

Malnutrition Matters

FOOD TECHNOLOGY SOLUTIONS

Improved, Sustainable Nutrition and Community Development

With the VitaGoat & SoyCow Systems



MM: Sustainable Nutrition & Community Development

- Relieve malnutrition through food technology
 - Focus on most suitable cereals, grains, legumes, vegetables and fruits
 - Include fortification and therapeutic foods
- Provide local employment via:
 - VitaGoat and SoyCow food enterprises
- Provide community training in hygiene, nutrition awareness and micro-enterprise via:
 - Partnership with larger NGOs/PVOs
 - SHG, community center and school-based training
 - Local food product development
- Provide other food-security and job opportunities:
 - Backyard solar drying
 - Backyard water purification



Soy milk being made in an Ashram in New Delhi

Why are Soyfoods Ideal for Development?



- Large variety of locally processed low-cost foods
 - Soymilk, tofu, soy yogurt, sour soymilk (low-cost dairy alternatives)
 - Okara (soybean pulp) can be added to foods or sold for feed
 - Provides local jobs & training through sustainable micro-enterprise
- Nutritional Uses
 - Safe hydration through high-temperature process
 - Micronutrient delivery capability
 - Excellent base for low-cost therapeutic food (tofu or soy flour, peanut butter, micronutrients, oil and sugar)
 - Ideal HIV/AIDS protein nutrition and weaning foods
- Environmentally friendly
 - Efficient water usage and no food waste

