International Conference on Sustainability Initiatives (ICSI) 2015 in conjunction with 8th ASEAN Environmental Engineering Conference (AEEC), Kuala Lumpur, Malaysia, 24-25 August 2015

Apples to Oranges: Harmonising Home Buyer Preferences in Japan and Malaysia through Standards Comparison

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SUMMARY: Sustainable building standards differ around the world due to differing development philosophies and local idiosyncrasies, hindering international comparative studies. In this study, the CASBEE standard used in Japan and the GBI used in Malaysia are compared. Using CASBEE as a baseline, items in each standard are matched, compared, and then filtered to only include those affecting end users. Differing levels in these items in both sustainable building standards are matched and are included in a survey of home buyer preferences. This allows for a single survey to be used to study sustainable housing preferences in both Japan and Malaysia.

Keywords—Home Buyer Preferences; Japan; Malaysia; Sustainable Housing;

INTRODUCTION

Sustainable building standards have enjoyed a contemporary renaissance, as a developing country Malaysia joined the sustainable building fray by introducing their own sustainable building standards. Malaysia's Green Building Index (GBI) was introduced in May 2009 [1] to much fanfare from the private and public sectors.

Malaysia's sustainable building efforts are, in comparison to developed countries like Japan, are piecemeal [2] and its nascence prevents any prediction of long term successes. Therefore, it is imperative that we learn from the implementation successes of senior sustainable building standards [3] and study the applicability of such efforts within the Malaysian context.

The factor often highlighted as a critical success factor in Malaysian sustainable development is home buyer awareness [4] and demand [5]. However, it is not possible to compare home buyer attitudes directly between Japan and Malaysia. To this end, sustainable building standards can be used as an intermediary to measure such attitudes.

There are fundamental differences between the GBI [6] and Japan's sustainable building standard; the Comprehensive Assessment System for Built Environment Efficiency (CASBEE) [7]. This study attempts to harmonise between the two standards and use the results of this to measure home buyer attitudes in Japan and Malaysia using a universal tool.

2. MATERIALS AND METHODS

The research methodology employed in this study consists of drawing up the commonalities and differences between the GBI and CASBEE, filtering items that affect home buyers' living quality [8] and comparing the levels present between these items across the two standards, to arrive at a common term between them.

The first step is to list the items used to score sustainability in both standards. The GBI [6] splits these into six categories; energy efficiency, indoor environmental quality, sustainable site planning and management, materials and resources, water efficiency, and innovation. CASBEE [7] splits sustainability measures between a building's environmental quality, which includes indoor environment, quality of service, and outdoor environment on-site, and its environmental load, categorised into energy, resources and materials, and off-site environment measures.

The individual categories are then matched between the two standards and any category that do not have a counterpart in the other standard is listed. For the purpose of this study, CASBEE is used as the yardstick to compare the GBI with.

The categorised and matched sustainable building criteria are then tested for search, experience, and credence characteristics [8], [9] for end users. The individual levels prescribed within each item are compared across both standards to allow for comparable figures to be used to measure home buyer preferences in both Japan and Malaysia.

3. RESULTS

The comparison between standards have shown that most sustainability criteria has its counterpart between both the GBI [6] and CASBEE [7]. However, some criteria cannot be matched. Because of the frequent natural environmental hazards in Japan, almost a non-issue in Malaysia, the durability and reliability of houses are assessed in CASBEE but not in the GBI. Inversely, the issue of construction waste management in Malaysia is acute enough [10] to warrant its heavy emphasis in the GBI [6], a non-issue in Japan [11].

Using the search, experience, and credence characteristics [8], [9] of these criteria, the following sustainable building criteria are included to assess home buyer preferences for sustainable housing, shown in table 1.

Table 1: Sustainable characteristics for assessing home buyer preferences

GBI	CASBEE
Sound Insulation	Noise & Acoustics

Indoor Air Quality	Air Quality
Community Services & Connectivity	Local Characteristics & Outdoor Amenity
Renewable Energy	Natural Energy Utilisation
Advanced EE Performance	Building Thermal Load
Water Efficiency	Water Resources

For each of these items, a comparison is made between different levels prescribed in the GBI and CASBEE. Because of the differing measures used between these standards, such as the overall thermal transfer value (OTTV) that measures the heat transfer into the building through its envelope [12] used in the GBI [6], in contrast to the annual heating and cooling load measures, based on the Energy-saving Countermeasures of the Japan Housing Performance Standard [13] are used in CASBEE [7].

Based on these comparisons, the levels of attributes were decided as both common to both the Japanese and Malaysian standards and is relevant to home buyers in both countries, shown in table 2.

Table 2: Attribute levels for cross-country survey

Attribute	Level 1	Level 2	Level 3
Energy Savings	None	20% (equivalent to CASBEE Grade 2)	40% (equivalent to CASBEE Grade 3)
Renewable Energy Use (1kWh = 3.6MJ)	None	Nominal ($\geq$1MJ/m^2)	Significant ($\geq$15MJ/m^2)
Amenities	Basic amenities (convenience store, eatery, & park)	Basic amenities with $\geq$10% total area landscaping	Basic amenities with $\geq$20% total area landscaping
Interior Environment (Sound insulation & air quality)	Standard soundproofing (STC 30) with basic ventilation (25 m^3/ hour-person)	Exterior soundproofing (STC 45) with enhanced ventilation (30 m^3/ hour-person)	Interior (STC 35) & exterior soundproofing (STC 45) with enhanced ventilation (35 m^3/ hour-person)

4. DISCUSSION

Despite the divergences in sustainable building standards worldwide, it has been shown that many sustainability criteria originate from common bases [14]. This study has shown that despite the philosophical differences in measuring sustainability between the GBI and CASBEE standards, there exists enough commonality to bridge the two standards.

Based on the comparison of the home buyer-centric sustainability criteria used in both the GBI and CASBEE, it is possible to form a common base to measure home buyer preferences in Japan and in Malaysia. The suitability of these criteria in each country should be tested to verify this claim.

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