

Fly Ash Bricks

Greening the Brick Sector in Bihar

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Red Brick Industry in Bihar



Consumes 2 million tons of coal every year for its production

Leads to emissions of 4-6 millions tons of CO₂ every year

Damages 5,500 acres of fertile land every year

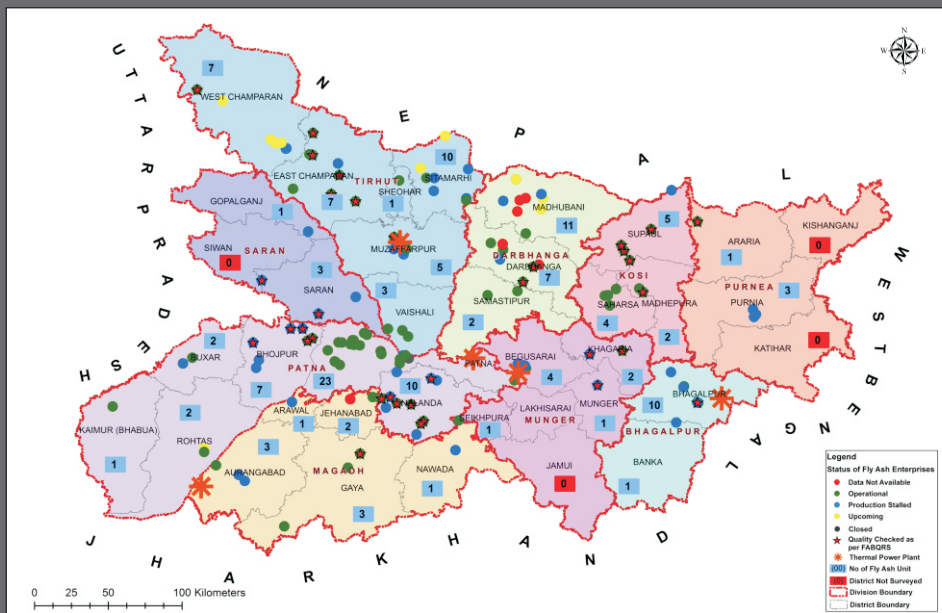
Dominates 90% of brick production

Fly Ash Bricks Present an Opportunity for Sustainable Growth of Bihar

What is Fly Ash Brick

Fly Ash brick made up of fly ash - very fine powdery material generated after combustion of finely ground coal in thermal power plants, sand and cement. Another popular variant is Fal-G brick made with fly ash, lime, sand and gypsum.

Availability of Fly Ash Bricks in Bihar



Source of Fly Ash in Bihar

There are 5 major sources of fly ash in Bihar. These are all existing thermal power plants in Kahalgaon, Muzaffarpur, Barh, Barauni and Nabinagar.

**Bihar Can Produce
300 Million Fly Ash
Bricks Per Year**

Why Fly Ash Brick

- Environment friendly brick
- A by-product of thermal power stations
- Cost-effective substitute for red brick



The Bihar Task Force

The Government of Bihar has been actively promoting the adoption of low carbon and resource efficient technologies especially fly ash brick technology in the state. An Inter Departmental Task Force on Accelerating 'Cleaner Production Systems' in the building material sector was setup in 2012. It aimed to streamline the efforts of the various Government departments involved. Convened by the Bihar State Pollution Control Board, its members include the Department of Environment, Forests and Climate Change, Department of Building Construction, Department of Industries, National Thermal Power Corporation (NTPC) and other stakeholders.

Major breakthroughs of Task Force

- Revision of Schedule of Rates(SoR) of fly ash bricks
- Inclusion of fly ash brick production units in thrust area of Bihar State Industrial Inclusion Policy 2011
- Streamlining process of procurement of fly ash from NTPC, Kahalgaon

Supportive Policies for Fly Ash Brick Utilisation

State Policies

Bihar State Pollution Control Board

Exception from Consent to Establish (CTE) and Consent to Operate (CTO) from State Pollution Control Board

Bihar Industrial Inclusion Policy 2011

Fly ash brick units included in the policy and can avail the financial benefits

Fixation of SoR Rates

National Policies

Fly Ash Brick Notification 2016 S.O. 254(E).

Use of Fly ash bricks mandatory in buildings constructed within 300 km Radius of thermal power plant

State Authorities to amend building bye-laws of million plus cities to ensure the mandatory use of ash based bricks

Use of Fly ash bricks mandatory in all buildings greater than 1000 sqft built up area under government schemes and programs

100% use of fly ash mandatory for all thermal power plants in the state

Monitoring Quality of Fly Ash Bricks in Bihar

- Development Alternatives with support from Shakti Sustainable Energy Foundation developed a Fly Ash Brick Quality Rating System (FABQRS)
- Objective of FABQRS is to create a favorable fly ash brick quality environment in Bihar

Quality Rating Process*

Enrollment
of
Entrepreneur

Sample
Collection
using set
protocol

Testing of
bricks by NABL
lab and cross
verification of
results

Award Quality
rating to the
bricks

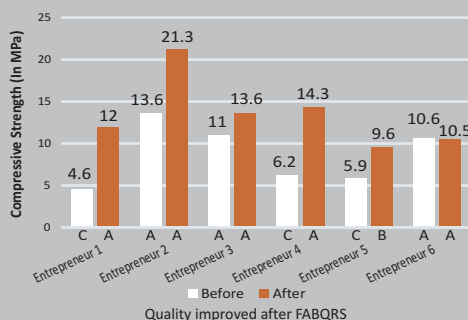
Technical
support to
enterprises in
enhancing
quality

Category	Compressive Strength	Water Absorption	Dimensional Tolerance	Efflorescence	Applications
Class A	$\geq 10.0 \text{ N/mm}^2$	<15 percent by mass	Length $\pm 4 \text{ mm}$ Breadth $\pm 2 \text{ mm}$ Width $\pm 2 \text{ mm}$	NIL/Slight	All type of buildings
Class B	$\geq 7.5 < 10.0 \text{ N/mm}^2$	Not greater than 20 percent by mass	Length $\pm 4 \text{ mm}$ Breadth $\pm 2 \text{ mm}$ Width $\pm 2 \text{ mm}$	Nil/Slight/ Moderate	Low rise building (1/2 storey)
Class C	$\geq 3.5 < 7.5 \text{ N/mm}^2$	Not greater than 20 percent by mass	Length $\pm 4 \text{ mm}$ Breadth $\pm 2 \text{ mm}$ Width $\pm 2 \text{ mm}$	Nil/Slight/ Moderate	Boundary wall
Class D (Fail)	$< 3.5 \text{ N/mm}^2$	Greater than 20 > percent by mass	Length $\pm 4 \text{ mm}$ Breadth $\pm 2 \text{ mm}$ Width $\pm 2 \text{ mm}$	NA	NA

* As per IS12894-2002: Pulverized Fuel Ash - Lime Bricks.

Advantages of FABQRS

Comparative strength of fly ash bricks before and after FABQRS in Nalanda



- Third party verification of fly ash brick quality
- Enhance confidence of users in fly ash bricks
- Enhance and maintain quality of fly ash bricks in Bihar
- Strengthen decision making of users in procurement of fly ash bricks