A review on bamboo to use as an axially loaded column in low rise structures

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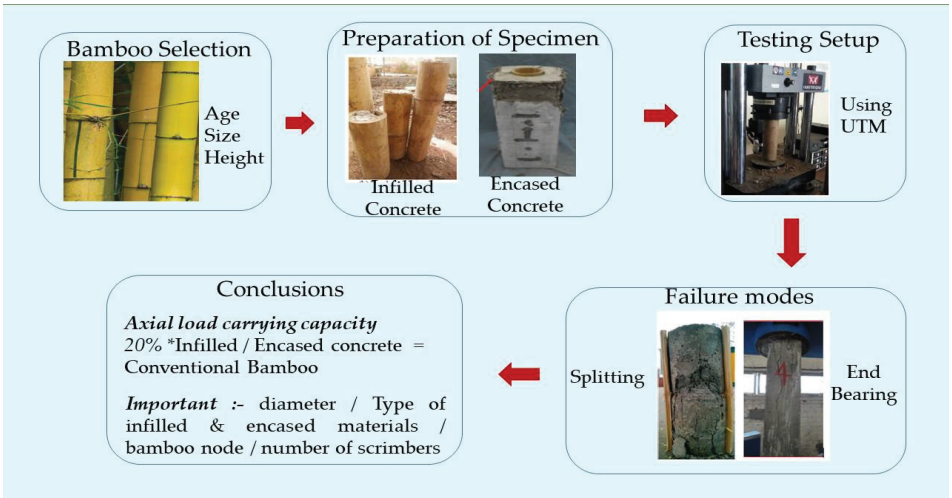

Bamboo has been used as a construction material, since ancient times and has a long tradition of being used as a structural material in the construction industry due to its availability and low cost. However, due to inadequate mechanical properties of bamboo, modern technologies should be identified to improve these properties to enhance the long durability and structural stability of them. Bamboo has not been used as structural column members, even in medium rise structures due to its low compressive and buckling strength under dynamic loads such as wind and seismic loads. Bamboo filled with concrete or cement mortar, infilled concrete with bamboo reinforcement and concrete encasement for bamboo column are some advanced techniques to improve these mechanical properties for long service life. Nowadays, steel reinforcement cost is very high and highly affect the construction industry. Therefore, adopting the bamboo reinforcement in low-rise structures with enhanced properties will be more beneficial for the sustainable environment. In the recent studies, splitting and end bearing failure modes have been identified under axial load and most of the bamboo filled with concrete column specimens failed due to splitting. This type of failure can be minimized by adding stiffeners to bamboo columns. Studies have shown that the axial load bearing capacity and initial stiffness of bamboo column depends on the properties of the infilled and encased materials.

Keywords: splitting, buckling, bamboo reinforcement, end bearing