

IPRO 325



Developing Affordable Products For the Poor of the World

Sub-team ENERGY



Problem: Lack of Affordable Energy

Currently, there are 2 billion people across the world don't have access to affordable energy. The use of firewood and charcoal for cooking and heating has led to deforestation in many areas of the world. Using firewood for cooking is also hazardous, since it can cause fires (especially in arid regions) and smoke inhalation can lead to serious health problems.

Solution: Customized Solar Cookers

One very inexpensive and affordable solution to this problem is a solar cooker made out of locally available materials. The sun is the most powerful energy source available to the Earth, and it's free.

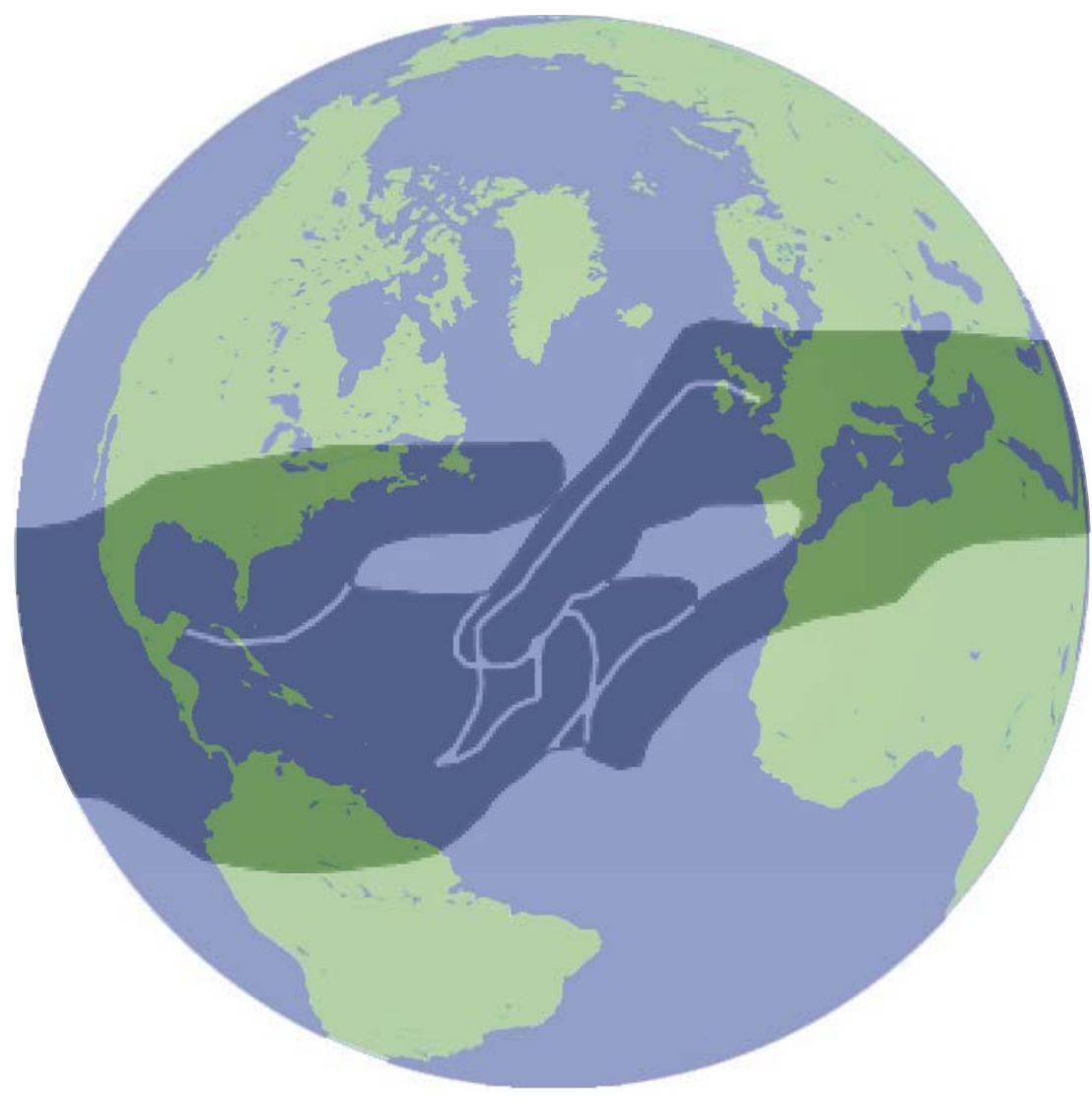
How the Solar Cooker Works

The solar cooker is essentially a well insulated box with a glass cover that traps the energy from the sunlight inside and uses it to heat up the interior of the cooker. It utilizes reflectors to gather as much sunlight as possible.

