IPRO 325
Developing Affordable Solutions for the World’s Rural Poor
The Problem

3 billion people live on less than $2 a day
Team Overview

- **3 Subgroups**
  - Water
  - Cooking
  - Evaporative-Cooling

- **Location Interest Group**
  - Identified 3 regions for field testing & implementation
    - China, Nicaragua and Peru
  - Identifying potential sponsors
  - Fundraising

Trips planned for January & June 2008 to Nicaragua and Peru
Water Purification

Jessica Henson, Ashley Ono, Brian Schiller, David Curtin, Ryan Witthans
Problem

- Tainted water kills 5 million each year
- Secondary effects on village
- Need for extremely cheap solution
- Current solutions don’t fit every village
SODIS method

- Solar disinfection process
- Some drawbacks

Design & Build
A working prototype
A “how to” manual

Testing
- Through various tests we will establish standards of maximum performance and efficiency
Our Solution

- Combines filtration with SODIS
- Highly adaptable
  - Can target specific pollutants
  - All indigenous materials
  - Easily maintained
- Implementation-oriented approach
Progress
- Determined location resources and needs
- Examined current purification methods
- Developed a prototype
- Completed first round of testing

Future work
- Complete testing
- Create a field implementation manual
- Implement in real world situation
Cooking

Curtis Aubry, Jaime McClain, Nick Przybysz, Ernest Dogbe, Ian Seagren, Heling Shi
Problem

- 1.6 Million premature deaths each year caused by indoor air pollution due to cooking.

- Inefficient cooking methods such as open fire cooking, lead to social, economical and environmental problems.
Solution

- **Design & Build**
  - Conventional Oven
    - Improved Efficiency
    - Simple Construction
  - Solar Oven
    - Umbrella Design

- **Testing**
  - Conventional Oven
    - Time to boil, peak temperature, gas emissions, fuel consumption
  - Solar Oven
    - Time to boil, peak temperature, solar intensity, sun angle
Progress

- **Research**
  - Research has been conducted to identify:
    - Extent of problem
    - Types of ovens and current usages
    - Locally available materials
    - Existing projects in field
    - Testing Procedures

- **Design & Build**
  - Design nearing final design phase.
  - Construction beginning.

- **Testing**
  - Parameters have been defined.
  - Benchmark comparisons defined and acquired.
  - Testing procedures are being adapted.
Evaporative-Cooling

Amber Heinz, Bryan Murillo, Eliza Bober, Phil Korol, Shreyas Dole, John Sullivan-Fedock
Objective

- **Problem:**
  - Food storage is a major issue preventing the advancement of the world’s rural poor.

- **Solution:**
  - Our subgroup’s objective is to develop and implement a more effective and efficient way for the world’s rural poor to store food.

- **Design & Build**
  - A working prototype
  - A “how to” manual

- **Testing**
  - Through various tests we will establish standards of maximum performance and efficiency
Results to Date

- The outer layer is to be constructed of adobe bricks

The mixing process…

The brick making process…
The inner layer is to be constructed of clay pots. Each side must be rolled out into a slab and dry until “leathery” before being assembled. The pots must sit for 1-2 days before entering the kiln. Professor Steve Stanard made two circular pots for the group.
Testing

- **Benchmarks**
  - leaving the fruits and vegetables open to the elements
  - a standard cooler

- **Tests will include:**
  - Varying the sizes and shapes of the inner layer
  - Varying the saturation levels of the sand
  - Testing covering methods and materials