

WPI

COMBATING INDOOR AIR POLLUTION

Lidya Gebremeskel (ChE), Shamsur Rahman (AE), Hary Teklegiorgis (Mac)
Advisors: Professor Geoffrey Pfeifer (HUA), Professor Derren Rosbach (CEE)



Abstract

Globally, about 4.3 million people die each year due to exposure to indoor air pollution (IAP). The major cause of this problem is burning biomass inefficiently indoors mainly for cooking purposes. Our project focused on finding an alternative cooking method that is affordable, available and culturally sensitive to the people in rural Orissa, India. After analyzing each aspect we recommend an awareness campaign and the use of heat retention boxes that reduce the time of smoke exposure.[8]

The Problem

Indoor Air Pollution(IAP) is the accumulation of toxic gases within households. The underlying cause of IAP is Energy Poverty: lack of accessibility and affordability of better forms of energy. About 3 billion people worldwide burn biomass inefficiently causing emission of smoke in their homes. Thus, this practice has been integrated into their customs and traditions.[8]

Evaluation of Cooking Methods

Evaluating Factors	Traditional Technique	Recommended Technique
Time cooked on fire		
Smoke emitted		
Firewood		

Project Goal

People in Orissa are energy poor and under the poverty line. Thus, our aim is to find an affordable, accessible, and culturally sensitive technique to reduce the negative health, social, environmental impacts of indoor air pollution.

