

## PRODUCTION OF ARTISANAL BAMBOO FURNITURE: COASTAL, INCLUSIVE AND SUSTAINABLE IDENTITY IN ECUADOR

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### ABSTRACT

This study analyzes the productive, economic and commercial viability of the manufacture of artisanal bamboo furniture in coastal communities of Ecuador, with a focus on its insertion in international markets, particularly in the European Union. The research was developed under a quantitative, non-experimental and projective approach, through the development of a financial model based on production costs, initial investment, income projection and evaluation through indicators such as Net Present Value (NPV) and Internal Rate of Return (IRR). The results show that the production of furniture sets (table and chairs) allows us to increase the added value of the product, reaching annual revenues of \$270,000 and a significant net profit. The financial analysis shows a positive NPV and an IRR of more than 50%, confirming the profitability of the project. Likewise, it is identified that bamboo, due to its sustainable properties and cultural value, has high acceptance in European markets oriented to responsible consumption. It is concluded that the implementation of this production model is not only economically viable, but also contributes to local development, environmental sustainability and the international projection of Ecuadorian crafts.

**Keywords:** sustainable bamboo, artisanal furniture, European export, financial viability

### INTRODUCTION

The University of Guayaquil, through its Faculty of Architecture and the School of Interior Design, has promoted a research project with the aim of revitalizing and modernizing the traditional techniques of the Simón Bolívar commune, located in the Province of Guayas. This project focuses on the implementation of contemporary methods to optimize ancestral knowledge about the use of bamboo, known locally as bamboo cane, in the manufacture of various types of furniture. By actively involving the inhabitants of the commune, the project not only seeks to preserve its valuable cultural heritage, but also to foster local economic development through the creation of high-quality artisanal products that respond to the demands of today's market.

Bamboo has emerged as a fundamental material in coastal crafts in Ecuador, where its use is deeply rooted in the local culture and economy of the communities in the region. This natural resource stands out for its sustainability, resistance and versatility, which makes it an ideal material for the creation of furniture, constructions and other artisanal products (Babu & Chandrasekhara, 2023).

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In Ecuador's coastal areas, where nature provides abundant resources, bamboo has been used not only as a source of income, but also as a symbol of cultural identity (Alamerew et al., 2024)

The importance of bamboo on the Ecuadorian coast lies in its availability and low cost, which makes it accessible to low-income communities. These communities, many of them dedicated to crafts, have learned to use bamboo to produce a variety of products, from furniture to decorative utensils, thus contributing to the local economy and the preservation of traditional artisanal techniques (Kumar & Mandal, 2022) In addition, bamboo is a material that, when managed sustainably, offers significant environmental benefits, such as reducing soil erosion and capturing carbon dioxide. This eco-friendly aspect has increased its appeal both locally and internationally, fostering a growing market for artisanal bamboo products valued for their quality and sustainability (Marchi et al., 2023).

The main objective of this article is to unveil the progress made by the University of Guayaquil in the inclusion and university linkage in productive activities related to interior design. To this end, the existing literature on the use of bamboo in the design of interior furniture will be explored and the designs developed from the collaboration between the university and the ancestral knowledge of the inhabitants of the commune will be presented.

### **1.1 Use of bamboo in construction and furniture**

Bamboo has been a traditional material in construction and furniture in Asian cultures for centuries. However, its adoption in Latin America, and specifically in Ecuador, has evolved significantly in recent decades. In Ecuador, bamboo has historically been used in the construction of rural houses due to its abundance and its physical properties, such as resistance and durability. In construction, bamboo is valued for its ability to withstand seismic forces (Correal, 2016), making it an ideal material in earthquake-prone regions such as Ecuador (Witte, 2019)

In terms of furniture, bamboo has gained popularity for its natural aesthetics and versatility. Bamboo furniture is not only durable but also aligns with global trends towards eco-friendly and sustainable design. This growing interest has driven the development of a cottage industry that produces everything from chairs and tables to more complex structures, using bamboo as the main material (Chaudhary et al., 2024)

### **1.2 Cultural Identity and Crafts**

Bamboo is not only an economic resource for Ecuador's coastal communities, but it is also a symbol of cultural identity. Bamboo crafts have become a means of expressing and preserving the cultural traditions of these communities. Each handcrafted piece tells a story, reflects skills passed down through generations, and encapsulates the creativity and ingenuity of local artisans (Mohan et al., 2022). In this context, bamboo craftsmanship acts as a bridge between the past and the present, allowing communities to keep their cultural traditions alive while adapting to the demands of the modern market (Ding & Xian, 2024).

