International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 02 | Feb 2020 www.irjet.net p-ISSN: 2395-0072

Chemically Treated Bamboo to Replace Steel as a Reinforcement

Prof. Rashmi Pantawane[1], Monish Zade[2], Sanket Korde[3], Aditya Bhakre[4], Suyog Gabhane[5], Nikhil Kumeriya[6]

[1]Lecturer Department of Civil Engineering, Guru Nanak Institute of Technology, Nagpur.
[2,3,4,5,6]Student, Bachelor of Civil Engineering, Guru Nanak Institute of Technology, Nagpur

---

Abstract –Balco bamboo this is often the foremost Bamboos vulgaris species in India, has been chosen because the basis for the newly developed bamboo reinforced composite materials.Each every sample of bamboo we treated the bamboo during a chemical composition.Bamboo is economical, fast developing, and broad distribution of growth, is normal to contribute knowingly to earthquake-resistant construction and seismic retrofit technology within the developing countries.We even have been studied about the mechanical behavior of bamboo ferroconcrete member and illuminating the differences of structural properties from steel ferroconcrete and bamboo ferroconcrete.There are various paper we studied about the mechanical properties of bamboo reinforced

Key Words: Balco, Economical, Bamboo reinforced beam, earthquake resistance.

1. INTRODUCTION

Bamboo has shown great future for creating of multiple materials and modules which are cost- effective and may be successfully utilized for structural and non-structural applications in construction. Bamboo can be developed in large quantity with low cost and this will be economical for construction purpose. Bamboo is a flexible material with its high strength, workability and durability. Bamboohas high lastingness property **also** as compression property. We have mainly focused on the comparison of steel reinforcement and shear reinforcement by taking into consideration the bamboo as structural material for stirrups as well as reinforcement in beam and column. The objective of shear reinforcement by using as a structural member was to get a good as well as effective shear strength and flexural strength of bamboo in a beam. We used bamboo stirrups for reinforcing bamboo beam. Bamboo has a high tensile strength as compared to steel bars. According to this paper bamboo has a high compression property as compared to steel and the compression strength of bamboo is 168 KN. Bamboo is generally used as structural material but it is also used in construction of bridges, scaffolding and housing. In this paper we compare the result of flexural strength between steel reinforced concrete and bamboo reinforced concrete beam.

Before you start to format your paper, first write and save the content as a separate document. Keep your text and graphic files separate until after the text has been formatted and styled. Do not use hard tabs, and limit use of hard returns to just one return at the top of a paragraph. Do not add any quite pagination anywhere within the paper. Do not number text heads-the template will do this for you.

Finally, complete content and organizational editing before formatting. Please note of the subsequent items when proofreading spelling and grammar: Bamboo as a building material is used for the construction of scaffolding, bridges and structures, houses. Due to a distinctive rhizome-dependent system, bamboos are one of the fastest-growing plants in the world and their growth is three times faster than most other species of plants. Bamboo can be utilized as a building material for scaffolding, bridges, houses and buildings. Bamboo, like true wood, is a natural composite material with a high strength-to-weight ratio useful for structures. ... Bamboos are some of the fastest-growing plants in the world, due to a unique rhizome-dependent system. It has greater tensile strength (or resistance to being pulled apart) than steel, and it withstands compression better than concrete. ... Bamboo's strength is in its abil ity to bend, and that's the miracle." The Western mind is also opening to bamboo's environmental qualities. Bamboo actually has a greater tensile strength than steel. It is also much cheaper to use, and completely environmentally friendly.

2. LITERATURE REVIEW

Experimental Study on Flexural Element using Bamboo as Reinforcement, Nirav B. Siddhpuraa , Deep B. Shaha , Jai V. Kapadiaa , Chetan S. Agrawala and Jigar K. Sevaliaa ,Vol.3, No.2 (June 2013): According to this paper , Bamboo is used as a construction material from the earlier times due to its advantageous and versatile properties. As it is sweet in tension

and bending properties it's drawn the eye of researchers to use it as reinforcement in cement concrete. This study reflects about the usefulness of Bamboo as a support in flexural element. Various surface coatings on the Bamboo are given and therefore the reinforcement cage has been prepared using the Bamboo stirrups. The flexural test was performed on the beam elements. Modulus of Elasticity has been calculated.

