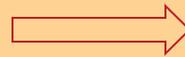


# Improving Cookstoves for Reducing Indoor Air Pollution:

## VERC Experience from Bangladesh



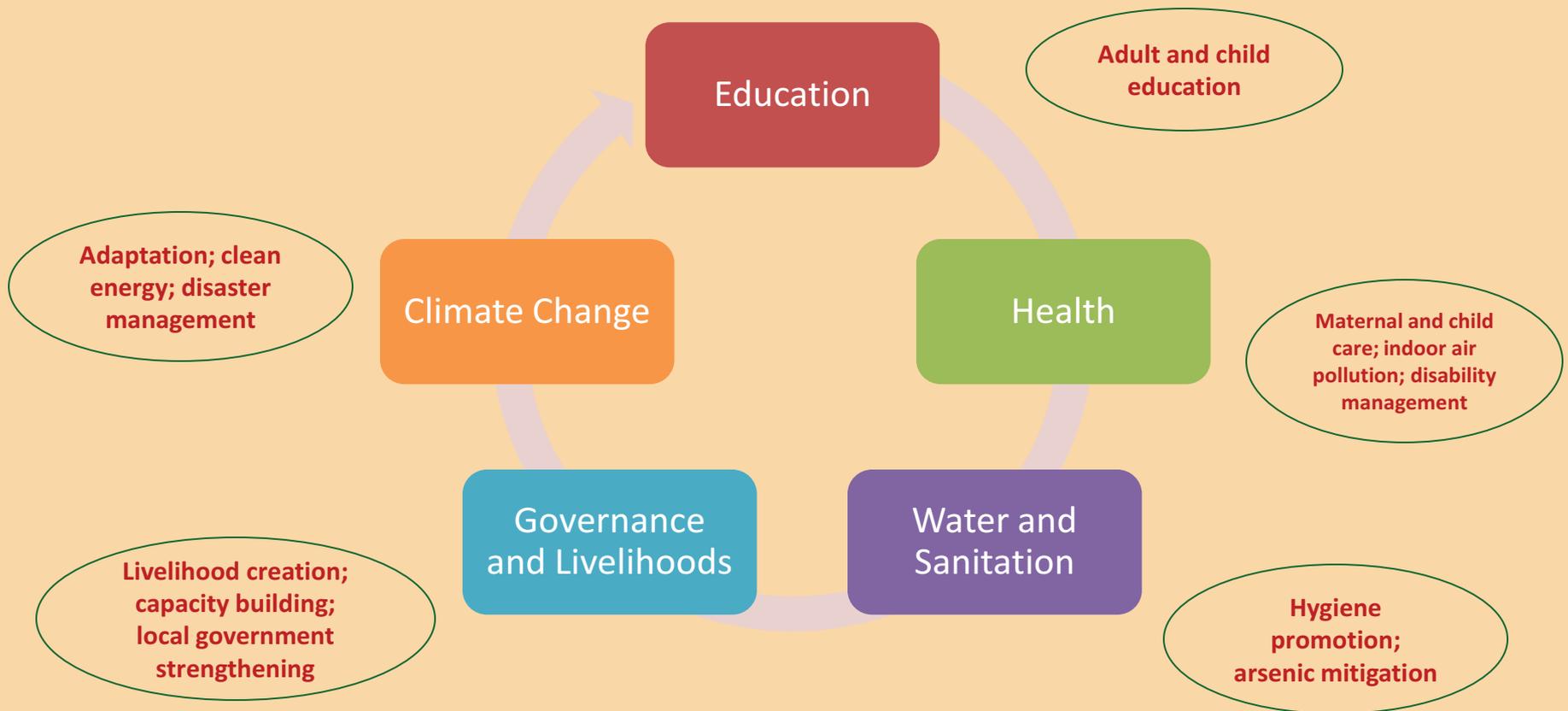
# VILLAGE EDUCATION RESOURCE CENTER

Est. 1977



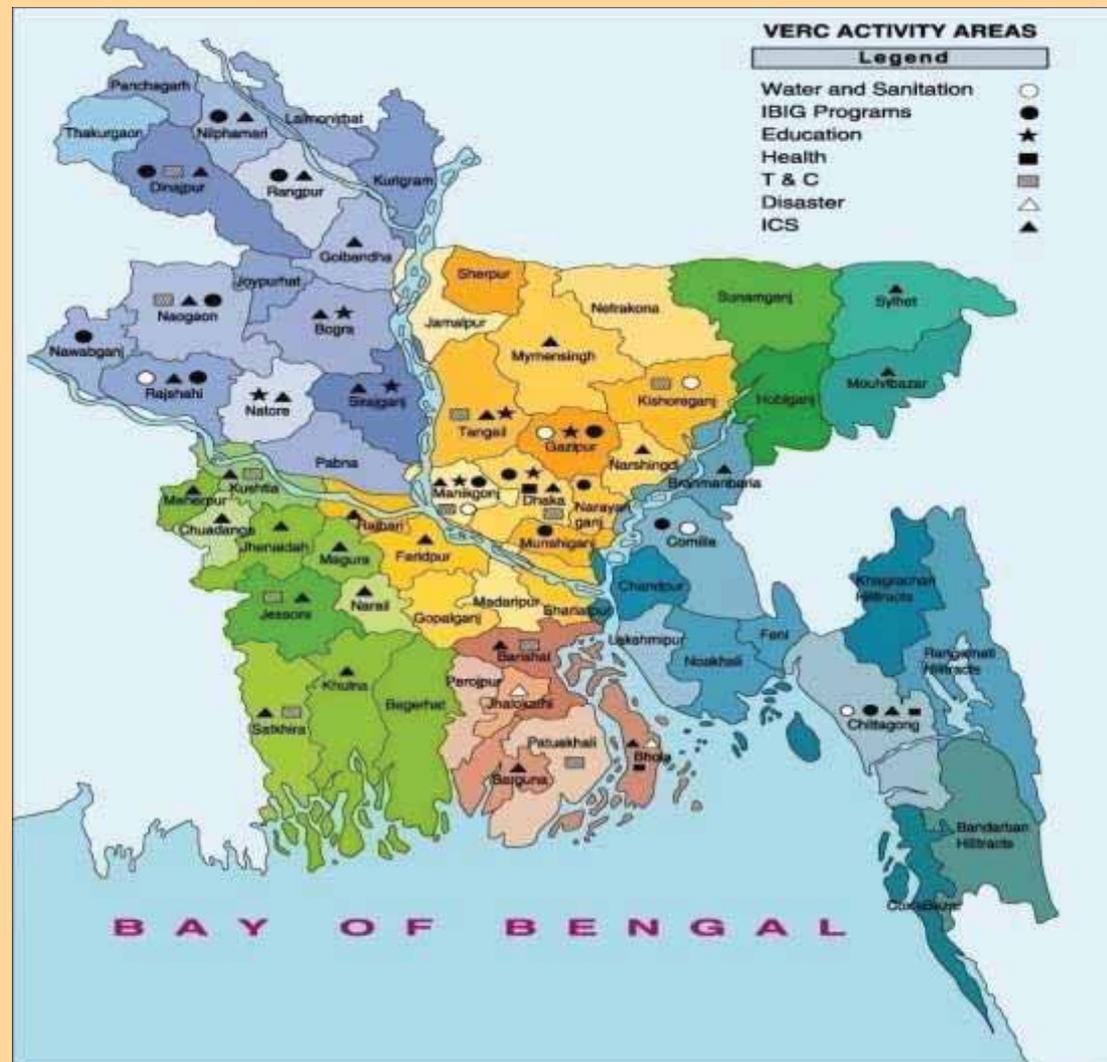
**Mission:** Establish and promote a dynamic and participatory sustainable process towards human development

**Approach:** Multi-sectoral, integrated development at grassroots level



VILLAGE EDUCATION RESOURCE CENTER

# Geographical Coverage



- Operations in 34 districts (54 sub-districts and 283 Unions)
- Partnership with 126 national and local NGOs
- Over 2343 staff
- More than 2.2 million beneficiaries
- Annual Budget (2011-12): US\$ 23.6m

# Improved Cookstove Program (ICS)





# Major Activities

## Enabling Activities

## Technical Activities

### Social Marketing

- Audio-visual material
- Demonstrations
- Exhibitions/Film shows
- Folk songs

### ICS Installation

- Work through catalysts
- 7 stove models
- Install and monitor performance

### Community Mobilization

- MPA/PRA/Catalysts
- Seminar/workshop
- Promote best practice
- Involve in stove selection

### Stove Testing

- Control Cooking Test
- Kitchen Performance Test
- Water Boiling Test

### Enterprise Development

- Train local entrepreneurs
- Provide seed money
- Extend credit support
- Create production centers

