Construction Professionals’ Environmental Perceptions of Lumber, Concrete and Steel in Japan and China

Daisuke Sasatani and Ivan Eastin, School of Environmental and Forest Sciences, University of Washington

Abstract

Green Building Programs (GBPs) are designed to lessen environmental impacts voluntarily to attempt for choosing more sustainable products and systems for residential and non-residential buildings. GBPs have been popular in European nations and North America, but they were just recently introduced in Asian nations, such as Japan and China. A GBP programs determine what kinds of construction materials and methods are “green”; therefore, it impacts on material choices of construction industry as the GBP become popular. Ideally, a GBP should consider a building’s entire life-cycle in terms of environmental impact. Current established life-cycle analysis methodologies are powerful tools to analyze commensurable aspect of quantifiable environmental category, but it is not possible to objectively integrate and quantify the importance of multi-dimensional complicating environmental issues of products and systems used for a building. However, individuals have different opinions on environmental issues perhaps due to their different background.

Since construction professionals, such as builders and architects, are the direct or indirect decision makers whether they adopt a GBP or not, it is critically important to know how these individuals perceive overall environmental issues and environmental friendliness of some materials. To better understand construction professionals’ perception in two Northeast Asian countries, Japan and the People’s Republic of China, we conducted a series of surveys in 2009 and 2010 at several professional trade shows. First of all, survey question was designed to investigate professionals’ perceptions of the relative importance of five major environmental attributes when they choose building materials. Overall, they perceive saving energy and saving water are relatively more important environmental categories compared to using renewable materials, low carbon footprint and using recycled materials. Also, survey was designed to gain insights into respondents’ perceptions of the relative environmental performance of the three major structural building materials (wood, concrete and steel) along five environmental categories and overall environmental friendliness. Asian construction professionals perceive lumber is the more environmental friendly materials compared to concrete and steel. Regression analysis shows energy efficiency of home built and the level of pollution generated during the manufacturing process contribute the most to the overall environmental friendliness of the material. Resource sustainability is significantly important in China. CO₂ emissions and energy use during the manufacturing process do not significantly impact on the perception of overall environmental friendliness. Chinese and Japanese professionals show similar responses to environmental attributes even though their construction practices are very different.