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Could using bamboo scaffolding reduce construction's carbon footprint and achieve carbon reduction goals, despite urbanization? This executive summary discusses the current decline in bamboo scaffolding in Asia, despite its strength, sustainability, and history in China.

Since pre-historic Asia, bamboo has served hundreds of purposes, both literally as food and products and culturally in art and literature. Bamboo construction has been common in China for centuries because of its widespread availability. There is little historical documentation about techniques because of the exclusive apprenticeship-guild structure of the construction industry in ancient China and because of the secrecy of illegal rural construction (due to government land ownership), although today there are more design guidelines, formal teaching resources, and safety regulations, especially in Hong Kong, where bamboo scaffolding is a part of cultural identity and is used for 90% of construction, including skyscrapers as tall as 80 stories high. Bamboo scaffolding became popular in Hong Kong because of the need for cheap and fast methods to keep up with the rapidly developing city and competitive economy.

Bamboo can grow in tropical to temperate climates globally. Of the 1500 known species, the most common species for scaffolding are Mao Zhu (毛竹, *Phyllostachys edulis*, "Moso Bamboo") and Kao Zhu (篙竹, *Bambusa pervariabilis*). Bamboo has good material properties (high strength, low weight) and allows for more creative designs and faster assembly. Modern innovations (nylon ties, mixed bamboo-metal scaffolding systems (MBMSS)) improve performance further. Bamboo forests can boost local economy (jobs, products) and environment (reduce soil erosion, sequester carbon 10x faster than trees).

Still, critics of bamboo scaffolding distrust the strength, safety, and reliability due to lack of quality control in the harvesting, curing/drying, and assembly processes and the lack of standardization in material and engineering design. Despite new regulations (requiring safety gear and inspections; banning single-layer scaffolding, scaffolding above certain heights, and other high-risk scenarios), there is little enforcement of safety procedures/precautions. Many bamboo scaffolders simply accept this level of risk and the cost of injuries, and it is unclear about whether this practice is less safe than construction in general. In addition to strength and safety, the re-usability of bamboo scaffolding are also under debate.

Regardless, both advocates and critics of bamboo scaffolding acknowledge that strength and safety are limited by the supply of quality bamboo and skilled workers, which are declining due to socioeconomic and cultural factors. For example, 80% of the world's Moso bamboo is produced in China, which has prioritized preserving panda wildlife habitats and banned bamboo construction higher than six stories. Political tension between China and Hong Kong may fuel uncertainty. Increasing frequency and severity of tsunamis inflate concerns about the structural challenges. Gendered stereotypes of bamboo scaffolding as a gutsy profession may deter young people from this profession, especially because of the shift from fathers handing-down their profession to encouraging the next generation to strive for a better job.

In short, bamboo is superior for many, but not all, types of scaffolding projects, subject to the availability of local materials and qualified workers, which are major obstacles today. Bamboo offers global opportunities for carbon sequestration, regardless of end use. Alternative uses of bamboo in construction and socioeconomic trends in both rural (unofficial) and urban (commercial) construction are related on-going areas of research.

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