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# Behavior change approaches to enable uptake and use of clean stoves and fuels:

Lessons from the field on what works, what doesn't and what's next?

Wednesday, May 7th, 2014

11:30AM – 1:00PM EDT



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# Introduction

Kendra Williams  
Research Analyst,  
USAID TRAction Project



# Translating Research into Action Project (TRAction)

- TRAction supports implementation science related to maternal, newborn, and child health
  - Gives awards to institutions and organizations to carry out research on priority health problems
  - Goal is to generate evidence and recommendations for program implementers and policy makers to scale-up successful strategies around the world
  - TRAction disseminates lessons learned and best practices to encourage adoption of research findings in practice
- TRAction is funded by the U.S. Agency for International Development (USAID), and is managed under a Cooperative Agreement by University Research Co., LLC (URC) in collaboration with its partner, the Harvard University School of Public Health.



# Where We Work

- Latin America and the Caribbean
  - Guatemala
- Asia
  - Bangladesh
  - Cambodia
  - India
  - Indonesia



5/7/2014

- Africa
  - Burkina Faso
  - Ethiopia
  - Ghana
  - Kenya
  - Malawi
  - Mali
  - Mozambique
  - Niger
  - Nigeria
  - Rwanda

- Senegal
- Tanzania
- Uganda
- Zambia



TRAction HAP Webinar



## TRAction Research Topics

- Task Shifting of C-Sections
- Nutrition
- iCCM
- Performance-Based Incentives
- Malaria
- Tuberculosis
- Respectful Maternal Care
- **Household Air Pollution**
- Water, Sanitation, and Hygiene
- Recognition of MNH Complications
- Equitable Healthcare Access



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# Household Air Pollution (HAP)

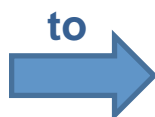
- Every year, nearly 4 million people die prematurely due to HAP
- Reducing the problem requires that people adopt clean cooking technologies
- However, adoption requires significant behavior change



Woman cooking on TLUD stove, Uganda

# Behavior Change for Reducing HAP

Switching from this...



This...



Requires...

**Significant  
Behavior  
Change**

- Individual Changes: fuel preparation and loading, timing of food preparation and cooking, stove maintenance, etc.
- Other changes along the value chain: production, marketing and distribution, and sustained support



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# What is a behavior change strategy?

A behavior change technique or strategy is the “active ingredient” in an “intervention designed to alter or redirect.. behavior.”

-- Susan Michie, et al., The Behavior Change Technique Taxonomy (2013)





## TRAction HAP Research

- Goal: Develop and test behavior change strategies to increase the acquisition and correct use of improved cookstoves
- Three projects:
  - PATH and Impact Carbon in Uganda
  - Duke University in India



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## Today's Speakers

### **TRAction-funded Researchers:**

Allen Namagembe, PATH

Theresa Beltramo, Impact Carbon

Marc Jeuland, Duke University

Conclusion by Kirstie Jagoe, TRAction HAP  
Consultant



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# PATH

## **Uptake and use of clean cookstoves and fuels: Behavior change approaches Lessons from Uganda**

Allen Namagembe  
Epidemiologist/Biostatistician

Photo credit: PATH Uganda

## Background and approaches

### **Location:**

- Peri-urban sub counties, Wakiso District, central Uganda

### **Study population:**

- Community leaders and households, village health team (VHT) members, sales agents, Top-Lit Up Draft (TLUD) stove purchasers

### **Partners:**

- PATH
- Berkeley Air Monitoring Group and the Center for Integrated Research and Community Development
- Joint Energy and Environment Projects



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## Behavior change approaches

Training VHTs on household indoor air pollution messaging

Cooking demonstrations, referrals, and information flyers

Fuel access interventions

## Lessons learned: What worked? Community cooking demonstrations

Most effective behavior change strategy

### Benefits:

- Observe and experience the benefits first hand.
- Participants observe fuel preparation and correct stove use.
- Able to ask questions.
- Generate excitement/demand



