[CON 1] METHODS FOR IMPROVING PROJECT OF GREEN BUILDING IN INDONESIA CONSTRUCTION INDUSTRY: CONTRACTOR PERSPECTIVE

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ABSTRACT

Green building is an integral part of an organization responsibilities to create green sustainable living and designed of building has environmentally friendly, efficient energy and provide healthy air cycle. The issue of green building factors must be carried out using green building method and can be expected to be a solution for reducing the impact of global warming and environmental damage. This research study is identifying the methods for improving project of green building in the construction industry and explore the way to convince the government about related importance of green building. The research method using qualitative research that consists of two contractors from Indonesia. The finding of this research attains the method for improving green building from the aspect of size building, location and selection of material. The finding also show the way to convince government using green building is applying promotion to minimizing cost and implementing of green building into daily life. The implication of this research can intend the method by the contractor produce treated and stabilized in concept of green building, economize energy use by user of that building and show the new idea from contractor to design green building that can giving best quality standard.

Keywords: *green building, method, convince, contractor, Indonesia*

INTRODUCTION

The number of exponential growth of humans are very rapid and uncontrolled in this century. It causes many problems, both problems for the human himself and the earth as a place of residence because in order to meet the necessities of life, people use the natural resources of the earth (Pawar, 2012). According to Smintha and Venkataramanan (2011), development of town and human lifestyle, it was causes uncontrolled electrical energy requirements and other resources are increasing, especially in urban areas. The whole world rigth now focused on finding a solution to the various problems to arise nature. Therefore, the concept of green building was starting to be applied for some planning to operations and maintenance the building. This will have expected to be a solution for reducing the impact of global warming and environmental damage (Baharudin, Faieza & Algburi. 2016). Green Building is an integral part of an organization responsibilities to create green sustainable living in the future. Anastasia (2012) stated that in 2020, Indonesia has a target to reduce carbon emissions 26% for contribute to reducing the global warming that will give affect for human beings. Therefore, the issued of government already make several regulations

which related to construction and building itself. Increasing the effectiveness of green building must be carried out by using the procedure of strategy development because it would be having to rely on the industry and contractors who can handle it. Rathod (2015) stated that both relationship have to see what kind of issues, conduct research in government, optimized of green building and beneficial for the government.

In Indonesia, the scenario of green building by using the concept of green building can provide influence and profound effects on the natural environment around humans. Smintha and Venkataramanan (2011) stated that based on the aspect of developers, designers, engineers, architects and contractors, by deciding concept of green building, the government can realize a green rating tool to do the construction in terms of sustainability and awareness which can encourage governments to address environmental issues and accountability in future generations. According to Nsairat and Ali (2009), the method has the opportunity to make a building can be used to design the building for the integration and reduce the negative effects on the natural environment by some contractors. Bhaat and Rana (2016) stated that the concept of green building must be associated with various factors, such as management control, leadership factor, promotion of green building programs and convince the government to use green building which can provide a lot of benefits.

PROBLEM STATEMENT

Green Building is a building that can utilize less water and can optimize the energy to make it more efficient, conserve natural resources, less waste and provides healthier spaces for the community and government rather than compared to conventional building (Pawar, 2012). However, there are several problem into improving and designing green building. Fisrt, problem statement arises when contractor and government can't take responsibility to maintain and use optimally benefits from green building itself. In Indonesia, green building has been control by the government still less effective in many areas of the building. Second, green building in terms of contractors, some contractors are still inexperienced to make a design green building project which can given influence good or bad quality in that building (Baharudin, et al. 2016). Ashuri and Pedini (2010) stated that green building design should be provided the best design method in a way to knowing how to process of building systems, indoor environmental quality, building commissioning and building material specification. By knowing the procedures, some contractors can apply in the construction industry and provide an experience for own contractor in dealing with green building project.

The significant of this study can help contractors to solve problems on construction site that related green building management and given a clear research about information using the methods for improving project of green building management. Therefore, the purpose of this research was identify the methods for improving project of green building in the construction industry and explore the way to convience the government about related importance of green building.

