# ABSTRACT

The demand for more sustainable and durable construction materials has led to the development of Engineered Cementitious Composites (ECC), which exhibit enhanced mechanical properties, ductility, and crack resistance compared to conventional concrete. This study investigates the performance of ECC with a sustainable twist, where Polyvinyl Alcohol (PVA) fibre, traditionally used for improving the material's tensile strength, is replaced with Sisal fibre-a natural, renewable alternative. Sisal fibre, derived from the Agave plant, is eco-friendly and possesses promising mechanical characteristics. The primary objective of this research is to evaluate the effect of Sisal fibre on the fresh and hardened properties of ECC, including compressive strength, flexural strength, workability, and durability under various environmental conditions. A comprehensive experimental program is conducted, comparing ECC mixtures with varying Sisal fibre content to traditional PVA-based ECC. The results are analyzed to determine the feasibility of using Sisal fibre as a viable substitute for PVA fibre in ECC, with a focus on improving sustainability without compromising structural performance.