The Direction of Developing Green Building Criteria in Indonesia

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Abstract. Until 2020, one province and two cities in Indonesia have local regulations governing green buildings’ implementation. Besides, there is also a ministerial regulation governing green building implementation, which serves as the primary reference for various cities or provinces that do not have local green buildings regulations. Three of the four laws are more than four years old. The implementation of these regulations has resulted in various achievements and findings and multiple obstacles. It is time to review these criteria so that the green building concept's performance is broader and more weighty. This study aims to review these regulations' requirements, particularly the requirements related to passive strategies, and propose further development directions. We were researching by dissecting the criteria contained in the rules, analyzing the potential impacts generated, and then comparing them with the opinions of building stakeholders. In the future, the green building regulation criteria need to prioritize measures that can significantly impact the environment and energy, and people as the three essential factors of the green building concept.

1. Introduction

Efforts to increase economic development accompanied by environmental and social (human) considerations have resulted in the emergence of the sustainable development concept [1]. This principle then underlies the idea of sustainable design as a process that meets needs and provides value for humans and their environment [2]. The design process should provide a comprehensive solution that considers: energy, shape, construction process, material, place of origin, and time (age) and avoids practical finishes that only meet immediate needs. For example, to fulfill a sustainable concept in energy needs, the energy source should be clean and sustainable energy.

Attention to the environment in sustainable design is philosophically realized by maximizing the built environment quality while minimizing or eliminating negative impacts on the natural environment [3] and improving human quality. It is hoped that such a process will not be obsolete or outdated because it is born from a philosophical awareness. Some of the sustainability principles used as a reference are respected for natural wisdom, humans, places, life cycle, energy, and natural resources and processes. These six principles can be used as a parameter for the sustainability of a design product, including architecture [3]. There are at least three principles that must be considered in the green concept of buildings, namely:

1. Efforts to minimize the impact on the environment at the whole stages of building life cycle from design, construction, and utilization to building demolition [3-5]
2. Energy conservation efforts at the design, construction, and operational stages of buildings [5-]
3. Efforts to pay attention to human comfort and health [6-8]
Efforts are needed to review the direction of green building policies stated in regulations and other legal instruments by understanding the stakeholders' character so that the results are expected to be more optimal.

2. Methodology
The green building concept can be applied anywhere by considering location as the starting point. One of the peculiarities of the place is the characteristics of the culprit. For this reason, to develop green building criteria (mainly passive strategies) that will be stipulated in policies (regulations), it is necessary to have complete knowledge of the theory and its implementation and an understanding of the various actors involved in it. This research was conducted by interviewing several actors who were considered to represent green building stakeholders. The interview was chosen as the method because it was believed that it would reveal more about the ongoing process and its trends in the future. The interview results were then analyzed to determine essential things that need to be considered in developing green building criteria, mainly passive strategies.

3. Results and Discussion

3.1 Government
In principle, the government tries to place itself amid various interests and alignments. The government attempts to ensure that the parties involved in the construction industry carry out their obligations and, at the same time, get their rights. However, in certain parts, the government has taken a stand for particular interests for the sake of more significant interests in the future, one of which is the government support for the environment. This alignment is manifested in making laws or regulations used as a guide for all stakeholders, including rules related to green buildings, including Ministerial Regulations, Governor Regulation, or Mayor Regulations.

It is believed that the making of regulations has gone through a socialization process to get input from various stakeholders through Focus Group Discussions (FGD). When it is implemented, it is hoped that it can accommodate multiple interests that exist in society. The process of deciding and enforcing rules is not straightforward since the government tries to accommodate the updated community's understanding.

The desire to accommodate various interests in society apart from delaying the stipulation also sometimes makes the contents of regulations very general because they need to consider the weakest parties. Several specific criteria often fail to be listed because of these considerations. The problem that arises then is that the absence of these particular criteria causes stakeholders' reluctance to implement them [9]. Some parties only intend to comply with the rules even though they can do better. The Ministry of Public Works Regulation on Green Building provides mandatory, suggested, and voluntary options for the stakeholder to implement green building criteria according to their ability. These Ministry efforts should be appreciated even though it seems less firm and allows the stakeholder to avoid the requirements for various reasons.

