

# **Climate Change and Environmental Pollution from Brick Industry**

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# Presentation Structure

## Phase 1

- Climate change and Global warming
- Climate change scenario in Bangladesh

## Phase 2

- Brick industry in Bangladesh
- Eco-friendly bricks
- Research carried out in BCSIR
- How BCSIR and PRC can work together
- Conclusion

# Research Goal

- To develop a framework to address the adverse impact of Conventional Brick Manufacturing and its use for Sustainable Environment.
- To develop a platform for promoting interaction among researchers, academicians from across the country.
- To enhance understanding of the current activities and research capabilities in the country and thereby identifying key lacunae
- Exploring ways to more effectively link climate research and action program

A blue oval with a white border, centered on a white background. Inside the oval, the text "What is Climate Change?" is written in white, sans-serif font, arranged in two lines.

What is Climate  
Change?

# Global Warming

- Green House Gases
  - Fossil Fuel
- Water vapour
  - Coal
- Carbon-di-oxide
  - Natural gas
- Sulphur-di-oxide
  - Oil
- Nitrous oxide
- Ozone

## Deforestation

# Effect of Global Warming

- Change in rainfall
- Rise in sea level
- Extreme weather events
- Species extinction
- Loss of habitat
- Agriculture
- Health

# Policy design to reduce global warming

- United Nation Framework Convention for Climate Change (UNFCCC)
- Intergovernmental Panel for Climate Change (IPCC)
- Kyoto Protocol

# Climate change Impact in Bangladesh

## Main Disaster

- Cyclone
- Storm surge
- Coastal erosion
- Flood
- Extreme temperature and Draught
- Salinity intrusion



# Climate change Impact in Bangladesh

contd.

## Sector wise impacts

- Agriculture and fisheries
- Water resource
- Coastal areas
- Bio-diversity
- Urban areas

# **Actions in relation to climate change effects in Bangladesh**

- Government of Bangladesh has already developed (BCCSAP) “Bangladesh Climate Change Strategy and Action Plan 2009”
- Capacity building
- Resilience
- “The national Adaptation Programme of Action” (NAPA)in 2005

