Consumer Preference & Willing to Pay Studies: Nepal & Bangladesh
Consumer Preference

Why is consumer preference so important?

Cooking is personal, if cooks don’t like or can’t buy the stoves, they won’t use them; no benefits!

1. No “one size fits all” cookstove
2. Lab performance ≠ field performance
3. The “best” stoves can be unappealing to cooks
4. Stove “stacking” is the norm
5. Lack of IAP health risk awareness
6. Poverty
7. Higher priorities for $
8. Lack of HH purchase decision making power
Study Objectives

• Elicit desired ICS attributes/perceived benefits
• Compare consumer reactions to five ICS types
• Assess willingness to pay, consistency of use
• Test efficiency, impact on household fuel use
• *Make recommendations to USAID/CCEB and AEPC to expand the selection of improved cookstoves (ICS) offered in each country*
Baseline options

Bangladesh

Nepal
Consumer preference trials

TIPS includes semi-structured questionnaires-qualitative and quantitative elicitation questions

- Baseline/demographic
- Stove installation (e.g. 5 stove models; 140 HH)
- 3-6 day initial assessment/problem solving
- Endline survey (at 4/8/12 weeks)
- Market demos and FGDs
- Willingness to Pay (2 methods)

- Add-on monitoring
  - Fuel wood usage (CCT, KPT)
  - Stove usage (SUMS)
  - Indoor air pollution monitoring
CCTs and KPTs

CCT: Assess stove performance in local context (fuel use and cooking time); controlled setting pre-trials

KPT: Assess impact of stove on HH fuel consumption
Stove Use Monitoring

Stove usage measurement sensors (SUMs)
• temperature-sensitive iButton data loggers
• record stove temperature every 10 minutes
• determine how long/often stoves used

Maxim iButton
WTP methodologies

Determine how consumers value and are willing to pay for these technologies, including through installment plans

- Auction/bargaining in Nawalparasi: participants invited to bargain for stove; lump sum or installment payment options

- Buy-back in Dang: participants given stove as gift, offered a cash buy-out
## Consumer preference trials

<table>
<thead>
<tr>
<th></th>
<th>Bangladesh</th>
<th>Nepal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stove types</strong></td>
<td>5 imported</td>
<td>4 imported, 1 local</td>
</tr>
<tr>
<td><strong>Households</strong></td>
<td>120</td>
<td>140*</td>
</tr>
<tr>
<td><strong>Geography</strong></td>
<td>8 villages across 2 districts</td>
<td>4 villages across 2 districts*</td>
</tr>
<tr>
<td><strong>Trial duration</strong></td>
<td>3 weeks</td>
<td>4-7 months*</td>
</tr>
<tr>
<td><strong>KPTs</strong></td>
<td>116 intervention</td>
<td>123 intervention</td>
</tr>
<tr>
<td></td>
<td>24 control</td>
<td>27 control</td>
</tr>
<tr>
<td><strong>SUMS</strong></td>
<td>Intervention in all study HH, traditional in ½ of study HH</td>
<td>Intervention and traditional stoves in all study HH</td>
</tr>
<tr>
<td><strong>IAP monitoring</strong></td>
<td>Limited sample</td>
<td>None</td>
</tr>
</tbody>
</table>

*Not as planned
Nepal study challenges

• April – May earthquakes
  • Loss of Dolakha district
  • IRB delays

• Accidental fire first day in field

• Political unrest, delays in field visits
  • Inability to reach Dang = 4 month gap in SUMS data
  • KPT, endline and WTP delayed from Sept to Dec in Dang (into winter)
Changes from BD to Nepal

- Added FGDs
- Moved CCTs prior to TIPs
- Had cooks practice on stoves in homes prior to CCTs
- Included local “improved” stove in the mix
- Some stoves modified by manufacturers to address Bangladesh findings
- More buy-back WTP families
- Others?
Study stoves

**Envirofit Z3000**
- Single-pot built-in-place rocket-design stove

**EcoZoom Dura**
- Single-pot portable rocket-design stove

**Prakti LeoChimney**
- Two-pot metal chimney stove

**Greenway SmartStove/JumboStove**
- Single-pot portable natural draft gasifier stove

**Alpha Renewable Energy EcoChula**
- Single-pot portable fan stove (battery/solar)

**Xunda Field Dragon**
- Single-pot portable rocket-design stove

**Local AEPC-promoted mud/chimney stove**
- Double-pot built-in-place mud stove
Nepal study sample

- Nawalparasi & Dang
- Most families 4-5 people; average = 5
- Primary wood fuel usage, mostly gathered
- Poor, but not the very bottom of the pyramid
- All participants 18-50yo; ~50% were 21-30 yo
Nepal: preference for new stoves over traditional stoves

*Replace with endline*
Bangladesh: preference for ICS over traditional stoves

Number Preferring ICS over Traditional Stove, at 3 Day and 3 Week

![Graph showing the number of responses for different stoves at 3 days and 3 weeks.]

