

# Overview of the Clean Cooking Challenge

**S.C. Bhattacharya**

President, International Energy Initiative  
Board member, World Bioenergy Association  
Adjunct Professor, IISWBM, Kolkata

# Presentation Outline

## 1. Introduction

1.1. Cooking Energy Access in Developing countries: Dominant role of biomass

1.2. The Case of India

2. Implications of lack of access to modern cooking fuels

3. Biomass based cooking options

4. Scenarios

5. Closing Remarks

# 1. Introduction

## 1.1. Cooking Energy in Developing countries: the dominant role of biomass

Region	Relying on traditional use of biomass for cooking	
	Population, Million	Share of population
Africa	657	65%
Developing Asia	1921	54%
Latin America	85	19%
Middle East	0	0%
World	2662	39%

**Number and share of people depending on traditional biomass for cooking in 2009**

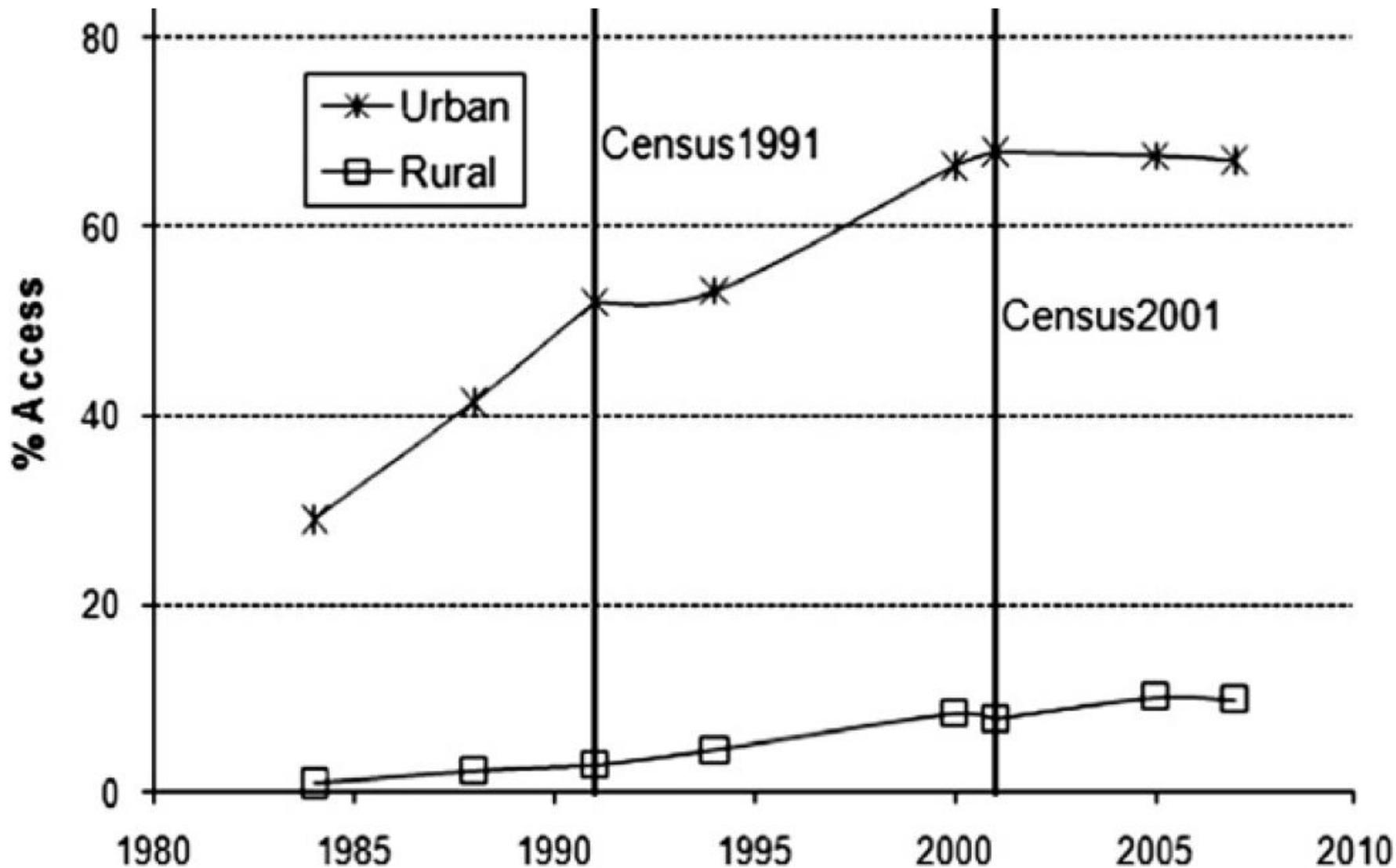
## 1.2. The Case of India

Dependence on traditional biomass for cooking energy needs in 2009: 72% people (836 million).