# Climate change projects in Bangladesh

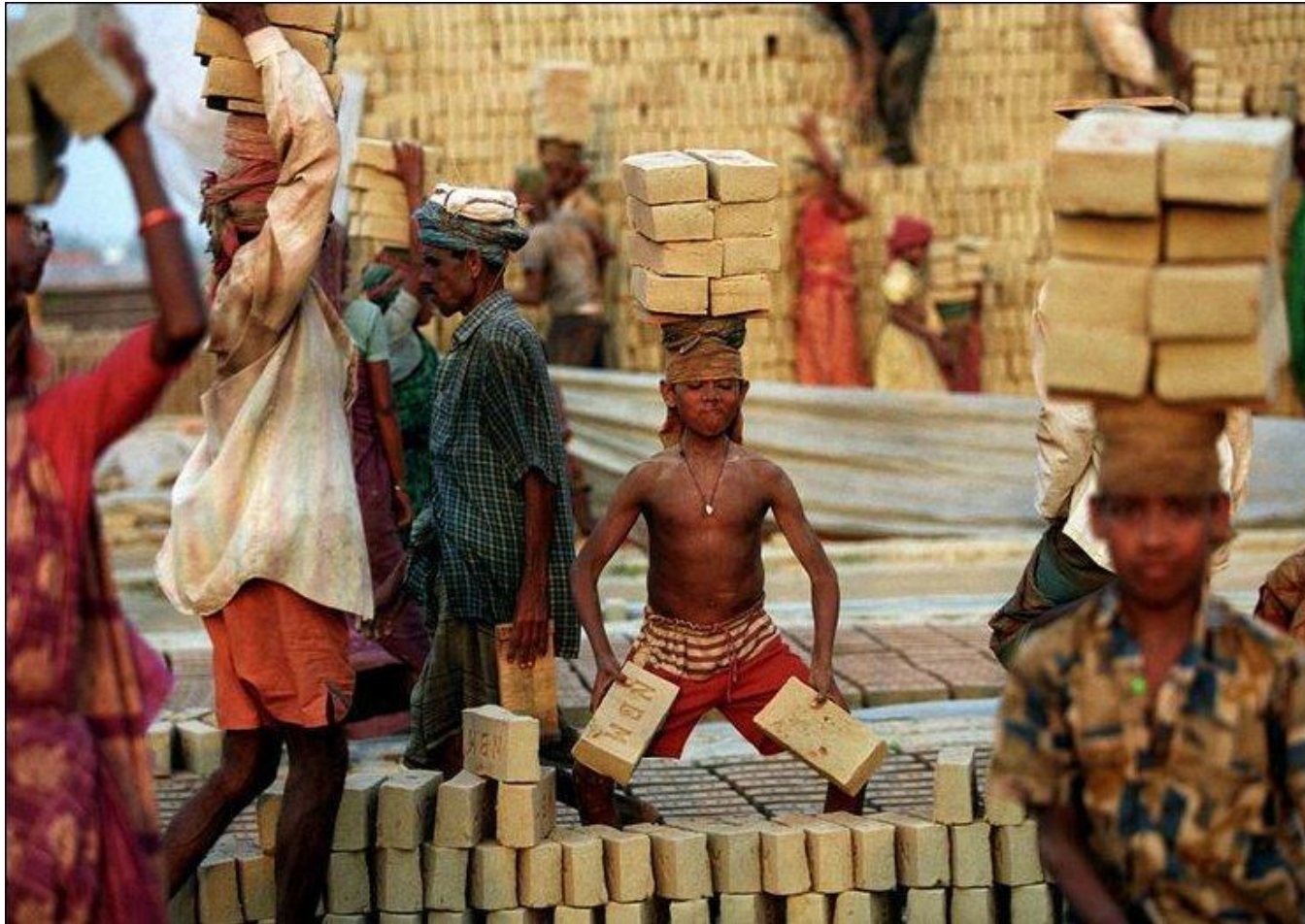
- Climate Change Fund Trustee- 46.50 crore
- Project: Institutional Strengthening on Climate Change Study Cell for knowledge generation, BUET
- Other partners
- Water development board
- Ministry of Women and Children Affairs
- Dr. Wazed Res. Inst. Of Begum Rokeya Univ., Bangladesh
- Bangladesh Rice Research Institute

# Climate change projects in Bangladesh

contd.

- UK funds on Climate Change projects in Bangladesh
- Main focus on poverty
- UK's Dept of Int. Dev. will raise fund for 1,00,000 lac home above flood level
- DFID- Char, livelihood project
- UK AID- English in action

# Brick Industry in Bangladesh



# Brick industry, an overview

- **Total production- 12.6 billion**
- **No. of kiln-3,935**
- **Fuel-Coal and wood**
- **Quality- 75% A grade**
- **Outdated Technology**
- **Low Energy Efficiency**
- **Growth Rate-5.6%**
- **Small Scale Entity**
- **Raw Material- Clay**



# Kiln used for Brick Manufacture

Type of kiln	Production	Location
• Fixed Chimney Kiln	1,00,000/ kiln	• Gabtali, Savar, Ashuliya,
• Zigzag	2,00,000/ kiln	• Keraniganj, Narshingdi, Gazipur and Manikganj.
• Vertical Shaft Kiln		
• Hoffmann kiln		
• Bull's Trench kiln	16%	

# Brick Industry in Bangladesh

## ❖ Social issues:

- Occupational Safety and Health Aspect (OSHA)
  - Exposed to Hazardous pollutant
  - Exposed to heat
  - Lack of medical facilities
- Discrimination



# Impact from Brick Industry

## ❖ Major problem:

- **Green House Gas - 6.0 million ton/year**
- **Air pollution**
- **Land degradation**
- **Deforestation**

# Impact from Brick Industry

contd.

