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Mohammed Ali Berawi[1], Van Basten[1,2*], Yusuf Latief[1], and Igor Crévits[3]

[1]Civil Engineering Department, Faculty of Engineering, Universitas Indonesia, Kampus Baru UI, Depok, 16424, Indonesia
[2]Program of Civil Engineering Study, Institut Sains dan Teknologi Pradita, Scientia Business Park Tower I, Gading Serpong, Tangerang, Indonesia
[3]Laboratoire d'Automatique de Mécanique et d'Informatique industrielles et Humaines, Université de Valenciennes et du Hainaut-Cambrésis, Le Mont Houy 59313, Valenciennes Cedex 9, France

Corresponding author: van.basten@pradita.ac.id

Abstract. Adaptation to the concept of sustainability is a problem in developing countries, especially in terms of the level of knowledge, economic capability, environmental conditions, and regional policies. These four aspects become exogenous variables in this study to examine the role of green building concepts in sustainable concepts in building construction. Qualitative and quantitative methods become a way to prove the hypothesis of this study by using SEM-PLS as an analysis tool. The sample in this study limits the building developers and owners to assess aspects that affect the sustainability of the green building concept and obtain an overview of the incentive models they expect. The results of this study indicate the level of knowledge of building developers and building owners affects the ability of building management to achieve a sustainable concept. Besides, the aspect of sustainability has an impact on the acquisition of both internal and external incentives for developers and building owners. Specific incentive models that developers and owners expect are accelerating licensing and building certification and reducing property tax. The government also supports the provision of property tax compared to value-added tax because it is a controlling tool in implementing green building concepts.

Keywords: Green Building, Key Success Factors, Sustainable Construction, Incentive.

1. Introduction
The issue of global warming and climate change becomes urgency with the commitment of various parties in the world to reduce the rate of increase in global temperatures below two degrees. This natural change makes all parties in the world strive for environmentally friendly and sustainable programs to overcome the effects of global warming [1]. Efforts in overcoming this global issue have received a response from construction stakeholders because the construction industry has a responsibility for more than 40% of energy use and more than 30% of carbon emissions in the world [2]. The definite step to be a friendly environment development program is sustainable infrastructure

development forming a green building concept in the construction and operation of buildings. The establishment of green buildings is not only from the aspects of energy efficiency, water, material, and land use but also comfort, health, environmental sustainability aspects, and the benefits of building owners (see Table 1) [3, 4].

Table 1. Barriers of the green building concept implementation in some countries [3-6]

Rating tools name	BREEAM 2013	LEED	CASBEE	Green Star	Green Mark 4.1	Green Building Index	DGNB 2011	Greenship ver 1.2
Found year	1990	1993	2001	2003	2005	2009	2009	2009
Country	UK	USA	Japan	Australia	Singapore	Malaysia	Germany	Indonesia
a. Site development	5%	24%	17%	7%	22%	-	23%	17%
b. Transport	8%	-	-	9%	-	-	-	-
c. Energy conservation	27%	32%	17%	25%	61%	35%	-	26%
d. Water efficiency	8%	9%	8%	14%	9%	10%	-	21%
e. Material resources	11%	13%	8%	13%	-	11%	-	14%
f. Indoor health & comfort	9%	14%	17%	15%	4%	21%	23%	10%
g. Building management	20%	-	17%	9%	-	16%	10%	13%
h. Pollution	5%	-	17%	8%	-	-	-	-
i. Waste	6%	-	-	-	-	-	-	-
j. Innovation (green features)	2%	6%	-	-	4%	7%	23%	-
k. Regional priority	-	4%	-	-	-	-	-	-
l. Economic	-	-	-	-	-	-	23%	-

Table 1 shows that the concept of green building starts to implement from developed countries then experience adaptation and adoption by developing countries in the world. Therefore, in general green building rating tools accommodate the building's achievement in sustainable concepts such as economic aspects, environmental development, level of knowledge, and regional policies. They will test towards aspects of sustainability, efficiency, comfort, and manageability [7]. Therefore, an assessment of the key success factors in implementing the green building concept is an effort to count the number of buildings in each country to know the growing number of the users' concept. Based on data showing that of all countries with ownership of green building rating tools, Indonesia is the country with the lowest growth of three buildings annually compared to several countries in Asia such as Hong Kong, Singapore, and Malaysia, shows 48, 170, and 35 buildings annually from 2009 to 2013 [3, 4].

