



STUDY OF MODIFIED BUILDING MATERIALS FROM RECYCLED SOLID WASTES

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ABSTRACT

There are sufficient environmental advocacies that were attributed to correct waste segregation and solid waste management however solely few were deemed to achieve success due to the un-sustainability of the projects that were implemented. Thus, a research and environmentally adjusted company ventured on a social enterprise that might utilize recovered wastes as part of its raw materials in the development of materials that square measure deemed to be marketable and profitable.

The products that were developed were as follows: concrete formed with plastic strips, concrete hollow blocks with ground plastic/coco coir, geo-polymer adhesives, fiber board, wood plastic composite, activated carbon, adhesives, paper and organic fertilizer. The modified hollow blocks, modified formed and geo-polymer adhesives were found to be very marketable because the demand for building construction materials are increasing due to the boom in the industry. The another products that were indicated square measure still being researched and developed due to the constraints of the testing machines that may test its specific qualities.

KEYWORDS: *Solid waste management modified concrete products, concrete hollow blocks, concrete precast.*

INTRODUCTION AND LITERATURE REVIEW

Solid waste drawback has escalated due to the growing population, quickly increasing consumption and increasing urbanization. The extensive solid waste management (SWM) programs are some of the most difficult tasks in the accomplishment of institutional sustainability.

This study is restricted to construction waste materials, which may be described as the unwanted residue ensuing resulting from the alteration, construction, demolition or repair of any buildings or different structures. The employment of recycled aggregates saves natural resources and dumping areas, and helps to keep up a clean surroundings.

Activity	No. of enterprises	Solid wastes		Method of disposing of solid wastes				
		Enterprises that produce wastes	Quantity of solid wastes	Collection	Storing	Burial	Burning	Selling
Site preparation	22	18	8.1	8.1	0.0	0.0	0.0	0.0
Buildings construction & civil eng. projects	1049	414	1477.5	1333.0	0.0	97.3	40.4	6.8
Building installations	422	172	226.6	225.3	0.0	0.0	0.0	1.3
Building completion	66	59	9.6	8.5	0.0	0.0	0.0	1.1
Total	1559	663	1721.8	1574.9	0.0	97.3	40.4	9.2

Table 1 Quantity of solid wastes resulted from the construction activity distributed by method of disposing and economic activity, 2004 (ton)

Building construction waste management

In general, for any construction project, plans for recycling of waste materials ought to be developed before the commencement of work. These plans should recognize the kinds of waste to be generated and the method of handling, and the recycling and disposal procedures. In additionally, areas for the temporary accumulation or storage of the development waste materials should be clearly designated.

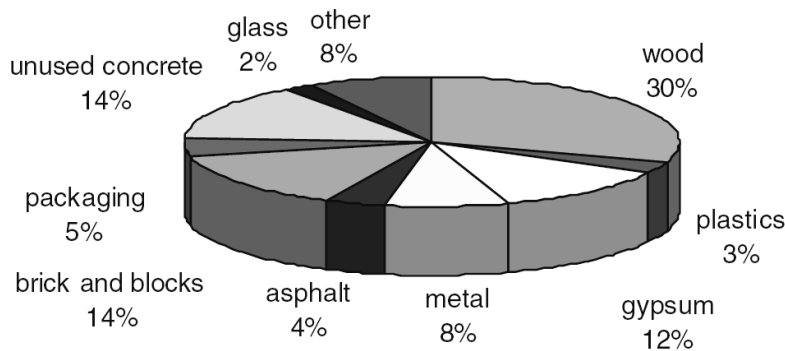


Fig. 1. Percentage, in volume, of construction wastes on site.

METHODOLOGY

Waste Segregation and Collection

The waste segregation is completely monitored and retraining/reorientations were done to confirm correct adherence to the advocacy. Waste materials were bifurcated on its physical and chemical properties. Wastes were collected on a uniform interval. Figure 1 shows the classification of different solid waste materials.