LITERATURE REVIEW

The concept of green building is counting in fact areas with high biodiversity. High biodiversity should be avoided for the construction buildings (Rathod, 2015). According to Ashuri and Pedini (2010), the concept of green building should be progress in long-term not short-term because the concept of green building doesn't has give a little cost. So, that's why the building should be designed optimally and efficiently. Kangari and Makarechi (2011) stated that to improve the performance of green building can doing with reducing the energy consumption the system of environmental comfort. Various attempts of improvements for performance has to pay attention in controlling and monitoring in the green building. Every effort need to be implemented properly which can give distributed into energy efficiency (Kangari & Makarechi, 2011).

The methods for improving project of green building

The concept of green building has become the system of green building research to comfort and health of the public life (Liu, 2015). There are three methods that would be give impact to improving project of green building.

a) Implementation of program selection material for green building

Reduce the use of energy is a step excessive green building that has the function to improve the efficiency of the building. The consumption of energy always increased during the number of buildings are being built these days more and more. The material used to construct public buildings are largely composed material that can be made less hazardous to health and environmentally friendly as well. According to Srikant, Satya, Navnit, Satish, Sanjeet and Radheshsyam (2016) stated that the selection material can provide a low cost at the beginning for make a building but these costs leads to higher energy expenditure and high protection fees which is resulted in increasing the overall cost of the building itself. Green building raw material should be recommended special benefits for building owners and occupants of the building by reducing maintenance and replacement costs of the building (Srikant, et al. 2016). Energy conservation is related with improving occupant health and productivity. The selection process of green building raw material should be draft perfected and will give benefits for the residents (Liu, 2015).

b) Enchance design of green building rating system

Development energy and environmental design of green building rating system has a purpose for assessing commercial building and high residential building which give effect to environmental attributes and sustainable features (Nsairat & Ali, 2009). Sustainability build of green building rating system is to perform the necessary assessment methods for environmental performance of construction works. According to Miller, Pogue, Saville and Tu (2010), these assessments are intended to provide or improve the quality and comparability the method for assessing an environmental performance of buildings. The benefits of green building rating systems will be helping for some contractors. According to Nsairat and Ali (2009), developed the program green building rating system should be based on the study and analyze the most famous practice for developed countries. This system should be developed in accordance with the local context and should be directed toward residential buildings and other building types that are not in the scope of the study. Meanwhile, this system should be developed and implemented from the early stages of design, considering the life cycle of the

building consists of a pre-design, design and post-design (Anastasia, 2012). The only significant challenge posed in the cost and length of time required for certification. This is consistent across all survey respondents and regardless of location. Enchance Design of Green Building Rating System can divided into 6 rating categories and 4 achievements (refer to Table 1 and Table 2).

Table 1
6 rating categories (Anastasia, 2012)

Rating Category	Criteria	Point	%
Appropriate Site Development	8	17	16.8%
Energy Efficiency and Conservation	7	26	25.7%
Water Conservation	8	21	20.8%
Material Resources and Cycle	7	14	13.9%
Indoor Health and Comfort	8	10	9.9%
Building Environment Management	8	13	12.9%
Total	46	101	100.0%

Table 2
Achievement of building rating system (Anastasia, 2012)

Achievement	Design Recognition		Final Assessment	
	Minimum Point	%	Minimum Point	%
Platinum	56	73%	74	73%
Gold	43	57%	58	57%
Silver	35	47%	47	47%
Bronze	27	35%	35	35%

Referring to Table 1, Anastasia (2012) showed that green building rating system has the best practice in the building industry to establish a quality environment through new buildings with enhancing the quality of life and health. With the criteria of building rating system, the current environmental problems can be solved through a system of rating and weighting (Ashuri & Pedini, 2010).

c) Implementation of green building design in strategic areas
Green Building has some factors that have been identified as an important reference in creating a commercial building environment. Newman (2011) stated that quality of the environment will impact on the health and defining factors of productivity, such as air quality, thermal comfort and lighting, indoor environmental measures and consideration physiological measurements. According to Newman (2011), by highlighting understanding of productivity in green building, the contractor has an attempt to show how the green building design elements define the physical framework and environment. The contractor also trying to show how behavioral factors and human factors interact with the building management to enable of overall increasing productivity in key strategic areas of green building (Miller, et al. 2010).

