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The drive for sustainability in material science has spurred interest in alternatives to synthetic fibres traditionally used in polymer composites. Our research focuses on natural fibres, specifically kenaf and Arenga pinnata, as eco-friendly reinforcements in polymer matrices. While it is well known that natural fibres generally offer lower mechanical properties than synthetic options like glass or carbon fibres, the environmental benefits of natural fibres are compelling. This research aims to showcase the practical potential of kenaf and Arenga pinnata fibres in applications where environmental sustainability is prioritized over maximum mechanical strength.

Our study demonstrates that kenaf and Arenga pinnata fibres can be effectively integrated into polymer composites, providing sufficient strength and durability for applications in industries such as packaging, furniture, and low-load-bearing structures. These natural fibres are renewable, biodegradable, and abundantly available, presenting an eco-

friendly alternative to synthetic fibres, which depend on non-renewable resources and contribute substantially to environmental waste.

This research addresses the rising demand for sustainable materials by demonstrating the environmental advantages of natural fibres. Adopting natural fibre composites reduces carbon emissions, promotes renewable resource use, and minimises waste through their biodegradability. As industries focus more on eco-friendly practices, natural fibre-reinforced polymers present a compelling, sustainable alternative to traditional composites.

Promoting natural fibres over synthetic alternatives aligns with global sustainability goals and supports a circular economy by reducing reliance on finite resources and minimising environmental impact. This research highlights the critical balance between material performance and environmental responsibility, demonstrating how sustainable choices in material science can drive meaningful change.

Advancing Sustainable Materials through Natural Fibre-Reinforced Polymer Composites

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