



Green Building Concept on the Planning of Islamic Development Bank (IsDB) Building at Jember University

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Abstract

The rapid growing of development in Indonesia has increased the energy needs and made current Green Building issue become very important. To support the development, green building is regulated in the policies and programs to improve energy efficiency, water, and building materials as well as increasing the use of low carbon technology. This study aims to carry out the design recognition stage by identifying and ranking the 5 (five) Islamic Development Bank (IsDB) Building at Universitas Jember based on the criteria of using a greenhip assessment tool for GBCI's new building version 1.2. The results show that the Islamic Development Bank (IsDB) Building at Universitas Jember for GBCI access data meet 4 (four) building eligibility criteria but does not meet 3 (three) other eligibility criteria. The value/points of the Auditorium Building is 28 (two eight) points (36,36%/Bronze), Biotechnology Engineering Building is 30 (thirty) points (38,96%/Bronze), Plant and Natural Medicine Building and Health and Nurse of Biotechnology is 41 (forty one) points (53,20%/Silver), Natural Science and Food Technology Building (38,96%/Bronze), and Science and Public Communication Building is 30 (thirty) points (38,96%/Bronze).

Keywords: GBCI; Greenhip rating tool version 1.2; Design recognition stage.

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1. Introduction

The rapid growing of development in Indonesia has increased the energy needs and made current Green Building issue become very important [1]. In supporting the development, green building is regulated in the policies and programs to improve energy efficiency, water, and building materials as well as increasing the use of low-carbon technology [2]. Renewable energy is the best choice for securing energy demand to the next generation with a cleaner environment because of the increasing energy needs [3]. The new planned building and the existing building are operated by considering the environmental/ecosystem factors [4]. Green Building Council Indonesia (GBCI) provides GreenShip Rating Tools consisting of three categories, namely for buildings being built, new buildings, and home interiors [5]. This study aims to carry out the design recognition stage by identifying and ranking the 5 (five) Islamic Development Bank (IsDB) Building at Universitas Jember based on the criteria of using a greenShip assessment tool for GBCI's new building version 1.2. Islamic Development Bank (IsDB) Building at Universitas Jember consists of 5 buildings studied consists of 1 (one) Auditorium Building and 4 (four) Integrated Laboratory Buildings. The construction of the Islamic Development Bank (IsDB) Building at Universitas Jember which is located in campus area is still under construction. The GreenShip rating tool is a rating system as an effort to bridge the concept of environmentally friendly and the principle of sustainability with real practice. With this rating system, every building that declares itself as a Green Building will be assessed based on the standard criteria contained in the assessment system [6]. GreenShip for New Building Version 1.2. The components of the GBCI assessment include: Appropriate land use (ASD), Energy Efficiency and Refringeran (EEC), Water Conservation (WAC) Source and Material Cycle (MRC), Air quality and space comfort (IHC), and Building environmental management (BEM) [7]. The GreenShip assessment phase consists of the Design Recognition (DR) stage, with a maximum score of 77 points in which the team gets the chance to get an award for the project at the design and planning finalization stage based on the GreenShip assessment tool [8] in the Table 1.1:

Table 1.1: Values in Each Category Based on Steps

Category	Total Value for DR			Total Value for FA		
	Pre. Condition	Credit	Bonus	Pre. Condition	Credit	Bonus
Land use/ASD	-	17	-	-	17	-
Energy efficiency and conservation/EEC	-	26	5	-	26	5
Water conservation/WAC	-	21	-	-	21	-
Material source/MRC cycle	-	2	-	-	14	-
Air quality and comfort/IHC	-	5	-	-	10	-
Building environmental management/BEM	-	6	-	-	13	-
Number of Benchmarks	-	77	5	-	101	5

Source: Green Building Council Indonesia, 2013

Total points from the analysis results are calculated using the equation

$$\sum \text{Actual}_{\text{point}} = \text{ASD} + \text{EEC} + \text{WAC} + \text{MRC} + \text{IHC} + \text{BEM} \quad (1)$$

The percentage of the index scale value is measured using the equation

$$\text{Percentage of Rating} = \frac{\sum \text{Poin aktual}}{\sum \text{Poin maksimum}} \times 100\% \quad (2)$$