Photo credit: Nancy Muller/ PATH

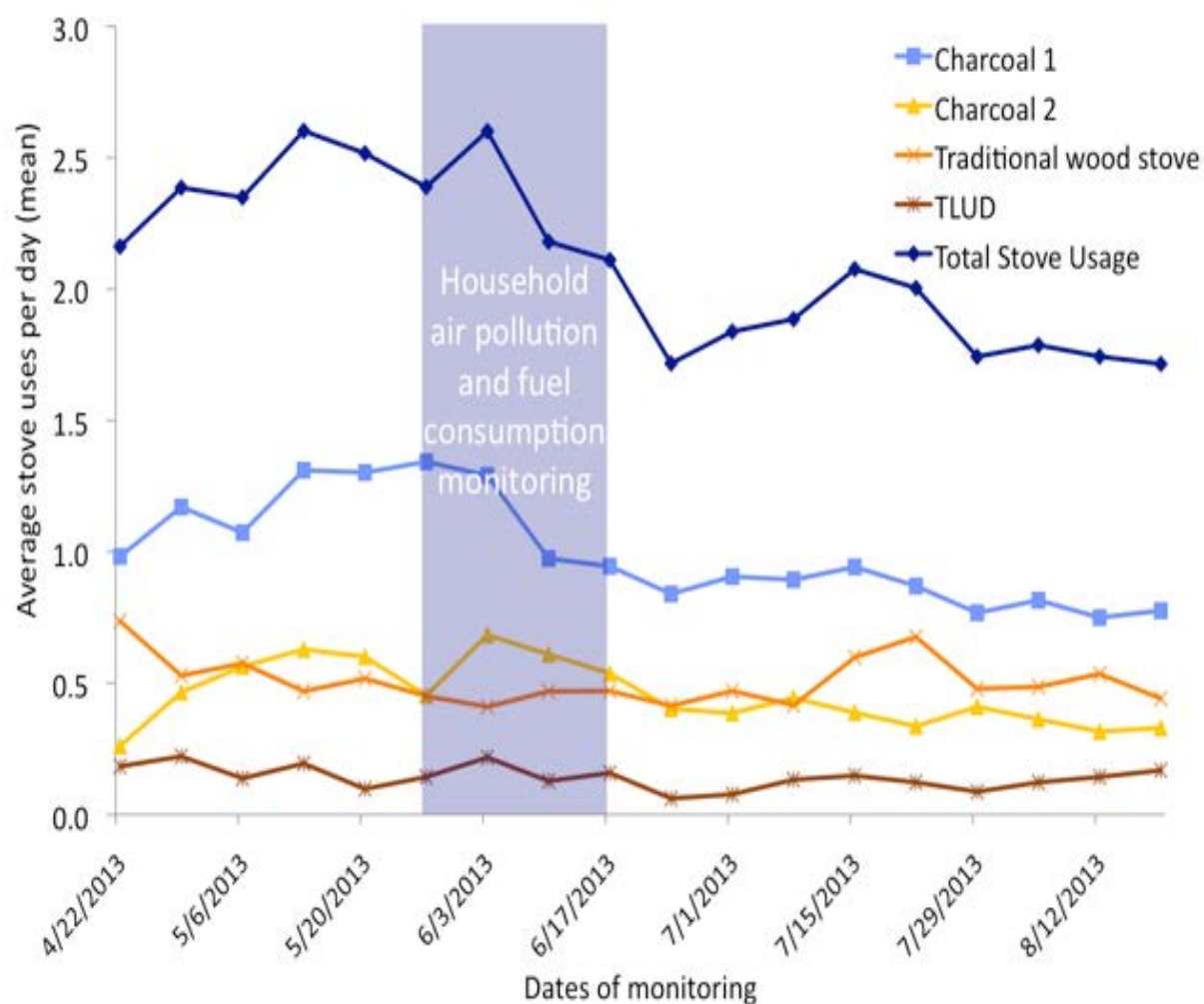


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## Lessons learned: What worked Increasing access to processed fuel



42% relative increase in TLUD usage among group that had access to pre-processed fuel or bow saw for cutting wood.

Absolute usage level is still low.

## Lessons learned: What worked Information sources

Engaging VHT members played a positive role in raising awareness on:

- Risks of household air pollution.
- Benefits of improved cookstoves
- Purchasing information
- Correct use practices



Photo credit: Nancy Muller/ PATH





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## Lessons learned: What did not work

### Stove cost and fuel access

TLUD contributed to just 7% of the recorded stove usage events.

Primary barriers to consistent stove use:

- Cost (in money and time).
- Lack of access to TLUD-sized firewood.

Current TLUD stove design too expensive to manufacture, especially considering added cost of fuel, rendering TLUD commercially unviable.



photo credit: Kendra Williams/University Research Co., LLC

*If we can get someone to cut and sell [TLUD] firewood, most challenges would be solved.*  
17  
-Cook, Kira

## Lessons learned: What did not work

### Stove not fully compatible with cooking practices

Mixed feedback on stove's ability to cook staple foods (e.g., matoke, posho, and rice).

Most used the TLUD to cook beans.

Stove stacking: All participants had multiple stoves.

Each stove used for different purpose.

*I would appreciate a second fuel chamber because after cooking on the TLUD, it gets very hot such that it would help having two fuel chambers made per stove. -Cook, Kyaliwajjala*



Photo credit: PATH Uganda

## Recommendations

**Integrate community cooking demonstrations** into cookstove interventions to convey benefits and correct use.

**Pair access** to fuel with introduction of improved cookstoves.

Consider **training community health workers** as powerful, trusted voices for changing cooking behaviors.

**Map out** true manufacture cost of new/improved stove designs.

## Next steps

Evaluate innovative sales, marketing, and distribution mechanisms for clean fuels (e.g., liquid petroleum gas) and stoves as a means of reducing health impacts of household air pollution.

Bundle improved cookstoves and fuels with other health-related consumer goods.

Identify financing mechanisms to increase affordability of improved and commercially viable cookstoves and fuel.



Photo credit: Sonita Khun



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# Thank you!

Ms. Allen Namagembe,  
PATH

[anamagembe@path.org](mailto:anamagembe@path.org)

**A Stove That will Better Your Life!**

- Uses less fuel
- Cooks faster
- Makes charcoal
- Gives off less smoke
- Portable

**Saves Money!**

# Impact Carbon

What drives willingness to pay and adoption of nontraditional cookstoves?