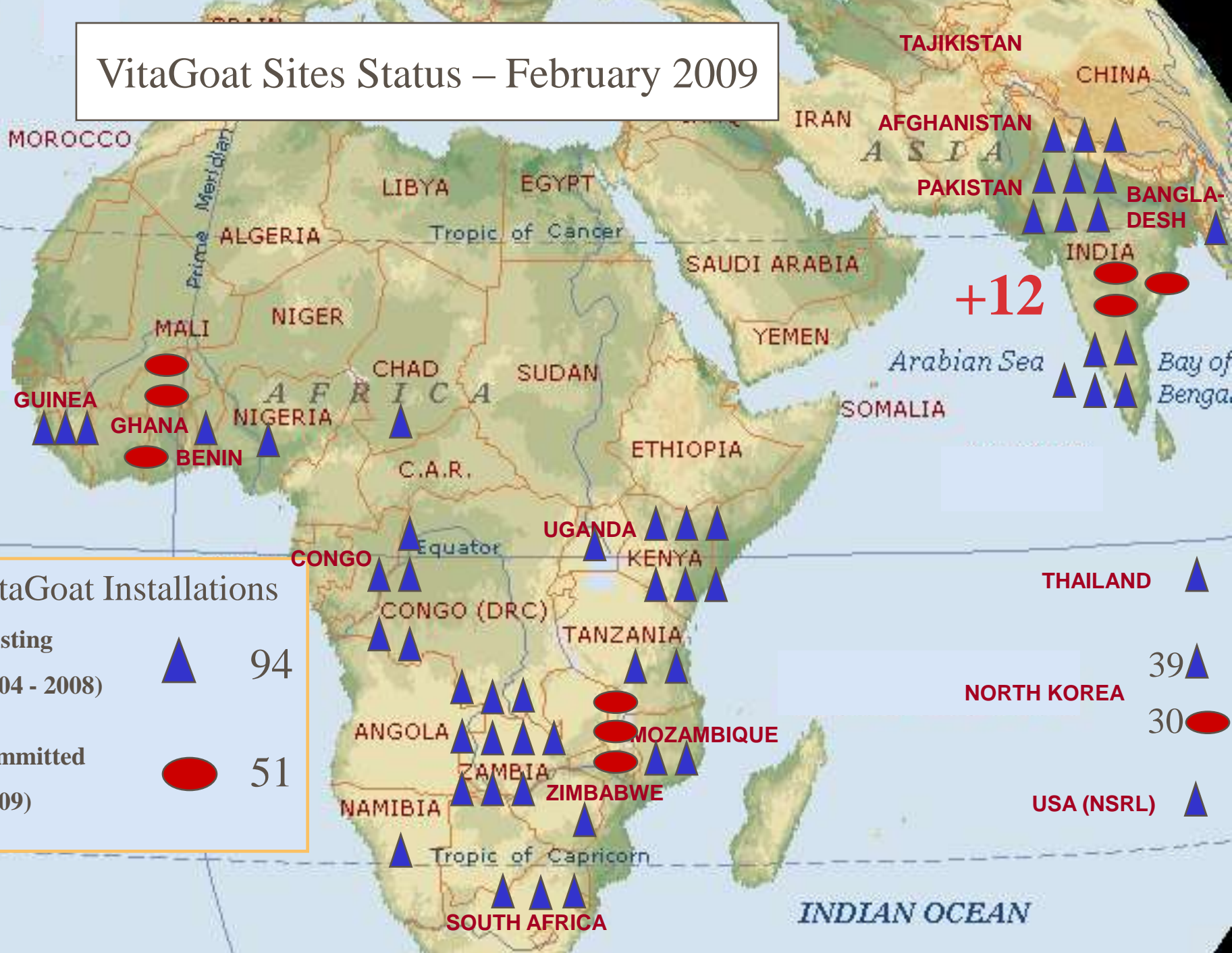
Today

- Over 1,000 older electric SoyCows in over 40 countries
- VitaGoat technology transfer to India completed in 2006; training and support centers operational in India & Africa
- About 100 VitaGoats have been installed in 13 African countries, India, Thailand, Bangladesh and North Korea in past 4 years
- New-generation SoyCow models are available (Electric soy-only hybrids of the VitaGoat)
- WISSH projects include VitaGoats and SoyCows in Africa and Central America
- World Bank award in 2007 for sustainable 20-VitaGoat project to provide midday meal for 15,000 students in Orissa
- Interest in the VitaGoat and SoyCow, as a vehicle for community development, continues to increase



