Overview of state of regulation and challenges

Centre for Science and Environment

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Brick making process

- Mining of clay
  (Clay is excavated/collection from agricultural fields, ponds, river banks)

- Preparation of wet clay-mix
  (Homogeneous wet clay mix is prepared by adding water and additives to clay)

- Moulding of bricks
  (Wet clay-mix is put in moulds to shape into bricks)

- Drying
  (Bricks after moulding are dried in the open or under shed)

- Firing
  (Bricks are fired in a kiln to a temperature of 800–1100 °C)
Environmental impacts

**Emission**
- Particulate matter
- $\text{SO}_x, \text{NO}_x$
- GHG
- Black carbon
- Toxics emission

**Clay mining**
- Unregulated mining
- Land degradation
Brick kiln sector
Countries have emission standards as well as norms for stack height

<table>
<thead>
<tr>
<th>Country</th>
<th>Emission standard (mg/Nm³)</th>
<th>Stack height (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>1000</td>
<td>37</td>
</tr>
<tr>
<td>Nepal</td>
<td>400 -700</td>
<td>15-30</td>
</tr>
<tr>
<td>India</td>
<td>250-1200</td>
<td>12-30</td>
</tr>
<tr>
<td>Vietnam</td>
<td>No emission standard</td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>Clamps: Ambient air quality standard</td>
<td></td>
</tr>
<tr>
<td>Pakistan</td>
<td>No standards for brick kiln, ambient air quality standard applies</td>
<td></td>
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</tbody>
</table>
Clay mining

• Run majorly by informal players
• Regulations are lax - comes under ‘eco-friendly mining’ (*No blasting, less manpower*) --- CTO obtained easily from SPCB
• No specific guidelines on working depth.
• Nexus between brick manufacturers and farmers: Brick manufacturer procures clay from unregistered farmlands also --- goes unrecorded
Siting Guideline

- India, Bangladesh and Nepal has
  - Distance from human settlement, hospitals, school
  - Distance between two kilns
  - Distance from water body, forest
  - Water sprinkler, paved approach road, housekeeping,
  - A Sign Board showing the name, address and capacity of the brick kiln as well as validity of the consents should be displayed at the entrance of the site

- Rarely followed
## Problem in implementation

<table>
<thead>
<tr>
<th>Size</th>
<th>Kiln capacity</th>
<th>Stack height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>Less than 15,000 bricks per day (less than 15 ft trench width)</td>
<td>Minimum stack height 22 metre [OR] Induced draught fan operating with minimum draught 50 mm WG with 12 metre stack height</td>
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<tr>
<td>Medium</td>
<td>15,000 to 30,000 bricks per day (15 ft to 22 ft trench width)</td>
<td>Minimum stack height 27 metre with gravitational settling chamber [OR] Induced draft fan operating with minimum draft 50 mm WG with 15 metre stack height</td>
</tr>
<tr>
<td>Large</td>
<td>More than 30,000 bricks per day (More than 22 ft trench width)</td>
<td>Minimum stack height 30 metre with gravitational settling chamber [OR] Induced draft fan operating with minimum draft 50 mm WG with 17 metre stack height</td>
</tr>
</tbody>
</table>
Policy interventions

• Nepal: Banned the movable bulls trench kiln
• Europe: Tall chimney because of acid rain issue
• Bangladesh: Banned FCBTK, moving towards zigzag, Hoffman kiln and VSBK, banned use of agricultural soil
• India: Banned Moving bulls trench kiln in 1996 and introduced emission standard for VSBK kiln
• South Africa: Government incentive to move from energy inefficient clamps to cleaner technology, carbon tax on brick sector
Policy interventions

• Vietnam
  • Department of building Materials
  • Vietnam Construction Glass and Ceramic Corporation

• China
  • Organised sector: Township and Village enterprises & State Owned Enterprises
  • Easy to regulate
  • 1999: Banned the use of solid clay bricks in coastal cities
  • 2004: Controlled use of solid clay brick in small towns and rural areas
  • 2005: 170 cities
  • 2007: Phasing out outdated technologies
Challenges with sector

• Run by informal players
• Cheap traditional kiln: cost of conversion is not small.
• Low cost of labor: hindrance to mechanization
• Conservative building material
• Lack of R&D