Geographical Analysis, Building Regulations in Indonesia, PP No: 16 of 2021

Ch. Koesmartadi1*, B. Resti Nurhayat1, and M. Kusyanto2

1. Program Studi Arsitektur Fakultas Arsitektur dan Desain Universitas Katolik Soegijapranata Semarang Jawa Tengah Indonesia
2. Program Studi Arsitektur, Fakultas Teknik, Universitas Sultan Fatah Demak, Jawa Tengah Indonesia 59516. *Email: ch.koesmartadi@unik.ac.id

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Abstract—Currently, Indonesia in regulating buildings refers to PP No: 16 of 2021, this regulation was made by the government. This regulation contains all the regulations regarding the layout of architectural forms, including the area limits relating to the area of the site and the allowable height limits. It is suspected that the concept of this regulation adopted from a European country so that its application often encounters problems, because the concept that is suspected of adopting one of the European countries has not been adapted to the geographical conditions of Indonesia. The regulation regulates the floor area which is calculated as the edge of the building with the percentage of the site area, even though for Indonesia's geographical conditions, shade is needed which takes up an additional area beyond the floor area. The rule regarding the height of the building is measured by the height of the top floor, even though according to Indonesia's geographical characteristics, where the sun passes through, it requires a roof that can reduce the heat and accelerate the drainage of rainwater. In Indonesia, which is known for its many varieties of architecture that follow local characteristics, it gets less attention. As a result, several traditional house architectural characters disappeared, which were quite numerous and varied. In this discussion, we look for formulas for building regulations that take into account geographical conditions and architectural variations

Keywords: locality; islands; microclimate; architecture

1. Introduction

At present building regulations throughout the vast Indonesian archipelago apply the same as if they have the same problems as a small country such as the area of a province in Indonesia, considering the character of the regulations refers to a country like in Europe.

It should be noted that Indonesia has long had "building rules" that are used for the embodiment of architectural works, as we can see in several relics, both damaged, conserved and intact. It should be noted that for a very long period, since the eighth century, Indonesia has had architectural works with the relics of several temples that we can see to this day. Architecture during the royal period also shows that since ancient times, our people have been capable of architecture. Finally, the focus of the discussion is the large variety of traditional houses spread throughout Indonesia. Architectural works of traditional houses which are very diverse and stand a lot throughout the territory of Indonesia. We can see that many works were built in the colonial period. This is where the clash occurred because with the presence of the colonial building it was as if the traditional houses that had existed before did not exist. Even though the presence of colonial buildings has made efforts with several adaptations, with the character of adaptation eating the spirit of architecture, not much has been worked out. This is what causes building regulations in Indonesia to not carry the 'aspirations' of the existence of very many and varied original Indonesian houses that should be a source of
inspiration for the implementation of building regulations in Indonesia.

Objects and problems in the research conducted include: (1) Building regulations that apply in Indonesia; (2) New architectural buildings that purely use rules regardless of Indonesia's geographical conditions; (3) Modern buildings that are in accordance with the geography of Indonesia; (4) Architectural buildings that maintain local concepts follow the regulations; (5) The original traditional house building has not followed the rules at all.

2. Method

The method used is descriptive qualitative by examining building regulations that have been applied to real conditions in the field. The existence of the Indonesian archipelago which has a two-season climate that has different characteristics in the application of building regulations causes a discrepancy between the regulations passed and the real conditions on the ground.

Data collection is done by collecting data in detail according to the type of data desired. The data collected is the area of the building which is calculated from wall to side wall. This data is to get data on walls exposed to rainwater runoff and sunburn. Data on the application of climate regulations in real terms in Indonesia, which has two seasons, namely the dry season and the rainy season, which uses the principle of shelter by freeing walls from exposure to rain and heat. While the regulations are made in the conditions of the four seasons, the walls require exposure to heat in order to distribute heat into the room. Other data collected is upper bound data as a flat field. Roof data on the real condition of buildings in Indonesia follow the architectural rules of the roof as a shelter. If applied to regulations, the principle of domination of soaring roofs becomes the main concern in building regulations. Data analysis uses an approach by taking samples of climate-related regulations such as walls as the outer boundary which if analyzed in more depth then the walls will rain runoff and heat, whereas for Indonesia which uses the concept of shelter it only needs a vaulted roof so the walls are free from these two problems.

Analysis of this data is to determine the application of sloping roofs in conditions in a two-season climate. Another analysis is the analysis of air movement. The curtain wall acts as a slow-moving air diversion, by using a sloping roof, the curtain wall can function optimally.

3. Results and Discussion

This discussion is more focused on the shape of the building which is a recommendation from the contents of government regulations regarding buildings which are then lined up with three cases of authentic Indonesian houses which illustrate the diversity of buildings. On the one hand, the building regulations that apply in Indonesia are more focused on cubication elements as if all areas can be treated the same. The study was continued with a study of building volumes in three areas with different building characteristics. From the study of government regulations which are then lined up with three cases, gaps will be found for the development of regulations as a whole.

