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A Study on Estimating the Carbon Sequestration Effects of Wood Use in Japanese Buildings

Tokunaga, Y.*
The University of Tokyo forests, 1-1-1, Yayoi, Bunkyo-ku, Tokyo, 113-8657, Japan
**yuka-tokunaga@g.ecc.u-tokyo.ac.jp*

Abstract

Removing carbon from the atmosphere is crucial as a climate change mitigation strategy. Forests, in particular, have a significant carbon sequestration effect, and promoting wood utilization is expected to enhance this effect. This study estimates the carbon sequestration effect of wood utilization in Japanese buildings, which have a large volume of wood use. In Japan, seismic-related laws have been revised multiple times. Few buildings currently meet the standards required to comply with the latest regulations. Many structures require seismic retrofitting. Structural components like columns can extensively utilize wood, enabling long-term carbon sequestration. This study estimates the amount of carbon that can be sequestered when wood is used for seismic retrofitting in Japan. It also evaluates the extent to which this can sequester atmospheric carbon. Beyond structural components, wood can be used in furniture such as desks and shelves. This is also one method capable of long-term carbon sequestration. This study verifies how much atmospheric carbon can be sequestered through wood utilization in Japanese buildings-specifically, by using wood for both structural materials and furniture. The average Japanese home has an area of approximately 100 m², and a wooden home uses about 30 to 40 cubic meters of timber. This equates to roughly 50 to 70 logs of cedar or cypress. Japan has a total of approximately 65,000,000 housing units. Assuming 50% are wooden structures, and that 40% of these meet the old seismic standards, it is estimated that 13,000,000 homes require seismic retrofitting. Adding 30% more timber for reinforcement in these homes would sequester an estimated 151,666,667 cubic meters of carbon fix in Japan.

Keywords: *Carbon sequestration, Wood utilization, Seismic retrofitting, Japanese buildings, Climate change mitigation*