

Feasibility Study of Using Local Materials and Wood Structure in Dayu Yashan Scenic Area

Lin Li^{1*}

¹ Jiangxi Environmental Engineering Vocational College, Ganzhou, Jiangxi, China

Email Address

23740840@qq.com (Li Lin)

*Correspondence: 23740840@qq.com

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Abstract:

This paper introduces the application of on-site sourced timber structure buildings in tourist scenic spots. Taking the Yashan scenic spot as an example, the paper elaborates on the advantages of on-site sourcing in reducing production costs, rich availability of timber resources, mature and reliable technology, feasible and efficient operations, and broad market prospects. This building form has characteristics in environmental protection, energy-saving, fast construction speed, lightweight and high strength, and good seismic resistance, which can enhance the cultural value of scenic spots and bring significant economic benefits. The paper concludes that, in designing and development, the building's function and environmental issues should be fully considered, and the local cultural characteristics should be incorporated to provide tourists with better travel experiences.

Keywords:

Local Materials, Wood Structure Buildings, Dayu Yashan Scenic Area, Feasibility Study

1. Introduction

Yashan Scenic Area is located in Huanglong Town, Dayu County. It is named after its highest peak, Shuangxiu Peak, which resembles the character “丫”. It is situated in the world-renowned golden ecological zone at 25 degrees north latitude, and the air, water, and soil environment quality all meet national first-class standards. The area is surrounded by lush forests, flavored with tea and bamboo, and filled with the sound of waterfalls and chirping of birds. Its scenery is breathtaking, like a fairyland. With a long history and rich cultural heritage, the cultures of Confucianism, Buddhism, and Taoism blend together here, and the philosophy of Yangmingism flourishes.[1] It boasts a unique geographical advantage and rich human resources, with a forest coverage rate of up to 92.6%. Yashan Tourist Resort is equipped with five-star standard leisure facilities and management services. Currently, it has Dalongshan Ecological Rehabilitation and Leisure Center, New Power (Yashan) Off-road Base, Wolonggu Waterfall Group, three major Aduo theme parks (Aduo Village, Aduo

Forest, Aduo Water Village), more than 1,200 acres of ecological agriculture base, eight eco-health, sports, leisure-themed hotels, and several farmhouse landscape restaurants. An ecological agricultural product processing center has also been built. The aim of this project is to explore the use of local natural resources as building materials, to create wood structure buildings with local folk culture characteristics, and to enrich the sightseeing experience and cultural connotation of the scenic area. [2]

2. Project Background

Local sourcing refers to using available resources in the production and processing process instead of transporting raw materials from other regions. The feasibility of local sourcing varies depending on geographical location and resource distribution.

Firstly, local sourcing can reduce production costs. Because there is no need to transport raw materials from far away, transportation costs and time are saved. Also, local raw materials may have a more favourable price because there are no transportation costs. This can promote regional economic development, attract more investment and create job opportunities.

Secondly, local sourcing can reduce environmental pollution and carbon emissions. Long-distance transportation produces a lot of carbon dioxide and other pollutants that have a negative impact on the environment. Local sourcing can reduce these emissions and lower a company's environmental and social responsibility costs. [3] Timber construction using local sourcing refers to building structures using locally sourced timber that is processed by a woodworker into structural parts and then assembled on-site. This construction method is environmentally friendly and aligns with the concept of sustainable development.

It also reflects regional cultural characteristics and adds to visitor experiences. As wood materials are sourced from biomass resources, they better reflect natural and environmentally friendly characteristics in comparison to traditional steel-reinforced concrete building materials. To assess the feasibility of local sourcing, factors such as material supply capabilities, quality, price, and transportation need to be considered. Furthermore, local sourcing requires processing and manufacturing at the local level, which may require additional technical support and equipment investments. In conclusion, local sourcing can reduce production costs, reduce environmental pollution and carbon emissions, and promote regional economic development to some extent. [4]

3. Project Feasibility Analysis

3.1. Rich Wood Resources

Deyu County is located in the world-renowned golden ecological zone, at the latitude of 25 degrees north. The forest resources here are abundant, mainly consisting of pine trees, and providing rich raw materials for wood-structured buildings.

