

PES Institute of Technology and Management

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“FABRICATION OF PAPER BY AGRO WASTE”

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In

ELECTRICAL AND ELECTRONICS ENGINEERING

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KEYWORDS

Fibrous Materials, Grass, Non-Wood, Pulp and Areca Waste.

INTRODUCTION

There has been an increase in paper and board production and consumption in recent decades. Due to the strong growth in demand in recent years, it is predicted that the forecasted demand for wood materials may exceed the potential supply.

Production of pulp from non-wood resources has several advantages compared with wood, such as easy pulping capability, excellent fibers for special types of paper and high-quality bleached pulp. Based on the foregoing, we undertook a project aimed at comparing the effectiveness of non-wood raw materials such as agrowastes.

OBJECTIVES

- To fabricate paper from agro-waste.
- To use non-wood raw materials.
- To contribute in Paper Production.
- To reduce the dependency on Bamboo/Forest.
- To extract pulp from non-wood materials.

METHODOLOGY

Hardware components

Cutting Tools, Boiling Vessels, Strainer, Grinder, Weighing Machine, Pulp Extractor, Mesh Frame, Roller, Oven/Iron Box.

Raw materials

Areca waste, Grass and used paper / waste paper

Process:

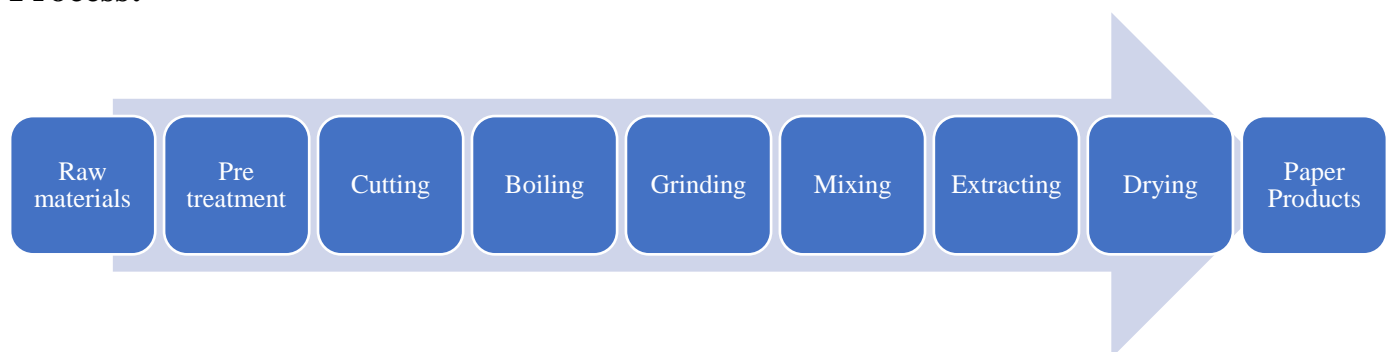


Fig. 1: Block Diagram of Paper Fabrication

The above block diagram describes the process, what we have carried out. Which involves number of steps like collecting the raw materials, treating it before cutting, then boiling the materials under specified temperature, grinding it till the hard material becomes softer. After the boiling process, the prepared pulp is combined with usual pulps then after mixing, only the uniform textured pulp is extracted into paper layers. Once after frame work it is sent for drying process. Further after drying it is moulded into different sizes and shapes according to the consumers need.

Results

In order to reduce the effects of environmental hazard, induced by imbalance in the ecosystem due to deforestation, the use of non-wood biomass is an option that can be adopted by paper mills. Non-wood biomasses such as agricultural residues and annual crops have amenable properties appropriate in the production of pulp and papers of high quality. They have similar characteristics to those obtained from paper woods. Non-wood biomasses are readily available and are cost-effective compared to wood materials. Development of efficient pulping and bleaching processes is required for easy production. Majority of the non-wood fibres have almost similar chemical and morphological properties of wood fibres. This makes them efficient and useful in the production of pulp with required qualities and for speciality papers. Fibres with higher lignin content are not readily pulped and therefore produce pulps with low yield.