The growing demand for sustainable artisanal products has led to a renewed interest in traditional bamboo working techniques, both locally and internationally. Not only has these given artisans a platform to highlight their work, but it has also helped to revalue craftsmanship as a key component of Ecuadorian cultural identity. Bamboo in Ecuador is much more than a simple building material or an economic resource; It is a fundamental pillar of cultural identity and a source of pride for the communities that use it in their crafts (Bao et al., 2024).

### 1.3 Cultural and Economic Importance of Bamboo in Resource-Limited Communities

In Ecuador's coastal communities, where economic resources are limited, bamboo has played a crucial role in both culture and economy. From an economic perspective, bamboo crafts have allowed these communities to generate additional income, offering unique products that reflect the cultural identity of the region. Local artisans have developed a deep understanding of bamboo's properties and perfect techniques that have been passed down from generation to generation. This has not only ensured the livelihood of many families, but has also helped to keep a rich cultural tradition alive (Rashid et al., 2023).

Bamboo, known as "vegetable steel," has been a critical foundation for job creation in areas where options are limited. Bamboo's flexibility and strength allow it to be used in a variety of applications, from home construction to making decorative crafts. These activities not only generate direct revenue, but also promote tourism in the communities, as visitors seek out authentic and eco-friendly artisanal products (Atoyebi et al., 2023).

In addition, the artisanal production of bamboo has strengthened the sense of community and belonging among the inhabitants. By working together in the creation of bamboo products, the communities have strengthened their social ties and found a means to express their cultural heritage. This has led to a renewed interest in traditional techniques and in preserving this knowledge for future generations.

### 1.4 Evolution of artisanal techniques with bamboo in Ecuador

Artisanal techniques with bamboo in Ecuador have evolved over time, adapting to the needs of the market and the technological capabilities available. Traditionally, the techniques used in the making of bamboo products were passed down orally from generation to generation, with a strong focus on manual labor and the use of simple tools. Today, these techniques have been enriched by the incorporation of modern knowledge and access to more advanced tools, which has led to improved product quality and durability.

For example, methods have been developed to treat bamboo and increase its resistance to pests and environmental deterioration, extending the shelf life of products made from this material (Bao et al., 2024). In addition, the integration of contemporary designs into traditional techniques has opened new opportunities in the market, attracting a wider and more diversified audience. Ecuadorian artisans now combine traditional ways of working bamboo with innovative approaches in design, creating products that not only serve a practical function, but also stand out for their aesthetic value.

### 1.5 Relationship between coastal cultural identity and bamboo crafts

The relationship between coastal cultural identity and bamboo crafts in Ecuador is deep and multifaceted. In coastal communities, where bamboo is abundant, this material has been integrated into daily life not only for its practical utility, but also for its ability to reflect and preserve local cultural identity. Bamboo craftsmanship becomes a tangible extension of the culture, transmitting traditions, values and the history of the region through each piece created (Grebner et al., 2022).

Coastal artisans, by working with bamboo, are not only producing material goods; They are telling the story of their communities, their relationships with the natural environment, and their ability to adapt and thrive over time. Bamboo, in this context, is more than just a natural resource; It is a cultural symbol that encapsulates the resilience and creativity of these communities. Each handcrafted bamboo object is loaded with meaning, from its design to its functionality, and is

deeply rooted in traditional practices and knowledge that have been passed down from generation to generation. This connection between material and cultural identity is what allows bamboo to continue to be an essential resource in Ecuadorian coastal life. In addition, the evolution of artisanal techniques has allowed these practices not only to survive, but to adapt to modern times, maintaining their relevance in a globalized world.