The implementation and enforcing regulations is still an obstacle. Laws that have been established usually go through a one-year re-socialization process before fully implemented. Sometimes the socialization process for a year is still considered insufficient so that implementation in the second year is still constrained. Another obstacle is the government's lack of readiness in implementing it due to the lack of staff involved or the lack of uniform understanding of the regulations or the incomplete technical instructions for the implementation or the tug-of-war of the agencies involved in enforcing the rules.

The lack of appreciation for practitioners in implementing regulations is also an excuse for practitioners to fulfill the rules according to the minimum requirements even though they can do better. Meanwhile, what is provided by the government is more often in the form of an award in the form of a certificate of recognition without any incentives, such as tax deductions, ease of licensing, or additional Floor Area Ratio (FAR).
Attention to green buildings through regulations can be understood as the government's concern for the environment. Especially for the passive strategy it has not received specific attention; this is reflected in the rules that have been issued. Although there are indications of overlapping regulations, the contents of the rules still lack in detail. They are only general, weak enforcement of regulations, and a lack of appreciation for actors; it can be read that the government has shown its partiality and does not want to be considered too late in anticipating developing global issues.

3.2 Developers
The primary consideration for developers when designing and constructing buildings is profit. Efforts to bring green building issues to the property business tend to be used as marketing objects for a more fundamental purpose: profit. However, the developer will only adopt the green building concept if the concept's application will not make the building more expensive and unsold for sale. Developers tend to choose which part of the green concept they can adopt by their primary interest, namely making a profit. As long as this concept's application will have a good impact on increasing profits (relative to the investment), the developer will be happy to apply it. However, if the application of this concept will only increase the cost of investment or operational expenditures without the possibility of obtaining additional profits or obtaining profits that are not commensurate with the business, do not expect the developer to apply it.

Likewise, the application of a passive strategy, the developer will be happy to apply the strategy if the additional investment will impact increasing sales profits or reducing operating costs. In principle, the passive strategy is not difficult to implement. The reality shows that some parties seem to avoid using a passive strategy for various reasons. Developers tend to be reluctant to apply the recommended building envelop even though they understand that doing so will result in savings in operating costs. Developers are susceptible when construction costs increase. They worry that this will affect the less competitive selling price and reduce the potential profit obtained. Developers are sensitive when construction costs increase. They worry that this will affect the less competitive selling price. It will directly result in a decrease in buyers or a decreased gain. They still do not consider the potential operational benefits obtained later and tend to overcome this by using mechanical equipment whose costs will be paid directly by the user. Misunderstanding or lack of understanding of green building principles by stakeholders results in a lack of motivation to implement them [10].

As the owner or manager of funds, the developer has sufficient power to determine the building's shape. The philosophical or technical considerations put forward by planning consultants in designing buildings are often countered by practical considerations of financial and emerging trends. Economic interests are the primary considerations in determining the design of the building to be built. The dominance of the developer's role in determining the building design can also be understood from another perspective as the designer or consultant's weakness in defending the proposed concept. Developers sometimes impose blame on the designer because they cannot argue technically, aesthetically, and financially to protect their ideas. Implementing the green building concept, including the passive strategy, also seems to be constrained by the design consultant's inability to argue about its implementation benefits compared to the amount of additional effort (investment) the developer has to make.

One thing that limits the space for developers to move is the rules. Regulations that only have general criteria are a tool for developers to circumvent the greater interest, namely profit. Likewise, the low limitation on rules also means that the developer will only fulfill the minimum requirements to comply with the regulations even though he can do better. The developer is less interested in doing something more if it is not accompanied by additional benefits (benefits) that may be obtained. The absence of incentives is often an excuse for developers not to comply with regulations or be interested in exceeding minimum requirements even though they can implement them.

On the other hand, rating tools as an additional or complementary rule that is voluntary have not been given much attention, as evidenced by the lack of certified buildings. The advantages of implementing the green building concept, especially the passive strategy, still need to be socialized to
attract developers to expand the implementation of the green building concept. It is hoped that later there will be awareness among developers to implement the green building concept, even though it starts with a desire to profit.