Utilizing Local Materials

The most commonly available structural materials in poor villages include wood and adobe. These can be used for the construction of the base and the box of the solar cooker. Salvage or refuse materials, like the inside of a bag of potato chips, can serve as a very inexpensive solar reflector.





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Sub-team WATER



Problem: Lack of Potable Water

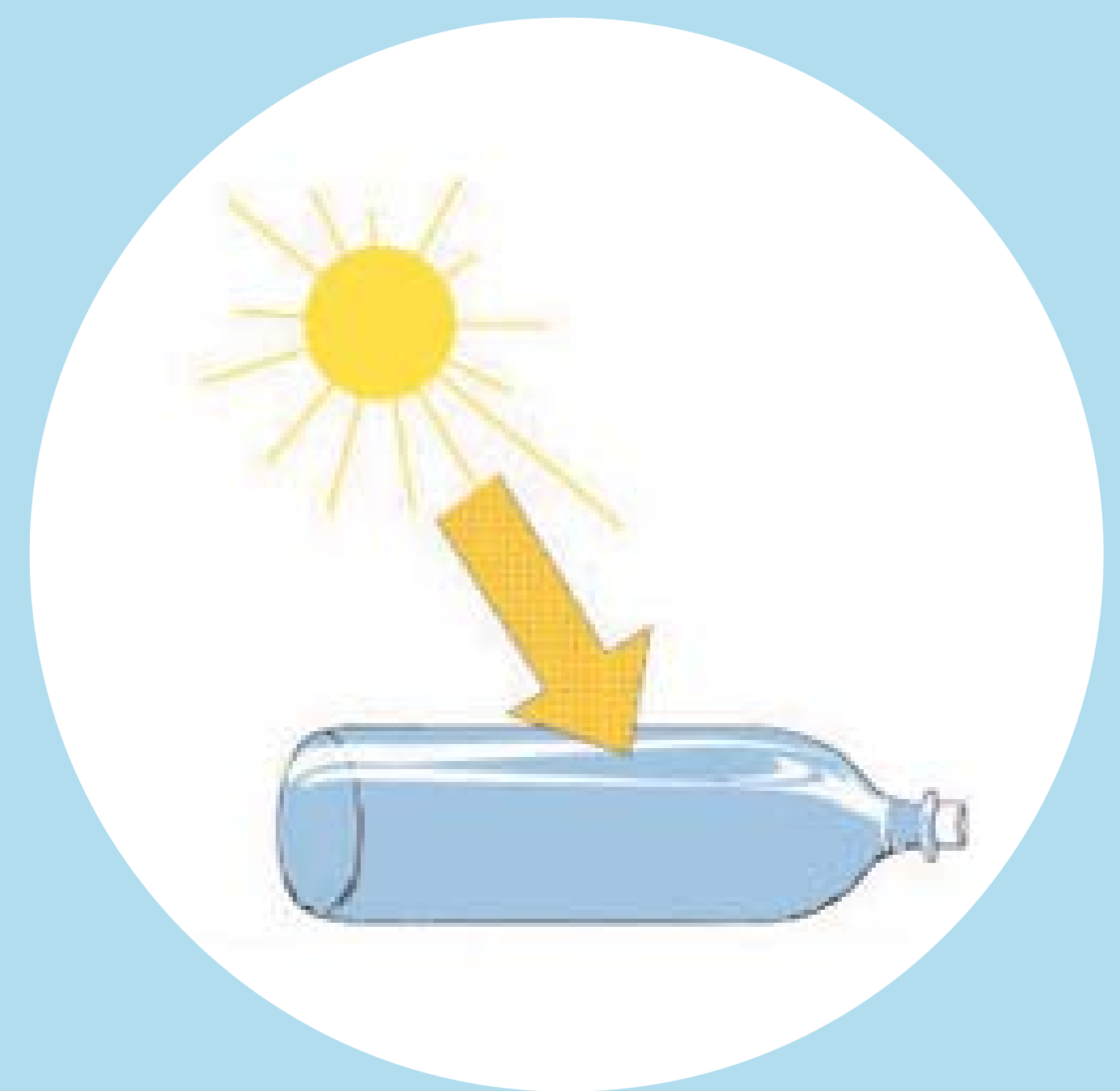
There are 1.1 billion people world-wide that do not have access to potable water. As many as 1.8 million people's lives are claimed by diarrhea each year and 90% of these deaths are by children under 5 years old.