The effectiveness methods of green building as practiced in among contractors
Contractors have an important role in the ultimate success of achievement and green building design. According to Salvaterra and Dalpra (2012), contractor who have the skill to build the green building should have three phases in which the involvement of contractor which is fundamental to developed effectiveness methods:

a) Pre-construction phase

Pre-Construction Phase is the budget review and site visit prior from start of construction of green building (Salvaterra & Dalpra, 2012). Contractor in complicity initially can provide owners and designers with information that related to the implications of the credit by pursing green building design in terms of cost. Salvaterra and Dalpra (2012) stated that contractor who have qualified skill can develop cost implied, perform the analysis of the life cycle cost of materials and determine the optimal solution based on necessary of the owner. In some cases, contractor must analyze the early budget to know what kind of materials to make project that related with the purpose of green building. Contractors must visit the construction site to assess the specific conditions. It is important to identify features in the ground for developing the better plan to reduce pollution from construction site.

b) Construction phase

Salvaterra and Dalpra (2012) stated that the key points of the construction phase is to make documentation jobsite of quality control, promotion the culture of green building, essentially qualified contractor who has the best skill to develop a specific jobsite plan and participate in a pre-bid meeting to assist contractor to explaining the strategy project of green building in a sustainable destination.

c) Closing phase

Closing phase is final documentation the development of green building. After construction is concluded and final documentation is complete, contractor must perform a building test air contaminant levels in the building prior to occupancy because it should be decided during the process to allow testing in the budget (Salvaterra & Dalpra, 2012). Test air is often where used occupancy was not required after the completion of the green building because the essential already qualified and contractors need to prepare final documentation to complete consistent as requirements for construction of green building to became productive project. Salvaterra and Dalpra (2012) stated that productive project certification requires ongoing effort by everyone in the team, consisting of owners, architects, engineers and contractors.

The methods for convience government to use green building

Green Building design is a kind of positive action, which can be expected to be a positive contribution to the natural environment (Liu, 2015). However, it need help and support with government to using green building. There are two methods to explore the way how to convince government to use green building concept:

a) Make a promotion about laying green building

Convincing governments is crucial moment in increasing the aesthetic value and important role in green building. Considerations in green building design and practices widely from building locations, materials design features and operational considerations. According to Rutherford (2006), green building should be located in brown fields, not in green fields and far away from the habitat of dense population or sensitive, contributing in urban centers, not clustered on the sub urban, integrated into the growth of a sustainable society, have the intelligent community and close to transport services in order to avoid or reduce vehicle congestion on the highway. Rutherford (2006) stated that energy saving building is very important to address because these building is not like car or motorcycle which is has a very long life time.

Invested in building infrastructure is very difficult to change, if efficiency is not included in the construction it will be very difficult to improve in this area in the future.

b) Implementation of green building into daily life
Implementation of Green Building into Daily Life means give a lot of benefits to government or residents which stay in Green Building. Green Building is constructed to incorporate energy saving features by using natural lighting, recycling waste materials to preserve biodiversity and maintain the ecological integrity (Rutherford 2006). According to Ashuri and Pedini (2010), green building bringing many benefits, for example: reduce environmental impact damage to use how to reduce excessive energy, the workers those have the interior in building is designed with green building concept has a higher productivity rate and support the organization as well as marketing and industries that involved many industries construction that can be due developing green building. By present the idea about advantages of green building, the contractor can convince the government to be able to make the green building concept to the fullest.

RESEARCH METHODOLOGY

Research methodology has a significant role in solving research purposes. This method is always used and applied in order the reseracher can easily understand their research more softly through the methodology (Clark & Emmel, 2009).

Research design
This research methodology explains about the method, process and procedure required in collecting the data in the design and concept of green building. This research includes the resources that can be made in research with green building contractor manager. For this study, the respondent involved are two contractors in Jakarta, Indonesia which is both of contractor having experience in construction, especially in terms of green building. Contractor manager plays an important role in this research because the contractor manager can control and maintain a building design. This study using qualitative method. According to Clark and Emmel (2009), qualitative method is a method of investigation used in many academic and social sciences are different in the context of the discussion in implied topical issues. Meanwhile, for data collection method, the researcher divided into two parts, first part is primary data, it would be doing interview with two contractors and second part is secondary data involve literature review based on reading journals, articles, books and internet. From this study, the researcher collecting the data to gain more information to further the finding of the study.

