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STUDY ON PHYSICAL AND MECHANICAL PROPERTIES OF
Bambusa vulgaris AND *Dendrocalamus giganteus*
FOR POSSIBLE VALUE ADDITION IN INDUSTRIAL FLOORING

A PROJECT REPORT PRESENTED BY

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Submitted by P.Peratheepan for the degree of
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ABSTRACT

The study on physical and mechanical properties of available structural bamboos such as *Bambusa vulgaris* and *Dendrocalamus giganteus* were investigated for its suitability in industrial flooring. The variation of mechanical properties; modulus of rupture (MOR), Mode-I stress intensity factor (K_{IC}) and Young's modulus (E_C) against physical properties namely specific gravity (SG), moisture content and dimensional shrinkage as well as swelling along the bamboo culms for both experimental species were investigated.

The mean specific gravity of *B.vulgaris* and *D. giganteus* exhibited nearly equal value and are competent with some wood species. The moisture content in green condition was increased along the height of the culm and equilibrium moisture content was achieved near 120 °C in oven-dry for both experimental bamboo species. The mean shrinkage and swelling in radial direction is significantly higher than in tangential and very much higher than in longitudinal direction. Hence, *B.vulgaris* and *D.gigantius* behaved as anisotropic manner like wood. Dry basis moisture content is strongly correlated with radial as well as tangential shrinkage. The MOR: Specific MOR value in radial direction of *B.vulgaris* and *D.gigantius* were 17.26 MPa:18.24 MPa and 15.08 MPa:15.73 MPa respectively. The mean K_{IC} value of *B.vulgaris* and *D.gigantius* were 20.70 (MPa)m^{1/2} and 22.53 (MPa)m^{1/2} respectively. The E_C is increased rapidly along the culm of both experimental bamboo species. The mean E_C value of *B.vulgaris* and *D.gigantius* were found to be 32.03×10⁵ N/m² and 29.37×10⁵ N/m² respectively. Based on the preliminary investigations made on this study, *B.vulgaris* and *D.gigantius* hold great potential for value-addition utilization. Thus, it can provide a less expensive and high quality alternative to wood for industrial flooring applications.