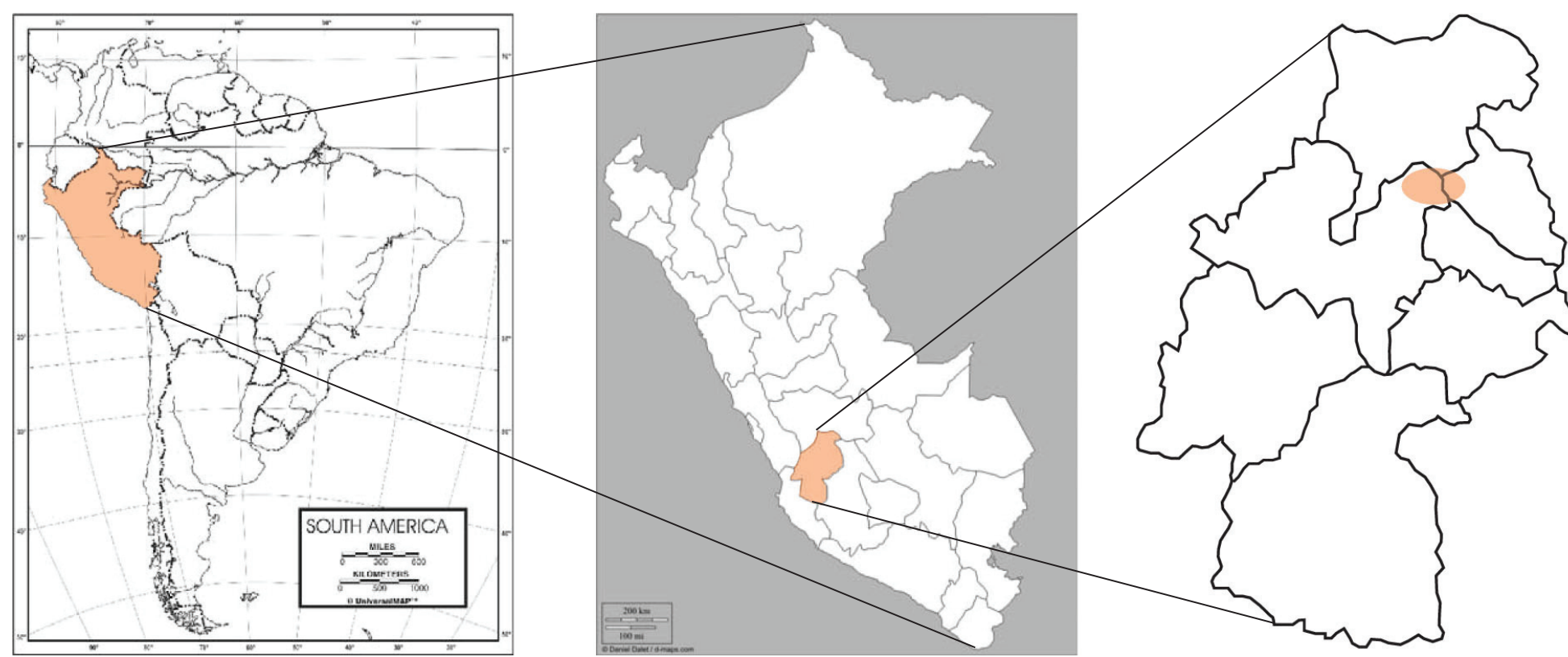


About Huancavelica, Peru

- 120 miles Southeast of Lima
- Parts extend into the Andes Mountains
- Over 80% of the population is in poverty
- Oceanic currents and climate change create dramatic temperature swings
- Smoke from open-fire cooking exposes much of the population to deadly fumes
- Health clinics are inaccessible by most
- Life expectancy in the region is low, partly due to high rates of pneumonia among children