Data analysis
The data analysis involves the process of developing anwers through the interpretation data using the “NVIVO 9” software to develop a different kind of question. Actually, the purpose of collecting data analysis is to identify the problem solving that happen in Indonesia, especially focus on how to improving green building and convince government to using green building.

FINDINGS

The finding of this qualitative study were carried out on company in area of Jakarta, Indonesia. The respondent for this interview session was labelled as contractor 1 (C1) and contractor 2 (C2). In addition, the researcher encodes categories for the type of question, for method for improving project of green building by symbol "A" and the symbol for convince government to use green building concept is "B".

The method for improving project of green building, based on the information from contractor 1 (C1) and contractor 2 (C2). The concept of green building focuses on the increased efficiency in the use of water, energy, design, building material and development maintenance of building to the front. Green building is a constructed building with environmentally friendly materials in addition to the operational and maintenance to save energy in the operational process. Both of contractors (C1 & C2) have similar opinion about how to improving project of green building. The methods for implementing green building program is very important before the building was designed. Firstly, is to identify the location of the building. It has a purpose to determine how the quality of the around of environment and how the possibility of the level of quality of life to be achieved. Secondly, is size of the building. Generally, common view that the greater of room is better for its users. Especially in residential buildings, the green building approach not always the case. A big of size is not always better because the smaller building it will be better to control the environmental aspects of the building. The last step is a selection material. This step related with more technical nature method which is studying alternative methods of building (alternatives to conventional construction methods) and using appropriate material (wise uses of materials). With a variety of opinions from both contractor, the method is still not optimal but the contractors hope in the future, these methods will be optimized. Example of excerptions:

"Langkah pertama yang sangat penting adalah mengenali lokasi bangunan. Hal ini bertujuan untuk mengetahui bagaimana kualitas lingkungan hidup di sekitar dan bagaimana kemungkinan tingkat kualitas hidup yang akan dicapai" (C2: A.Q.5)
"Menggunakan bahan ramah lingkungan secara efektif dan efisien mungkin dan optimalisasi energy terbarukan dalam green building" (C1: A.Q.5)

"Langkah berikut berikutnya adalah memertimbangkan ukuran bangunan. Size Doesn't Matter. Berlawanan dengan pandangan umum bahwa makin besar ruangan maka makin baik bagi penggunanya, terutama pada bangunan rumah tinggal, pada pendekatan bangunan hijau tidak selalu demikian. Lebih besar tidak selalu lebih baik, karena makin kecil (baca: sederhana) bangunan maka akan makin lebih baik kontrol aspek lingkungan terhadap bangunan tersebut" (C2: A.Q.5)

The method how to convince the government to use green building, based on two contractors from Indonesia is still a lack of self-awareness in the government itself. Both contractors 1 and 2 (C1 & C2) has same opinion that the orientation of development and society's views are still lacking. This is because the application or implementation as well as information on the development of green building is still limited and has not spread as well as the need for awareness of all parties. Both the community itself, developers and institutions involved in this case of government. Both of these contractors also provide important thing before performing a method to convince the government to use green building but there are had a different opinion.

Contractor 1 (C1) argues that the cost effectiveness is the most important thing to convince the government to use green building. If the countless green building can be more efficient in the construction and operation of the government, it would be highly appreciated. Contractor 2 (C2) found opinion that is very important to convince the government to use and make the building environmentally friendly. The environmentally friendly similar like saving and the concept of environmentally friendly development emphasizes increasing efficiency of water, energy, building materials of interior building design and maintenance of the building itself. Both contractor (C1 & C2) also found perceptions about the information from this study to convince the government to use green building by making a promotion about laying of green building and implementation of green building into daily life. This is because, it would be appear which green building is not just a concept but also can be applied in real terms. However, to convince the government to use green building is not easy as thought by contractors. Hereby, all this information related to the concept of green building construction is still not optimal and it must be able to change the mindset of the people that the implementation of the green building concept should be applied in their daily lives. Example of excerptions:

"Menyakinkan bahwa konsep Green Building ini akan memberikan manfaat yang sangat luar bisa terhadap lingkungan dengan cara meningkatkan kesehatan bagi penghuni seperti dengan cara memperbaiki kualitas udara, air, mengurangi pemakaian energi listri serta mereduksi limbah dan tentunya akan mereduksi terhadap biaya operasional, meningkatkan produktifitas si penghuni itu sendiri dan lain lain" (C2: B.Q.3).

