VISVESVARAYA TECHNOLOGICAL UNIVERSITY

Belgaum-590 018

PROJECT REPORT

On

"BICYCLE MADE USING BAMBOO AND COMPOSITE MATERIALS"

Approved by "Karnataka State Council for Science and Technology" (KSCST) Bangalore for the sponsorship.

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BACHELOR OF ENGINEERING
IN
MECHANICAL ENGINEERING

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ABSTRACT

Indiscriminate infrastructural growth is leading to rapid environmental degradation. Steel, cement, synthetic polymers and metal alloys used for construction activities are energy intensive as well as cause environmental pollution during their entire life cycle. To address this issue, research on non-polluting materials and manufacturing processes have been taken up in the recent years. In this context, use of bamboo which is fast growing and ecologically friendly material for structural applications especially in a tropical country like India is being considered as quite appropriate. Studies show that steel requires 50 times more energy than bamboo to produce a material equivalent of 1 m^3 per unit stress. The tensile strength of bamboo is relatively high and can reach up to 370MPa. The weakest direction of bamboo is perpendicular to the axis and tangent to a circle or within the wall. This makes bamboo an attractive alternative to steel in tensile loading applications. This is due to the fact that the ratio of tensile strength to specific weight of bamboo is six times greater than that of steel. There are about 1500 species of bamboo. Some are much stronger than others. Matching the bamboo to the application makes for greater success. Bamboo bicycle are stiffer than many carbon frames, light weight, crash tolerant, and possess excellent vibration dampening. Bamboo also has the advantage of sustainable building material. It is grown mostly In Asia, but can also be grown domestically. It takes only about three years for a bamboo shoot to reach full-size. The Energy input required for bamboo Is significantly less than that for other common bicycle materials such as steel, aluminium, titanium, or carbon fibre .Additionally, the material is fully biodegradable.