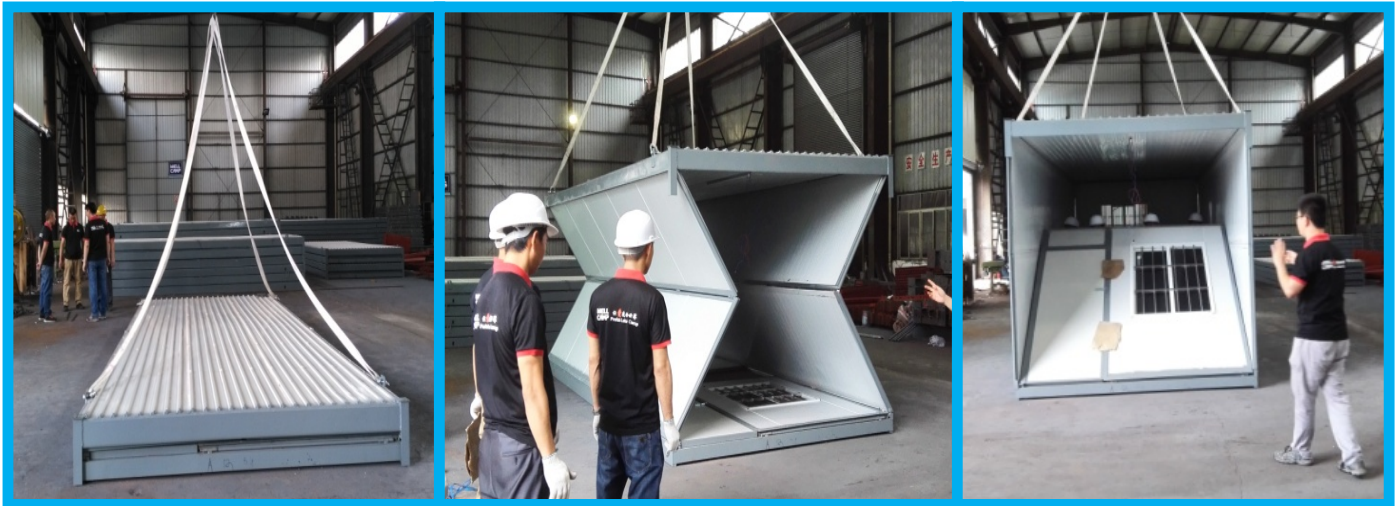
Advanced automated system provides precision quality control and standardization with easy-to-use control panel display. Regulate temperature, airflow and humidity for consistent optimal food production quality.



Complete Food & Economic Security System

Smart Data for Sustainable Development

Electronic sensor controls enable remote data collection so you can monitor quality, efficiency and production processes. Harvest, store and sort helpful information to grow your enterprise.



Strong Easy-Up Structure

The fold-and-lock design lets you pull a flat pallet into a full container factory in 20 minutes. Collapsible structure folds flat for easy transport, storage and reuse. Made with high-grade materials to meet food production standards. Weatherproof design built to withstand Grade 7 earthquakes, Category 1 hurricane winds and tropical storms.

Components & Optional Add-On Features:



Slicer

Juicer

Strainer

Dry Rack

Mill

Fryer

Technical Specifications

Structural Specifications	
Dimension	2.5M X 5.8M X 2.6H
Weight	~2,000 kg
Area (m ² /set)	14.5
Frame Beam	2.3mm---2.5mm galvanized 160 beam
Top Strap Beam	3.5mm bending parts
Under Frame	1.6mm (4x8 galvanized square tube)
Roof Decoration Sheet	2.00mm galvanized bending parts
Folding Panel	2.00mm galvanized bending parts
Density (kg/m ³)	20-50
Thermal Conductivity (W/(m. K)	0.032~0.036
Water Absorption Rate %	≤1.5
Compressive Strength (MPa)	0.15
Tensile Strength (MPa)	0.15
Bending Rank	Stable
Panel-Cement Motar Adhesiveness Rank	Adhesive
Fire Resistance Rank (as ranked in GB8624-2012)	A / B
Inflammable:	
Wall Panel	0.326mm(double sides)* 40mm IEPS sandwich panel
Roof Panel	(950mm wide)and 0.6mm(double sides)IEPS sandwich panel
Remarks:	<ol style="list-style-type: none">1. Steel structure;2. 40mm IEPS panel for roof and wall3. Aluminum sliding windows with bar and shutter window;4. EPS doors;5. 15mm cement panel

