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# A Review on Utilization of Processed Inorganic Mixed Municipal Solid Waste by Mechanical Device in Manufacturing of Bricks

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***Abstract:*** ***Municipal solid waste which is increasing day by day becomes eyesore and in turn pollutes the environment. The modern world is having a significant waste management crisis, particularly inorganic mixed municipal solid waste. Every day, hundreds of tones of inorganic mixed wastes are thrown in landfills, yet there aren't enough methods in the world to process and recycle them. Every day, a considerable volume of non-biodegradable waste is dumped or burnt, damaging the environment and the air. The accumulation of non-biodegradable trash in the environment is harmful to both plant and animal life. Non-biodegradable pollutants like Polyethylene Teraphthalate pose a significant environmental burden, and recycling them is difficult owing to their non-biodegradability. The huge amounts of materials required for infrastructure construction provide a potentially major opportunity for waste material reuse. To resolve this concern, plastic waste has been mixed with clay to form brick for construction purposes. This alternatively saves the quantity of sand/clay that has to be taken away from the precious river beds/mines. The inorganic MSW is naturally available in surplus quantity and hence the cost factor comes down.***

***Keywords: Municipal solid waste, waste management, plastic waste***

## I. INTRODUCTION

Modern world is facing a serious situation of waste management, especially inorganic mixed municipal solid waste. Everyday thousands of tones of inorganic mixed wastes are dumped to the garbage but there is no enough method to treat and recycle the of inorganic mixed wastes world.

A large amount of non-degradable waste are been discarded or burned daily which leads to the contamination of environment and air. Inorganic waste is one of the daily increasing useful as well as a hazardous material. At the time of need, plastic is found to be very useful but after its use, it is simply thrown away, creating all kinds of hazards.

Plastic is non-biodegradable that remains as a hazardous material for more than centuries. The quantity of plastic waste in Municipal Solid Waste (MSW) is expanding rapidly.

It is estimated that the rate of expansion is double for every 10 years. This is due to rapid growth of population, urbanization, developmental activities and changes in life style which leading widespread littering on municipal solid waste is generated annually, with evaluated increasing at a rate of 1.5 to 2% every year. Hence, these waste plastics are to be effectively utilized.

INORGANIC WASTE:-A Non degradable Waste

Plastic waste, or plastic pollution, is 'the accumulation of plastic objects (e.g.: plastic bottles and much more) in the Earth's environment that adversely affects wildlife, wildlife habitat, and human's. It also refers to the significant amount of plastic that isn't recycled and ends up in landfill or, in the developing world, thrown into unregulated dump sites. The three quarters that isn't recycled enters our environment, polluting our oceans and causing damage to our ecosystem.

In less developed countries, the majority of plastic waste eventually ends up in the ocean, meaning that marine animals are especially at risk. So much of what we consume is made of plastic (such as plastic bottles and food containers) because it's inexpensive, yet durable. However, plastic is slow to degrade (taking over 400 years or more) due to its chemical structure, which presents a huge challenge.

Reducing plastic consumption and raising awareness about plastic recycling is crucial if we are to overcome the problem of plastic waste and pollution on our planet.

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## II. NEED AND SCOPE OF STUDY

It has been found that the current scenario that brick production is causing numerous environmental hazards such as increasing global warming by releasing greenhouse gases and huge consumption of power and raw materials for the production of bricks. The need for this study is to reduce the land and air pollution by using this processed plastic via dross machine in bricks.

*1)* To find an alternative for the raw materials used in the fired clay bricks.
*2)* To reduce CO2emissions and produce eco-friendly bricks
*3)* To produce an economical product
*4)* To minimizing the plastic waste by using it in bricks.

Using waste plastic material will reduce land and air pollution, recycling of plastic waste via dross machine less time consuming and environment friendly; recycling of plastic helps to reduce energy usage, consumption of virgin raw materials, air and water pollution .

## III. OBJECTIVES OF STUDY

The following are the objectives of the study:

*1)* To find the composition of inorganic waste generated by Dross Machine.
*2)* To cast the clay bricks with different percentage of processed waste
*3)* To carry out the required test of inorganic waste based clay bricks as per Indian Standards.

## IV. LITERATURE REVIEW

This chapter reviews the different methods proposed by the researchers for monitoring of some or all of these parameters. Various study articles, relevant books, and reputable journals have been scanned by the investigator. Utilization of processed plastic waste by using dross machine in manufacturing of bricks has been the subject of extensive study to date. Following a thorough review of the literature, the investigator discovered that numerous topics have been left unexplored or dealt with just slightly.

R. S. Kognole et al(2019) deals with Waste plastic, which is available everywhere, can be put to an effective use in brick making, Plastic sand bricks can help reduce the environmental pollution, thereby making the environment clean and healthy, Plastic sand bricks reduce the usage of clay in making of bricks, Plastic sand bricks give an alternative option of bricks to the customers on affordable rates, Water absorption of plastic sand brick is zero percent, We conclude that the plastic sand bricks are useful for the construction industry when we compare with Fly Ash bricks and 3rd class clay bricks.