### Capacity Building

- Training modules and manual
- On field training for builders
- On field training for staff

# Community Mobilization



CMC Formation



MPA Practice



CMC Meeting

# Social Marketing



Bill Board



Poster,  
Newsletter

# Social Marketing



Demonstration Center



ICS Adopter



Exhibition



# Behavioral Change Communication



Courtyard Meeting



School Session



Film Show



Folk Songs

# Capacity Building



MPA Training

Training of Trainers (TOT)



# Entrepreneur Development



Stove Retailer  
ICS for Sale



Cap Making  
Installer



Training  
Accessories





# Progress in ICS Program

- Nearly 53,000 ICS installed so far
- Trained over 900 stove builders incl. 65% Women
- Conducted over 500 Awareness programs
- Promoted 5 stove models

## National Network on ICP

- 42,000 systems
- 36 districts
- Supported by ARECOP

## Reduction of Exposure to IAP

- 1000 systems
- 2 districts
- Supported by Winrock/USAID

## ICS Dissemination Program

- 3100 systems
- One Division
- Supported by GIZ

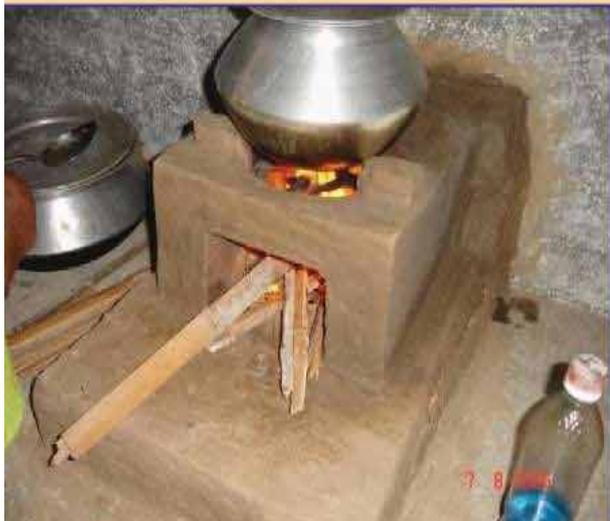
## ICS program through Carbon Finance

- 7618 systems
- 4 districts
- Supported by MEC/ EcoSecurities

# ICS Models



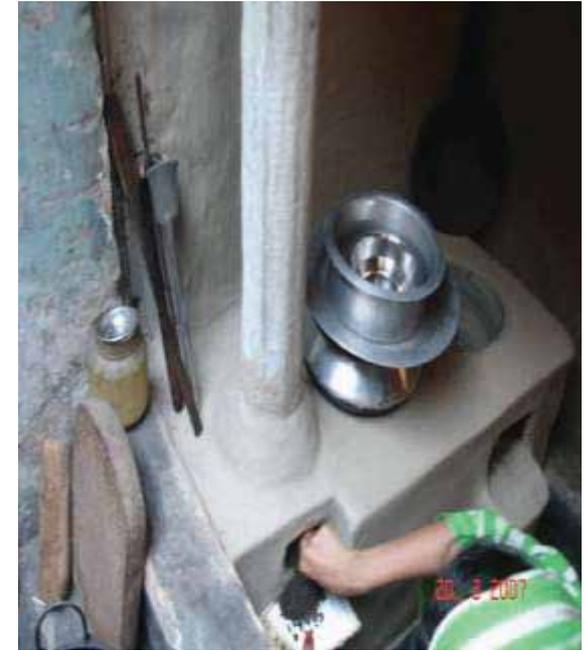
# ICS Models



# ICS Installation



# Stove Maintenance

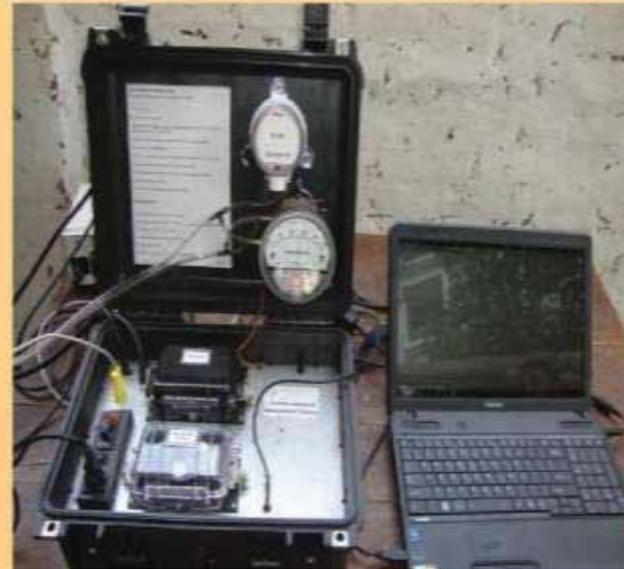


# Stove Performance



## ● Water Boiling Test

- Three tests were performed on both stoves (traditional and ICS)
- The fuel consumed and the water evaporated measured digitally
- The total emissions were collected with Aprovecho's Portable Emissions Measurement System
- The test was performed using the same traditional pots on both stoves

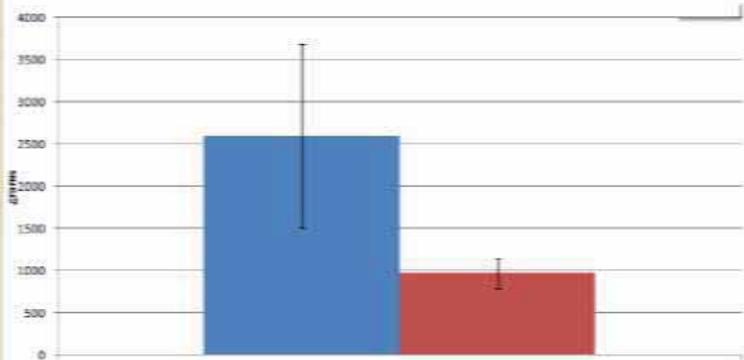




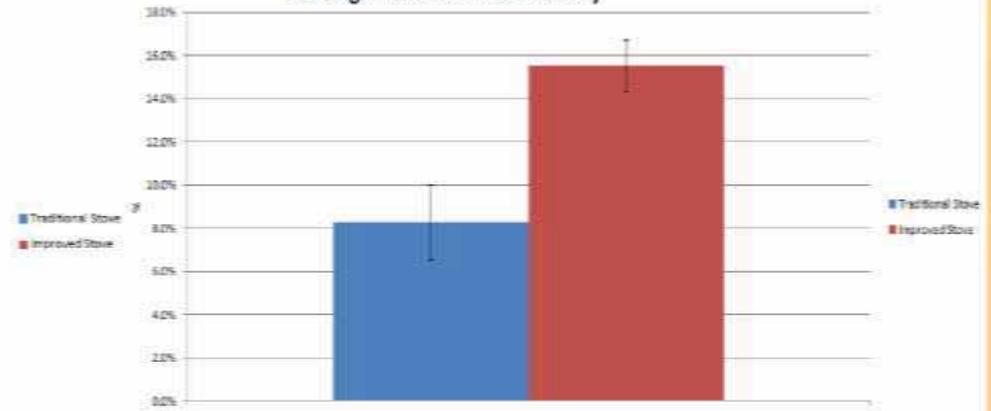
# WBT Results

Measures	Unit	Traditional Stove	Improved Stove
Fuel to boil 2.5 lt water	Grams	2594	969
CO	Grams	75	56
PM	m Grams	3252	1817
Energy content	Kilo Joules	47762	17850
Time	Minutes	25	22
CO <sub>2</sub>	Grams	3248	1559
Thermal Efficiency	%	8	16

