



Research Paper

## Influence of Sustainable Construction for The Environment and Social Community

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### Abstract

Sustainable construction is the way the construction industry develops to achieve sustainable development goals, taking into account environmental, socio-economic, and cultural preservation. Sustainable construction requires in-depth study, a synergy between various methods and approaches with technology exploration, and planning that prioritizes community welfare. This study aims to examine in depth implementation of sustainable construction in construction work discuss comprehensively benefits of sustainable construction for environmental and social sustainability. This type of research is normative juridical with a descriptive-analytical approach discussing existing legal symptoms and problems and testing their awareness of laws and legal norms. The results of this study show that the implementation of sustainable construction in construction work is applied through the concept of green construction or green building as a development that pays attention to environmental aspects, efficient use of energy and resources in the building cycle from the planning, implementation, and use of construction products. The benefits of sustainable construction for the environmental and social sustainability of the community include: reducing carbon emissions and resource efficiency, maintaining the continuity of the carrying capacity and accommodating capacity of the environment, reducing social inequalities or disparities in society, supporting cultural interactions and local wisdom, and moving the wheels of the national economy.

**Keywords:** *Construction Services; Environmental; Green Construction; Social; Sustainable Construction*

### INTRODUCTION

Human needs for natural resources continue to increase with the times, population growth, economic and industrial growth. Massive exploitation of natural resources continues to be carried out in order to meet human needs. This results in the erosion of natural resources, which can become a big problem in the future (Hidayati, 2017). The decrease in the quantity and quality of natural resources has a direct impact on planning, needs and integrated environmental management. Environmental damage is also closely related to poverty and economic growth rates (Etika Khairina, 2020). Overcoming this problem requires efforts to preserve and recover natural resources and wisdom in their use. That some important ideas of sustainable development are, first, the idea of the essential needs of the poor which must be the top priority. Second, as a foresight that emphasizes the precautionary principle against potential serious threats or something that cannot be prevented in order to overcome environmental degradation. Third, integrating complex relationships between environmental, economic, and social aspects of society are the main pillars of sustainable development (Ngoya, 2015).

Article 1 Paragraph (3) of Law Number: 32 of 2009 concerning Environmental Protection and Management states that sustainable development is a conscious and planned effort that integrates environmental, social, and economic aspects into development strategies to ensure environmental integrity and safety, ability, welfare, quality of life of present and future generations.

Based on the UNEP study, sustainable construction is the way the construction industry develops to achieve the quality of sustainable development, taking into account environmental, socio-economic, and cultural conservation, construction management, materials, operational quality of buildings, energy consumption and natural resources. Sustainable construction requires in-depth studies, synergies between various methods and approaches with technological exploration, and strategies that prioritize the welfare of society and the environment (Willar, 2021).

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One of the concepts of environmental conservation in construction work is adopted through the green construction program, which is a project management or construction work to minimize environmental impact and provide comfort to building users. Green construction planning is expected to result in efficient use of energy, water, and materials that can be recycled, reused and reduce excessive material use (Maulidianti, 2021).

Green buildings are designed to reduce the impact of the built environment on human and natural life, efficient use of energy, water, and other resources, protection of public health and increase worker productivity (Lauren Robichaud, 2011). The construction industry is a sector that consumes a lot of energy and produces emissions. That almost one-third of the world's total energy consumption is used for the construction sector (development) both housing and civil works. The construction industry contributes one-third of CO<sub>2</sub> emissions with the use of 30-40% of the world's energy (Siti Zubaidah, 2008). The emission is generated from the use of electricity sourced from fossil fuel plants. As an effort to reduce the negative impact, the green construction concept approach is an effective solution. The implementation of construction work must implement sustainable construction that not only pays attention to environmental impacts but also to the economy and social community.

The fundamental points of green building include site layout, construction management, protection and storage of building materials, air quality during the project, and understanding of green building requirements (Putu Ananda, 2023). That in terms of sustainability and its correlation to the environment, there is a fundamental difference between green construction and ordinary construction. Sustainable construction management systems are more oriented towards sustainable development goals that emphasize the sustainability of life and resource efficiency for the present and future related to environmental sustainability and social aspects (Fahmi Irhamsyah, 2019).

## **LITERATURE REVIEW**

A literature review is a description of the literature relevant to a particular field topic. Objectives regarding what is discussed in the research, hypotheses and supporting theories, as well as the formulation of problems in research. That this study uses the Theory of Legal Certainty, which according to Utrecht contains two meanings, namely: first the existence of general rules makes individuals know what actions can and what cannot be done. The second is in the form of legal security for individuals from government arbitrariness against general rules so that individuals can know what the state may impose or do on individuals. Legal certainty refers to the clear, fixed and consistent application of laws where their implementation cannot be influenced by subjective circumstances (Julyano, 2019).

The formulation of the problem that is the focus of this study is how to implement sustainable construction in construction work? How does sustainable construction benefit the environment and society? That the theory of legal certainty is used as an analytical knife in answering the focus of the problem in accordance with the purpose of this study, which is to examine in depth the implementation of sustainable construction in construction work and discuss comprehensively the benefits of sustainable construction for environmental and social sustainability of the community.