This research investigates the key success factors of green building implementation in developing countries with a case study of Indonesia. The results of the study are a picture for other developing countries to increase the attractiveness of green building implementation from the aspect of building development, green building assessment, and the benefits of incentives. The identification of factors from each aspect that influenced the successful implementation of the green building concept against the green building assessment explained in the previous. The benefit of incentives is a research gap

that is the question of this study where previous research states that incentives in some developed countries are the main attraction so that they are proven to be able to increase the amount of green building in the country [8]. Therefore, the purpose of this study is to identify key success factors implementation of green building concepts in developing countries and initiate the incentive models that had an appeal for developers and building owners. Specifically, the incentive model developed is an incentive that fits the results of the floating country case study in this research, namely Indonesia.

This study limits the aspects of building floating, licensing processes, green building certification, and the benefits of incentives for building owners. Therefore, this study only takes samples from the population who are the developers and owners of green buildings. Previous research states that the biggest obstacle of green building implementation is the responsibility of the developer and owner of the green building and followed by the government, consultants, contractors, and tenants [6]. Furthermore, the biggest obstacles in implementing green buildings are lack of motivation, lack of incentives, and weak enforcement of legislation. They are the main problem in Vietnam, Pakistan, Ghana, Hong Kong, and Indonesia. The government has a significant influence in green building implementation using the mandatory policy. But the biggest recipient of the impact is the building developer and owner. They take a risk not only the cost of increasing initial investment costs but also beneficiaries in building operations [9]. Some incentive models that have resulted in the impact of increased incentives in some developed countries are tax reductions, stamp duty exemptions, the addition of 2-10% gross floor area (GFA), and various internal incentives [10].

2. Research Methodology
Figure 1 is a picture that guides the framework in this study to the end. This research begins with the identification of real problems in developing countries in the implementation of the green building supported by previous research data through a literature review. After the problem formulation of this phenomenon approached, this research identifies the variables of the success factors for green building certification, permit processes, and building incentive models.
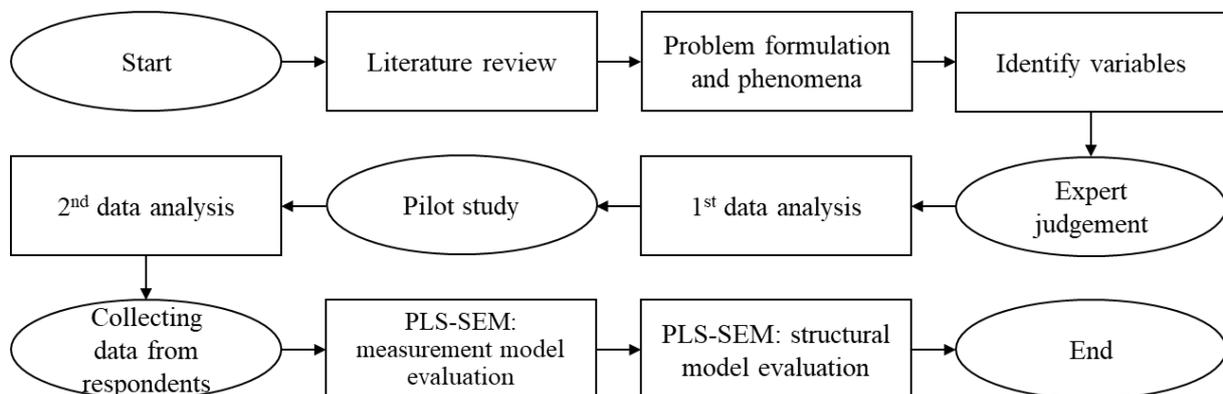
Figure 1. Barriers of the green building concept implementation in some countries

Table 2 is a description of the variables tested in this study consisting of aspects affecting the building development process, certification, and modeling the incentive. Variables that influence the success of building development include economic conditions (KpEko), environmental change (EnviDev), Knowledge (TinKn), and regional policies (RegPol). The endogenous variable indicators of the success of green building certification include sustainability (SustainGB), building efficiency (EfiGB), comfortable (ComfGB), and manageable (ManGB).