Strength properties of bamboo and steel ferroconcrete containing manufactured sand and mineral admixtures, S. Karthik, P. Ram Mohan Rao, P.O. Awoyera, 2017: According to this paper, the study showed that a combination of fly ash, GGBS and m-sand used as alternative materials in concrete improves the compressive and split tensile strengths. Under flexural loading, performance of bamboo ferroconcrete (BRC) made with alternative materials (fly ash, GGBS, and m-sand) was significantly low compared to BRC containing conventional materials. In addition, BRC made with conventional materials developed more flexural strength than the SRC, with a variation representing 6.5%strengthgain.

Bamboo as reinforcement in structural concrete elements Khosrow Ghavami Received 26 September 2003; accepted 4 June 2004 It is a incontrovertible fact that the development industry is that the main consumer of energy and materials in most countries. The pursuit of sustainable development, defined within the 3Brundtland Report 1987 as ''development that meets the requirements of this without compromising the power of future generations to satisfy their owned'', has become a major issue when trying to meet the challenges in providing proper housing for the ever-increasing world population. It is a fact that the construction industry is the main consumer of energy and materials in most countries. The pursuit of sustainable development, defined within the 3Brundtland Report 1987 as ''development that meets requirements of this without compromising the power of future generations to satisfy their owned'', has become a major issue when trying to meet the challenges in providing proper housing for the ever-increasing world population.

According to this paper, the study showed that a combination of fly ash, GGBS and m-sand used as alternative materials in concrete improves the compressive and split tensile strengths. Under flexural loading, performance of bamboo ferroconcrete (BRC) made with alternative materials (fly ash, GGBS, and m-sand) was significantly low compared to BRC containing conventional materials.

In addition, BRC made with conventional materials developed more flexural strength than the SRC, with a variation representing 6.5% strength gain.

3. CONCLUSION

After the study of literature review available broad research through the use of bamboo as a reinforcement in concrete is being agreed. It is recognized that the bamboo can suitably replace the steel for the modest housing for the urban poor areas who live close to bamboo regions. It is a good idea for low cost cheap structures, as it is a naturally or easily available material. The bamboo can be used as ecofriendly. It is economical or cheap for the poor peoples who cannot afford the high cost houses. The results obtained can accomplish that replacement of steel with bamboo stirrups as a shear reinforcement as well as by comparison of steel with bamboo stirrups can give shear and flexural strength of bamboo than the strength of steel.

4. REFERENCES

1. Md. Motiur Rahman, Tahmina Tasnim Nahar, (2015), "Strengthening of RCC Beams Using Bamboo Sticks", Civil Engineering Department, Pabna University of science and Technology, pabna, Bangl

2. I.k.khan (june 2014), "Performance of Bamboo Reinforced Concrete Beam", International journal of science, environment and technology vol 3.

3. Chandra Abnaki, Madhwanti .latkar and utpal Sharma(2013),"Can bamboo replace steel as a reinforcement in concrete, for the key structural elements in a 1.Chetan Agrawal, Jai Kapadia, Deep B. Shah, (April2013), "Study on bamboo as reinforcement in Cement Concrete", engineering Department, Sarvajanik College of Engineering and technology, surat, Gujrat.

4. Ajinkya Kaware, Prof. M.R.Wakchaure, Prof.U.R.Awari, (June2013), "REVIEW OF BAMBOO AS REINFORCEMENT MATERIAL IN CONCRETE STRUCTURE", engineering Department, A.IS.S.M.SC.O.E. Pune, Maharastra, India. Low cost house", International journal of chemicals, environmental and biological sciences vol 1.

5. Jigar K. Sevalia, Chetan S. Agrawal (March-April 2013), "Study on bamboo as reinforcement in cement concrete", International journal of engineering research.

6. Leena Khare (Dec 2005), "Performance evaluation of bamboo reinforced concrete beams", the university of texas at arlington. T. A. I. Akeju and F. Falade (2001), 'Utilization of Bamboo as Reinforcement in Concrete for Low-cost Housing', Proceedings, International Conference on Structural Engineering, Mechanics and Computation, Cape Town, South Africa , 2-4 April 2001, pp 1463-1470.

7. F. Falade and T. A. I. Akeju (1997). 'The Potential of Bamboo as Construction Material' Fourth Int. Congress on Structural Engineering Analysis and Modeling (SEAM 4) – Ghana 9-11 September, 1997, pp. 447-460