Solution: SODIS Water Farm

In order to effectively solve the problem of providing a safe water source for people that live on less than \$2/day, the most inexpensive materials were chosen - plastic bottles and sunlight.

Solar Disinfection (SODIS)

Clear or bluish polyethylene terephthalate (PET) plastic bottles are filled with contaminated water. The filled bottles are then exposed to the sun for a day (two days if cloudy) and the sun's heat and UV rays render harmful biological agents benign.

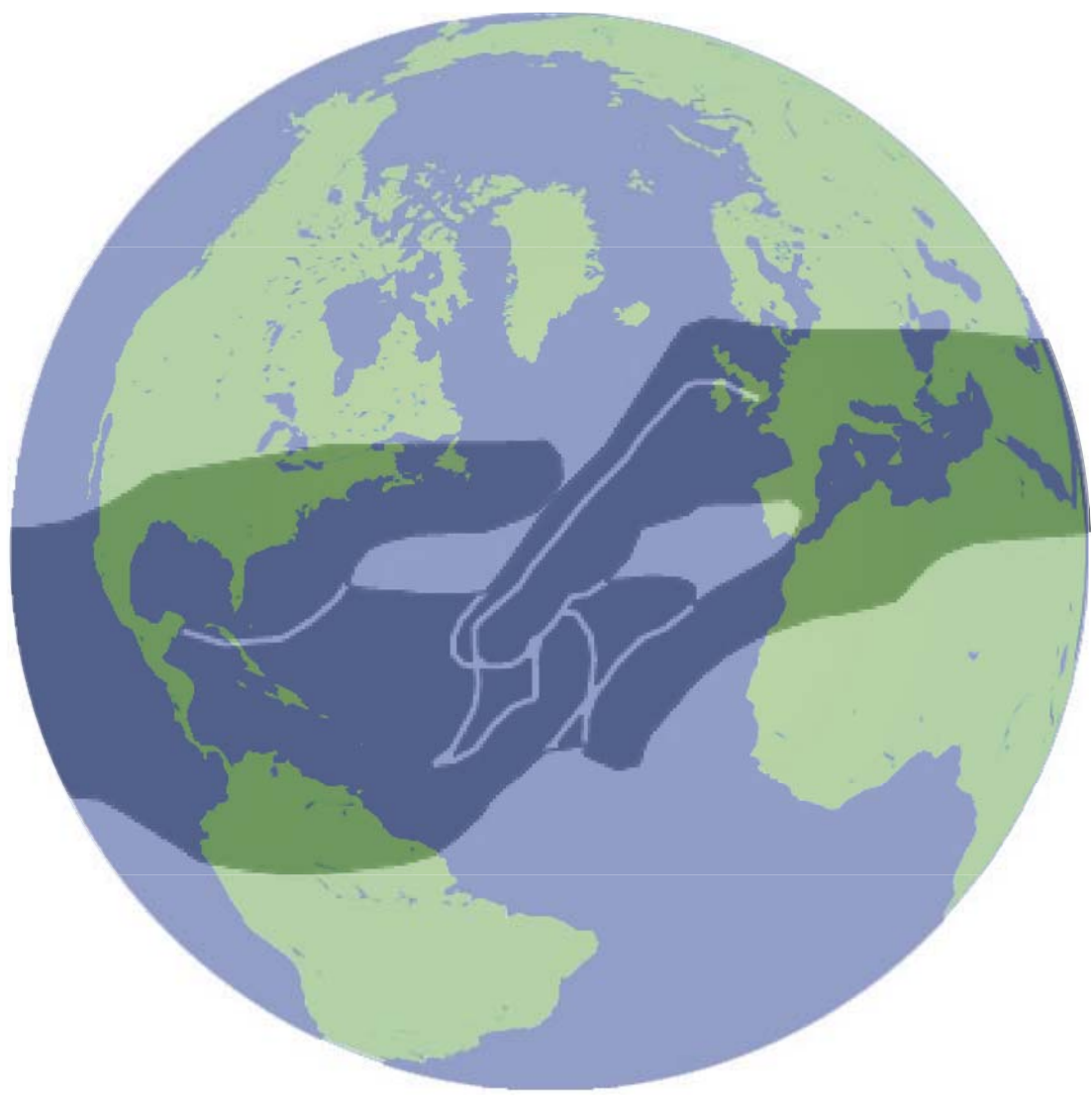


Harvesting Water

Through the SODIS method, water can be farmed for families.