Greenship's ranking reflects the building owner's business, the Greenship New Building rating is presented in Table 1.2:

Table 1.2: Ranking of *Greenship New Building*

Greenship Rating	Smallest Value	
	Grade	Percentage (%)
Design Recognition (DR)		
Platinum	56	73
Gold	43	43
Silver	35	35
Bronze	27	27%
Final Assessment (FA)		
Platinum	74	73
Gold	58	58%
Silver	47	47
Bronze	35	35

Source: Green Building Council Indonesia, 2013

$$\text{If } \sum \text{Actual}_{\text{point}} \geq 35 \text{ Points or Percentage of Ratings } (\%) \geq 35\% \quad (3)$$

2. Methodology

2.1. Research Setting

Islamic Development Bank (IsDB) Buildings at Universitas Jember consist of: (1) Auditorium Building, (2) Integrated Laboratory for Biotechnology Engineering Building, (3) Integrated Laboratory for Plant and Natural Medicine Building and Integrated Building Laboratory for Health and Nurse of Biotechnology, (4) Integrated Laboratory for Natural Science and Food Technology Building, and (5) Integrated Laboratory for Science Policy and Public Communication Building. Research on the Green Building Concept on Islamic Development Bank (IsDB) Building Planning at Jember University was carried out in several stages of the process presented The overall methodology is shown in Figure 2. Flow chart Criteria Analysis Green Building