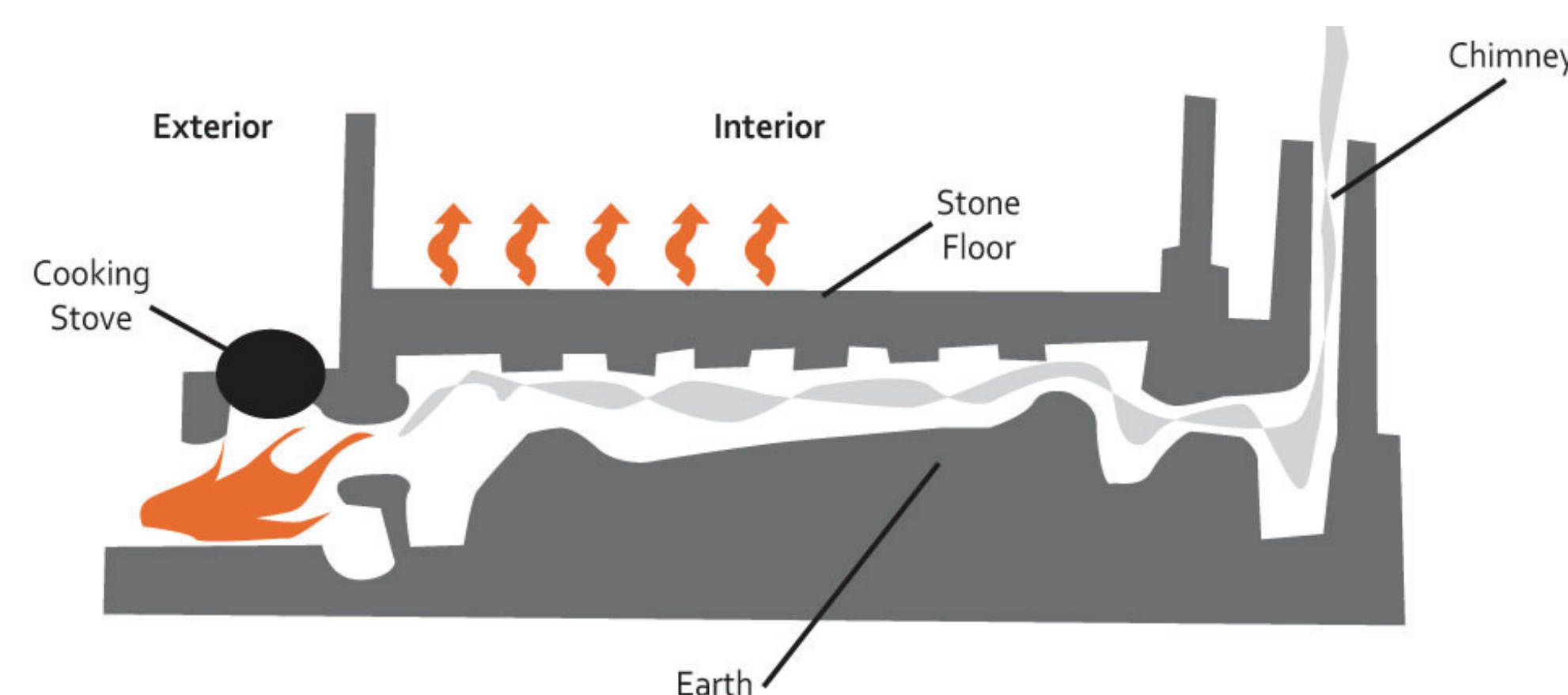


Project Goals + Precedents

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

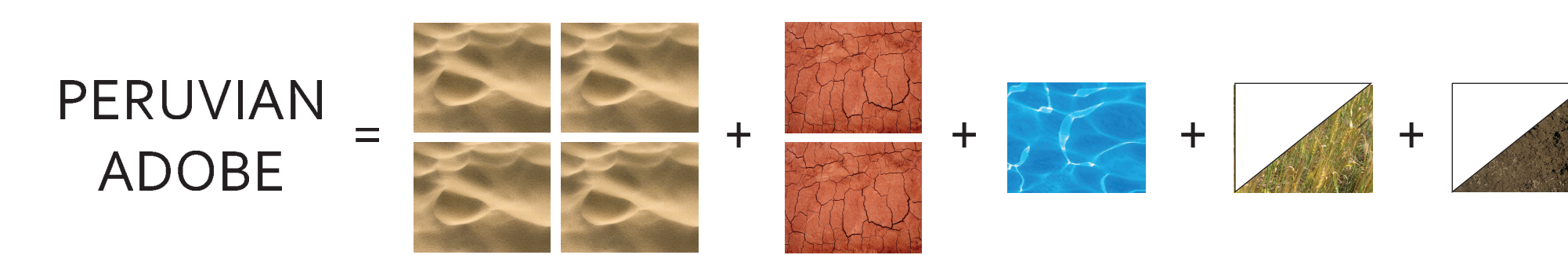
Precedent research yielded a variety of solutions from around the world, many of which would be too costly or complicated for the target population.