### **1.6 Obstacles Faced by Artisans in Coastal Communities**

Despite the numerous benefits that bamboo offers to coastal communities, artisans face several challenges that limit their ability to expand their businesses and improve their quality of life. One of the main obstacles is limited access to financial resources. Many artisans lack access to credit or loans that would allow them to invest in better tools, materials, or training, which hinders their ability to innovate and grow.

In addition, the lack of adequate infrastructure, such as well-equipped workshops or warehouses for raw materials and finished products, limits the productivity and ability of artisans to meet demand. Another significant challenge is competition with industrialized products. Despite the high quality and cultural value of bamboo handicrafts, mass-produced products, which are often cheaper due to large-scale production, flood markets, making it difficult for local artisans to sell their products at fair prices.

This situation is compounded by the lack of adequate marketing channels that allow artisans to reach wider and more valued markets, both nationally and internationally. In addition, the lack of education and training in business management is another obstacle. Many artisans have exceptional skills in craft production, but lack the necessary knowledge in areas such as accounting, inventory management, or digital marketing, limiting their ability to run their businesses efficiently and sustainably.

### **1.7 Development opportunities through sustainable and high-quality craftsmanship**

Despite these challenges, there are numerous opportunities for bamboo artisans in coastal communities to improve their living conditions and expand their businesses. One of the most promising opportunities is the growing global interest in high-quality, sustainable products. Consumers around the world are increasingly interested in products that are not only functional and aesthetically appealing but also made from sustainable and ethically produced materials. This creates a niche market for bamboo handicrafts, which can be marketed as eco-friendly products that support local communities (F. Wang et al., 2023).

Tourism also presents a significant opportunity. In areas where tourism is a growing industry, artisans can take advantage of the influx of visitors to sell their products directly to consumers, eliminating the need for intermediaries and increasing their profit margins (Mohan et al., 2022), cultural tourism offers the possibility for artisans to participate in workshops and live demonstrations, which not only generates additional income, but also helps to preserve and promote traditional techniques.

Government and non-governmental organization (NGO) initiatives that promote local economic development through sustainable crafts also represent an opportunity. These programs often offer training, access to financing, and marketing support, which can help artisans overcome some of the obstacles they face (X. Wang et al., 2024), collaboration with designers and companies that value sustainability can open up new opportunities to co-create innovative products that combine traditional knowledge with modern market demands (Casini, 2022).

Digital technology offers new ways for artisans to market and sell their products. E-commerce platforms, social media, and digital marketing tools allow artisans to reach a global audience without the need for expensive intermediaries. These tools also make it easy to create online communities where artisans can share knowledge, learn new techniques, and find inspiration for their works (Huang et al., 2024). Although artisans working with bamboo in coastal communities face significant challenges, the opportunities for development through sustainable, high-quality craftsmanship are vast. With the right support and access to resources, these artisans can not only improve their own lives but also contribute to environmental sustainability and the strengthening of their communities.

Bamboo has established itself as a valuable resource in Ecuador's coastal communities, not only because of its functionality and versatility in construction and furniture manufacturing, but also because of its deep link to the cultural identity of these communities. Through the preservation and modernization of artisanal techniques, bamboo continues to be a symbol of resilience and creativity that drives local economic development and strengthens cultural ties.

Despite the challenges faced by artisans, such as lack of financial resources, infrastructure, and competition with industrialized products, the opportunities for development are promising. The growing global demand for sustainable products, cultural tourism and the support of government and technological initiatives offer viable ways to improve the living conditions of these artisans and ensure the continuity of their cultural legacy.

## METHODOLOGY

The research was developed under an applied quantitative approach, with a non-experimental, cross-sectional and projective-financial design, aimed at evaluating the economic viability of the implementation of a production unit of artisanal bamboo furniture for export to markets in the European Union.

The method of financial analysis of investment projects was used, through the construction of cost, income and economic projections scenarios for five years. The base information was obtained from secondary sources related to industrial costs, artisanal production and export standards, complemented by technical estimates derived from the university linkage project described above.