### 3.3 Academics

According to environmental conditions, efforts to design buildings are an essential part of academics' material to their students. Apart from environmental conditions, attention is also paid to meeting the residents' needs, including comfort and health. Efforts to optimize both of these are an essential part of the building design process. It is hoped that the optimization process results will benefit the environment and its occupants and indirectly also positively impact the benefits generated for building owners.

The height and low of the building and the difference in function will not change the consideration to prioritize the environment and its residents. The design process can be started anywhere, as long as the environmental context and its inhabitants remain a concern. The rest of the design is part of the experience and sensitivity to absorb and accommodate the environment's needs and residents.

The existence of tools, one of which is energy simulation software, lighting, and ventilation, is a way to get design options with the best performance and sharpen sensitivity to the environmental context and its residents' needs. Similar to force formulas, scale theory, proportions, and various other design theories, energy simulation software, lighting, and ventilation are integral tools in the building design process needed today.

Academics are parties who have a strong interest in the environment and humans. In certain parts, academics will fully side with the environment and deal with humans if human efforts to meet their needs endanger the environment. In a broader scope, struggles to defend environmental interests also indirectly protect social interests. Efforts to preserve the environment are needed to be used by humans sustainably.

Academics continuously make people aware that the efforts made to meet their needs must always be in the environment's corridor, namely maintaining the best possible environmental conditions and minimizing the damage that may occur. Efforts to implement the green building concept, including a passive strategy, make a minimum impact while saving the environment's resources as much as possible.

One of the academics' efforts to defend environmental and human interests is by providing input to the government in the regulatory-making process. Propose regulations that involve many parties may shift from environmental interests to economic interests (profit). Academics are engaged in maintaining upholding environmental interests and social and economic interests as part of sustainable development demands.

Another effort made by academics to protect the environment is to pass the knowledge they have to students. The green building concept and optimization of the passive strategy implementation need to be continuously conveyed to students as the next generation. Some of these students will become representatives of construction industry stakeholders, and they can fight for the green building concept (including passive strategies) if their knowledge is sufficient. The need for knowledge that must be possessed is more detailed and includes many things so that it is adequate when they have to argue with other parties. Building science has become a necessity, as well as building economics.

Although there are some similarities and differences in understanding the performance of the green building's passive strategy [11], academics have the opportunity to share their knowledge, especially about green buildings, with designers, developers, and contractors. The slow progress of implementing the green building concept is the lack of uniform understanding among stakeholders. Standard views are necessary to synergize efforts towards the same goal. The primary purpose of practitioners (designers, developers, and contractors) to achieve the optimum profit as part of a business entity can still be realized while implementing the green building concept. The more implementations, the more efficient the investment and operational costs are so that profits can be maintained and realized [12].
3.4 Architects

Architects feel that the application of passive strategies has become part of the planning process. Designing the building's orientation and its envelope according to outdoor conditions (sun, wind, climate, weather) has become a routine part. Optimization efforts (environmental and user interests) made by academics are also a designer's concern. One more thing that planners always consider is the developer's interests, namely, business interests. This interest cannot be ignored because the developer is the client of the designer, after all.

The obstacle that planners often face is convincing their clients that the design has been optimal considering the environment's interests, users, and developers, in this case, the developer or building owner. Architects often face developer comments about construction costs due to optimizing these three interests, including passive strategies to adopt environmental claims. Implementing the passive strategy depends on the planner's ability to convince the developer that passive strategy results from design optimization and has considered various interests, including those of the developer.

Architects believe that they need various energy simulation software, lighting, and ventilation to design buildings with better environmental performance. However, not all planners are specialized to have a particular division or exceptional staff to handle it. Some planners will only take advantage of this software when needed, one of which is to get green building certification. This condition indicates that this software's existence, for the time being, is only used to justify the previously made designs and not be used to select various building design options. The buildings' obligation to comply with the DKI Governor Regulation regarding green buildings makes planners need this software more. The Governor Regulation's existence further proves that simulation is only required for practical purposes, namely to justify the design that has been made according to the minimum requirements and is not used to get the design option with the best environmental performance.