- Envirofit: 3 Day = 8, 3 Week = 10
- Greenway: 3 Day = 6, 3 Week = 6
- EcoZoom: 3 Day = 7, 3 Week = 7
- EcoChula: 3 Day = 9, 3 Week = 12
- Prakti: 3 Day = 9, 3 Week = 9

Number of responses: 0 to 20

Sample size: n = 101

# of stoves:
- Envirofit = 20
- Greenway = 21
- EcoZoom = 19
- Eco-Chula = 20
- Prakti = 21

Redo graph
## Drivers for ICS preference

<table>
<thead>
<tr>
<th>Important stove qualities</th>
<th>Dislike about old stove</th>
<th>Reason for preferring ICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumes less firewood</td>
<td>Uses a lot of firewood</td>
<td>Uses less firewood</td>
</tr>
<tr>
<td>Emits less smoke</td>
<td>Emits a lot of smoke</td>
<td>Emits less smoke/ reduces health problem</td>
</tr>
<tr>
<td>Easy to light</td>
<td>Difficult to light</td>
<td>Easy to light (24%)</td>
</tr>
<tr>
<td>Easy to cook</td>
<td></td>
<td>Is right height to sit and cook</td>
</tr>
<tr>
<td>Appropriate for the cooking pots</td>
<td>Pots get too dirty</td>
<td>Pots are cleaner</td>
</tr>
<tr>
<td></td>
<td>Looks ugly</td>
<td>Aesthetics, looks nice</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cooks food quickly, Portable/ good to handle</td>
</tr>
</tbody>
</table>
BD drivers of preference

Less soot/cleaner
Looks nice
Less firewood/fuel
Emits less smoke
Portable/good handle
Well manufactured
Cooks food quickly

USAID
From the American people
Nepal preference over time

- 5-7 days follow up: 9.6% (Traditional stove) vs. 90.4% (New stove)
- 16 weeks follow up: 16.2% (Traditional stove) vs. 83.8% (New stove)

Redo graph
BD preference over time

Percentage (n=120)

- Traditional Stove
- New Stove

3 Day

3 Week
Problems identified by cooks

- It takes long time to start the fire
- Cannot start fire with plastic
- Need to keep on adding woods
- Need to remain in kitchen for longer time as fire goes off early
- Cannot use large piece of woods in the stove

Number of responses

- LC (n=3)
- XU (n=6)
- EC (n=7)
- GW (n=5)
- PR (n=9)
- All (N=30)
## Nepal: who would buy?

<table>
<thead>
<tr>
<th>What Kind of People Would Use This (These) New Stoves?</th>
<th>Frequency n = 136</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinary person</td>
<td>128</td>
<td>94.1</td>
</tr>
<tr>
<td>Poor people</td>
<td>16</td>
<td>11.8</td>
</tr>
<tr>
<td>Thrifty</td>
<td>11</td>
<td>8.1</td>
</tr>
<tr>
<td>Modern</td>
<td>8</td>
<td>5.9</td>
</tr>
<tr>
<td>People who are taken as a example in society</td>
<td>8</td>
<td>5.9</td>
</tr>
<tr>
<td>Respected person</td>
<td>3</td>
<td>2.2</td>
</tr>
<tr>
<td>Smart</td>
<td>2</td>
<td>1.5</td>
</tr>
</tbody>
</table>
Market demo preferences

- **Prakti** liked for its chimney and two pot holes
- **EcoChula** liked for its solar-powered fan
- Many undervalued the price by nearly half, “more expensive than LPG stoves”
- Expected to see stoves with different fuel options; solar or electric powered
Willingness to Pay: Nepal

**Auction/bargaining:** 70 households/Nawalparasi
- Stoves offered at discounted market value ($6-43)
- 37 bargained; all 37 purchased the stove
- 23 cash payments, 14 on installment plan

**Buy back:** 66 households/Dang
- Stoves offered as gifts, cash buy-out option ($6-43)
- 8 opted for the (relatively significant) cash
- 58 preferred to keep their stove!
Willingness to Pay: Bangladesh

**Auction/bargaining:** 105 study participants
- Stoves offered at discounted market value ($19-54)
- Only 1 purchased the stove

**Buy back:** 15 study participants
- Stoves offered as gifts, cash buy-out ($19-54)
- 3 opted for the (relatively significant) cash
- 12 preferred to keep their stove!
Nepal CCT: Fuel Savings

Significant fuel savings for all stoves: 29-47%
Significantly reduced cooking times for all stoves: 15-33%
KPTs and SUMS

Distinct differences between Nawalparasi and Dang:

- Nawalparasi = outdoor stoves for animal feed/alcohol common (77%; Dang only 16%)
- Nawalparasi KPT in Sept
- Dang KPT in Dec

Cross-sectional
- 123 study households
- 27 control households
Stove use in Nawalparasi

• Improved stove use in Nawalparasi relatively consistent over the four month study period, except:
  • EcoChula usage decreased with time
  • Local Chimney usage increased with time

• Greenway, Prakti, and Xunda = significantly more use than traditional stove

• EcoChula and Local Chimney used regularly but not significantly more than traditional stove
Fuel use in Nawalparasi (trad+ICS)

Significant fuel savings: 32-50%
Fuel use in Nawalparasi

Fuel savings from indoor and outdoor stoves
Stove use in Dang

- Improved stove use in Dang was consistent over the first three months, except:
  - Local Chimney usage decreased with time

  *Then a 4-month gap in SUMS data*

- By December all ICS use was low, and traditional stove use went up

- ICS use was *in addition to* typical traditional stove cooking
Fuel use in Dang (trad+ICS)

No significant fuel savings; min ICS use add’l to trad use
Stove use in Dang

- Latent heat use in the colder months
- Despite not using them, 80%+ preferred the ICS at endline in Dec
- Went back to using the improved stoves in summer
Bangladesh: The majority of study households did not prefer study stoves over traditional stoves, and were not willing to pay for them.

- CCEB decided to NOT add those particular models into their portfolio, but used features feedback to identify/develop appropriate local models—credits study with consumer choice break-through

Nepal: Enthusiastic support of study stoves over traditional stoves, majority willingness to pay

- Recommendation to AEPC for inclusion of these or similar models into national stoves program
WASHplus contacts

Elisa Derby, WASHplus HHE Specialist
Winrock International
617-524-0466
ederby@winrock.org

Julia Rosenbaum, WASHplus Deputy Director
and Senior Behavior Change Specialist
FHI 360
202-884-8838
jrosenbaum@fhi360.org

http://www.washplus.org