Review the current building regulations.

According to Zahnd (1999) In general, in the implementation of "conventional" urban planning, a uniform approach is generally taken, meaning that the implementation method for directing and managing urban development is carried out with the same management system. The system focuses on a design control by paying attention to development constraints with minimum or maximum criteria. This system does not pay attention to the quality of the building and its environment, but only applies general standards with the hope that it can protect building users and the surrounding community.

In general, the implementation is governed by regulations specified in the following four plans:

- Land use plan (zoning)
- Traffic plan
- Infrastructure plan
- Building shape plan

In accordance with the control system for the design of urban areas and their buildings, several factors that need to be considered are:

- Building height
- Building function
- Mass/space density
- Traffic effects (circulation frequency and number of parking spaces)
- Lighting and ventilation of public spaces
- Security
- Environmental disturbance

In this case, technical terms are used to control these criteria, at least for building plans (see figure).

- Basic coefficient of building/building coverage (KDB/BC)
- Building floor coefficient/floor area ratio (KLB/FAR)
- Maximum building height (KBM)
- Fence equivalent line (GSB)
- Building line equivalent (GSB)
However, if you look at the building regulations that we are currently following, they refer to Government Regulation Number 16 of 2021, which outlines the area and height permitted for an area, such as:

The Cultural Heritage Building (BGCB), which is then called the BGCB, is a building whose status has been assigned as a cultural heritage building under the provisions of laws and regulations on cultural heritage. In fact in the field there are two categories of Cultural Heritage buildings in Indonesia, there are various types of buildings:

Government-protected buildings come from foreign countries

Original protected building from Indonesia

In practice, the term cultural heritage only deals with Colonial heritage buildings, this is reflected in the activities and formulations of buildings that lead to conditions of colonial buildings and pay little attention to the original Indonesian heritage. Because there are differences in preserving heritage buildings and traditional house buildings, colonial buildings are conserved by repairing damaged parts, while traditional house buildings are being conserved by replacing construction material rods.

Green Buildings, hereinafter referred to as BGH, are buildings that meet the Building Engineering Standards and meet significant performance elements in saving energy, water and other resources through the BGH principles in accordance with their functions and classifications in each implementation.

The term green building comes from the term green building which is a foreign term for a building that has the concept of saving energy and being friendly to the environment. In the implementation of energy-efficient buildings, it is usually made around wasted water energy. AC energy as indoor air conditioning. This condition is certainly different from local conditions where biological resources in the form of trees are abundant and have many characters, of course, also add to the energy-saving nature which really extends to the use and care of wood that grows around buildings. In Indonesia, with a two-season and humid climate, houses on stilts or decks, although they are classified as green buildings, have not yet entered the level of green buildings according to the table above.

Building Border Line (GSB) is a line that regulates land boundaries that cannot be crossed by buildings that physically limit buildings to the front and back and sides

Building commensurate lines are made using the concept of developed countries where the level of wealth and building ownership is evenly distributed, it is different from the condition of Indonesia where there are still many differences in the level of wealth between residents who live side by side with each other. On the other hand, the building zones are still mixed, resulting in small buildings and large buildings that can still be found side by side on one road. The difference in land area between buildings between small land and large land is striking. This condition causes that in adjoining land each follows the rules of equivalent building lines, as a result, one small building is greatly disadvantaged by the adjoining one which follows the same rules but the function of the mall building is very broad. It's being unfair. In a small piece of land, the same line applies to a building, for example a mall.

Building Height (KBG) is the maximum number of floors of the building that are permitted

In the building regulations it is stated that the height of the building is calculated from the height of the top floor which is counted as the top part of the roof. This condition is quite difficult if applied in Indonesia. With a hot and rainy tropical climate, there will be problems if the building uses a flat roof. When it's hot, the flat roof concrete material will easily generate heat in the room below, during the rainy season there are difficulties in flowing water down and cracks due to the rain will always hit the flat roof material.

Basic Building Coefficient (KDB) presentation figure based on the comparison between the area of the entire ground floor of the building to the area of plotted land or the planning area according to the KRK

The ground floor coefficient of the regulations is thought to originate from the four seasons country where the walls are made in addition to supporting loads as well as functioning
as heat absorbing walls to warm the room. It's different from Indonesia, which imposes more barriers as curtains instead of walls. This condition can function optimally if the roof is covered which ensures that the walls/curtains are not exposed to heat stroke and rainwater runoff. This condition requires a design with an additional area as a lattice for an additional design in the form of a gable roof. So that in terms of the concept of the ground floor, additional space is needed for roof trusses.

Various categories of building forms in Indonesia

In Indonesia, which consists of islands and oceans, there have been many traditional houses that have existed for a long time. Then with the entry of the colonial, buildings were scattered with Dutch influence. It was only after independence that the flow of various forms of buildings developed towards modern buildings, so that in the Indonesian archipelago today there are many types of buildings that are influenced by various aspects.