1. Micro-loans are being considered to finance shipping of clean plastic bottles, fencing, and any other material costs.
2. Households purchase bottles for a small nominal fee. The bottles are marked and the purification is managed by a water "rancher".
3. Replacement bottles are purchased with future capital.
4. Proper disposal is managed by the water "rancher" free of charge once the bottles reach the end of their useful life.





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Our Mission

There are 3 billion people worldwide who live on less than \$2 per day. We feel that it is our ethical responsibility to do something to help the less fortunate. Our goal is to develop extremely affordable and sustainable solutions (costing \$5 or less) to these poverty aspects. Ultimately, we envision our solutions being implemented in villages throughout the world by future IPRO students through service-learning trips.

Our Objectives

IPRO 325 is a continuation of the research conducted by last semester's team. Our objective is to:

1. Expand upon the information compiled from last semester by focusing further research on specific solutions to the poverty aspects of water and energy.
2. Develop specific prototypes to solve the problems of unsanitary water supplies and lack of affordable energy.
3. Create instruction manuals to instruct villagers in the installation and maintenance of the systems.
4. Increase campus awareness about world poverty.



Our Method

Our IPRO team worked together towards developing affordable and sustainable solutions by:

1. **Dividing responsibilities** among sub-teams to research specific solutions to the water and energy aspects of poverty.
2. Sub-teams would **communicate** their findings to the IPRO team via PowerPoint presentations.
3. Our IPRO team would **reflect** upon the information presented to determine the next course of action.

IPRO325

ENGINEERING POVERTY REDUCTION
Dr. John Duffy, PhD Lecture

About...
Dr. John Duffy will share his experiences from his service learning partnerships with several villages in Peru and also share his vast knowledge of Solar Engineering with the IIT community.

Thursday, March 1st
MTCC Auditorium 4:45 ~ 5:30
Reception to follow (Refreshments provided)

To learn more, go to <http://energy.caeds.eng.uml.edu/index.htm>
Sponsored by IPRO325 to Increase Poverty Awareness

Raising Campus Awareness

This semester our team hosted two guest lectures by members of renowned organizations to share their experience in humanitarian service with the IIT community in order to help students gain perspective about their place in the world and their ethical obligation to serve the global community. Through teamwork, members assumed various roles in poster production, flier and email dissemination, and event coordination in order to make each speaking event a success.

Engineering a Better World - March 1st, 2007

Dr. John Duffy, Director of the Center for Sustainable Energy at the University of Massachusetts, Lowell discussed the Village Empowerment project, in which over 90 students have designed and installed over 75 solar-powered systems for communication, lighting, vaccine refrigeration, and water supply and purification in remote areas of the Peruvian Andes.

Enabling Prosperity: Creative Design Solutions for Global Poverty - April 5th, 2007

Ms. Zenia Tata, Executive Director of International Development Enterprise (IDE) discussed IDE's role in helping over 17 million families around the world climb out of poverty by providing impoverished farmers access to extremely low-cost water control technologies as well as connecting them to markets to sell their produce.

Enabling Prosperity: Creative Design Solutions for Global Poverty

IDE
INTERNATIONAL DEVELOPMENT ENTERPRISE

Guest Speaker: **Zenia Tata - Executive Director of IDE**

Location: **MTCC Auditorium**
Date: **Thurs, April 5th**
Time: **4:45 PM - 5:30 PM**
Reception to follow (food & refreshments provided)

Zenia Tata will discuss how International Development Enterprises (IDE) works to provide impoverished farmers with access to extremely low-cost water-control technologies and connect them to profitable markets for their produce. By providing a way for families to make small investments in tools and training, IDE has helped over 17 million families improve their health and enrichment as well as increase their household incomes. Samples of IDE's low-tech solutions will be on display.

<http://www.ide-international.org>
Sponsored by IPRO 325 to raise poverty awareness

By hosting these guest lectures, our IPRO team was able to:

1. Provide a forum for students at IIT to learn about organizations working to end poverty.
2. Receive invaluable insight towards developing our solutions from experts with field knowledge.
3. Establish potential long-term partnerships with these organizations to realize our team's mission.

