

## Development and Characterization of a Composite Material for Ceiling Board Construction Applications in Ethiopia

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**Abstract :** This research was aimed at reducing and recycling waste paper and sawdust from our environment, thereby reducing environmental pollution resulting from the management/disposal of these waste materials. In this research, some mechanical properties of composite ceiling board materials made from waste paper, sawdust, and pineapple leaf fibers were investigated to determine their suitability for use in low-cost construction work. The ceiling board was obtained from the waste of paper, sawdust chips, and pineapple leaf fibers by manual mechanical bonding techniques using dissolved polystyrene films as a binding agent. The results obtained showed that the water absorption values of between 6 % and 8.1 %; as well as density values of 500 kg/mm<sup>3</sup> and 611.1 kg/mm<sup>3</sup>. From our result, the better one is a ratio of pineapple leaf fiber 25%, sawdust 40%, binder 25%, and waste paper 10%. The composite ceiling boards were successfully nailed with firm grips. These values obtained were compared with those of the conventional ceiling boards and it was observed that these composite materials can be used for internal low-cost construction work and Insulation (acoustic and thermal) performance. It is highly recommended that small and medium enterprises be encouraged to venture into waste recycling and the production of these composite ceiling materials to create jobs for skilled and unskilled labor that are locally available.

**Keywords :** composite material, environment, textile, ceiling board

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