Access to clean cooking energy (CCE) is particularly low in rural areas, where 70% of the population live. In 2005

84% of rural households depended on biomass fuels.

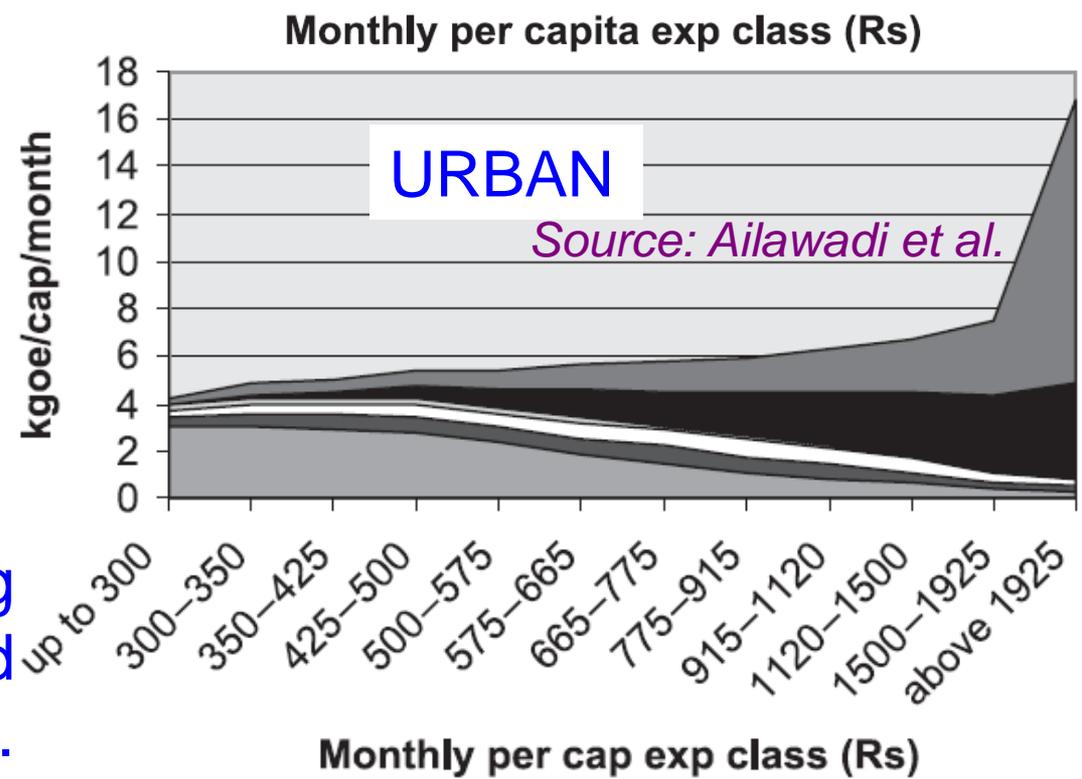
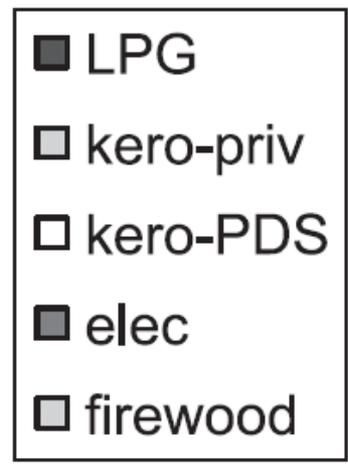
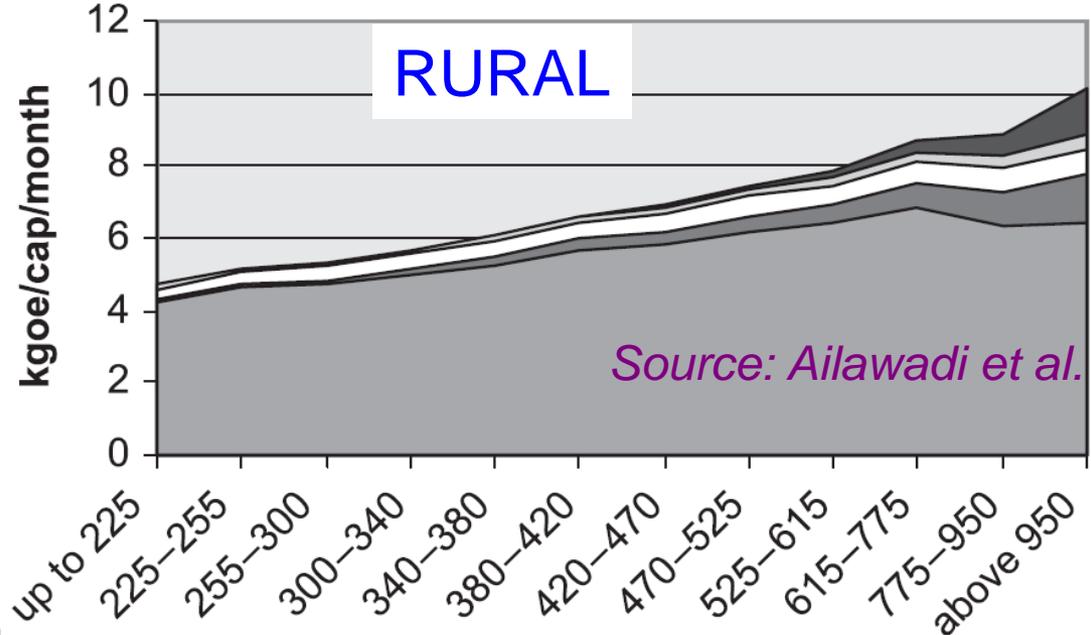
Access to modern cooking fuels in rural areas ranged from 0% for lowest income group to 43% for the highest income group.



