

DEVELOPING THERMAL INSULATION MATERIAL FROM WATER HYACINTH AND PLASTIC WASTE FOR APPLICATION IN SUSTAINABLE BUILDINGS

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BACKGROUND :

The use of water weeds (water hyacinth) and plastic waste as raw materials for thermal insulators is considered a major advantage for saving energy and the environment and has economic benefits. In this study, an environmentally friendly thermal insulator panel board was developed based on water hyacinth and plastic waste with two alternative binding materials, namely cement and resin. This panel board is expected to be a substitute material for wooden boards, the use of which is no longer encouraged because it can cause depletion of natural resources, deforestation, flooding, soil erosion, etc.

METHOD : This study monitors and compares the physical properties of various compositions between water hyacinth fiber and plastic as well as cement and resin binders, then compares them with other materials such as wooden boards, sawdust and glass walls.

RESULTS & DISCUSSION: The results showed that the panel board from the composition of water hyacinth, plastic and cement had a thermal conductivity value ranging from 0.0433-0.056 W/m oC. While the panel board from the composition of water hyacinth, plastic and resin had a thermal conductivity value ranging from 0.0236-0.0424 W/m oC. Both of these panels are close to commercial thermal conductivity values.

CONCLUSION : Thus, this environmentally friendly insulation material is a good candidate for sustainable thermal insulation in buildings.

KEYWORDS : Thermal insulation, Water Hyacinth, Plastic Waste, Physical Properties