The DKI Jakarta Government, as the party that grants the building permit, even provides convenience by making calculation tables that are easy to operate to calculate the environmental performance. Some architects did not use the tables to test the optimization of various building design options but only checked whether their design meets the minimum requirements. The need to utilize environmental software or calculation tables to obtain green building certification or comply with government regulations is a good development in the building design process. The use of this software is not supposed only to justify the fulfillment of the criteria. It is time to place this software as an essential part of building design since the beginning of the design process and the necessary material for arguing with the developer.

3.5 Contractors

The contractor feels comfortable in a position to carry out what planners and developers have planned. The contractor's responsibility is limited to designing and carrying out the construction process, referring to the design as efficiently as possible to obtain financial benefits. In some circumstances, the contractor also carries out some value engineering process to minimize costs without compromising the final product's quality. Generally, the contractor will propose specific material changes to consider ease of purchase or ease of installation without changing the design.

In the last five years, several contractors have started introducing green concept application in the building process as part of the green building concept. The principle of green construction emphasizes reducing energy consumption and reducing environmental impacts on the construction process. Regarding the passive strategy, contractors generally position themselves to propose changes to building envelope materials even though the proposed changes are based more on considerations of the construction process's efficiency and effectiveness and not on environmental or user concerns.

These considerations will be different if the contractor is in a design and build contract position or makes for their interests as part of their business development. In this position, the contractor acts as
an implementer and works as a designer or developer. The issue is no longer just implementing green (green construction) but also concerning green design (green design / green building design) and even green development (green development). For this reason, control is needed to maintain the balance of the contractor's role as a business entity that prioritizes the achievement of profits while still paying attention to environmental and human interests.

3.6 Users
One of the interests is considered in the design process in the user's interests. Still, because building users, in this case, high-rise office buildings, are often not the building owners, their interests are often neglected. Users are forced to accept the conditions of the buildings they occupy. Related to the passive strategy for the thermal and visual environment, the user can adjust the interior and adjust themselves.

Attractive conditions are shown in the willingness of residents to help reduce or conserve energy use in buildings. Most of the office buildings' occupants admit that their workroom temperature conditions are colder (especially in the morning or at night), so they are willing to temporarily turn off or raise the threshold for room temperature as part of the energy-saving process. However, at certain hours (noon to evening), they hope that they still need a warm temperature (not too cold or too hot) to support their work effectiveness. They feel that the hot room conditions will interfere with their work concentration. Replacing the AC with a fan is also mostly undesirable because it is thought that the fan will disturb and cause the body to be less healthy.

Regarding room lighting, most respondents are willing to reduce the number of lights they work with because it is excessive (especially during the day to evening for residents who are close to outside glass). Some respondents are even willing to turn off at certain times (during breaks). The willingness to be involved in saving energy is quite encouraging and should be considered in tall buildings. We need to consider the freedom to adjust the air conditioning threshold according to the conditions of the occupants, the freedom to turn off and turn on the air conditioning according to the occupants' needs, the freedom to turn on or turn off the lights as needed.

4. Conclusion
The successful implementation of the green building concept, especially the passive strategy is inseparable from the stakeholders' support. A passive strategy's performance depends on the benefits alone and depends on the building stakeholders (Government, Academics, Architect, Developers, Contractors, and Users). Dissemination ease of implementation, savings in investment, and operational costs of green building's passive strategy are needed for all stakeholders. Information from academics about the performance of passive strategies in a scientific manner is needed. We also need the data from users about the experience they feel, from contractors about the ease of application, from suppliers about their availability.

The key to successfully implementing a green building's passive strategy is not measured by how much it is used. Instead, it lies in the continuous dialogue between the various parties involved in this field. For this reason, it is necessary to have a common understanding or viewpoint, determine targets and stages of implementation so that a regulatory product can be effectively implemented. It is hoped that with this dialogue process, all interests can be represented and moved to participate in implementing it according to the expected goals.

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