Table 2. Variable indicators in this research testing

Code	Indicators	References
SustainGB1	Accessibility	[5, 11, 12]
SustainGB2	Amount of green open space	
SustainGB3	Investment values in green features	
EfiGB1	Low cost strategy in building energy	[13-15]
EfiGB2	Water resource conservation	
EfiGB3	Using recycle/ reuse materials	
ComfGB1	CO_2 periodic test	[16, 17]
ComfGB2	Reduce waste/ emission/ pollution	
ComfGB3	Aesthetic values in green features	
ManGB1	Providing the solid waste recycle facility	[18]
ManGB2	Integrated system in building monitoring	
ManGB3	Periodic performance monitoring	
KpEko1	Green feature prices (initial/ maintenance costs)	[19, 20]
KpEko2	Availability of financial loan services	
KpEko3	Accuracy of capital investment payback period	
KpEko4	Operational costs	
KpEko5	Property/ transaction taxes	
EnviDev1	Climate (example: increased rainfall affects to runoff discharge)	[21, 22]
EnviDev2	Building function (example: office building into office and commercial)	
EnviDev3	Number of occupants/ tenants	
EnviDev4	Building design	
EnviDev5	Land function	
TinKn1	Integrated in building design	[23, 24]
TinKn2	Capability in green construction	
TinKn3	Passive design implementation	
TinKn4	Certification achievement target	
TinKn5	Integrated green features	
RegPol1	Green building mandatory zones	[25, 26]
RegPol2	Green features tax exemption	
RegPol3	Expedited building permit	
RegPol4	Gross Floor Area concession	
ModeIn1	Comprehensive building planning	[27, 28]
ModeIn2	Human well-being	
ModeIn3	Obtained technical assistance	
ModeIn4	Achieve resource savings in construction phase	
ModeIn5	Achieve resource savings in operational phase	
ModeIn6	Increase property (market) reputation	
ModeEk1	Discount in construction tax	[29-31]
ModeEk2	Obtaining property tax reduction	
ModeEk3	Gross floor area (GFA) concession	
ModeEk4	Expedited permit	
ModeEk5	Payback period acceleration	

The variable indicators in Table 2 tested on 34 respondents who were green building developers and owners in Indonesia. The number of respondents is relatively small compared to developed countries because, in addition to the relatively small number of green buildings, knowledge transfer has not gone well since the formation of Greenship rating tools in 2009. Respondent profiles show

76% male and 24% female respondents, moreover based on respondents' education who graduated 56% and postgraduate 44%. More than 50% of the respondents have more than five years of experience in green buildings development. The first time green buildings developed in Indonesia was in 2012. The results of the questionnaire provided input for the analysis process carried out by the Quantitative Method with SEM-PLS. The qualitative method conducted with in-depth interviews with five green building experts in Indonesia. Qualitative methods are a step for the validation of variables and indicators at the stage of preparing the questionnaire (initial validation) and the last stage of the questionnaire result analysis (final validation).

3. Result and Discussion

In the initial stages of the analysis of the results of the questionnaire is the reliability test, the parameters tested are the Cronbach's Alpha value and the Composite Reliability value. A research instrument is consistent if the Cronbach's Alpha value is more than 0.70. Also, the exploratory research has a reliability when the composite reliability value between 0.60 - 0.70. In this research, the Cronbach's Alpha value is more likely to be underestimated or far below the consistent limit. So the reliability measurement is sufficient in terms of Composite Reliability and closer approximation with the assumption of accurate parameter estimation [32]. Overall, the measurement model is stated consistent and proven from the Composite Reliability value of discriminant indicator ≥0.60 so that all construct indicators are maintained to be carried out at the validity test stage.