Theresa Beltramo, Ph.D. Economics



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# Impact Carbon Research Overview

- Goal: The goal of this research is to test some solutions to hypothesized barriers to adoption of nontraditional cookstoves.
- Research Questions:
  - Can improved contracts improve uptake of clean cookstoves?
  - What factors affect willingness to pay for the improved cookstove?
- Location: rural Western Uganda





## Lessons from project preparation & implementation



**Envirofit**



**Envirofit w/ Chimney**



**EcoZoom  
(without skirt)**



**JikoPoa**

1. Get the stove right.
2. Design locally appropriate marketing messages
3. Engage local stakeholders





# Study 1: Testing an improved contract

The improved contract includes:

- Free Trial - to address the obstacle of imperfect information about energy savings
- Time Payments- to address liquidity constraints and present bias
- Right to stop time payments and return product at any point during time payments- which addresses the obstacle of imperfect information on product durability

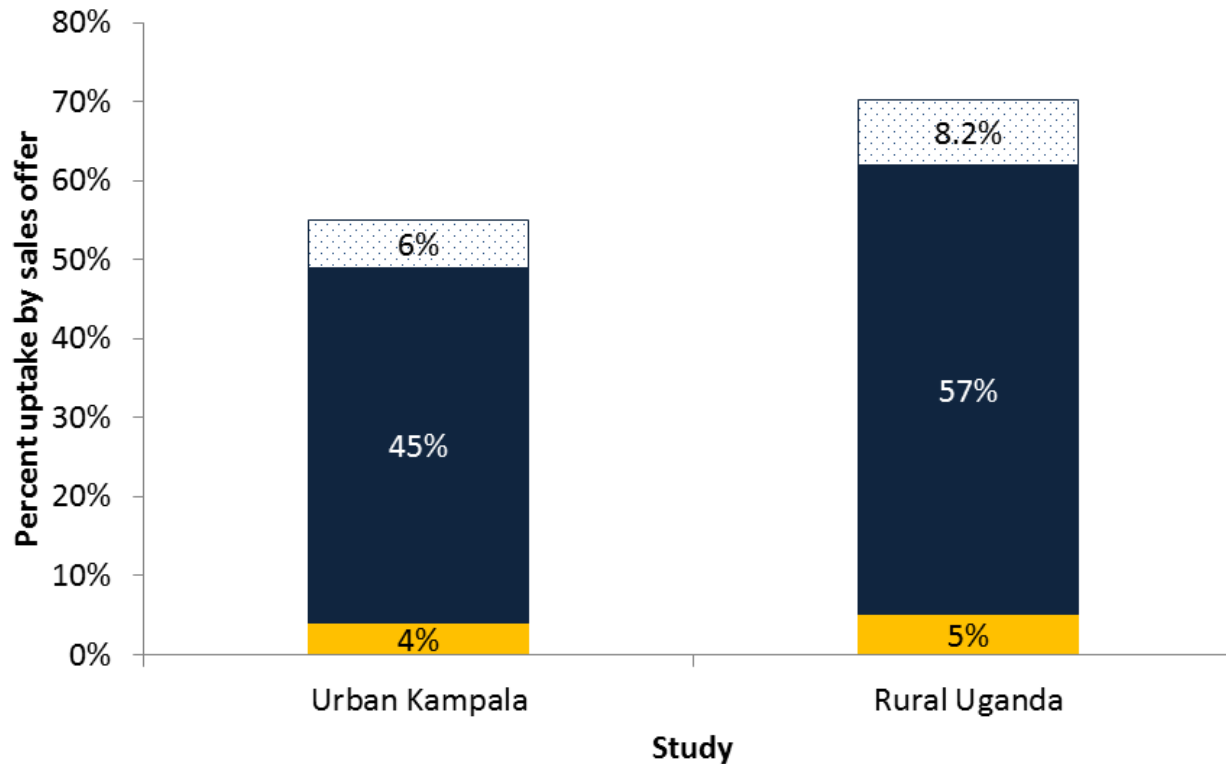


## Study Design (1)

- Step 1: Randomly selected 10 parishes to receive a pay within the week sales offer and 14 parishes to receive the improved contract offer.
- Step 2: For both sales offers, marketing meetings were held to sell stoves in each community.
- Step 3: The price (~US\$16) was informed by our previous willingness to pay experiment.
- Step 4: At the meetings, people placed orders to purchase stoves.



# Results: Improved contract increases uptake eleven-fold





## Study Design (2)

### Measuring willingness to pay

- Step 1: Select 36 parishes to hold a meeting and auction two Envirofit stoves using Vickrey second price auctions;
- Step 2: Divide the participants (n~63 participants/meeting) into four groups.
  - Group 1 received a message related to the Envirofit improves health;
  - Group 2 received a message related to the Envirofit saves time and money;
  - Group 3 received both messages; and
  - Group 4 received no message.
- Step 3: Hold two auctions- one with a pay-within-a-week offer and one which includes four separate payment in four equal weekly time payments.