3.2. Mature and Reliable

Technology Wood-structured building technology has become mature and reliable, developing into a reliable building material system. At the same time, the project will also use local wood, which has natural anti-corrosion and durability properties, ensuring the quality and long-term use of the building. Local wood will be selected as the building material for the wood-structured building design. First, structural

calculations will be performed to determine the main material size and the corresponding assembly and connection methods. [5] Then, the exterior and interior design will be created based on local folk elements. Finally, construction of the building will take place, with guidance from professional architects and construction workers throughout the entire process. (Figure 1)



Figure 1. Yashan Wooden Structure Architecture.

3.3 Feasible and Efficient Operation

The suitability of wooden structure buildings in scenic areas includes aspects such as architectural design, structural stability, fireproofing and anticorrosion. Wooden structure buildings are a widely used and highly advantageous form of construction, with wood as the primary structural material.

a. Environmental protection: As a natural material, wood has the green and sustainable characteristics of an environmentally friendly material. Wooden structure buildings have less environmental pollution during production, construction and use, meeting the requirements of sustainable development.

b. Energy-saving: Wood has excellent thermal insulation performance, which can effectively reduce energy consumption. Compared with reinforced concrete structures, wooden structure buildings consume less energy and have better energy-saving performance.

c. Fast construction: Wooden structure building components can be prefabricated in factories and then assembled on-site, with much faster construction speed than traditional construction methods.

d. Lightweight and high-strength: Due to the characteristics of wood, wooden structure buildings are relatively lightweight, yet their strength and stiffness are comparable to reinforced concrete, making them adaptable to various natural disasters.

e. Good seismic resistance: Wooden structure buildings have good seismic resistance, ensuring building safety during earthquakes and other natural disasters.

3.4. Wide market prospects

Scenic wooden structures have unique cultural value and viewing appeal, and can increase revenue through ticket sales and tourism poverty alleviation. Building wooden structures with locally sourced materials can enhance the sustainability of scenic wooden structures, strengthen the cultural characteristics of scenic areas, and increase their attractiveness to attract more tourists and increase revenue. This project is expected to attract a large number of tourists, enhance the visibility and influence of the scenic area, and bring considerable economic benefits. [6]

Cost savings From the perspective of purchasing raw materials, sourcing locally is usually less expensive than sourcing from other regions. Since locally sourced materials eliminate the intermediate links of transportation and warehousing, they can be obtained directly from the range of forest resources, avoiding many transportation and warehousing costs. In addition, locally sourced materials can also help avoid losses and decay caused by transportation, reducing related costs.

Promoting local economic development Building wooden structures with locally sourced materials can promote the development and utilization of local forestry resources, improve the income level of local people, and promote local economic development. At the same time, locally sourced materials can avoid environmental damage caused by excessive logging and benefit the maintenance of ecological balance, promoting sustainable development. [7] This project will play a positive role in protecting local resources and promoting local economic development. Wood is also a green and environmentally friendly building material. In addition, wooden structures designed with local folk elements will also reflect local cultural connotations, enhancing local visibility and reputation. [8]

Environmental protection During the construction of wooden structures, attention should be paid to environmental protection, including the use of sustainable logging methods and reducing material waste. During the use of wooden structures, energy conservation, pollution reduction, green building materials, and energy-saving equipment should be used to reduce the impact on the environment. Relevant laws and regulations should be adhered to and pollution and damage to the environment should be avoided. [9] In addition, during the design of wooden structures, the integration of buildings with the natural environment should be considered as much as possible to minimize damage to the natural environment.

4. Conclusions

In summary, locally-sourced wooden structures have potential and feasibility in scenic areas, and can be applied in specific scenic conditions. During the design and development process, the functionality and environmental impact of the building should be fully considered to ensure safety and sustainability, while also reflecting local cultural characteristics to enhance tourists' travel experience. This project is a significant architectural facility with good technical feasibility, economic feasibility, and social benefits. With scientific and reasonable planning and implementation, it's believe that this project can bring new vitality and development opportunities to Yashan scenic area. [10]

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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