Trend in access to modern cooking fuels

Source: Balachandra, 2011

Firewood is the main cooking fuel in rural India, with higher income households consuming significantly more wood per capita.



Patterns of Cooking Energy use in Rural and Urban India 1999-2000.

## 2. Implications of lack of access to modern cooking fuels

Impacts of heavy dependence on solid fuels used in traditional stoves include:

- Health effects due to Indoor Air Pollution
- Burns and scalds from open fires/Traditional cookstoves
- Poisoning of children who drink kerosene fuel stored in soft drink bottles;
- Risk of injury and violence while collecting wood and other solid fuels;
- Missed time from school for older children involved in fuel collection.
- Significant time spent collecting solid fuel
- Pressure on forest resources
- Emission of black carbon

**Table 8. Numbers and rates of deaths and DALYs per million population attributable to indoor air pollution from solid fuel use, for all causes (pneumonia, COPD, lung cancer), 2004<sup>27</sup>**

	Attributable deaths per year		Attributable DALYs per year	
	Number ('000)	Per 1 million population	Number (in millions)	Per 1 million population
Developing countries	1,944	378	40.5	7,878
LDCs	577	771	18.4	24,606
Sub-Saharan Africa	551	781	18	25,590
South Asia	662	423	14.2	9,075
Arab States	35	114	1.1	3,489
East Asia and Pacific	665	341	6.5	3,308
Latin America and Caribbean	29	54	0.7	1,334
World	1,961	305	41	6,374

The number of attributable deaths per year in India is 488,200.

*Source: WHO 2009*

### **3. Biomass Based Cooking Options**

“ --most studies indicate households will depend on biomass energy or solid fuels for decades to come.”

*World Bank 2011*

# Traditional Cooking Stoves

## Random sample



Bangladesh



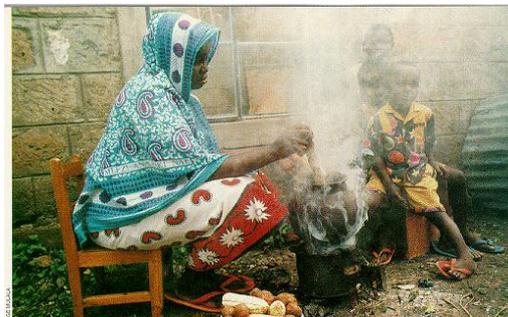
Ghana



India



Nepal



Kenya



Burkina Faso

# Improved Stoves:

## Random sample



India



Thailand



Eritrea



Nepal



Kenya



Sri Lanka



Honduras



China

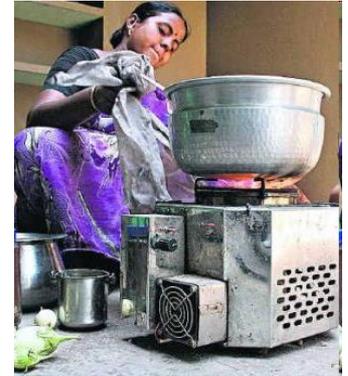
# Advanced Stoves/Solid Biomass Based Cooking



