

Project Goals + Precedents

The primary goal of the project is to provide an effective heating solution that can be easily implemented given the limited resources available to those most in need.

Precedent research yielded a variety of solutions from around the world, many of which are too costly or complicated for the target population.

Stove design principles were extracted from existing precedents and melded into the two design models.

Peruvian Culture

- Climate

Oceanic currents create very unstable conditions.

- Health

Poisoning from wood burning stoves is common.

- Poverty

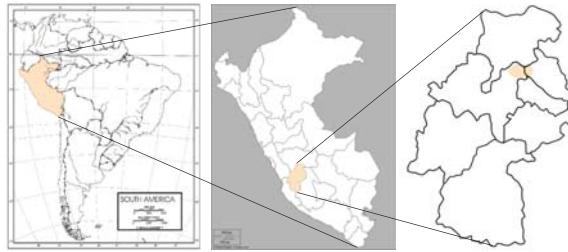
80% of Huancavelica is considered in poverty.

- Lack of Infrastructure

Rural areas of Peru have little access to clean water or food.

Huancavelica, Peru

The area we are looking at is the province Huancavelica, which is also the name of the region it is located in. We are targeting the northeast portion due to the problems the region faces: low temperatures, poverty, and residents in need.



Research

- Ondol

Korean Wood Burning stoves used to heat house.

- Wood Burning Stoves

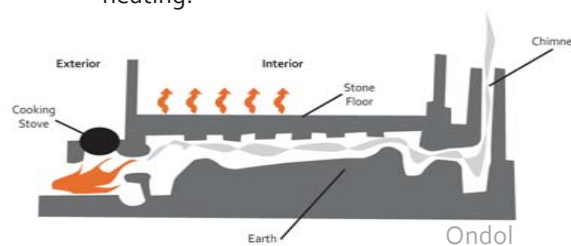
German, Russian, and Chinese designs.

- Radiant Heating

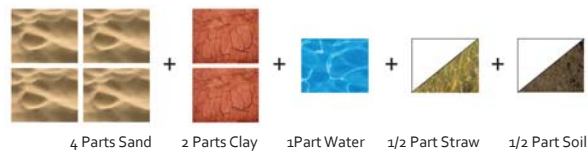
Concept of heating an element through water to heat a space.

- Previous IPRO 325 Groups

Structural development, roof design, and some research into heating.



Adobe Composition



Building Process



Analysis and Findings

Analysis of stoves was based on:

- Efficiency: or the amount of time needed to boil water.
- Heat retention capabilities, based on measuring the temperature of various points on the stove during and after burning.
- Effectiveness of smoke exhaust

Stove design #1 showed no problems exhausting smoke, boiled water in 50 minutes, and retained significant heat for over 90 minutes.

Stove design #2 showed significant problems correctly exhausting smoke such that the experiment had to be ended prematurely.

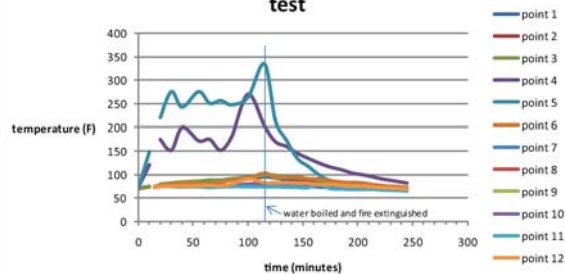


Design #1



Design #2

Temperature of various points on stove during test



What's Next?

Future testing should include:

- Rigorous use to determine long - term durability.
- Covering the front opening to improve efficiency and exhaust.
- Raising the fire closer to the cooktop to determine optimal distance.
- Testing outside of a controlled laboratory setting.
- Building and testing full scale models to improve accuracy of results.

Team Members

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Affordable Heating for Peru

I PRO 325



Affordable and Sustainable Quality of life
Improvements for World's Poor
Spring 2010
Illinois Institute of Technology