## **RESEARCH METHOD**

In accordance with the subject matter, the type of legal research carried out is normative juridical research or research that analyzes written law, jurisprudence and norms that live in society. The descriptive analytical approach aims to take systematic, factual, and accurate data on a problem based on applicable laws and legal norms. Data collection techniques are carried out through literature studies, namely to obtain data by reviewing literature materials or secondary data, which include primary legal materials, secondary legal materials in the form of laws and regulations, books and works, or other scientific journals as well as tertiary legal materials such as dictionaries, magazines, newspapers and articles (Ronny Hanitijo Soemitro, 1990).

## **FINDINGS AND DISCUSSION**

### **Implementation of Sustainable Construction in Construction Work**

Article 1, paragraph (3) of Law Number: 2 of 2017 concerning Construction Services states that Construction Work is the whole or part of activities that include the construction, operation, maintenance, demolition, and rebuilding of a building. In construction work, owners and users of construction services must pay attention to aspects of security, safety, health, and sustainability standards (K4) (Agustina, 2023).

Standard K4 is a technical guideline for aspects of security, safety, the health of construction workplaces, protection, and social labor, as well as the local environment and environmental awareness in the implementation of construction services. Meanwhile, what is meant by the principle of sustainability in Law Number: 2 of 2017 concerning Construction Services is the implementation of construction service work carried out by considering the impact that will arise on the environment so that it is maintained continuously regarding ecological, economic, and socio-cultural aspects (Manurung, 2022).

Sustainable construction is a technical part of realizing sustainable development. Sustainable construction is a fundamentalist value in the implementation of construction work, both infrastructure development and buildings in Indonesia that prioritize environmental conservation. Legal regulations on sustainable development and construction are regulated in several provisions, namely:

- a. Law Number: 32 of 2009 concerning Environmental Protection and Management;
- b. Law Number: 2 of 2017 concerning Construction Services;
- c. Perpres Number: 111 of 2022 concerning the Implementation of the Achievement of Sustainable Development Goals;
- d. Regulation of the Minister PUPR-RI Number: 9 of 2021 concerning Guidelines for the Implementation of Sustainable Construction;
- e. Regulation of the Minister PUPR-RI Number: 21 of 2021 concerning Performance Assessment of Green Building Buildings.

Article 1 Paragraph (5) of the Regulation of the Minister PUPR-RI Number 9 of 2021 concerning Guidelines for the Implementation of Sustainable Construction states that sustainable construction is an approach in carrying out a series of activities needed to create a physical facility to meet current and future economic, social and environmental goals. The implementation of construction services to erect buildings or civil buildings must implement sustainable construction consisting of three main pillars, namely: "economically feasible and can improve community welfare, maintain environmental preservation and reduce social disparities in the community.

Sustainable construction is applied to the concept of green construction, which is a life cycle that starts from the planning, construction, operation, maintenance, renovation, to demolition stages which must pay attention to various impacts. Green construction is more effective and efficient is also a priority in business models that consider aspects of cost and energy savings (Kadek Sudiarta, 2015)

Supporting the implementation of sustainable construction in infrastructure implementation, the Ministry of PUPR has established a Sustainable Construction Implementation Commission, which is responsible for directing the implementation of sustainable infrastructure from the beginning to the end of the implementation. That the main functions of the Sustainable Construction Implementation Commission are:

- a. establish sustainable infrastructure implementation activities and integrate each stage of sustainable infrastructure implementation;
- b. provide general direction and techniques, criteria/targets, and rating tools in order to ensure the implementation of sustainable infrastructure implementation;

- c. provide input on process improvements at each stage of sustainable infrastructure implementation based on reports on the results of monitoring and evaluation;
- d. Report the results of sustainable infrastructure implementation in an integrated manner (Lawalata, 2019).

In Indonesia, the feasibility category of a green building is determined by the Green Building Council Indonesia (GBCI). The assessment system is called Greenship which consists six categories, namely water conservation, land use, material efficiency and cycle, indoor air quality and comfort and building environmental management. Here are some buildings that received the title of green building for their success in saving the use of electricity, water, and recycling, including Gedung Kementerian PUPR-RI, Menara BCA Jakarta, Sequis Center, Sampoerna Strategic Square, Pacific Place, Gedung Teraskota, L'Oreal Indonesia, Alamanda Tower, Gedung Dusaspun dan Citra Maja Raya (Kementerian PUPR-RI, 2021).

That the implementation of sustainable construction must contain technical criteria based on several important aspects, including:

- a. Technical aspects which must be met to maintain building reliability, including building technical criteria, K4 standards, and meeting the feasibility of building functions;
- b. environmental aspects are aspects that maintain the continuity of carrying capacity and accommodating capacity of the environment, utilize resources efficiently and minimize environmental impacts, including appropriate land use, energy conservation, water conservation, material resources cycles, comfort, health, and environmental management;
- c. economic aspect, which is an aspect that can provide economic benefits for all parties and encourage continuous improvement of community welfare, including contributions to increasing regional economic potential, prioritizing programs to obtain maximum benefit for the community, resource efficiency, and supporting business activities;
- d. the social aspect is an aspect that has an impact on reducing social inequality as a whole, including community participation, gender elements, people with disabilities and marginalized people, supporting community interaction, and preserving a culture or local wisdom (Kementerian PUPR-RI, 2021).