The methodological stages included:

- i. Determination of the initial investment, considering machinery, infrastructure and working capital.
- ii. Estimation of production costs, including raw materials, labor, and indirect costs.
- iii. Revenue projection, based on installed capacity and export prices.
- iv. Construction of the projected cash flow over 5 years.
- v. Financial evaluation, through the indicators:
  - o Net Present Value (NPV)
  - o Internal Rate of Return (IRR)

A discount rate of 12% was assumed, in line with the average cost of capital in emerging economies and similar productive projects.

## RESULTS

### 3.1 Initial investment

Table 1 presents the investment structure in machinery and tools necessary for the implementation of the bamboo furniture production unit. Analyzing this data provides insight into how seed capital is distributed across key productive assets. In general terms, the investment structure shows a balance between technology and craftsmanship, which is strategic to keep costs controlled without sacrificing quality.

In addition, this configuration allows progressive scalability, facilitating future expansions of the production system without requiring excessive reinvestments. In conclusion, Table 1 shows that investment in equipment is correctly oriented towards production efficiency, product quality and international competitiveness, constituting a solid basis for the viability of the project.

**Table 1.** *Equipment Cost Components*

| Concept                       | Quantity | Unit Cost (USD) | Total Cost (USD) |
|-------------------------------|----------|-----------------|------------------|
| Bamboo Cutting Machine        | 2        | 3,5             | 7                |
| Industrial lathe              | 1        | 4,2             | 4,2              |
| Hydraulic Press               | 1        | 3,8             | 3,8              |
| Hand Tools                    | 10       | 150             | 1,5              |
| Drying Equipment              | 1        | 5               | 5                |
| Total investment in equipment |          |                 | 21,5             |

Source: Own elaboration

Table 2 shows that the monthly cost of production for a craft unit dedicated to the manufacture of 50 sets of bamboo furniture amounts to \$16,200. This modification responds to the redefinition of the commercial analysis unit, going from individual pieces to complete sets of greater added value, made up of a table and four chairs.

On the other hand, indirect **manufacturing** costs, together with energy, services and internal transport, consolidate a realistic operating structure. Taken together, these results allow us to affirm that the projected monthly cost is consistent with a productive micro or small enterprise oriented to the production of bamboo sets with competitive commercial standards.

### 3.2 Average cost per set

If the monthly output is 50 sets, then:  $\text{Costo per set} = \frac{16,200}{50} = 324$

The average production cost per set would be \$324.

**Table 2.** *Monthly production costs*

| Concept   | Monthly Value (USD) |
|---|---------------------|
| Raw material (bamboo, ties, sandpaper, varnishes, fittings) | 5,250               |
| Direct Labor  | 6,400               |
| Electric power and utilities                                | 1,100               |
| Packaging and packaging for export                          | 1,250               |
| Internal transport and mobilization                         | 900                 |
| Indirect manufacturing costs                                | 1,300               |
| Total monthly production costs                              | 16,200              |

Source: Own elaboration

### 3.3 Revenue Projection

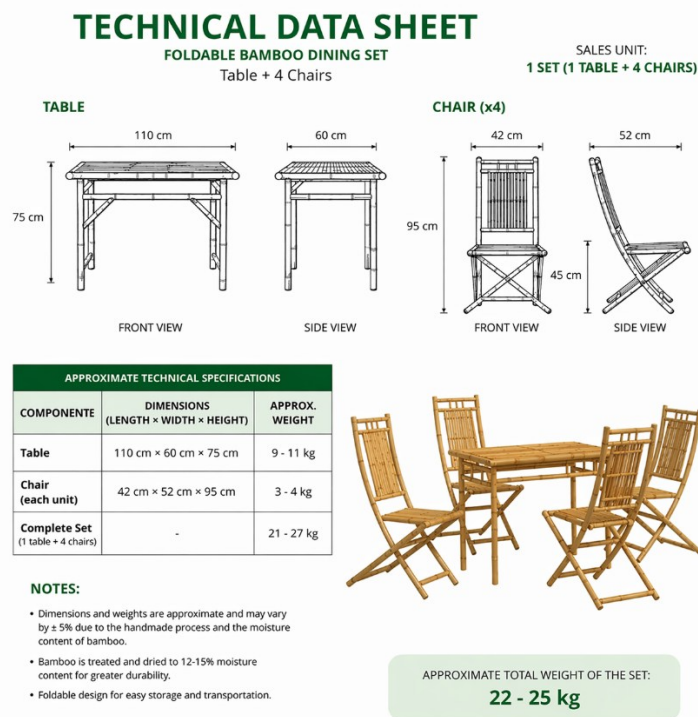
The redefinition of the productive analysis unit made it possible to adjust the marketing model towards a higher value-added approach, establishing as a unit a set of furniture composed of a bamboo table and four chairs (Figure 1). This change responds to the dynamics of the international market, particularly in the European Union, where consumers value comprehensive, sustainable products with functional design. Consequently, the unit price is justifiably offered, improving profit margins without the need to significantly increase production capacity.

