D-Lab India: Ranikhet & Avani

Six anonymous MIT students
Ranikhet & Avani

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Ranikhet & Avani

Issues

• Deforestation due to energy needs
• Invasive species (overgrowth of pine)
• Geographical isolation
• Burning of fossil fuel
• Depleting water supply
• Waterborne disease
Community Partners

Pan-Himalayan Grassroots Development Foundation
-Non-profit NGO in Ranikhet
-Environmental degradation leads to lower quality of life
-Focus on water supply & sanitation, renewable energy, forestry, enterprise

Avani
-Community of approx. 40 people
-Focus on building self-reliance, sustainable works
-Areas of work include renewable energy, water management, farm-based enterprise, and textiles
Our Contribution

- Solar Light
- Solar Dryer
- Education
- Water filtration system
- Charcoal
- Walnut Crusher

In the Works:

- Pine Needle Gasifier
- Health Awareness
Solar Light

Grassroots:

Solar torch:
< $10 sale cost
Daily use, portable

Solar lantern:
~ $40 sale cost (2000-2500 rupees)
Design: Hangs from ceiling to light whole room

Want IDDS light, but no lathe ava

Avani:

Looking for a cheap torch
Lasts 2-3 hrs
Smaller battery pack and solar panel
Solar Dryer

Region has abundance of fruit
Looking for way to increase food security

Solar dryer
- Dries fruits for preserve
- Dries herbs for cooking
Education

Target: Primary school children

Subject: Basic Science

Lesson Plans drafted:
- Circuits
- Earth science
- Lego Cars
- Microbiology

Lesson Plans in Progress:
- Laser Mazes
Water Filtration

Water Sources:
- Nearby Springs
- Rainwater harvesting
- Infiltration Wells (Ranikhet)

Focus is on household water treatment and sanitation

Filtration Methods:
- Sodis
- Slow-Sand filters

Looking into chemical treatment options

Additionally,
Goal is to educate communities importance of clean water and proper sanitation
Charcoal

- Emissions Testing

- Possible Binders
  - Tops of banana plants
  - Rice water
  - Aloe Vera

- Binder is negligible when it comes to emissions testing

- Test more in the U.S.
Walnut Crusher

Large supply of walnuts (500,00 per year per person)

Problems with walnut crackers:
- crush walnut inside
- time spent separating walnut from shell

Last year, modeled large rotating peanut sheller
Walnuts were too hard for machine to crack

Methods:
- Density separation