New architectural buildings that purely use rules regardless of Indonesia's geographical conditions. Building planning that purely uses building regulations is usually the side wall as the edge of the building and the upper floor boundary functions as the flat roof of the building. This design model usually relies on the use of air conditioning and especially glass made with the concept of reducing the effect of heat into the room. The dependence of this concept means that all rooms rely on this equipment and the design of passive countermeasures is not included in the design concept. When one Indonesian architecture is juxtaposed with another, you can immediately see the different roof shapes, and of course there is no objection to starting your observation of this archipelago architectural form by getting to know the shape of the roof. Because the concept of Archipelago architecture is shade or shade, the roof is the main element of architecture. It can be said that each of the Archipelago's architecture certainly shows the roof of the building; so there is no flat roof which only makes the building look like a building without a roof (Prijotomo, 2018).

Modern buildings that are in accordance with the geography of Indonesia. There is an effort to harmonize the design of the building by adjusting the climate of the two seasons, hot and rainy and aligning with the movement of the breeze through curtains that allow the wind to easily move through the room. The design of this building usually uses a sloped roof to protect the walls from the heat and rain splashes. By taking shelter and shelter, a person is inseparable or isolated from the surrounding environment, it means that a feeling of unity with the surrounding environment can still be obtained (Prijotomo, 2006), the space that is shaded then becomes a volume of space where shelter can do what it should. Contextual buildings according to Idham (2014) are related to ecological aspects having a correct and appropriate suitability for their environment, hereinafter referred to as contextual, namely buildings that are built not only in terms of an architectural style with a certain style, but also related to the physical characteristics of the natural surroundings. Contextual with the physical characteristics of the environment consisting of soil and air. Contextual is closely related to aspects of building safety against earthquake hazards, tornadoes, flood rains, drought heat and so on.

Architectural buildings that maintain/local concept by following regulations. This design tries to use the latest local concept while following the rules that have been set. The concept of this model is not entirely a form of locality that is fully decomposed in design because of current demands, it is sometimes difficult to apply the concept of locality in design. Regulations can be used but with a little compulsion because updating local architectural designs requires careful attention because they are sometimes contradictory. This condition often occurs considering that the applicable building regulations come from abroad which are not fully suitable for implementation in Indonesia, as a result the design lacks a local flavor. The essence of building a building that utilizes everything that can lower the temperature and protect against sunlight so that the room becomes comfortable, the building should be equipped with a wide roof (trim) not exceeding three floors (Frick dan Suskiyanto, 2007). Conditions of air temperature, air humidity, wind speed, rainfall and air pressure are climatic elements in the building environment that must be considered in determining human comfort in building spaces (Kusyanto dan Rihadiani, 2021). Architecture is shelter or shelter. The thoughts of the ancestors who live in the topic area and are prone to earthquakes, may be based on the enjoyment and comfort of taking shelter or taking shelter under a shady tree (Prijotomo, 2018). Shady trees have branches and twigs that extend from the parent plane, and from the branches grow leaf after leaf that is lush. This shady tree then becomes a metaphor, model or role model in making a building that becomes a shade or shade.
The original traditional house building has not followed the rules at all. Traditional house buildings were built long before the regulations came into effect, so that the designs from many areas were difficult to reach by building regulations which seemed to lead to one form of design. Traditional house buildings scattered throughout the archipelago have a variety of basic forms, with many variations of the basic form it is likely difficult to enter into the realm of building regulations. Almost all of the traditional house owners use the roof as the main thing, or rather the roof architecture. This position makes it difficult for traditional houses to enter into the current building regulations, because in addition to the various traditional house buildings, the implementation is different because of the different architecture. As is well known, the archipelago has nearly 700 types of buildings, each of which is different from one another, strangely none of which are included in the realm of building regulations. This is very understandable because the origin of the formation of building regulations refers to the form of foreign countries which have an area of approximately one province. In the matching table of Indonesian Archipelagic Architecture/Archipelago (Koesmartadi, 2019) it is stated that the archipelago region has archipelagic character, has a two-season climate, has architectural characteristics of shelter, covered in nature, fireplaces as material preservatives, no differences in treatment between indoors and outdoors, organic architecture traversed by earthquakes so that the architecture should be responsive to earthquakes, preservation with replacement, temporary status, not killing the nation's architecture, high humidity and architectural cultural products.

4. Conclusion

After looking more closely at Government Regulation No. 16 of 2021, it can be concluded that this regulation was made to take materials from foreign countries, landlocked countries whose area is approximately equivalent to a province with a character form that has not been adapted to the geographical conditions of the Indonesian archipelago, so that sometimes it is not appropriate applied in Indonesia, where previously there were various forms of architectural buildings.

Improvement steps can be taken by improving building regulations which are prepared based on the local architectural potential of the entire Indonesian archipelago which are summarized in the form of regulations that truly represent the variety of local architecture.

References