Recommendation

Awareness Campaign + HRB

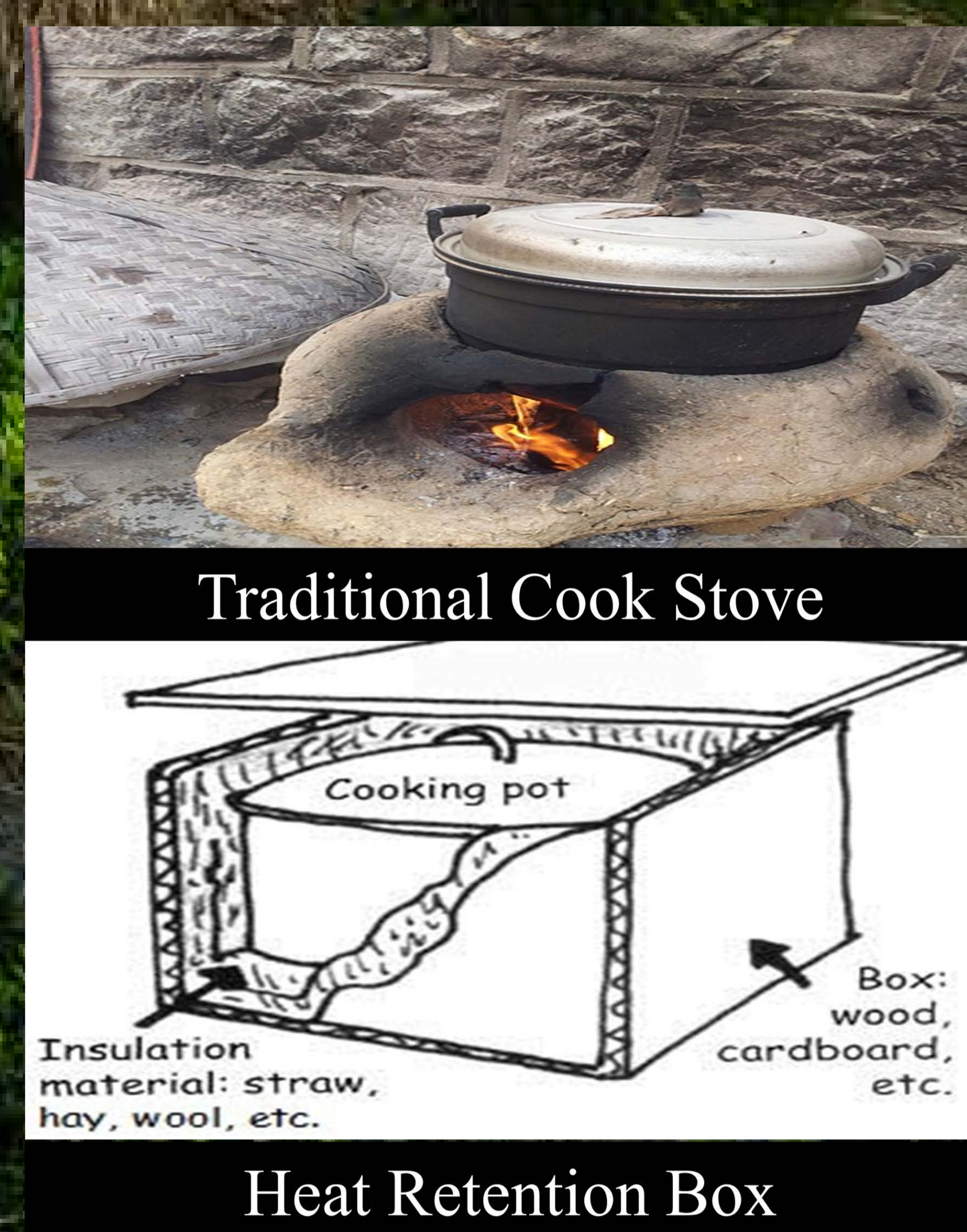
Progress

1. Problem Globally	→	Problem in Orissa
2. Analyzed Solar stoves awareness campaign, Improved Cooking Stoves and heat retention box(HRB)	→	Recommended HRB and awareness campaign

Make the community acknowledge the problem of Indoor air pollution.

Introduce and encourage better cooking practices such as wearing facemasks and using dry fire wood.

Facilitate the acceptance of heat retention boxes.



Food is brought to a boil on the traditional stove.

Cooking pot is taken off the stove, wrapped in a blanket and placed in the box.

Food continues to cook with the retained heat.

References

1. Awareness Program Picture. Retrieved April 27 from http://upload.wikimedia.org/wikipedia/commons/5/59/Breast_Cancer_Awareness_Programme_Nsana_Foundation_-_Unani_-_Howrah_2013-12-22_5520-5522.JPG
2. Awareness in India picture. Retrieved April 27 from http://upload.wikimedia.org/wikipedia/commons/c/c5/IndFACES_-_Rural_women_driving_their_own_change_1_1229752965.jpg
3. Daffu, E., Greenstone, M., & Hanna, R. (2008). Cooking stoves, indoor air pollution and respiratory health in rural Orissa. *Economic and Political Weekly*, 71-76.
4. Fireplace, Hearth, Old Stove, Burning picture. Retrieved April 27 from <http://picabay.com/en/fireplace-hearth-old-stove-burning-289206/>
5. Pushkar Fair. Retrieved April 28, 2015 from <https://www.flickr.com/photos/kkashy/4042342708/>
6. School children at Nandikotkur village. Andhra Pradesh India picture. Retrieved April 27 from http://commons.wikimedia.org/wiki/File:School_children_at_Nandikotkur_village_Andhra_Pradesh_India.jpg
7. [Untitled image of Heat Retention Box]. Retrieved April 21, 2015, from <http://www.google.com/imgref/http://www.fao.org/docrep/009/a0218e/A0218e181.jpg?imgref=http://www.fao.org/docrep/009/a0218e/A0218e10.html&h=258&w=308&ibid=X2wOpGpMlNk&zoom=1&docid=ZgZ3sO79hLM&ei=BB43VpSGC6f6AW9GwCg&fbm=isch&ved=0CCQQMygIMag>
8. World Health Organization. (2014). *Health Indicators of sustainable energy in the Context of the Rio+20 UN Conference on Sustainable Development*. Retrieved from <http://www.wha.int/mediacentre/factsheets/fs292/en/>