WBT Fuel to Cook 2.5 Liters



WBT High Power Thermal Efficiency



# Stove Performance



## ● Controlled Cooking Test

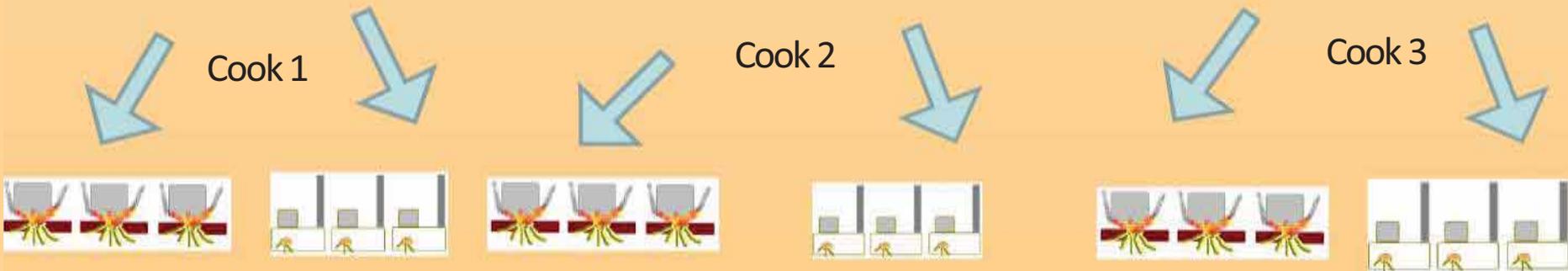
- 18 stoves (9 traditional and 9 ICS) tested with three cooks
- Same meal of rice, lentil and greens (by weight) cooked on all stoves

Ingredient	Weight (g)
Rice	750
Lentil	112
Onion/garlic/peppers	58
Water	3110
Condiments	21
Leaves	460
Oil	72

Cook 1

Cook 2

Cook 3



# Controlled Cooking Test

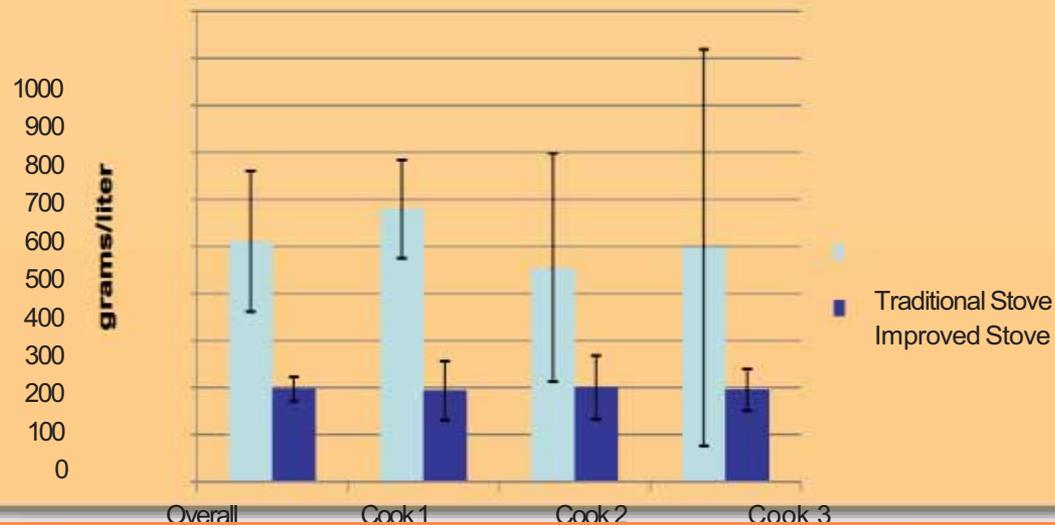




# CCT Results

Measure	% reduction in ICS
Specific Fuel Consumption	61%
CO	40%
PM	58%
CO <sub>2</sub>	42%