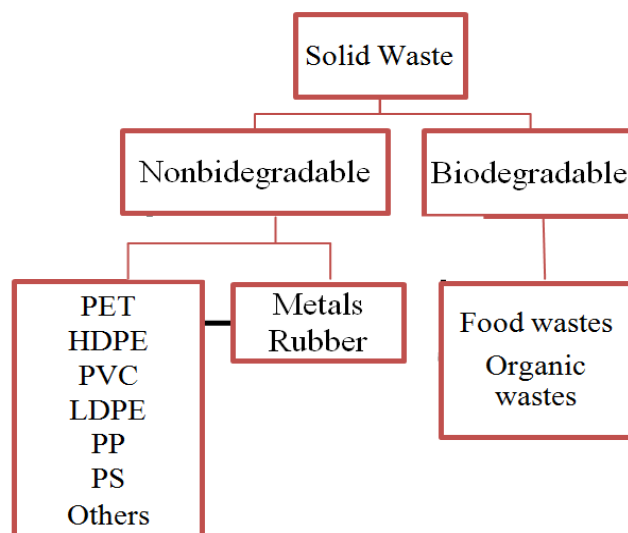


Fig.2 Classification of different solid waste materials

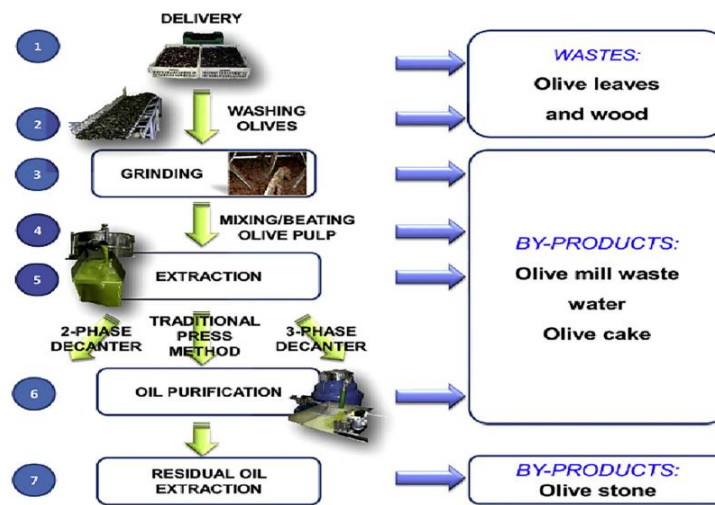


Figure 3. Waste generation from oil purification

Biodegradable Waste

Biodegradable waste could be a variety of waste, originating naturally from plant or animal sources, which may be degraded by different living organisms. Biodegradable waste will be typical found in municipal solid waste like green waste, food waste, paper waste, and biodegradable plastics. a number of the sources contain human waste, sewage, slaughterhouse waste etc.

Non- biodegradable Waste

A Non-Biodegradable material can be described as a type of material that can't be demolished by natural organisms and function a supply of pollution. They stay on earth for thousands of years with none degradation or decomposition. Associated example could be a plastic to give these plastics a long- lived outcome, higher quality plastics are being used. Different cases are cans, metals, and chemicals for agricultural and industrial uses. They're the chief causes of air, water and soil pollution and diseases like cancer.

DEVELOPMENT OF DIFFERENT PRODUCTS

Masonry Brick with Polyethylene Terephthalate(PET)

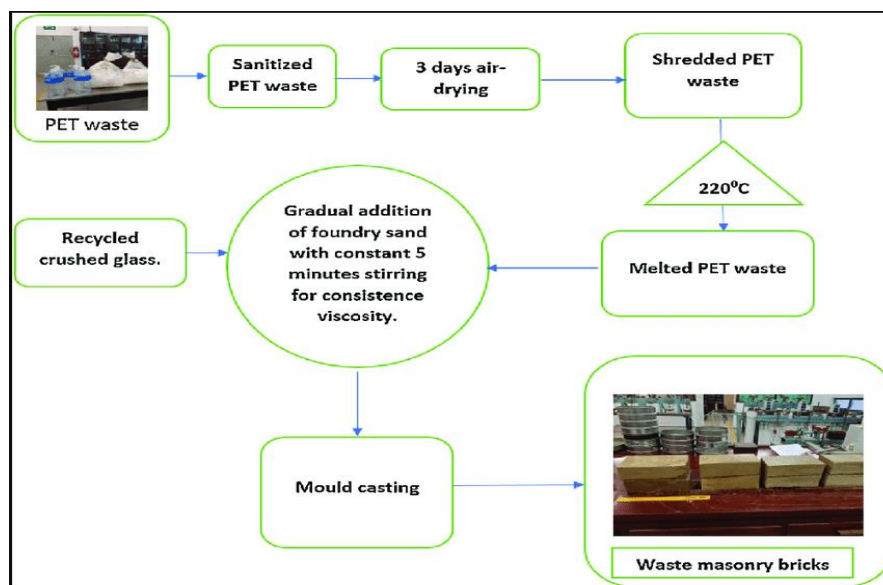
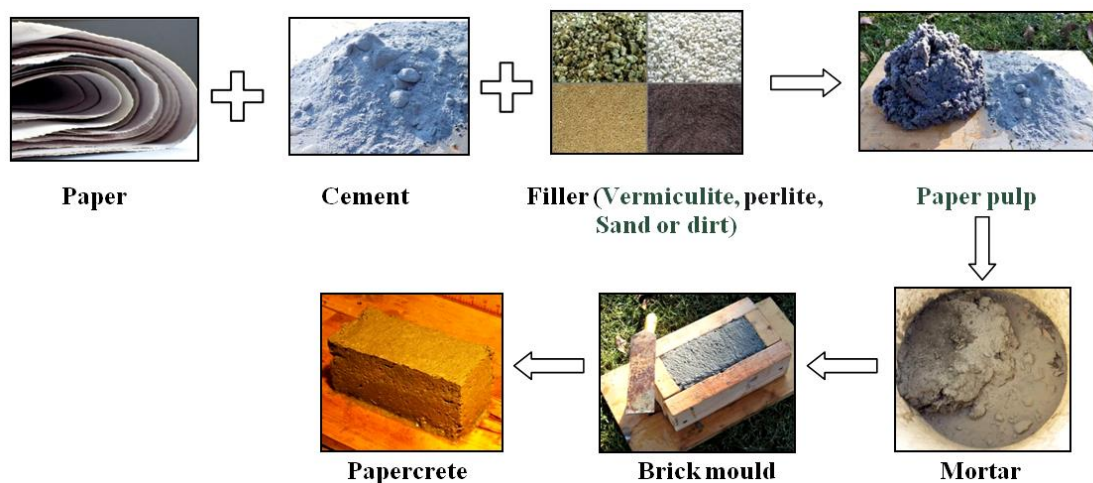