- 4000 brick kilns require 20 tons of coal and 20 tons of wood
- Kiln set up- Forest areas
- Built Dikes
- Wages for worker- 80tk/day
- **Source:Roy 2004,Akter 2010**

## Type of kiln, energy used, particulate matter and CO2 gas

<b>Kiln type</b>	<b>Coal per 100,000 bricks (t)</b>	<b>Particulate (mg/m<sup>3</sup>)</b>	<b>CO<sub>2</sub> emitted per1000 Bricks (t)</b>
<b>FCK</b>	<b>20–22</b>	<b>1,000 +</b>	<b>50</b>
<b>Zigzag</b>	<b>16–20</b>	<b>500-1000 +</b>	<b>40–45</b>
<b>Hoffmann (natural gas)</b>	<b>16,000 m<sup>3</sup></b>	<b>&lt; 100</b>	<b>30</b>



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# Comparison between Traditional and Green Brick

Set up Cost of Brickfield	Traditional 1 crore	Green 8-10 crore
Cost (per piece)	5.5tk	5.8-6
Coal (1,00,000 Brick)	24 tons	7.8-8 tons
Production (annual)	Lakh	2crore

# Alternate and Improved Brick Kiln Technologies

**Improving Kiln Efficiency in Brick Making Industries in  
Bangladesh – UNDP, 2005**

**Improved Fixed Chimney Kiln**

**Improved Zigzag Kiln**

**Hybrid Hoffman Kiln**

**Vertical Shaft Brick Kiln**

## Comparison between FCK and IFCK





# World Bank / Energy Sector Management Assistance Program (ESMAP).



Conforce Brick 2010

# Hybrid Hoffman Kiln , GEF



Universal Brick Ltd, 2009

# Policy Developments in Brick Making Sector

- **1989** *Burning of Bricks (Control) Act, 1989 First Act for Brick Making Activities*
- **1992** *Burning of Bricks (Control) (Amendment) Act, 1992 Amendment of 1989 Act*
- **2001** *Burning of Bricks (Control) (Amendment) Act, 2001 Further Amendment of 1989 Act*
- **2004** *Brick Burning (Control) Rules, 2004*
- **2011** *(Proposed) Brick Manufacturing (Control) Act, 2011  
The latest brick making regulation 1989 2011 2001 1992*

# Policy Development

Contd

## **Features of Brick Making Acts (1989-2004)**

Banned use of firewood

- Restricted Kiln locations
- Did not address product quality, kiln efficiency or emission issues

# Policy development

contd

- **Salient features in brick making in New Draft Brick Manufacturing**

- Prohibits firewood use

Prohibits use of agricultural topsoil and cutting of hills for clay mining

- Promotes use of clay from fallow , marshy and swampy lands and alternative materials
- Production of hollow bricks and concrete compressed bricks encouraged .

## **Salient Features Contd. Punishment**

- Maximum 3 years rigorous imprisonment and fine of 300,000 BDT if firewood is used.
- 1 year imprisonment or fine of 50,000 BDT or both for not maintaining location specifications
- Maximum 2 years imprisonment or fine of 200,000 BDT for not maintaining clay usage specifications

# Eco-friendly Brick

- Depletion of resource
- Irreversible environmental impacts
- Biodegradable
- Renewable source
- Locally available
- Reuse/recycle
- Energy efficient

# Industrial waste/by-product for brick making

## ❖ Waste Material

- Fly ash
- Baggase
- Rice husk ash
- Slag
- Waste paper
- Phospho-gypsum



# Brick Developed in BCSIR

- Soil stabilized building block
- Fly ash-lime brick
- Rice husk ash-lime brick
- Fly ash Lime Gypsum brick
- Energy saving brick
- Insulating brick



Without  
Burning



700-800°C

# Roadmap for Cleaner Brick Production

❖ **Launch a clean brick development program**

**Public Private Partnership**

- **Develop Brick Centre of Excellence**
- **Changes in Act**
- **Mechanism for implementing Act**
- **Support R&D**
- **Promote access to Carbon Market**
- **Training**

# **Conclusion**

**Sustainable Environment  
through Developing  
Clean Brick  
Manufacturing Sector**