School children drinking soymilk at rural school in Orissa

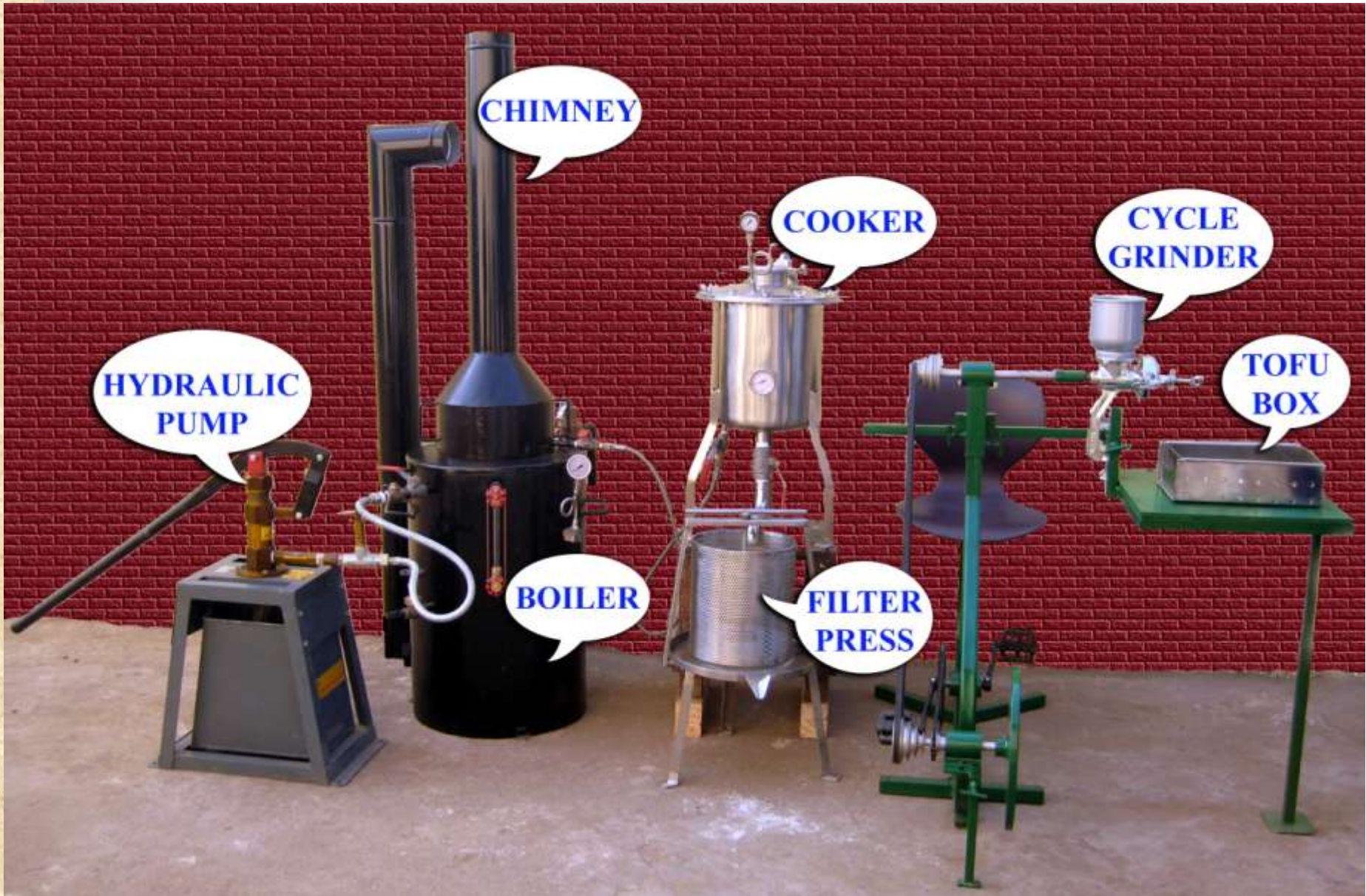
VitaGoat Sites Status – February 2009



VitaGoat Installations

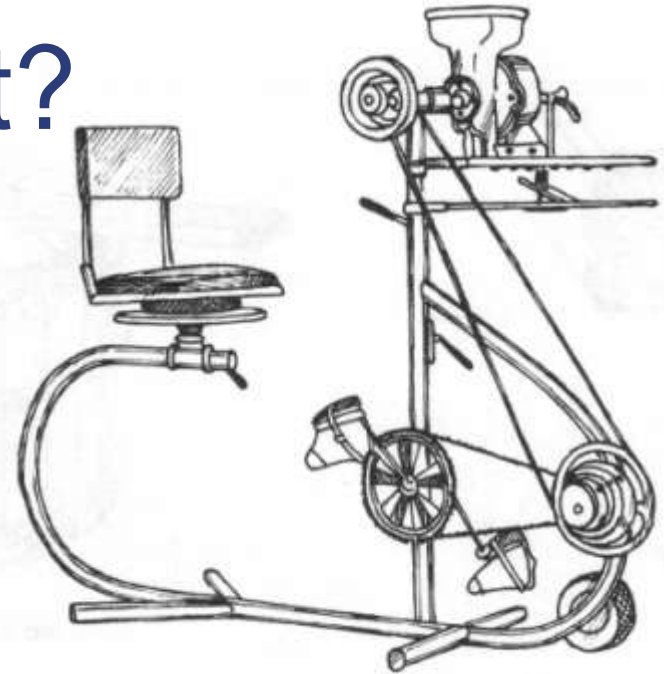
Existing (2004 - 2008)		94
Committed (2009)		51

The VitaGoat System



Why the VitaGoat?

- Manual (non-electric) operation to enable rural micro-enterprise
- Wood, coal, gas or other fuel options
- Lower cost and more versatile
- High-efficiency boiler conserves fuel
- No electric/water connection costs
- Dry and wet food production



Cycle Grinder

Rural groups benefit from processing their own foods, especially when there is a glut of local produce

The grinder can be used alone to grind coffee, peanut butter, flour, and other nuts, cereals and grains.



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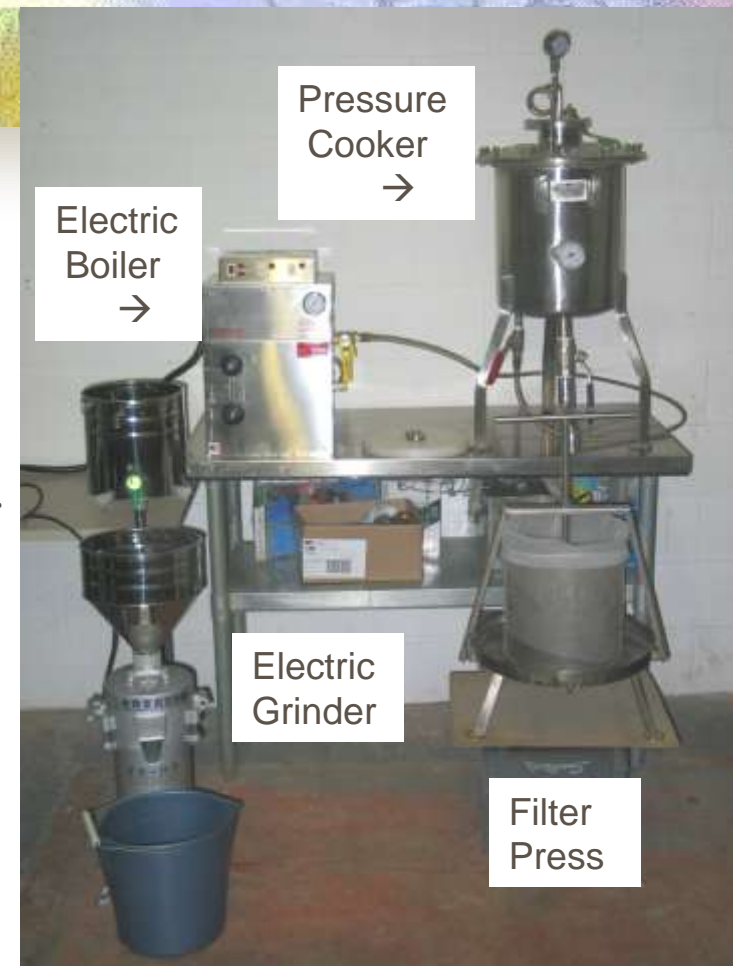
The VitaGoat – Food Production Chart