"Hal yang sangat penting untuk meyakinkan pemerintah untuk menggunakan dan membuat bangunan yang ramah lingkungan adalah konsep pembangunan ramah lingkungan ini menekankan peningkatan efesiensi dalam penggunaan air, energi dan material bangunan mulai dari desain building interior, pembangunan hingga pemeliharaan bangunan itu sendiri dan itu semua harus di applikasikan dalam kehidupan sehari-hari" (C2: B.Q.4).

"Setuju, karena selama ini informasi terkait dengan konsep pembangunan Green Building masih belum optimal dan memang harus bisa merubah mind set dari masyarakat bahwa implementasi dari konsep Green Building ini harus bisa diterapkan dalam kehidupan sehari hari" (C2: B.Q.5).

DISCUSSION AND CONCLUSION

Regarding the problems in this study, the research has been done to achieve the objective set. Here is discussion based on results.

Discussion of the study

The methods to improve green building project has a results from the aspect of location, size and material. The method of location in line with what is presented by Newman (2011) and Miller et al. (2010) stated that the location method is very important to know how the quality of the environment and how the possibility of the level of quality of life are achieved relating to the quality of the environment will impact on the health and defining factors of productivity, such as air quality. The method for increasing green building projects not only focus on the location, also focus on the selection of materials

in the construction of green building itself. That method is parallel with what was presented by Srikant et al. (2016) and Liu (2015) stated that the method of election materials must use environmentally friendly materials with effectively and efficiently where the building has a good design that can help reduce the amount of waste generated by the occupants and provide solutions of location, such as trash. And also, reduce the problem a landfill to reduce the impact on wells or plant. This material can provide a low cost at the beginning to make the building. Hereby, the method for increasing green building project need to focus on design size method. These method in line what was presented by Pedini and Ashuri (2010), Nsairat and Ali (2009), Anastasia (2012) and Miller et al. (2010) stated that the method of size design of the building need to be considered, whether the building has a large or small, it is still not a guarantee because the building must have an approach to a green environment and easy way to maintain and control the building.

The method to convience government about related importance of green building is make a promotion about minimizing cost and implementing of green building into daily life. Make a promotion about minimizing cost is a right way to convince governments in using green building. The method of make a promotion about minimizing cost is parallel with what was presented by Rutherford (2006) stated that convinced the government to use green building is using effectiveness of cost, if green building accounting can be more efficient in the construction and operation of course the government would greatly appreciate provide an overview the real state of society. The method to convience government also focus on implementing of green building into daily life is in line with what was presented by Rutherford (2006) stated that it was very important to convince the government to use and make the building environmentally friendly which is environmentally friendly similar like saving where green building need to designed and constructed to incorporate energy saving features. For example using natural lighting and recycling waste materials. All of that is done to preserve biodiversity and maintain the ecological integrity.

Implication of the study

Contractors should give serious consideration to intend the method. It would be produce treated and stabilized in concept of green building to increasing green building concept that the building can give good influence by the users of the building. Besides, the implication of the study may have an impact energy efficient, with the purpose to create awareness to conserve energy and provide occupants green building with activities that can make a difference at home or in the building itself. Apart from this study, the contractor will be responsible for managing green building to provide new idea from contractor to design green building that can giving best quality standard that may be used by the people to lead a better life and healthy.

Future research

This study focused to identify the methods for improving project of green building in the construction industry and explore the way to convience the government about related importance of green building. There a few suggestions can be studied by the future research. First, can creating technology and software to support and improve the concept of green building in the site. Second, method to research for improving project of green building can using quantitative method because the information will obtained more accurately from the larger number of contractor feedback. Third, can apply this method to other country beside Indonesia.

Conclusion

As a conclusion, this study proves that how to improving project of green building in the construction industry and explore the way to convience the government about related importance of green building are need to focus from aspect of the method and implication. The methods to improve green building project is contractor should focus from aspect of location, size and material. Otherwise, the method to convience government about related importance of green building is contractor need to make a promotion about minimizing cost and implementing of green building into daily life. These parts must should be done as well as possible by the contractor which will provide a positive impact for Indonesia, especially for Indonesian people who want to life healthy and convenient than before.

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