

# CASBEE-CITY (WORLDWIDE USE) ASSESSMENT IN JOHOR BAHRU

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## ABSTRACT

Urban sustainability assessment consists of a set of indicators and a scoring system which function as a tool to measure the city's sustainability and assist decision-makers in setting sustainable future targets. In Malaysia, MURNInets was put for implementation whilst in Japan, CASBEE-City is broadly used in over 1500 cities. In expanding its assessment for worldwide cities, CASBEE-City has developed indicators from Sustainable Development of Communities: Indicators for City Services and Quality of Life (ISO37120) or ISO and Sustainable Development Goals (SDGs) by the United Nations (UN) in its latest CASBEE-City for Worldwide use (CASBEE-City (W)) version. This paper examines the application of CASBEE-City (W) assessment and methodology in Malaysian cities using the case of Johor Bahru. The paper also demonstrates how the Q assessment items are customised based on data availability, reliability and suitability in study area via interviews and focus group discussions held between researchers, urban planners and related stakeholders at the local level. This paper reveals an assessed Johor Bahru as a case study applying the model of customised CASBEE-City (W) according to the local context. The customised model can then be used in Malaysian cities or revised for future research studies.

## 1. INTRODUCTION

In the 21<sup>st</sup> century, countries all around the globe are pursuing urban sustainability assessment as quantitative mechanism to assess cities' efficiency and setting future sustainable programs. Urban sustainability assessment functions as a tool to assist decision-makers or urban

planners in framing suitable sustainable programs using the assessment of sets of indicators, weightage and scoring system (Ness et al., 2007). In Japan, CASBEE-City was introduced which applies "a unique assessment framework taking into account the concept of environmental efficiency, which is different from a simple summation of points or credits awarded in each performance area" (Murakami, et al., 2011).

Having the latest version of CASBEE-City (W) which consists of indicators developed from the ISO and SDGs by the UN will need proper adjustment in trying to apply these indicators to suit the JB local context. This paper outlines the learning and experiences gathered from Malaysia (Universiti Teknologi Malaysia (UTM)), Japan (Institute for Building Environment and Energy Conservation (IBEC)) and regional development authority (Iskandar Regional Development Authority (IRDA)) in a unique 'academic-policy maker' partnership towards formulating the CASBEE-City (W) customised for Malaysian cities. This research objective has been to apply a customised CASBEE-City (W) in Johor Bahru as a case study for Malaysian cities which are first *acceptable to policymakers* and the *public at large*. It is hoped that through more in-depth understanding of the scientifically-evidenced urban sustainability assessment will lead to eventual implementation.

## 2. OVERVIEW OF JOHOR BAHRU (JB) AS CASE STUDY

Johor Bahru is located in the heart of Iskandar Malaysia and is envisioned to become an international world-class city by 2025, covering areas of Plentong, Johor Bahru City Centre and Tebrau. Johor Bahru City

Council (MBJB) is responsible in governing this area under the Town and Country Planning Act 1976 (Act 172). JB has distinct characteristics such as population; land area and density (see Table 1). Figure 1 shows the location of the study area.

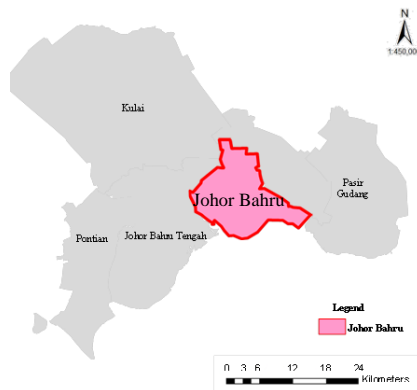


Fig. 1 Location of Johor Bahru in Iskandar Malaysia

*\*The delineation of Johor Bahru new boundary which upgrades the city council to city hall will be amended in January 2016.*

**Table 1** Statistical data for JB (2010)

Criteria	Johor Bahru
Population	541, 508
Land Area (km <sup>2</sup> )	466.0587
Density (hab/km <sup>2</sup> )	1161.89
Gross Domestic Product (mill. RM)	16, 950

Source: Ho et. al. (2015)

### 3. CASBEE-CITY (W) FOR MALAYSIAN CITIES

In CASBEE-City, a city or urban area's environment efficiency is evaluated using the Triple Bottom Line (TBL) perspective; Q1: Environment, Q2: Social and Q3: Economy. A hypothetical boundary is also set around the city to be evaluated. Figure 2 (a) shows the hypothetical boundary.