Figure 4. Schematic Diagram of the Process in Developing Modified Concrete Hollow Block with PET

Concrete Hollow Block with Coco-coir**Sand + Cement + Water + Coco coir + Additives = Modified CHB w/ Coco coir****Figure 5. Schematic Diagram of the Process in Developing Modified Concrete Hollow Block with Coco coir****Paper and Paper Products/ Papercrete****Figure 6. Schematic Diagram of the Process in Developing Recycled Paper****Activated Charcoal****Figure 7. Schematic Diagram of the Process in Developing an Activated Charcoal from Coconut Shell**

Fiber Board

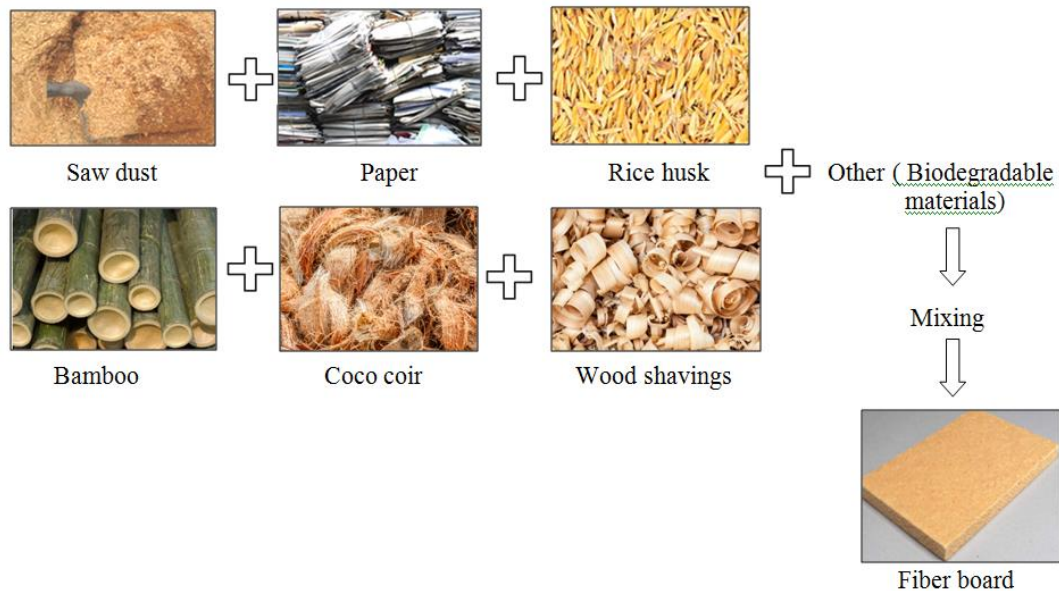


Figure 8. Schematic Diagram of the Process in Developing Fiber Boards

Wood Plastic Composite

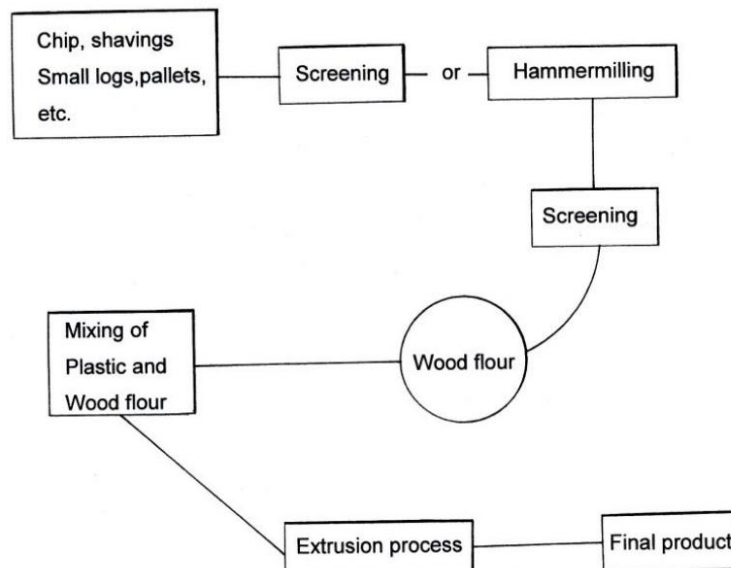


Figure 9. Schematic Diagram of the Process in Developing Wood Plastic Composite

CONCLUSION

Solid waste management is a tasking method. Varied product will be developed and however the product that were developed should pass the quality testing to confirm its engineering capability. Another side that needs to be taken into thought is that the marketability of the said products as well as the sustainability of the raw materials that may be utilized within the development of the product.



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