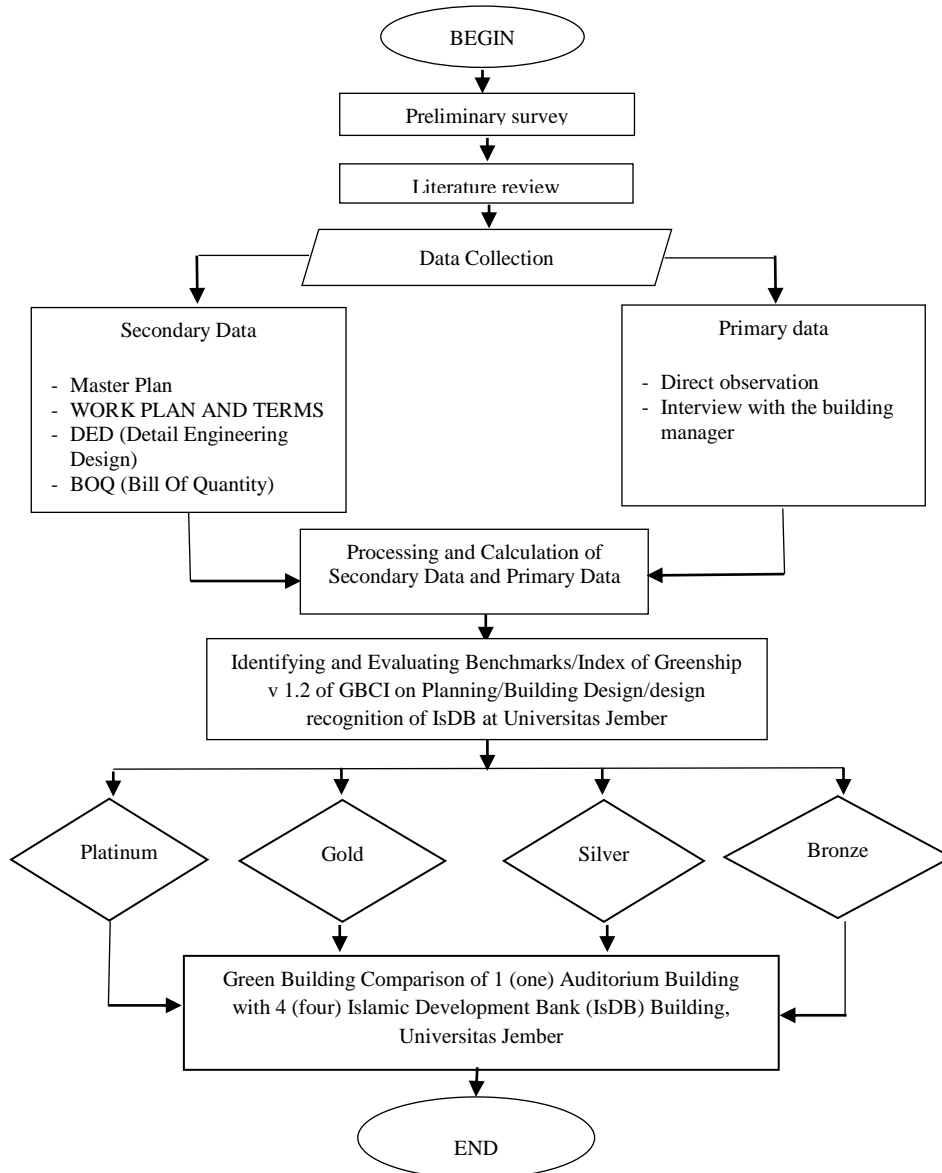


Figure 2: Flow chart Criteria Analysis Flow Green Building

3. Results and Discussion

3.1. Building Eligibility Requirement

The study on the Green Building Concept in the Islamic Development Bank (IsDB) Building Planning at Universitas Jember uses primary data obtained through the method of observation (direct observation), interviews with building managers and secondary data from planning data obtained by the building manager. Master Plan data, Work Plan and Terms (RKS), Detailed Engineering Design (DED), Bill of Quantity (BOQ). Data calculation and comparison to obtain the results of the analysis will later be used as a reference in the assessment of categories and criteria for the Greenship Assessment Tool for New Buildings Version 1.2 [9] in the Table 3.1 Building Feasibility Matrix:

Table 3.1: Building Feasibility Matrix

No.	Criteria	Eligibility	
		Yes	No
1	Minimum building area is 2500 m ²	√	
2	Availability of building data to be accessed by GBC Indonesia related to certification		√
3	The function of the building is in accordance with the allocation of the local RT RW land	√	
4	Environmental Impact Analysis and Environmental Management and Monitoring Efforts Ownership		√
5	Building compatibility with fire safety standards	√	
6	Building suitability to earthquake resistance safety standards	√	
7	Building compatibility with disability accessibility standards		√

There are 4 (four) criteria that have met the proper standard, while 3 (three) criteria have not been feasible. From the assessment, Islamic Development Bank (IsDB) Building at Universitas Jember has not met the eligibility requirements set.

3.2. Greenship Predicate in Building Applications for Greenship Assessment

The final assessment of the Recognition Design (DR) stage is related to the assessment of the application of green building criteria for the Islamic Development Bank (IsDB) Building at Universitas Jember with a maximum score of 77 points. Total points obtained from each category are all Islamic Development Bank (IsDB) Buildings at Universitas Jember.

3.3. Application of Greenship Predicate in Building Recognition Design (DR) Stage

The final assessment of the Recognition Design (DR) stage is related to the assessment of the application of green building criteria for the Islamic Development Bank (IsDB) Building at Universitas Jember with a maximum score of 77 points. Total points obtained from each category are all Islamic Development Bank (IsDB) Buildings at Universitas Jember and Overall values can be seen in the table 3.3 for Comparison of the total points obtained from the evaluation results and the actual points of the building, it can be concluded that the Islamic Development Bank (IsDB) Building, University of Jember is categorized as a building with a predicate figure 3. The total points obtained from each of the Greenship version 1.2 categories are calculated using equation 1 and equation 2 One example of the calculation of the Auditorium Building:

$$\sum \text{ACTUAL}_{\text{point}} = \text{ASD} + \text{EEC} + \text{WAC} + \text{MRC} + \text{IHC} + \text{BEM}$$

$$= 10+7+3+2+3+3$$

$$= 28$$

$$\text{Percentage of Rating} = \frac{\sum \text{Poin aktual}}{\sum \text{Poin maksimum}} \times 100\%$$

$$= \frac{28}{77} \times 100\% = 36,36\%$$

Table 3.3: Evaluation and Predicate in the IsDB Building, Universitas Jember

Category	Total Score		
	Credit	Percentage	Predicate
Auditorium Building of Universitas Jember	28	36.36% <35%	Bronze
Building Integrated Laboratory for Biotechnology Engineering	30	38.96% <35%	Bronze
The Integrated Laboratory Building for Plant and Natural Medicine and the Integrated Laboratory Building for Health and Nurse of Biotechnology	41	53.20% > 35%	Silver
Building Integrated Laboratory for Natural Science and Food Technology	30	38.96% <35%	Bronze
Building Integrated Laboratory for Science Policy and Public Communication	30	38.96% <35%	Bronze