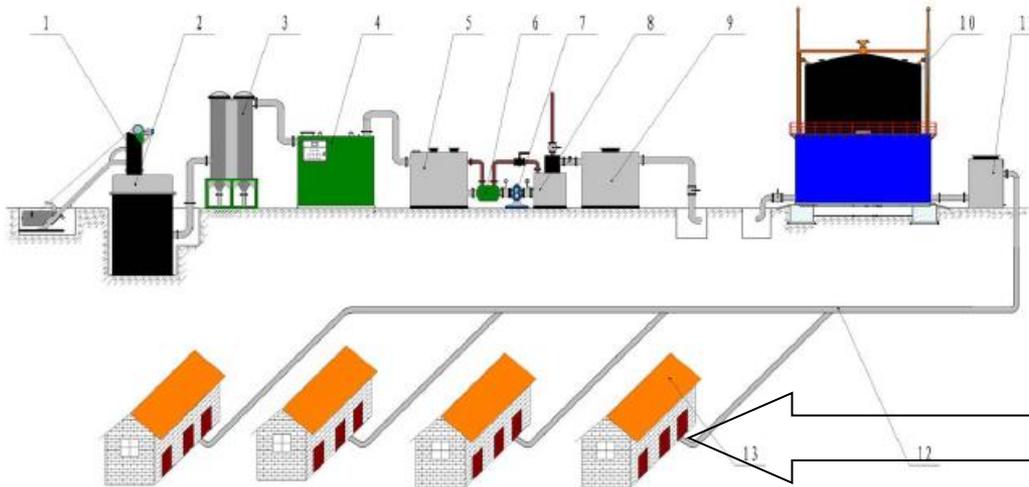
NERD Gasifier stove



Rocket stove



Urja stove



Producer gas supply network



# Non-Solid Biomass Options



Ethanol stove



Gel fuel stove



DME Stove



Plant oil using stove  
(Bosh and Siemens)



Biogas stove (Nepal)

## **4. Clean Cooking Energy Access Scenario**

### **New Energy Policies Scenario (IEA)**

These take into account existing policies and declared policy intentions.

Involves average annual investment of 1 billion US\$ during 2010-2030 for providing clean cooking facilities to 42 million people per year.

Proportion of people without access to CCE declines from 39% in 2009 to 33% in 2030.

Number of people without access to CCE in 2030 remains nearly at the 2009 level (2.7 billion).

53% of Indian population (780 million) will remain without CCE in 2030.

## **Energy for all Scenario (IEA)**

About \$ 3.5 billion per year above New Energy Policies Scenario (\$ 4.5 billion total per year - about 1% of global subsidies for fossil fuels in 2010) will be needed during 2010-2030 for universal access to CCE (LPG, Biogas, advanced stoves) by 2030.

India needs to invest \$ 0.8 billion per year over and above New Energy Policies Scenario for universal access.

## 5. Closing Remarks

### Some Random Observations

- Choice of CCE options are favoured by a number of factors, e.g. regular income, particularly from non-ag. sources, higher level of education particularly for the females, small family size etc.
- The poorest people are unlikely to switchover to cleaner fuels (poverty reduction/income generation needed.)
- The rich rural households use more biomass fuels (income generation alone is not enough, awareness campaign needed).

- Clean Cooking Energy access programs in developing countries are likely to use a number of CCE options. Each option has certain constraints: LPG - cost and lack of physical availability; biogas - cost and raw material limitation; advanced cookstoves – cost and lack of availability of processed solid biomass fuels (chips/pellets/ briquettes).

# Way Forward

- Convince users about the importance of CCE: significant awareness campaign.
- Ensure availability: e.g. supply of LPG/processed biomass fuels.
- Ensure affordability: link CCE programmes with poverty reduction/income generation programmes – integrated approach.
- Dedicated fund, programme and agencies would be useful.
- National governments, and private sector and NGOs need to rally around the UN initiative to achieve “Universal access to energy by 2030”.

## **Concluding remarks**

- Achieving universal access to CCE will be a milestone in human history.
- Mobilising the necessary finance for providing stoves and clean fuel connections will be probably relatively simple.
- Most challenging will be removing multitude of barriers, informing/involving/motivating a range of stakeholders and mobilising political will.

*“Rarely does the global community have the opportunity to address a problem where the societal benefits from concerted action are so far-reaching.”*

- GACC Report on Universal adoption of Clean cooking stoves  
Nov. 2011

**Thanks**