## Results: Willingness to Pay

- Marketing messages did not affect willingness to pay (WTP).
- Time payments raised WTP for a nontraditional cookstove by 41%.
- Wealth matters- Each additional asset owned increased WTP by 10%. Having a stable income increased willingness to pay by 8-10% for both men and women participants, though there is no effect of having a stable income on WTP for married women.
- Large gender differences- On average men are willing to pay 21-23% more than women.



## Lessons Learned

- The success of the improved contract suggests liquidity constraints, present bias, concerns about savings, and concerns about durability are important barriers to address in cookstove programs.
- Over 90% of participants who accepted a free trial successfully completed time payments in both studies.
- Some strategies to keep the cost of payment collection low include employing local focal point people to collect the funds, and/or (where appropriate) using mobile payments.



## Implications of the findings

- Marketing messages are not sufficient to address obstacles to adoption of nontraditional cookstoves.
- Given evidence of reduced purchasing power of women, future stove projects should consider promoting stoves with features valued more highly by men.
- Addressing barriers to adoption, particularly addressing liquidity constraints through time payments, significantly increased demand for cookstoves (41%).



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# Increasing ICS adoption & use in rural India

## Lessons from the Duke-TRAction Project



Photo credit: Adam Ferguson, The New York Times

**M. Jeuland, SK Pattanayak, J. Lewis, & Project SURYA**

May 7 2014

Contact: [marc.jeuland@duke.edu](mailto:marc.jeuland@duke.edu)





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# Outline

- Main study hypotheses and features
- Summary of main lessons learned



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# Outline

- **Main study hypotheses and approach**
  1. Basic approach
- Summary of main lessons learned



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## Our approach

### Literature / Prior Work

- Adoption Determinants
- Impact evaluations
- Marketing studies



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## Our approach

### Literature / Prior Work

- Adoption Determinants
- Impact evaluations
- Marketing studies

### Context-Specific Data

(n=2,120)

- Baseline cooking and fuel use behaviors
- Knowledge & perceptions
- Stove design preferences



## Our approach

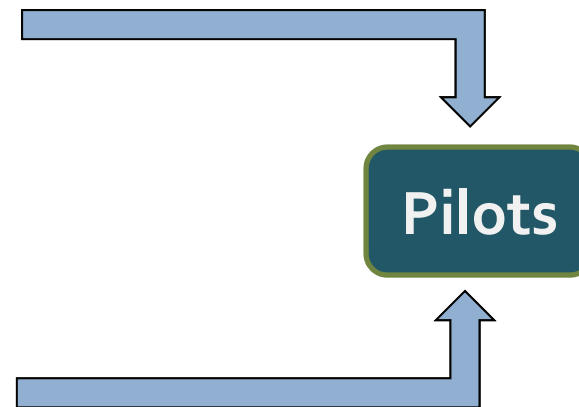
### Literature / Prior Work

- Adoption Determinants
- Impact evaluations
- Marketing studies

### Context-Specific Data

(n=2,120)

- Baseline cooking and fuel use behaviors
- Knowledge & perceptions
- Stove design preferences



→ Context-specificity from focus groups, baseline survey & pilots



## Our approach

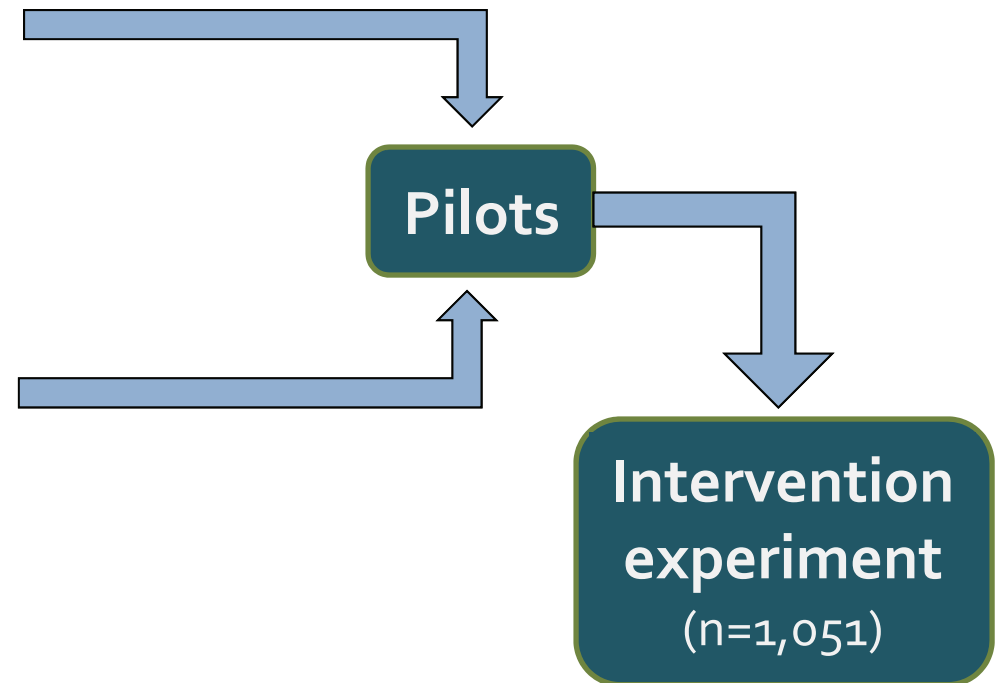
### Literature / Prior Work

- Adoption Determinants
- Impact evaluations
- Marketing studies

### Context-Specific Data

(n=2,120)