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



Building Process

RECIPE, based on average Peru soil conditions:



STEP 1, mix all ingredients by hand into a smooth paste:



STEP 2, form mixture into bricks via wood frames:



STEP 3, allow bricks to dry for at least 48 hours:



STEP 4, construct stove to specifications using fully dried bricks and adobe mortar:



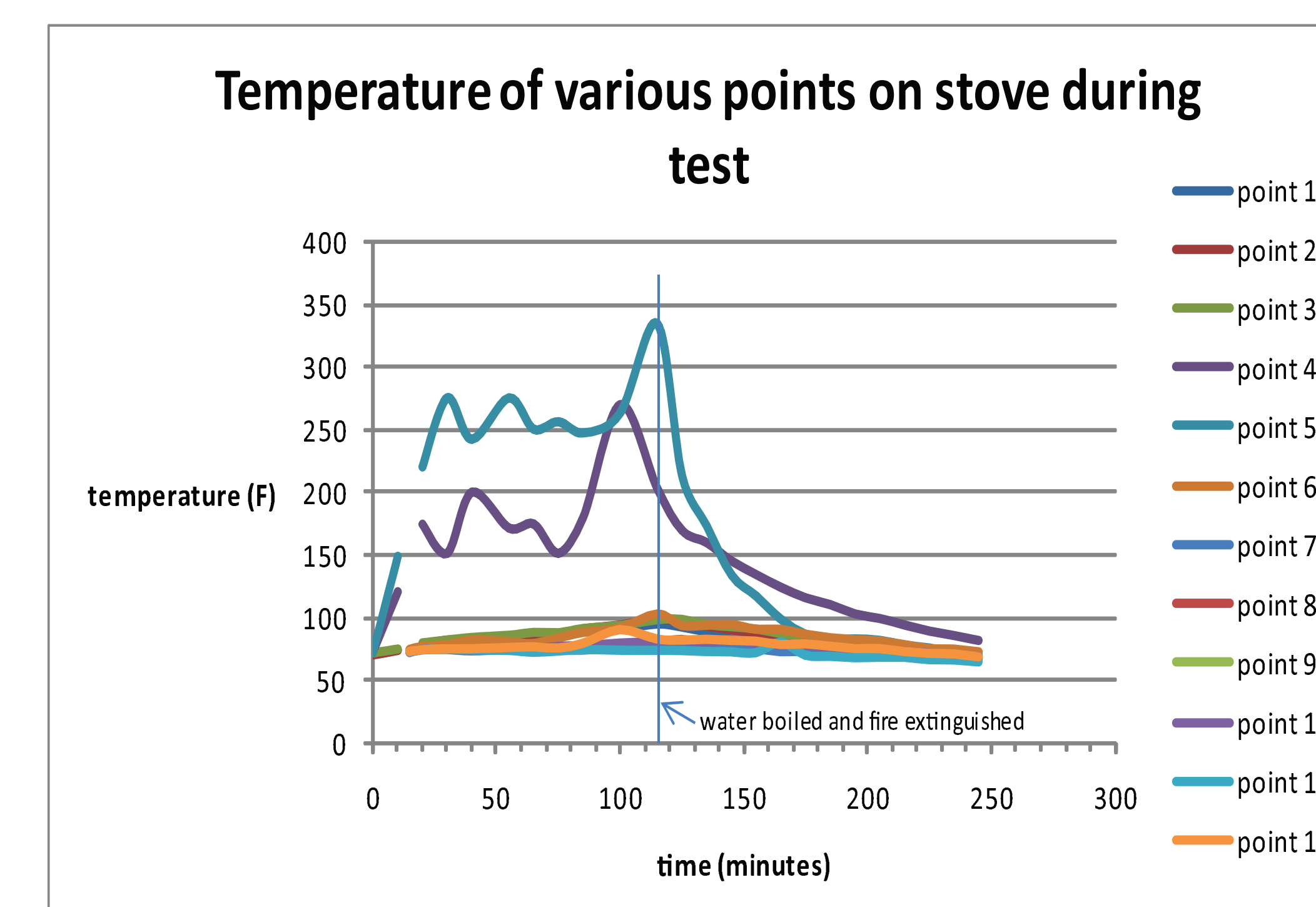
Analysis and Findings

Analysis of stoves was mainly based on:

- Efficiency, or the amount of time it took to boil water
- Heat retention capabilities, based on frequently 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.



What's Next?

Future testing could include:

- Rigorous use to determine long-term structural stability
- Covering the front opening to improve efficiency
- 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 Development

Over the semester, our team took extra measures to develop our understanding of both Peruvian culture and team culture:

- Contacts in Peru, who imparted knowledge of everyday life
- Trip to *Ay Ay Picante!*, Peruvian cuisine on Chicago's North side
- Outside-of-class social events
- Team production of over 600 quarter-scale adobe bricks



IPRO Team Members:

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