Real Sustainable Development: Zero Waste Production

Biomass Generator: Waste-to-Energy System

- Affordable, high-performance, small scale compact gasification system
- Provides a carbon negative waste-to-energy solution
- Power generation system converts biomass and agricultural waste into clean electricity
- Produces carbon-sequestering biochar (which we know boosts soil productivity by 20% and is used to filter water and clean toxicities from the ground).

10 biomass generators operating 10 hours per day for 1 year, would offset about the amount of CO₂ released in 1 year from 23,500 gallons of gasoline while, sequestering as much carbon as 100 acres of forest.



- Efficient, on-demand power: 1 kg of biomass for 1 kWh of electricity
- Compact size fits most anywhere and easy to transport (fits in back of standard pick-up truck)
- Runs on organic feedstock such as nutshells, wood chips, corn husks, etc
- Perfect for rural, off-grid and island communities and villages

Zero Waste Solution

The biomass generator has the following performance specifications:

Continuous power rating:	18 kW @ 60 Hz
Biomass Consumption:	1.2kg/2.5 lbs per 1 kWh
Dimensions (crated):	145 x 145 x 140 cm / 57 x 57 x 54 in (can fit in the back of a pickup truck)
Weight:	700 kg/ 1550 lbs.
Start up time:	10–20mins

Fuel cost comparison:

Diesel/LPG	\$0.40 - \$0.75/kWh
Gasoline	\$0.50 - \$1.00/kWh
Gasified Biomass	\$0.00 - \$0.20/kWh



**The EcoMana
Agricultural Dryer's
Win-Win-Win Partner:
*Biomass Generator***

The Opportunity

The BEI project presents tremendous opportunity to:

- take leading role and position in an emerging global breadfruit market
- empower local communities (growers, farmers, entrepreneurs) in sustainable development
- support more equitable and environmentally-conscious development model
- showcase state-of-the-art solutions for food security, regenerative agriculture, clean energy, zero waste and climate change



Linked Solutions



Climate Resilient Reforestation Initiative



Carbon Emission Reduction Platform

Linked Solutions

Borneo Breadfruit Reforestation Project

Reforestation of devastated tropical forests with breadfruit to

- provide indigenous communities with more substantial and sustainable source of livelihood and year-round agricultural productivity
- enhance food security and boost economic development with global market demand
- restore devastated forests and lands; sequester tonnes of carbon to mitigate climate change effects



Linked Solutions

Borneo Breadfruit Reforestation Project

It is estimated that more than 3 billion tonnes of carbon dioxide are released to the atmosphere due to deforestation every year (deforestation accounts for 17% percent of current climate-changing CO2 emissions)

- A single tree can absorb CO2 at a rate of 48 lbs per year
- 1 acre of trees absorbs enough CO2 over one year to equal the amount produced by driving a car 26,000 miles.



- Multi-strata agroforestry has by far the best carbon sequestration rates of any food production system (between 10 and 40 times higher than typical improved annual crop production)
- Including breadfruit as part of a suite of food-producing trees like mango, avocado, citrus and banana has environmental benefits while providing much-needed food and jobs.

Linked Solutions

Carbon Emission Reduction Platform

Path-breaking climate change fighting app that:

- links financiers and environmental advocates directly to sustainable global carbon sequestration/reduction projects and people on ground
- promotes environmental protection work by enabling people to make a living saving the planet
- provides a way to assess and monitor carbon emission reduction globally
- uses digital currency and crowdfunding platforms to empower global citizens to take action and do their part
- provides vehicle and super highway to speed planet-saving projects
- leverages immense carbon credit market to support social and environmental impact





Thank You.

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