- Baseline cooking and fuel use behaviors
- Knowledge & perceptions
- Stove design preferences



- Context-specificity from focus groups, baseline survey & pilots
- **Basic Idea:** Combine lessons from the literature with a focus on hypothesis testing that is sensitive to local context & realities



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## Study design: Two different contexts in India at baseline



Gangetic Plains of UP



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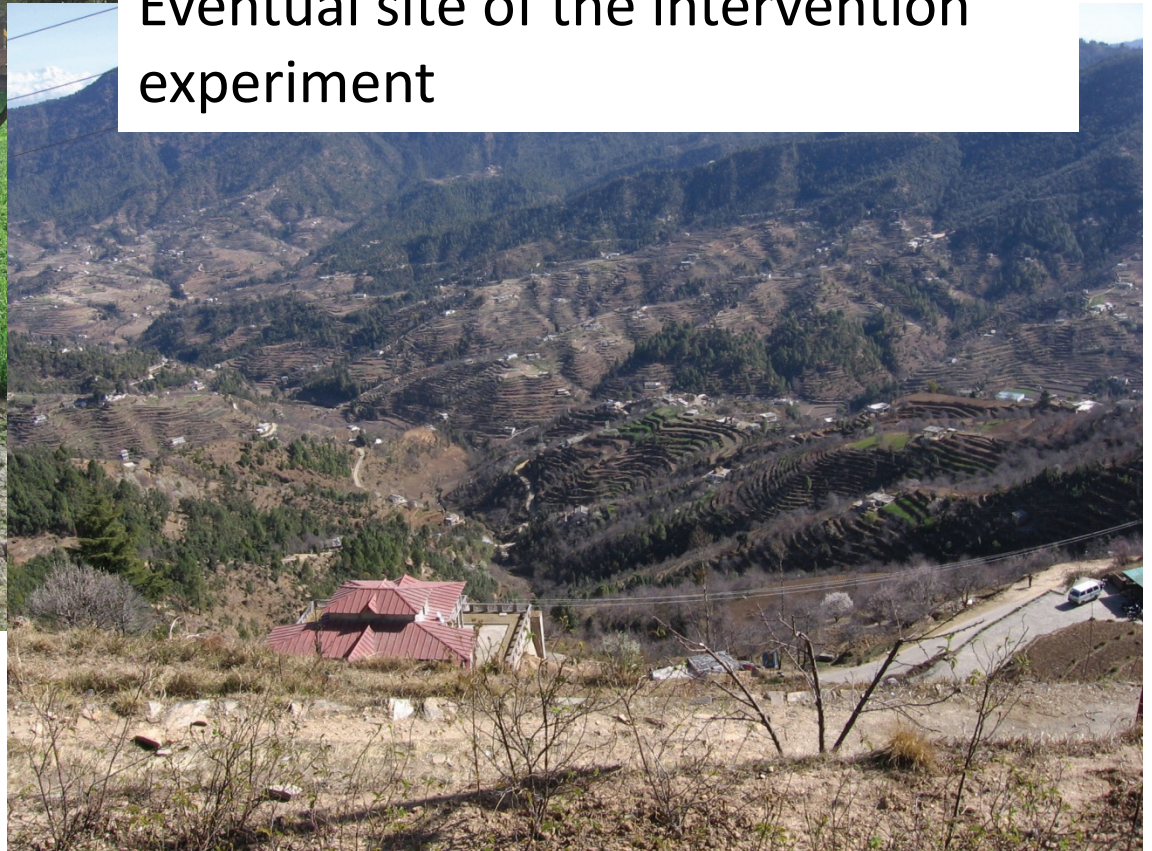


## Study design: Two different contexts in India at baseline



Gangetic Plains of UP

Mountains of Uttarakhand (UK)  
Eventual site of the intervention  
experiment







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## Study design: Two different contexts in India at baseline



Mountains of Uttarakhand (UK)  
Eventual site of the intervention  
experiment

**Deliberately induced variation in institutional context of target communities; select random households within them**



Gangetic Plains of UP





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# Outline

- **Main study hypotheses and approach**
  1. Basic approach
  2. **Experimental hypotheses: Information and marketing matter; incentives matter**
- Summary of main lessons learned



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# Intervention experiment: Features

1. Information – Fact sheets comparing 2 improved stoves



Promotional material & product sales plan



Choice of natural draft & electric stoves



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## Intervention experiment: Features

1. Information – Fact sheets comparing 2 improved stoves
2. Personalized household demonstrations



Training &  
messaging



Field testing &  
demonstrating



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## Intervention experiment: Features

1. Information – Fact sheets comparing 2 improved stoves
2. Personalized household demonstrations
3. Payment in 3 even installments



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## Intervention experiment: Features

1. Information – Fact sheets comparing 2 improved stoves
2. Personalized household demonstrations
3. Payment in 3 even installments
4. Rebates randomized at the household level