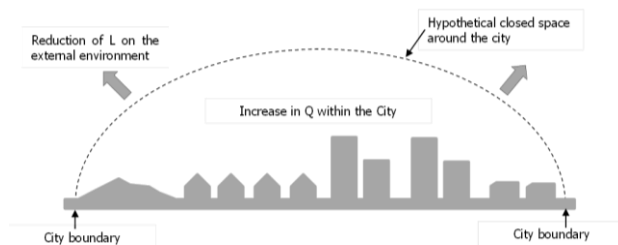


Fig. 2(a) Hypothetical boundary.

Source: JSBC (2012)

Built Environment Efficiency (BEE) is calculated by dividing the value of environmental load (L) emitted to the outside of the city and the value of Quality of Life (Q) activities inside the city. Higher BEE value indicates the city has an excellent environmental efficiency. Figure

2(b) shows the BEE calculation.

$$\text{Built Environment Efficiency (BEE)} = \frac{\text{Scores for Quality (Q)} \quad (Q: \text{Quality, } 0 < \text{score for } Q < 100)}{\text{Scores for Load (L)} \quad (L: \text{Load, } 0 < \text{score for } L < 100)}$$

Fig. 2(b) CASBEE-City BEE calculation.

Source: JSBC (2012)

### 3.1 Quality (Q) Assessment Indicators

There are 58 candidate indicators selected from SDGs and ISO to be used in the CASBEE-City (W) assessment for JB. All indicators are carefully classified into Q1, Q2, and Q3 and revised via interviews and focus group discussions with urban planners and relevant stakeholders. The indicators are revised based on their suitability, adaptability, reliability and data availability. There are four (4) types of all revised indicators identified in this study as shown in **Table 2** below.

**Table 2:** Four (4) types of revised indicators identified.

Indicator	Revision status
1. Mean urban air pollution of particulate matter (PM2.5)	Suggestion to use PM10 instead of PM2.5 as Malaysia data uses PM10.
2. Consumption of ozone-depleting substances per capita	Not applicable or put on hold.
3. Evaluative Wellbeing and Positive Mood Affect	Uses the same data as MURNInets's Happiness Index indicator.
4. Number of homicides per 1000,000 population	No issues found.

### 3.2 Data acquisition

Secondary datum for assessment indicators are collected from official national statistics, local authorities and government agencies: Johor Bahru Municipal Council (MBJB), Johor Water Company (SAJ), National Energy Cooperation (TNB), EPU Johor, The World Bank: Data and etc.

### 3.3 Focus Group Discussion (FGD) & Interviews

Two (2) FGDs and three (3) interviews have been conducted to discuss and revise the candidate indicators for the CASBEE-City (W) assessment which involved urban planners from MBJB, Japanese CASBEE-City researchers/experts and stakeholders to obtain better data for assessment as well as revision of Q assessment indicators.

### 3.4 Preliminary Assessment Result for JB

Using the customised Q assessment indicators and better data acquisition, the first assessment result for study area is identified and shown in 3D charts below:

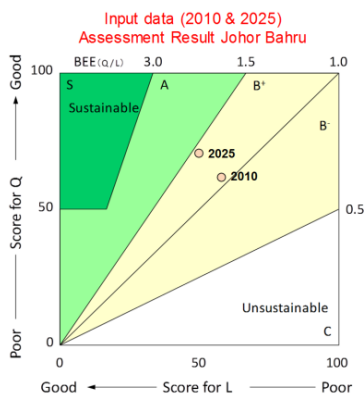


Fig. 3 Assessment result for JB.

Johor Bahru received B+ result for base year 2010. By simulating result for target year 2025 based on Johor Bahru's policies and plans, it will still achieve B+. The targets are also depending on the local authority's vision and capability in achieving the visions.

### 4. CONCLUSION

Better data acquisition and assessment indicators revision for CASBEE-City (W) assessment can potentially be customised according to Malaysian cities. Further study on CASBEE-City will increase the understanding upon the system and can help improvise the existing Malaysian urban sustainability assessment framework.

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