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BRICK OF WASTE MATERIALS

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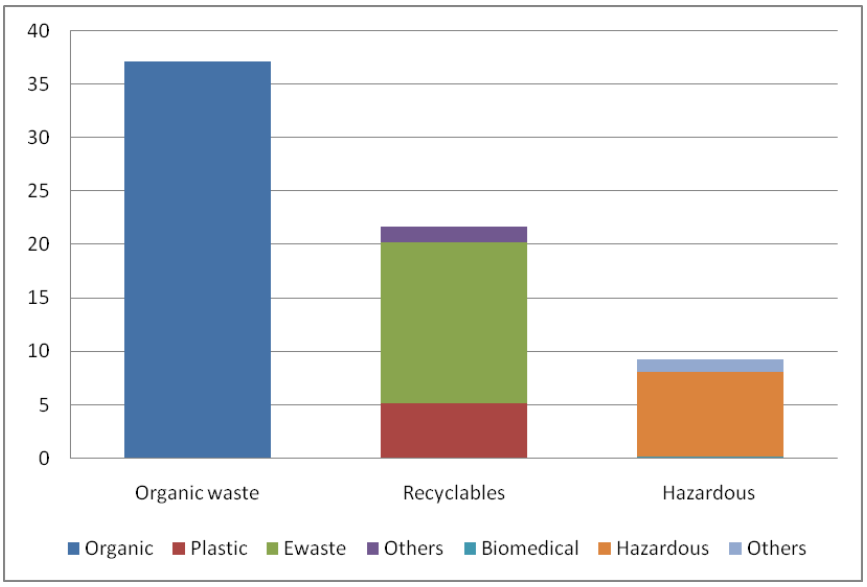
ABSTRACT

India generates 62 million tonnes of waste every year, of which less than 60% is collected and around 15% processed. With landfills ranking third in terms of greenhouse gas emissions in India, and increasing pressure from the public, the Government of India revised the Solid Waste Management after 16 years..

I attempt to understand the existing scenario of waste management, impact of poor waste management solutions, policies that have been framed to address it and the major systemic changes that need to happen to ensure this important public issue does not turn into a national calamity.

Waste Generation in India

According to the Press Information Bureau, India generates 62 million tonnes of waste (mixed waste containing both recyclable and non-recyclable waste) every year, with an average annual growth rate of 4% (PIB 2016). The generated waste can be divided into three major categories: Organic (all kinds of biodegradable waste), dry (or recyclable waste) and biomedical (or sanitary and hazardous waste).



Keywords; construction materials, specimen preparation, GGBS(Granulated Ground Blast Furnace)

MATERIALS

- WHEAT STRAW ASH: Wheat straw is an agriculture waste. When it is burn, it leaves an ash which is very rich in silica oxide,that has pozzolonic property.

As an agricultural product, wheat straw contains considerable amounts of SiO_2: When burned it leaves an ash very rich in SiO_2 that has a pozzolanic character. Wheat is an important agricultural product in India. In this study, wheat straws are ground to 1–5-mm size and subjected to preburning treatment. The preburned material is later burned in controlled conditions for 5 hours at 570 and 670°C. The ash is cooled suddenly and ground to 90–200 μ size. The standard test specimens are produced from ash and mechanically, chemically, and physically tested for determination of its pozzolanic properties. It is obtained that the ash has pozzolanic activity.

COW DUNG ASH:

acted upon by symbiotic bacteria residing within the animal's rumen. Cow/Cattle are mostly found in every part of India. Cow dung Cow dung is basically the rejects of herbivorous matter which is comprises of organic matter including fibrous material that passed through the cow's digestive system, among other liquid digesta that has been left after the fermentation, absorption and filtration, then acidified, then absorbed again.

Exact chemical composition is of mostly carbon, nitrogen, hydrogen, oxygen, phosphorus, etc. with salts, cells

sloughed off as the digester went through the digestive tract, some urea, mucus, as well as cellulose, lignin and hemicellulos. Cow dung ash has chemical properties rich in Nitrogen, Potassium and calcium. It has relatively high carbon to the Nitrogen ratio.

\While it has physical properties such as it is bulky, has large ash content and burning ratio is low.

GGBS(GROUND GRANULATED BLAST FURNACE)

The main components of blast furnace slag are CaO (30- 50%), SiO_2 (28-38%), Al_2O_3 (8-24%), and MgO (1-18%). In

general increasing the CaO content of the slag results in raised slag basisity and an increase in compressive strength. The MgO and Al_2O_3 content show the same trend up to respectively 10-12% and 14%, beyond which no further improvement can be obtained. Several compositional ratios or so-called hydraulic indices have been used to correlate slag composition with hydraulic activity; the latter being mostly expressed as the

binder compressive strength. Use of GGBS significantly reduces the risk of damages caused by alkali–silica reaction (ASR), provides higher resistance

to chloride ingress — reducing the risk of reinforcement corrosion — and provides higher resistance to attacks by sulfate and other chemicals.

WASTE GLASS POWDER:

The term glass contains several chemical diversities including soda-lime silicate glass, alkali-silicate glass and boro-silicate glass. To date, these types of glasses glass powder have been widely used in cement and aggregate mixture as pozzolana for civil works. The introduction of waste glass in cement will increase the alkali content in the cement. It also help in bricks and ceramic manufacture and it preserves raw materials, decreases energy consumption and volume of waste sent to landfill. As useful recycled materials, glasses and glass powder are mainly used in fields related to civil engineering, for example, in cement, as pozzolana(supplementary cementitious materials), and coarse aggregate. Their recycling ratio is close to 100%.

MANUFACTURING PROCESS:

1. **PREPARATIONOF CLAY:**

- Take above raw materials in definite proportions & subject to crushing & grinding and obtain powdered form.
- Sieve the above powedered form to get more fine clay.

2. **MOULDING:**

- We pour the paste in the mould & obtain desire shape and size.

3. **DRYING:**

- To remove the moisture content from brick.

4. **BURNING:**

- It is very important operation in the manufacturing of bricks.
- It imparts hardness and strength to the brick and make denser and durable.

TESTING:

Compressive Test:

Compression testing machine, the compression plate of which shall have ball seating in the form of portion of a sphere center of which coincides with the centre of the plate.

Procedure of Compressive Strength Test on Bricks

1. Place the specimen with flat face horizontal and mortar filled face facing upwards between plates of the testing machine.
2. Apply load axially at a uniform rate of 14 N/mm^2 (140 kg/cm^2) per minute till failure occurs and note maximum load at failure.
3. The load at failure is maximum load at which the specimen fails to produce any further increase in the indicator reading on the testing machine.

Calculation:

Compressive Strength of Bricks = Maximum Load at Failure (N)/Average area of bed face (mm^2)

The average of result shall be reported.

Range Calculation

Maximum compressive strength =8-10N/mm^2 Contact area =230*114mm^2

Maximum expected load =200-250N/mm^2
The range to be selected is ……13-15N/mm^2……

Specifications of Bricks

Speciation of Common Clay Building Bricks

Dimensions: The standard size of clay bricks shall be as follows

Length (mm)	Width (mm)	Height (mm)
230	114	76

CONCLUSION:

From above we can come to a conclusion that these type of brick can be used in construction of structures which is subjected to less loading.

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