Finance plan  
including  
random rebates  
conditional on  
use





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## Intervention experiment: Features

1. Information – Fact sheets comparing 2 improved stoves
2. Personalized household demonstrations
3. Payment in 3 even installments
4. Rebates randomized at the household level
5. Control households received no information, visits or sales offers

Finance plan  
including  
random rebates  
conditional on  
use





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# Outline

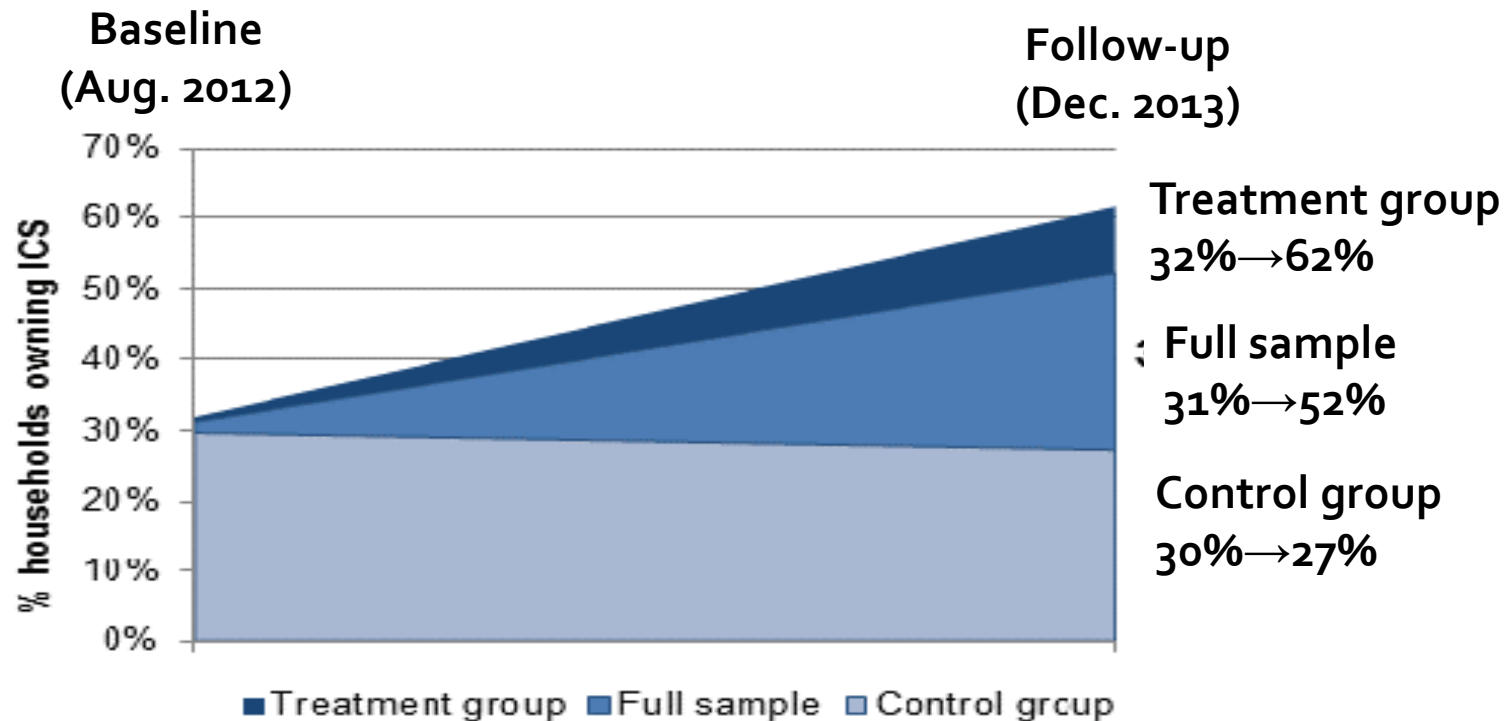
- Main study hypotheses and features
- **Summary of main lessons learned**