Turkeswari et al (2021) to search for an effective way to utilize plastic waste, reusing them for the production of construction material appears as an environmentally-friendly approach. This is also because conventional construction materials often consume high energy during production has caused many environmental impacts. This review paper summarizes the previous studies on reusing various PW as raw material and aggregate for construction and its properties with special attention to bricks and paving blocks.

Mr.N.Thirugnanasambantham et al(2017) studies that plastic sand bricks possess more advantages which includes cost efficiency, reduction in emission of greenhouse gases , etc., Plastic sand brick is also known as “Eco-Bricks” made of plastic waste which is otherwise harmful to all living organisms can be used for construction purposes. It increases the compressive strength when compared to fly ash bricks. By use of plastic sand bricks, the water absorption presence of alkalies was highly reduced. Owning to numerous advantages further research would improve quality and durability of plastic sand bricks.

Rajarapu Bhushaiah et al(2019) deals with Waste plastic, which is available everywhere, may be put to an effective use in brick. Plastic bricks can help reduce the environmental pollution, thereby making the environment clean and healthy. Plastic sand bricks reduce the usage of clay in making of bricks.

Plastic sand bricks give an alternative option of bricks to the customers on affordable rates. Water absorption of plastic sand brick is zero percent.

Compressive strength of plastic sand brick is 5.6 N/mm2 at the compressive load of 96KN. We conclude that the plastic sand bricks are useful for the construction industry when we compare with Fly Ash bricks and 3rd class clay bricks.

Lairenlakpam Billygraham Singh et al (2017) to manufacture bricks or building blocks from sand and waste plastics. The bricks are produced by mixing waste plastic and sand after heating at 200oC. T

wo specimens of bricks, one with sand and waste CDs; another with sand and waste water bottles are produced and tested for some physical and mechanical properties. The sand-plastic bricks are lightweight and present a waxy surface.

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Aman Kumar et al(2020) deals with Plastic waste which is increasing day by day becomes eyesore and in turn pollutes the environment, especially in high mountain villages where no garbage collection system exists. A large amount of plastic is being brought into the tourist trekking regions are discarded or burned which leads to the contamination of environment and air.

Dinesh.S et al (2016) Removal of waste products thus abolishing the land requirement problem for dumping plastic, Reduction in the emission of greenhouse gases by the conversion of flue gases into synthetic oil etc.,This method is suitable for the countries which has the difficult to dispose /recycle the plastic waste. The natural resources consumed for the manufacturing of Plastic sand bricks and Paver blocks are very much less when compared to its counterparts.

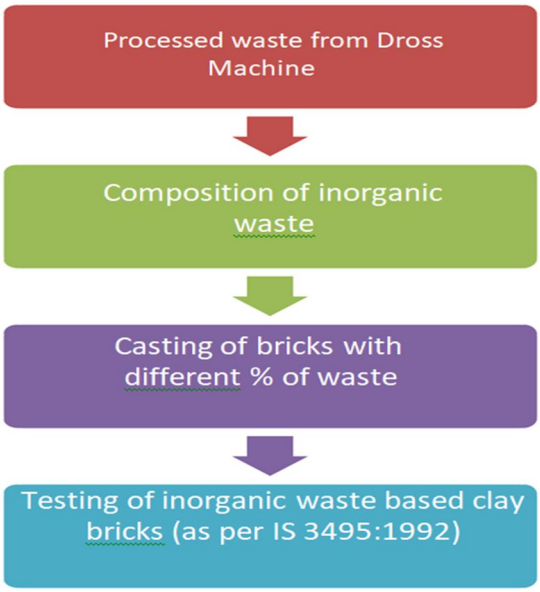
Jeevan Ghuge et al(2019) discussed waste and recycled materials in concrete mixes for paver blocks becoming increasingly important to manage and treat both the solid waste generated by industry and municipal waste. These blocks were rectangular in shape and had more or less the same size as the bricks. During the previous five decades, the block shape has relentlessly developed from non-interlocking to somewhat interlocking to completely interlocking to multiple interlocking shapes

## V. GAPS IN LITRATURE REVIEW

On the basis of previous research work done on the utilization of plastic waste, following are the gaps that are identified for the future research in order to promote large scale its utilization in various field of civil engineering:-

*1)* Plastic waste binders in plastic sand bricks and different parameters like compaction parameter different mix proportions, were optimized based on the mechanical performance of bricks.
*2)* The focus of the researcher was to optimize the amount of binder and its proportioning to the sand to get an optimized plastic sand brick.
*3)* Although goal of these plastic bricks is to deposition of plastic throughout the nature. Junking of plastic in landfills also diminished which emerge to be economical.
*4)* Various researchers observed that the influence of variation in the plastic waste binder was while using different plastic waste.
*5)* It is observed that with increase of plastic content in brick, compressive strength of the brick decreases.