The next analysis was the discriminant validity test using parameters of cross loading value. It must proof of the value of the square root AVE higher than the constructs' correlation value. The loading factor and AVE values based on the test results show that there are ten construct indicators eliminated because they are below the specified parameter limit value. These ten indicators are KpEko1, KpEko2, KpEko5, TinKn4, TinKn5, RegPol1, SustainGB1, EfiGB3, ComfGB1, and ModEks5 (Figure 2). It proves that the ten construct indicators on the convergent validity test results do under the discriminant validity test value. This research eliminated all ten indicators improving measurement model quality.
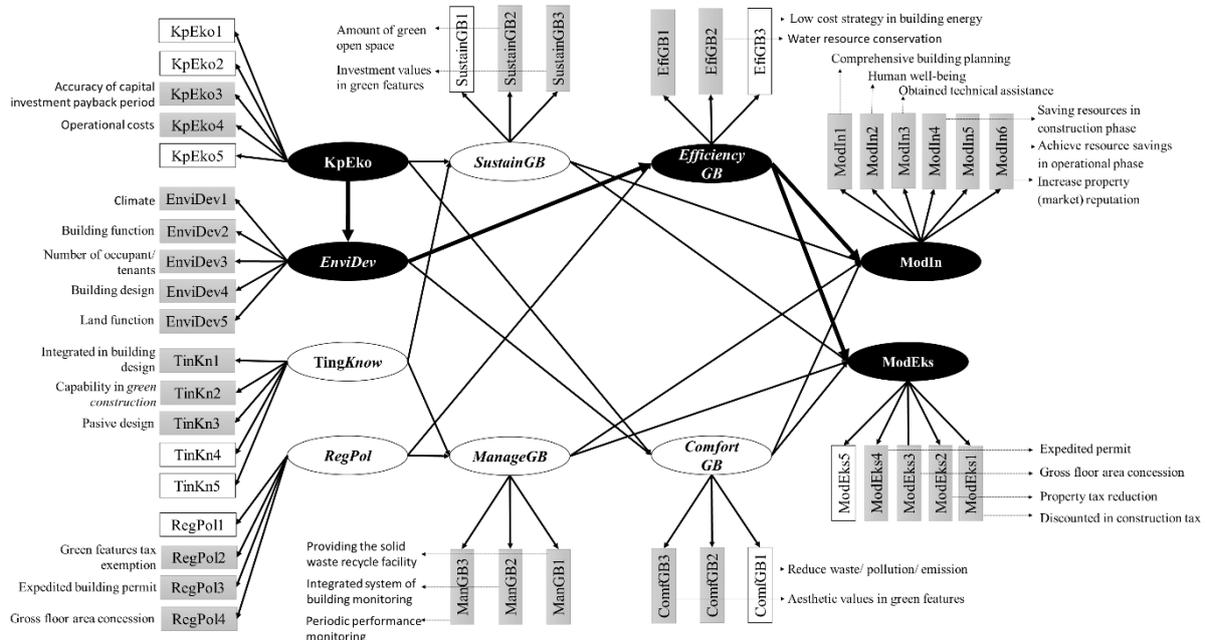

Figure 2. SEM-PLS analysis results for endogenous and exogenous variables testing

Convergent Reliability measurement is a picture of the number of positive correlations with differences in size between constructs. This value determined the composite reliability, average

variance extracted (AVE), and factor loading. In the next stage, a discriminant validity analysis is performed to ensure the level of similarity or difference between the two constructs. Measurements using the Fornell-Larcker application are carried out to evaluate discriminant validity according to conservative methods. The method confirms the construct by comparing AVE square roots with the results of the correlation values between constructs. Also, the p-value was less than 0.01 indicates the significance value of the convergent validity causing the strong relationship between constructs. The intensity evaluation using the SEM-PLS structural model was an objective of the study. This evaluation process went in several test models measuring internal consistency reliability, convergent validity, and discriminant validity. Besides, measurements of R^2 and corresponding t-values have also been carried out at this stage to measure the significance of variable indicators.

The test begins by determining the value of R^2 obtained with the help of SmartPLS 3.0 software. For example of the results of the analysis is the formation of an internal incentive model for endogenous incentives of 0.225. The results of the analysis based on the reference show that the model included in the moderately arranged category or the constructor construct in this study can explain the endogenous construct with a model of medium strength. The R^2 test in other constructs shows the value of the model forming is weak because it is under 0.190 [33]. The strength of structural models and hypothesis testing is examined using bootstrapping, a resampling method that draws a large number of subsamples taken from the original dataset. In this study, we used 500 subsamples to determine the significance of the pathway in the structural model [34]. The results of the statistical analysis on the structural model can see in the picture equipped with a path diagram in Figure 2. The quality of the model testing conducts testing the value of the Good-of-Fit (GoF) index. This test calculates with dividing the average geometric value of AVE with an average of R^2. The criteria for GoF values are between 0 and 1 [35]. The GoF value in this study is $\sqrt{0,6457\ x\ 0,0806} = 0,2281$, so the GoF index value in this study is a medium where the model has been able to be explained strongly enough between constructs or predictor variables produced globally.

