INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue IV
March 2025
Available online at https://www.instabrightgazette.com

EVALUATING THE POTENTIAL OF COCONUT HUSK AS A SUSTAINABLE RAW MATERIAL FOR THE DEVELOPMENT OF ECO-FRIENDLY PARTICLE BOARDS

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ABSTRACT

The increasing use of wood in the construction and furniture sectors has led to deforestation and environmental degradation. This research examines the potential for coconut husk as a sustainable substitute for conventional wood-based particle boards. This research will produce a sustainable product while reducing farm waste by leveraging coconut husks' high lignin content for enhanced durability and moisture resistance. Some adhesives such as epoxy resin, silicone sealant, and wood glue were tested for their performance in producing long-term coconut husk particle boards.

A design of experimental nature was employed whereby collecting, processing, and manipulating coconut husks were done initially, followed by particle board production with different adhesives. In order to establish their mechanical properties, the boards underwent tests for durability like load carrying and impact testing. From the results obtained, particle boards produced with the use of silicone sealant turned out to possess greater strength than conventional wood-based particle boards despite those produced by using wood glue being

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the same. But epoxy resin is of low durability. These results reinforce the need to choose an adhesive in optimizing coconut husk particle board's structural integrity.

The research suggests that coconut husk particle boards, especially with silicone sealant, can be sustainable substitutes for conventional wood-based boards. Future research should be directed towards enhancing their strength by means of improved manufacturing processes and exploring biodegradable adhesives for added environmental advantages. More testing in different environmental conditions, including high humidity and fluctuating temperatures, also needs to be conducted to confirm their long-term sustainability in the furniture and building industries.