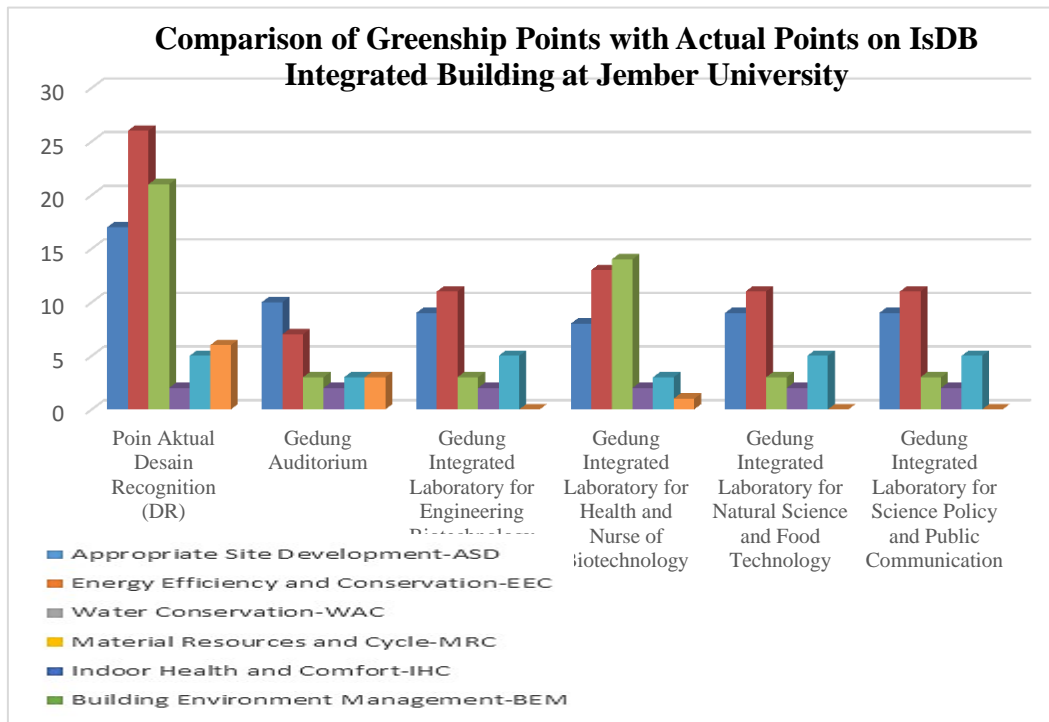


Figure 3: Comparison of Greenship points with Actual Points.

4. Conclusion

The assessments of the Green Building criteria uses the Greenship assessment tool for New Building Version 1.2 in the construction of the Islamic Development Bank (IsDB) Building at Universitas Jember are as follows:

- The planning of Islamic Development Bank (IsDB) Building at Universitas Jember meet 4 (four) criteria for building eligibility requirements, including: minimum building area, function of building suitability to RT/RW, building suitability to fire safety standards, and conformity to earthquake resistance standards, while 4 (four) eligibility requirement criteria are met namely Green Basic Area, Water Meter, Fundamental Refrigerant, and Air Introductions. Meanwhile, 3 (three) other eligibility criteria are not met, namely: the availability of data for GBCI access, environmental impact analysis

ownership and the suitability of the building to the accessibility standard.

- For score/point results and credit and bonus criteria in each Green Building category in Islamic Development Bank (IsDB) Building at Universitas Jember using Greenship category version 1.2 include: Auditorium Building is 28 (two eight) points (36.36%/Bronze), Biotechnology Engineering Building is 30 (thirty) points (38.96%/Bronze), Plant and Natural Medicine Building and Health and Nurse of Biotechnology is 41 (forty one) points (53.20%/Silver), Natural Science and Food Technology Building (38.96%/Bronze), and Science Policy Building and Public Communication is 30 (thirty) points (38.96%/Bronze).

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