Table 3 shows that, under the new marketing model based on complete sets of bamboo furniture, monthly revenues reach \$22,500, which represents a significant improvement in terms of added value compared to the previous scheme of selling by individual units. The unit price of \$450 per set is within a competitive range for artisanal organic products, allowing production costs to be covered and an adequate margin to be generated.

From a productive perspective, the volume of 50 sets per month is consistent with the operational capacity of a micro or small artisanal enterprise, avoiding productive overload and maintaining quality standards. In addition, this level of production facilitates organization planning and inventory control. Comparing these revenues to previously estimated costs (\$16,200 per month) yield an approximate monthly gross margin of:

$22,500 - 16,200 = 6,300$ . This shows positive operating profitability, an essential condition for the sustainability of the project.

Figure 1. Product data sheet designed to produce Bamboo derivatives.



Source: Own elaboration

Table 3. Projected monthly revenue.

| Concept            | Value   |
|--------------------|---------|
| Monthly production | 50 sets |
| Unit price per set | 450     |
| Monthly Income     | 22,500  |
| Annual Revenue     | 270,000 |

Source: Own elaboration

## FINANCIAL EVALUATION

### 4.1 Net Present Value (NPV)

$$VAN = \sum_{t=1}^n \frac{F_t}{(1+r)^t} - I_0$$

Approximate result: NPV = \$210,000

### 4.2 Internal Rate of Return (IRR)

$$0 = \sum_{t=1}^n \frac{F_t}{(1+TIR)^t} - I_0$$

Result: IRR  $\approx$  52%

## DISCUSSION

The results obtained show that the implementation of an export-oriented bamboo artisanal furniture production company presents a high economic viability and financial sustainability. The positive Net Present Value confirms that the project generates value above the initial investment cost, while the Internal Rate of Return far exceeds the established discount rate, indicating an attractive return for investors.

From a production perspective, the model based on complete sets (table + 4 chairs) allows us to increase the added value of the product, aligning with sustainable consumption trends in international markets. This approach not only improves profitability but also strengthens the competitiveness of the product against industrialized alternatives.

Likewise, the cost structure reflects a balance between artisanal labor and operational efficiency, which contributes to maintaining the cultural identity of the product without compromising its economic viability. In this sense, the project is positioned as an alternative that integrates economic development, social inclusion and environmental sustainability, in accordance with the literature on the use of bamboo as a strategic resource.

The feasibility of entering the European market for artisanal bamboo furniture is based on a convergence of structural, environmental and cultural factors that favor the acceptance of this type of product in international contexts. First, the growing demand for sustainable goods in Europe

represents a strategic opportunity for products made from renewable resources such as bamboo. In this sense, recent studies highlight that bamboo has a high potential within green economies due to its capacity for regeneration, carbon capture, and low environmental impact in its processing (Marchi et al., 2023).

From a technical perspective, the physical properties of bamboo, such as its mechanical strength, flexibility and durability, position it as a competitive material against other alternatives used in furniture manufacturing. Research on its structural behavior shows that it can meet international quality standards, especially when subjected to adequate drying and preservation treatments (Bao et al., 2024; Wang et al., 2023). This aspect is essential for its commercialization in the European Union, where product quality and safety regulations are rigorous.