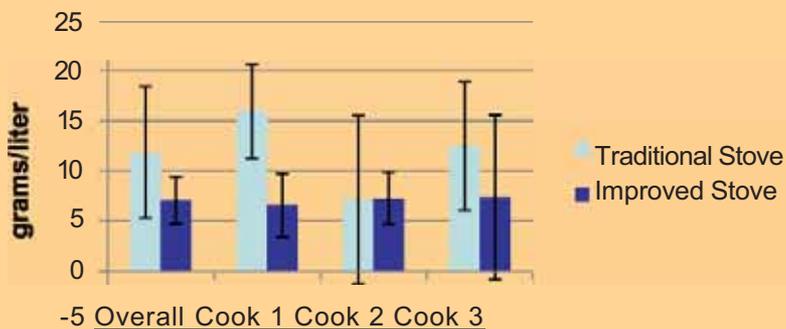
## Specific Fuel Consumption



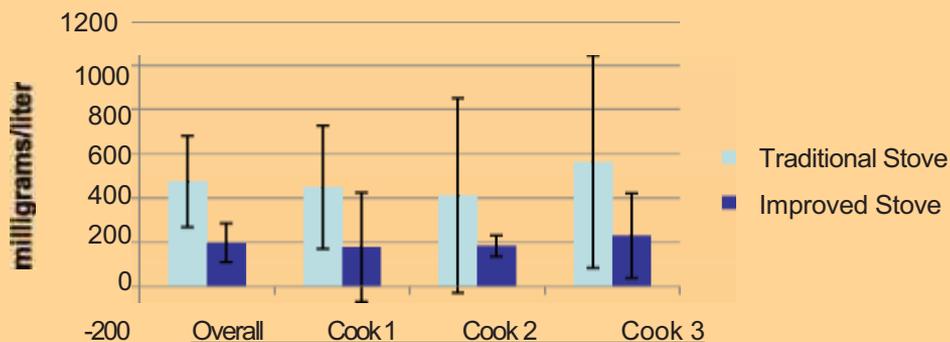


# CCT Results

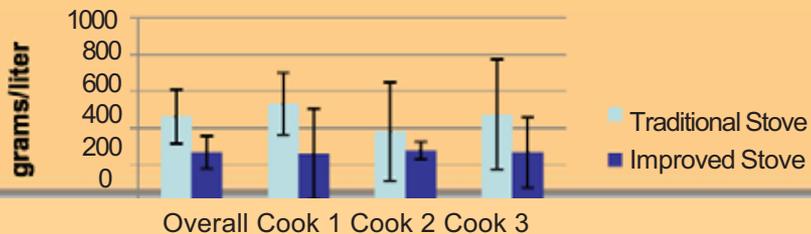
### Specific CO Emissions (Carbon Monoxide)



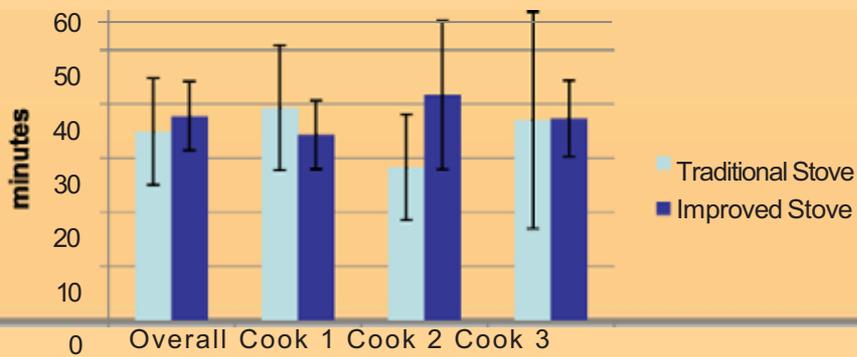
### Specific PM 2.5 Emissions (Particulate Matter)



### Specific CO2 Emissions (Carbon Dioxide)



### Cooking Time



# Beneficiaries



Name: Lata and Komola

Period of ICS use: Two years

Perceive benefits:

- Less fuel consumption
- Saves time
- Saves money
- Has more time for socializing



# Stove Builders



**Name: Shafali**

**Period: 2 years**

**Monthly income: 3000-4000  
Tk (\$40-50)**



**Name: Usha**

**Period: 1.5 years**

**Monthly income: 3000-4000 Tk  
(\$40-50)**



# Entrepreneurs



Name: Md. Babu Ali

- ICS Pipe Industry
- Income -- 15,000 TK
- Employs 5 people



Name: Maya Khala

- Selling portable stoves
- Income: 10,000 Tk (\$125)
- Employs 2 people



# Major Lessons

- ICS should be selected according to community demands and geophysical context
- Creating awareness on ill effects of indoor air pollution through motivational films and other means is imperative to effect behavioral change
- Demonstrations, taking part in exhibitions, etc. can help generate demand for ICS technology
- Information, educational and capacity building materials and manuals should be compatible with the socio-cultural norms to be acceptable to the community
- Acceptance levels for ICS can be increased by adopting an integrated approach at local level
- Stove building is a seasonal activity, so does not provide full time employment; important to integrate it with other livelihood activities to retain skilled people
- Quality control and regular monitoring are essential to ensure effective performance of ICS

# Conclusions and Future Plans



- VERC has demonstrated capability to undertake large, scaled-up interventions in ICS dissemination
  - Well-proven community-based approach
  - Extensive network of local associates and partners
  - High name recognition among local communities
  - Strong technical, training and program management skills among experienced staff
- VERC has targeted dissemination of 500,000 ICS over the next 5 years
- Substantive grants or carbon finance will be necessary to ensure sustainability of ICS programs that target poorest of the poor