

## BUILDING GUADUA BAMBOO PEDESTRIAN BRIDGES IN COLOMBIA

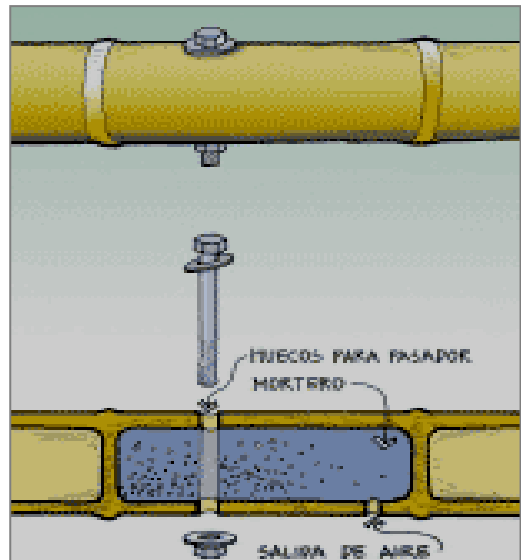
One of the articles published in the bookmarks of the [INBAR \*International Network of Bamboo & Rattan\*](#) presents the experience of Colombia in building pedestrian bridges with bamboo. The article highlights how these innovative constructions not only make possible to cross rivers and roads, but also show how competitive this material is in ecological engineering.

Colombia associated to the INBAR Network since its constituency in 1999. Colombia has the [highest woody bamboo diversity](#) in Latin America after Brazil. The country is also recognized at international level for having increased the [knowledge on the native \*Guadua angustifolia\* bamboo](#) and for its uses in construction technologies capable of responding to modern demands.

Since ancient times Colombian carpenters were used to build bridges with *Guadua* to cross rivers, especially in the areas where the bamboo grows, in the Departments of Quindío, Risaralda, Caldas, Tolima, Valle del Cauca, Cundinamarca and Santander. The constructions combine the arch of the bridge made with *Guadua*, with straps of the same material tied to piles or trees of the place. Those structures are still being built and traditional know-how is being even more valued thanks to innovations that permit to apply the *Guadua* properties to bigger and more resistant buildings.

[The Colombian architect Simón Vélez](#) contributed with one of the innovative techniques of great relevance and recognized worldwide. In spite of being a constructive material of great resistance, the limitation of the *Guadua* is that it is hollow and the architect found out how to make structural joints by injecting concrete in bamboo's knots, obtaining incredible results. Since this discovery Simón Vélez makes use of *Guadua*, the so called *vegetal steel*, to realize works of great dimensions and beauty. His buildings, internationally awarded, are constructed in Colombia, Germany, France, USA, Brazil, Mexico, China, Jamaica, Panama, Ecuador, and India.

An interesting monographic issue of the [Cátedra de diseño arquitectónico de la Universidad Nacional de Rosario](#) in Argentina presents diverse applications of the innovative building technique created by Simón Vélez. This technology has also allowed to open a new phase in the construction of *Guadua* bridges in Colombia. The method of mortar filling the hollow stems and anchor them with bolts eliminates the problem of joining the pieces with natural fibres, whose lifespan is weakened by the action of weather, putting the whole structure at risk. Local carpenters quickly adopted the technique of attaching one



bamboo to another by fastening and engineers opened a new phase in the design of bridges that combine natural and industrial materials, to cross rivers and overcome natural obstacles in rural areas and to cross the streets in urban areas.

The article published by [INBAR and the Magazine Tecnología en Marcha](#) shows some structural features of the new *Guadua* bridges, as for example the bridge designed by the German architect [Jörg Stamm built in the town of Cúcuta](#). Stamm also designed the bridge built at the Technological University of Pereira, in addition to collaborating in training activities of this university and other Colombian institutions for the constructions with *Guadua*.

Simón Vélez made the design for the [construction of the bridge of Guadua Jenny Garzón in the city of Bogotá](#). The distance between the support ramps reaches 45.60 m and the average height is 5.80 m. The bridge has been realized in cooperation with the Institute of Urban Development, [Bambú de Colombia S.A.](#) and the National Training Institute SENA. To build the bridge workers were hired from the territories where there is experience of constructions in *Guadua*. The SENA Institute contributed to the training of workforce skilled in assembling the structure.

A wide range of Colombian institutions, organizations, universities and local governments carry out experimental projects and research using the *Guadua* in the construction of bridges and other works of public interest. These projects provide new technological solutions that allow to maximize the extraordinary properties of the *Guadua*, adapting the design of each bridge to the required functions and to the geological and topographic characteristics of each territory.

The investment made by international renowned architects and by all these actors had the results that *Guadua* is no longer considered as a solution for the poorest areas and peasants. This natural product available in the country has many environmental benefits (functions as carbon sinks, produce oxygen), is renewable and extremely resistant; combined with other materials it allows to construct works of high quality that are inserted harmoniously in the landscapes and that exalt their beauty.

The experts see the production of laminates of *Guadua* to supply the country's demand in terms of quality and quantity, as the next step to take full advantage of its exceptional characteristics in all types of constructions. The experts also emphasize the need to improve the cultivation of *Guadua* and its rational and sustainable use.

The following articles show different experiences with construction of *Guadua* bridges in Colombia and they mention the main advantages of using this material to protect and enhance the resources of the environment and to develop ecological engineering.

#### To know more

[Bambú Guadua and pedestrian bridges - Dialnet](#)

[Document in Revista ibp.co.cu](#)

[Simon Velez website](#)



[Ecobamboo.net](http://Ecobamboo.net)

[Document in fceia.unr.edu.ar](http://Document.in.fceia.unr.edu.ar)

[Article in construdata.com](http://Article.in.construdata.com)

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[Bambu de Colombia S.A.sitio web](http://Bambu.de.Colombia.S.A.sitio.web)

[Sociedad Colombiana de Bambú](http://Sociedad.Colombiana.de.Bambú)

[SimposioRedsibguadua2015](http://SimposioRedsibguadua2015)

[Guaduabamboo.com website](http://Guaduabamboo.com.website)