## VI. RESEARCH METHODOLOGY




## VII. EXPECTED OUTCOME

*1)* Plastic in bricks also helps the environment, as best way for disposal the plastic is to reuse/recycle it and land cannot be degraded**.**
*2)* Minimize and reuse waste plastic generation on land and water to prevent land and water degradation and pollution hazards.
*3)* To develop a method for efficiently and successfully using waste plastics.
*4)* Based on the research work performance, publication will make in journal/conference of repute.

## VIII. CONCLUSION

In the present situation, both Waste Management and energy generation is becoming key challenge in our country. From the above discussion; we conclude that by adding processed inorganic mixed municipal solid waste which is available at almost zero cost in clay, amount of clay can be reduced. Cost of clay is much higher than this processed waste. Municipal waste is easily available everywhere, but clay is coming from river beds. So the cost of these bricks is lesser than ordinary clay bricks, that's why these bricks are more economical than ordinary bricks.

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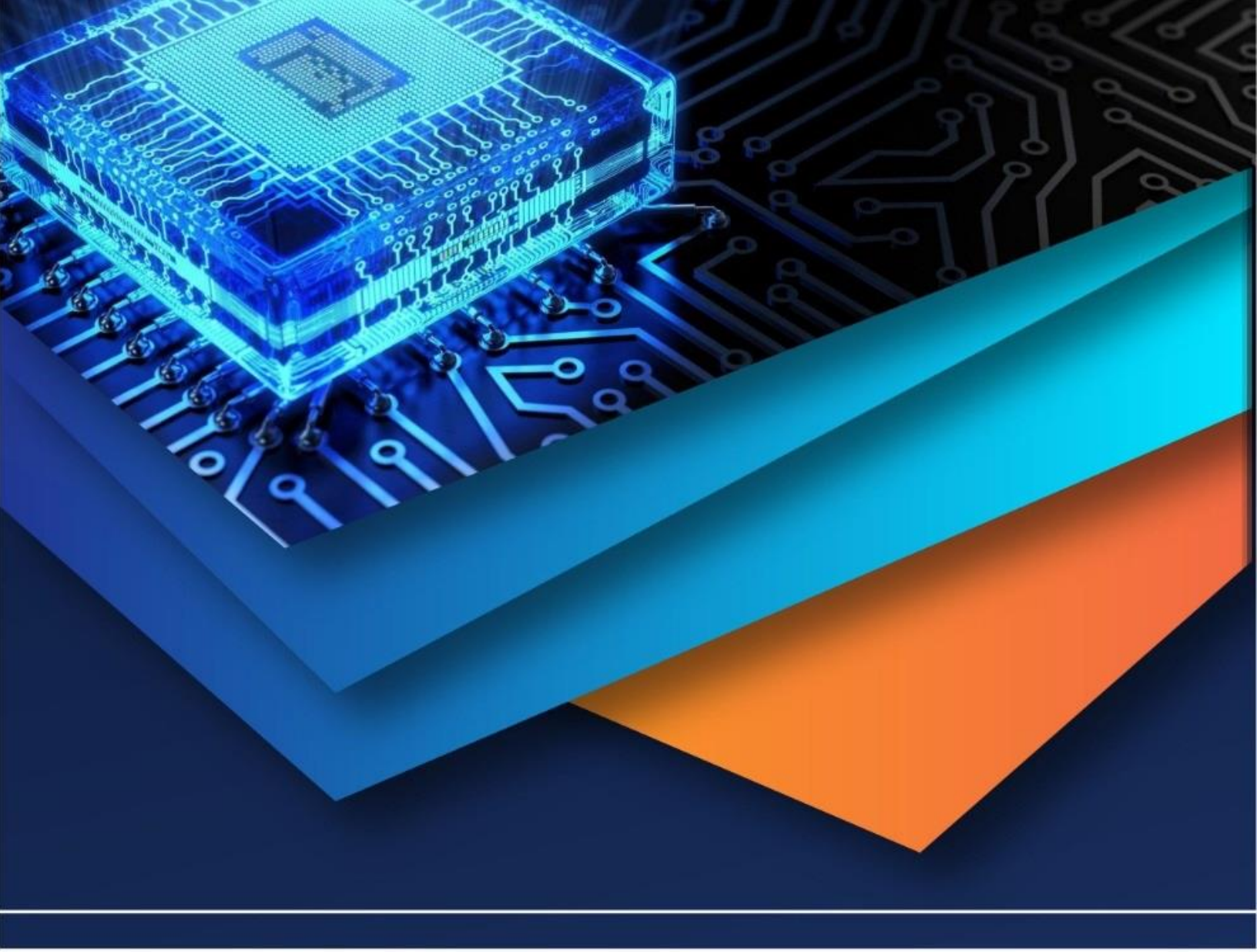
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