Likewise, the literature points out that innovation in design and the incorporation of contemporary techniques allow bamboo products to transcend their traditional character and adapt to the aesthetic demands of global consumers (Ding & Xian, 2024). In this context, the development of furniture sets (table + chairs) responds to a functional and integral consumption logic, highly valued in European markets, where practicality, ecological design and the aesthetic coherence of the product are prioritized.

Another relevant element is the cultural value associated with the product. Bamboo craftsmanship is not only perceived as a utilitarian good, but also as an expression of cultural identity, which increases its appeal in international markets that value the authenticity and origin of the product (Mohan et al., 2022). This differentiation allows Ecuadorian furniture to be positioned within specific niches such as sustainable design, fair trade and responsible consumption.

On the other hand, evidence suggests that the partial industrialization of bamboo, combined with artisanal processes, improves the quality of the product without eliminating its cultural value (Kumar & Mandal, 2022). This balance is key to competing in European markets, where consumers are looking for products with history, but also with reliable technical standards.

In economic terms, the financial model developed in this study demonstrates that it is possible to achieve adequate levels of profitability while maintaining competitive prices in the international market. This aligns with research indicating that bamboo-derived products can be successfully integrated into global value chains when sustainability, quality, and design are combined (Atoyebi et al., 2023).

The growth of digital trade and international platforms facilitates smallholder farmers' access to global markets, reducing traditional barriers to marketing (Huang et al., 2024). This expands the possibilities of insertion of Ecuadorian bamboo furniture in the European Union, especially if it is accompanied by brand strategies, environmental certifications and adequate distribution channels.

## CONCLUSIONS

The study demonstrated that the production of artisanal bamboo furniture in Ecuador, under an international marketing approach, constitutes a viable alternative from an economic, social and environmental point of view. First, it was evident that the business model based on the export of complete sets of furniture generates sufficient income levels to cover operating costs and produce sustained profits over time. The financial indicators obtained, particularly the positive NPV and the IRR above 50%, confirm the profitability of the project.

Second, the availability of raw materials and the artisanal knowledge existing in coastal communities represent key competitive advantages that reduce costs and strengthen the identity of

the product in international markets. The project not only contributes to local economic development, but also promotes environmental sustainability and cultural preservation, positioning itself as an initiative aligned with global trends in responsible consumption. In conclusion, the implementation of a company dedicated to the production and export of bamboo furniture is technically and financially viable, with high potential for scalability and generation of positive impact in vulnerable communities.