## Lessons learned

1. It does appear possible to achieve high adoption in low income settings! (57% below poverty line)



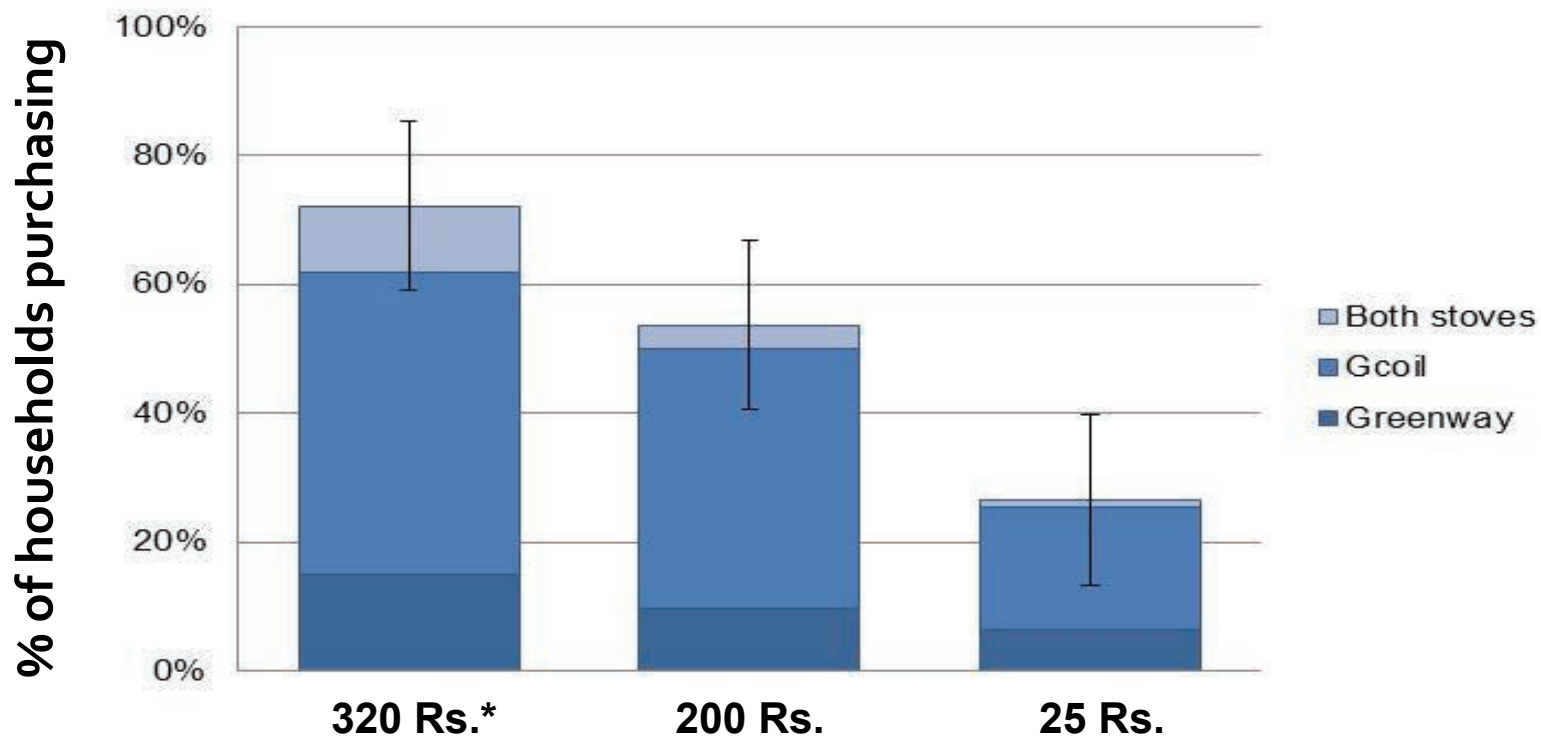
Important to note this is a random sample in the target communities → Demand is stimulated by a “full court press” of **information & promotion** by **well-trained staff**



# Lessons learned

## 2. Modest price incentives make a big difference

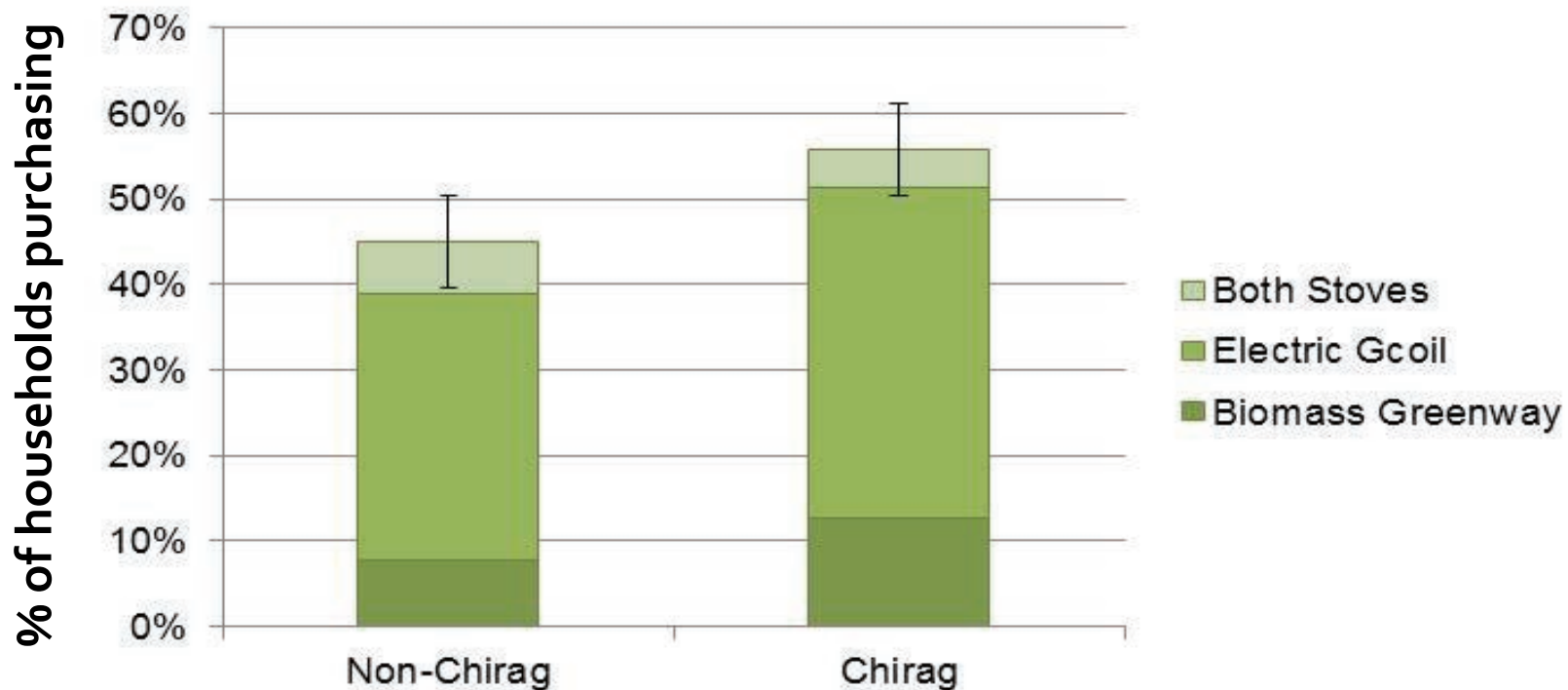
- a. Sales increase from ~25% to >70% across rebate levels
- b. These incentives translate into greater use, despite our fears