Foods	Production capacity	Full System	Cycle grinder only
<p>Soymilk from whole soybeans and soymilk-derived foods such as tofu, soy yogurt and sour soymilk. The fibrous by-product “okara” has many baking applications.</p>	<p>30-35 liters/hour (8-9 USG/hr)</p>	<p>√</p>	
<p>Fruit or vegetable sauces, purees and juices</p>	<p>30 liters/hour (8 USG/hr)</p>	<p>√</p>	
<p>Flour or meal from corn, sorghum, wheat, soya, rice, millet, etc</p>	<p>8 – 12 kg/hour (20-30 lbs/hr)</p>		<p>√</p>
<p>Peanut or other nut butter or paste</p>	<p>8 – 12 kg/hour (20-30 lbs/hr)</p>		<p>√</p>
<p>Ground roasted coffee</p>	<p>6 – 8 kg/hour (12-20 lbs/hr)</p>		<p>√</p>

Why a SoyCow?

Electric processing of soy foods

- SoyCow M (VitaGoat hybrid)
 - Electric grinder instead of cycle grinder
 - Multi-fuel boiler as per the VitaGoat
 - Equipment cost approx. US \$3,900
 - Suited for rural applications with household electricity
- SoyCow E (fully electric)
 - Electric grinder instead of cycle grinder
 - Electric boiler instead of multi-fuel boiler
 - Equipment cost approx. \$5,500
 - Suited for urban/commercial applications



SoyCow E

All are manufactured in India

Comparison of Systems

Foods Produced	SoyCow E	SoyCow M	VitaGoat
Soymilk (including tofu, yoghurt, etc)	√	√	√
Vegetable and fruit juices, purees & sauces			√
Coarse flours (cornmeal, rice, soy, wheat)			√
Groundnut butter (e.g., peanut butter)			√
Ground beans (coffee, roasted soybeans)			√
Electricity required	√	√	
Soymilk Capacity	40L / hour	35L / hour	35L / hour
Approximate price (subject to change; taxes, shipping and duties not included)	\$US 5,500	\$US 3,900	\$US 3,900



The VitaGoat / SoyCow

Applications & Economics

- Settings: - Direct feeding (emergency or other)
 - Social institutions (schools, hospitals, etc.)
 - Community or entrepreneurial businesses
- Economics: - Daily serving of soyfood for 500 to 1000 people
 - Can employ 3-6 people per system
 - Variety of local foods can be processed (VitaGoat)
 - Minimal infrastructure and set-up costs
- Training:
 - Provides an opportunity for nutrition awareness
 - Related hygiene training about food preparation
 - Health training about intestinal worms, treatment and prevention also appropriate
 - Basic training for micro-enterprise management is possible, for those with basic literacy and numeracy

Orissa Project: Achieve a positive health outcome for 15,000 pre-school students

- By providing a soymilk-based nutritional supplement
- Meals made locally on a daily basis, with full operational costs paid out of revenue from the government-sponsored midday-meal program
- Majority of capital cost financed by BISWA, local NGO partner
- 18-month health data survey to be conducted with 1400 subjects



Strategy and Priorities

- Alleviate malnutrition, which occurs in at least half of the children in the area
- Ensure long-term sustainability of the project, with no need for donor funds after project initiation
- Provide local employment for over 100 unskilled rural women
- Provide training in nutrition and hygiene to children, parents, teachers
- Provide basic business training to SHG members



Delivery boy ready to go, with soymilk in milk cans: rural Orissa, India

Recent Innovations

- VitaGoat Canning module
 - Low-cost kits and canning manual available
 - Steam from existing boiler used to sterilize content and jars / bottles for preserves, including soymilk
 - Sterilization can be done in cooker or extra canning vessel



Canning vessel and cooker shown left, both hooked to boiler

Jars inside canning vessel



Innovations cont.

● SolarFlex fruit and vegetable dryer

- Rural micro-enterprise to increase food security and create employment
- Most basic direct-sun drying panels: ½ sq m – price under \$70
- Smaller ‘Family’ Dryer has cabinet, 6 sq m of drying space : price \$800
- Larger dryer has cabinet, 30 sq m & PV-powered fan: price \$5,000
- Can be used to dry fruits, herbs, vegetables, fish, etc.



←
Tomatoes, mango,
pineapple and
bananas dried in
the dryer

→
Dryer installed in
South Africa



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- WISHH
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