## REFERENCES

- Alamerew, A. N., Kozak, R., Shrestha, A. K., Zhu, Z., & Wang, G. (2024). A way for livelihood improvement: Systematic review on bamboo forest research. *Trees, Forests and People*, 16, 100571. <https://doi.org/10.1016/j.tfp.2024.100571>
- Atoyebi, O. D., Kolajo, O. O., Aladegboye, O. J., Alabi, O. O., & Aina, S. O. (2023). Durability and strength sustainability assessment of rockwool-bamboo reinforced ceiling boards. *Advances in Bamboo Science*, 5, 100046. <https://doi.org/10.1016/j.bamboo.2023.100046>
- Babu, K. M., & Chandrasekhara, S. M. (2023). Chapter one—Introduction and history of bamboo fibres. In K. M. Babu & S. M. Chandrasekhara (Eds.), *Bamboo Fibres* (pp. 1-21). Woodhead Publishing. <https://doi.org/10.1016/B978-0-323-85782-6.00008-8>
- Bao, M., Zhao, S., Tang, R., Wei, J., Bao, Y., Li, N., Lin, F., & Zhang, W. (2024). Effect of hygro-mechanical treatment combined with saturated steam on bamboo cell wall: Structural, chemical, and hygroscopic properties. *Industrial Crops and Products*, 219, 119085. <https://doi.org/10.1016/j.indcrop.2024.119085>
- Casini, M. (2022). Chapter 7—Advanced construction materials. In M. Casini (Ed.), *Construction 4.0* (pp. 337-404). Woodhead Publishing. <https://doi.org/10.1016/B978-0-12-821797-9.00005-2>
- Chaudhary, U., Malik, S., Rana, V., & Joshi, G. (2024). Bamboo in the pulp, paper and allied industries. *Advances in Bamboo Science*, 7, 100069. <https://doi.org/10.1016/j.bamboo.2024.100069>
- Correal, J. F. (2016). 14—Bamboo design and construction. In K. A. Harries & B. Sharma (Eds.), *Nonconventional and Vernacular Construction Materials* (pp. 393-431). Woodhead Publishing. <https://doi.org/10.1016/B978-0-08-100038-0.00014-7>
- Ding, D., & Xian, M. (2024). Research trends and design strategies for bamboo architecture: A bibliometric and systematic review. *Advances in Bamboo Science*, 8, 100094. <https://doi.org/10.1016/j.bamboo.2024.100094>
- Grebner, D. L., Bettinger, P., Siry, J. P., & Boston, K. (2022). Chapter 2—Forest regions of the world. In D. L. Grebner, P. Bettinger, J. P. Siry, & K. Boston (Eds.), *Introduction to Forestry and Natural Resources (Second Edition)* (pp. 21-79). Academic Press. <https://doi.org/10.1016/B978-0-12-819002-9.00002-X>
- Huang, D., Zhu, J., & Shen, Y. (2024). Design of a 3-storey frame building using engineered bamboo composite (EBC). *Engineering Structures*, 300, 117230. <https://doi.org/10.1016/j.engstruct.2023.117230>

- Kumar, D., & Mandal, A. (2022). Review on manufacturing and fundamental aspects of laminated bamboo products for structural applications. *Construction and Building Materials*, 348, 128691. <https://doi.org/10.1016/j.conbuildmat.2022.128691>
- Marchi, M., Marchettini, N., Neri, E., Esposito, G., Niccolucci, V., Pulselli, F. M., Lajo, M., Rissone, E., & Pulselli, R. M. (2023). Carbon Footprint offset of a managed Bamboo plantation in temperate regions. *Sustainable Production and Consumption*, 40, 220-235. <https://doi.org/10.1016/j.spc.2023.05.025>
- Mohan, N., Dash, S. P., Mary Boby, N., & Shetty, D. (2022). Study of bamboo as a building material – Construction & preservation techniques and its sustainability. *Materials Today: Proceedings, Sustainable Materials and Practices for Built Environment*, 60, 100-114. <https://doi.org/10.1016/j.matpr.2021.12.263>
- Rashid, M. M., Abir, N., Hossain, Md. A., Iqbal, M. I., & Siddique, A. B. (2023). 2 - Bamboo cellulose: Structure, properties, and applications. In R. Arun Ramnath, M. R. Sanjay, S. Siengchin, & V. Fiore (Eds.), *Cellulose Fibre Reinforced Composites* (pp. 23-48). Woodhead Publishing. <https://doi.org/10.1016/B978-0-323-90125-3.00007-0>
- Wang, F., Ding, S., Wu, Y., Zhang, C., Zhang, T., Shao, Z., Guo, Y., Chen, Y., Xie, H., & Zhang, E. (2023). Study on the influence of node part on the bending behaviors of bamboo. *Industrial Crops and Products*, 204, 117384. <https://doi.org/10.1016/j.indcrop.2023.117384>
- Wang, X., Su, N., Chen, X., Fei, B., Ma, X., Liu, H., Miao, H., & Fang, C. (2024). Impact of temperature on mechanical properties and dimensional stability in a novel gradient pressure bamboo flattening technique. *Construction and Building Materials*, 427, 136258. <https://doi.org/10.1016/j.conbuildmat.2024.136258>
- Witte, D. (2019). Structural Bamboo Building Codes: Catalysts for Industry, Research, and Construction Technology. *Technology|Architecture + Design*, 3(1), 50-64. <https://doi.org/10.1080/24751448.2019.1571824>