At the end of the study, an in-depth interview is a way of final validation of the results of the questionnaire analysis with SEM-PLS. The five experts in this study are those who have experience in implementing green building concepts consisting of the Green Building Council Indonesia (GBCI), government (department of public works, spatial planning, and land affairs), developers, owners, and consultants. The GBCI, consultants, and the government as the party that often becomes the owner of the role in green building certification stated that the developer and owner are the key to the successful implementation of green building, especially in achieving efficient use of resources in building construction. The experts also gave the opinion that the essence of the green building concept achieves a healthy and comfortable building for its tenants. Therefore, it is necessary to have a building design that can accommodate climate conditions, functions, and building capacity to minimize changes in building design due to environmental changes due to incorrect planning. The beneficiaries of the green building concept are the developers, owners, and occupants of the building included human well-being, saving the cost of resources, and increasing property reputation. Therefore, the incentive to adopt environmentally friendly living habits according to the plan needs incentives for these stakeholders. The main problem of the stakeholders is the accuracy of capital investment payback period and operational costs, the external incentives that are under the conditions of Indonesia, namely property tax reduction, technical assistance, and expedited permit.

The results of in-depth interviews can provide an overview of the ease in licensing to building certification with green certified. Increased costs are a problem due to uncertainties in the design and licensing process. Therefore, the existence of technical assistance makes it easier for building owners and developers to implement the concept of green building and obtain feasibility studies from the application of green building concepts, especially financial aspects. Simplification of the licensing process and green building certification found in this study which the integration of the existing building process only takes a month for this process resulted from initially took three to five months each year (Table 3).

Table 3. Integration Green Building Permit and Certification

	Activity	Building designer	Permit service	Expert team	PWSPL	IOR	RSPCB	District head	MIA	Document	Duration	Output	Note
		Stakeholder								Standard quality			
	Start												
1	Submit an online building operational permit application: Green Building & Incentives									Building operational document	1 day	Submission receipt	
2	Verify submitted documents									Online document	1 day	Administration validation	
3	Assign the PWSPL Team to examine the building Green & Technical documents									Valid document	1 day	Letter of assignment	
4	Green building architecture work verification									Architectural document	7 days	Validation result	
	Green building structure and geotech work verification									Architectural document	7 days	Validation result	
	Green building mechanical, electrical, and plumbing system verification									Architectural document	7 days	Validation result	
	trying out and evaluating the implementation performance of green buildings									Engineering document	7 days	Validation report	
5	Financial and national evaluation to consider the green building incentive									Financial and engineering report	-	Evaluation result	
	Green building incentive validation									Evaluation report	-	Validation report	
6	Receive results of the validation in the form of green building incentives									Incentive validation	-	Incentive approval	
7	Establish preliminary building permit issuance									Validation report	1 day	Preliminary certificate	
	Establish building operational permit and incentive									Validation result	-	Operational permit document	
8	Operational permit, plaque, and incentive determination letter are issued									Approval document	-	Building certificate	
	Finish												
	Total processing time for Building Operational Permit – Green Certification – Incentive Letter (Existing Building)										32 days		

4. Conclusion

This research found that the economic aspects affect environmental conditions, which the indicators of building financing affect building design, building activity, and building climate. Therefore, efforts are needed to minimize changes in the building to improve the efficient use of building resources and reduce the amount of solid waste generated by the building. The concept of green building is an effort to improve the performance of building occupants by optimizing the use of resources to achieve a sustainable infrastructure concept. The incentives are the main attraction for developers and building owners to get the successful implementation of the green building concept consist of technical assistance, expedited permits, and property tax reduction. Two main costless incentive collaborations are technical assistance and expedited permit. Furthermore, this study suggests the investigating of two other incentives modeling consists of property tax reduction and gross floor area concession.

Acknowledgement

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