## Lessons learned

3. **Micro institutions** make a difference too
  - a. Sales ~10% higher; people seem more likely to listen
  - b. Greater fuel collection savings, and greater use of stoves
  - c. Also likely to be important for long-term maintenance





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## Lessons learned

4. Important to consider **what people actually want** before selling; **technology choice** is important
  - a. Observed this at baseline: Stove decision game with varying features of ICS
  - b. Then saw it in pilots; especially enthusiasm for electricity
  - c. Variation in choices then played out in experiment: Mostly electrical (~75%), but large minority selected natural-draft stove





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## Lessons learned

5. Critically important to undertake **field testing**
  - a. **Products** (some faulty stove prototypes)
  - b. **Demos and sales pitches** (tried community and household-level)
  - c. **Payment mechanisms** (finance, rebates, risk-free trials?)  
→ Insufficient fine-tuning could derail otherwise well-designed interventions



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## Lessons learned

### 6. **Supply challenges** are enormous

- a. Lots of hidden subsidies in this intervention
- b. Maintenance challenge: Will stoves fall apart, and who will fix them? (Hard to fit this within the typical project cycle)
- c. Goal of large-scale stove dissemination seems a long way off



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## Lessons learned (Recap)

1. High adoption in low income settings is possible! (Demand stimulated by a “full court press” of **information & promotion by well-trained staff**)
2. Big impact of **Modest price incentives** make a big difference
3. Differences by **micro institutional** context
4. Consider **what people actually want** before selling; **technology choice** is important (Variation in preferences, enthusiasm for electricity)
5. Important to undertake **field testing of products, demos, sales pitches, and payment mechanisms** (insufficient fine-tuning could derail otherwise well-designed interventions)
6. Enormous **supply challenges**; lots of hidden subsidies in this intervention – goal of large-scale stove dissemination seems a long way off



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# Cross-Cutting Lessons

Kirstie Jagoe

TRAction HAP Consultant



“Interventions to change behavior are typically complex, involving many interacting components”

Mitchie S





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## Product

Finding the right product for the target market is key to success.

Working with the target communities to identify the right product (stove/fuel), one which meets their needs and aspirations is a fundamental part of any stove program.





# Product

A new technology that requires less adaptation in fuel preparation and cooking habits but still provides clear benefits to the user will be accepted into the cooking patterns more readily than one requiring large behavioral shifts.

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# Supply

Consider the mechanisms and channels to supply stoves and the required fuel at the beginning of the project.



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## Stimulating demand

Increase trust in product and people.

Increase motivation and interest to purchase, through product promotion.





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## Trust in product and promoters

Mechanisms that gain the community's trust and increase stove uptake include:

- Rent to own/ rebates or option to return the stove
- Working with local trusted organisations and community members
- Cooking demonstrations





## Stimulating Demand: Product Promotion

Cooking demonstrations had an impact on stove acquisition.

Use of mix of promotional activities.

Need to identify the most appropriate and impactful marketing messages and channels



## Financing / purchasing

End users need to have the ability to purchase the product offered

Removing the barriers caused by liquidity constraints can have an impact on stove uptake.





## Stove Use: Correct but not consistent

Cooking demonstrations and VHTs can promote the correct use of the stove.

Purchase and uptake is only the start of the solution- the use of the new technology continued to be limited and the reasons for this need to be considered and addressed when planning future stove programs.

# *Journal of Health Communication*

## *International Perspectives*



### *TRAction-sponsored Special Issue*

Advancing Knowledge on Behavior Change  
Strategies for Increasing Adoption and Sustained  
Use of Clean Cooking Technologies



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Thank you!!

Any questions?



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[http://www.tractionproject.org/  
environmental-health-safety/household-  
air-pollution](http://www.tractionproject.org/environmental-health-safety/household-air-pollution)

Questions? Contact [tracinfo@urc-chs.com](mailto:tracinfo@urc-chs.com)