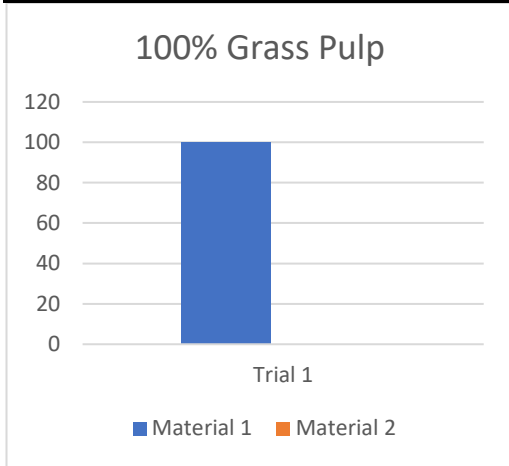
Sample data

Raw material 1: Grass

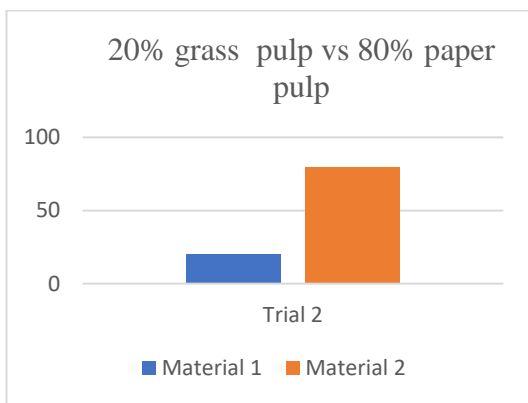
Raw Material 2: Used Paper

Sl. No	% of Raw material 1	% of Raw material 2	Thickness of paper
1	100	-	0.70
2	20	80	0.50
3	30	70	0.20

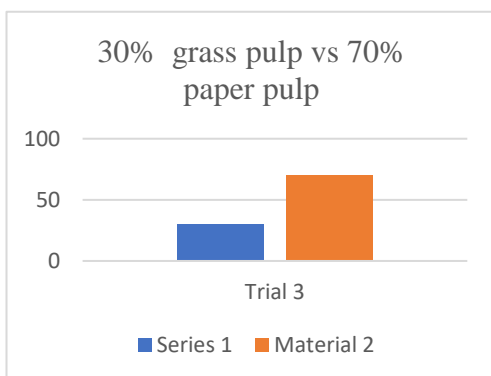
We carried out the paper making process by using the raw materials for different ratios and we measured for its thickness and stiffness as mentioned above and the fabricated paper with these ratios are shown below individually with its graphical representation of percentage of raw materials used.



Paper fabricated using grass as a raw material is shown in figure. Where we have used only the grass as a main raw material which is shown in graph. The paper is fabricated with 100% usage of grass fibers. This paper is tested for its thickness and it is found to be 0.7 mm.



The above graph represents the percentage of raw material used for fabricating paper. We have used 20% of pulp which contain grass and remaining 80% of pulp which is made up of used paper. This paper is tested for its stiffness and thickness and it is found to be 0.5mm.



The above graph represents the percentage of raw material used for fabricating paper. We have used 30% of pulp which contain grass and remaining 70% of pulp which is made up of used paper. This paper is tested for its stiffness and thickness and it is found to be 0.2mm.

Applications:**Fig. 2: Medical packet****Fig. 3: Envelope****Conclusion**

The main objective of this study was to establish the suitability of the banana stem fibre, areca, fruit fibre and grass etc., as a potential source of a lignocellulosic fibres for paper making. Paper making properties are characterised by low strength in banana fibre and it is high in grass. After undergoing the boiling process, the texture required for pulp making was high in grass. The permeability was very poor in banana fibre compared with other raw materials; the optical properties were found to be good in grass fibre. Because of the lowest quality of its pulp banana stem fibre is not suitable for fine paper making. However, there is a scope for future research to completely characterize the banana and grass fibre and facilitate proper application in paper or board industries.