Article 3 of the Regulation of the Minister of PUPR-RI Number: 21 of 2021 concerning Performance Assessment of Green Buildings contains the principles of BGH implementation, including:

- a. formulation of common goals, understanding and action plans;
- b. reduction in the use of resources, both in the form of land, materials, water, natural resources and human resources;
- c. reduction of waste generation;
- d. reuse of previously used resources, resource usage of recycle results;
- e. protection and management of the environment through conservation efforts;
- f. mitigation of safety, health, climate change, and disaster risks;
- g. orientation to the life cycle and the achievement of desired quality;
- h. technological innovation for continuous improvement.

Bon Gwang Hwang explained the challenges that must be faced in implementing green construction, including:

1. Higher costs

Compared to conventional construction, green buildings tend to be more expensive to build. According to Tagaza and Wilson, the capital cost of green buildings ranges from 10-25% higher than ordinary buildings. The higher costs are due to the complexity of the design and modeling costs required to integrate green construction into construction work.

2. Technical issues;

Green construction requires complex construction techniques and processes. If complexity is not handled properly, then it can affect the process and deliverables. One of the main challenges of green construction is the technical difficulties experienced during the construction process because the design is more complicated compared to conventional construction.

3. Risk management and contract form;

The successful development and implementation of green construction depends largely on the form of construction work contracts. The terms and forms of the contract used for green construction work must include detailed details regarding the design. This poses a problem if a complex design cannot be translated and implemented properly by the executor (Yuliana, 2017).

4. Lack of mastery and understanding of green construction

Green construction is the biggest obstacle faced by construction service business actors because the structure is more complicated than the conventional technology that exists today. In addition, the lack of understanding and mastery of technical knowledge or expertise, products, materials, systems, or green technology designs that are still unfamiliar is a challenge that must be resolved immediately (Novianto Pambudi, 2018).

### **Benefits of Sustainable Construction for the Environment and Socio-Economy**

The implementation of construction provides economic benefits for many parties and encourages continuous improvement of community welfare. Based on data from the Central Statistics Agency (BPS), the contribution of the construction sector to national GDP continues to increase, namely in 2017 by 10.49%, in 2018, by 10.53%, 2019 by 10.61% and in 2020 by 10.24%. The value of completed construction work reached Rp. 1,973 Trillion (2019), or an increase of 17.52% from the previous year of Rp. 1,679 Trillion (2018) (Kementerian PUPR-RI, 2021).

The implementation of construction also contributes to reducing social inequality in the community. According to Williams, social sustainability relates to how buildings can blend in with the area they occupy, such as the surrounding environment, public transportation, urban planning, and settlement patterns. Social sustainability is applied in accordance with regional designations such as urban scale, neighbor scale, and building scale so that existing social sustainability can be applied right on target (Ahmad Yusuf, 2020).

The development of infrastructure or infrastructure that is the main capital of economic growth and social order of the community applies the concept of sustainable development, which is further applied in sustainable construction (Willar, 2021). In general, the benefits of sustainable construction or green construction for the environment and social, namely: (Sudarman, 2021):

1. Increase comfort

A comfortable environment has a huge impact on people's health. Buildings with the concept of green buildings can provide comfort for the occupants of the building. Starting from the concept of open space to improve lighting visibility, ventilation design, and greenery to improve air quality to various other ergonomic features that increase comfort.

2. Save water resources

Eco-friendly buildings pay great attention to water use and efficiency. For example, the use of vacuum system toilets can save water use in buildings. Green buildings that use vacuum toilets only require 0.5 to 1.5 liters of water, in contrast to conventional toilets that require 5-6 liters of water for one use.

3. Reduce building operating costs.

One of the biggest benefits of green building is that it can reduce building operational and maintenance costs. Buildings are made using good quality, so they can last longer. Green buildings installed with solar panels can reduce the use of electrical power by up to 10% / day, this will certainly have a major impact on the monthly operational costs of the building.

4. Reduce carbon emissions

The Environmental Protection Agency (EPA) says building construction contributes as much as 30 percent of carbon emissions in the world. The presence of the green building concept is a construction solution for reducing carbon emissions. The concept of vertical green space adopted in green buildings can effectively reduce pollution and emissions in the air.

5. Industry

The green building supports not only government agencies but also marketing efforts and the industries involved in it. The concept of green building with its uniqueness also contributes to the development of industry in various sectors, especially those related to the environment. (Gregory Kevin, 2016). In addition, the construction sector also contributed to an increase in the national gross domestic product (GDP) by 10.24%, with a value of completed construction work reaching Rp. 1,973 Trillion (2019).

6. Social society

That the work of green building development contributes to the surrounding community, especially in absorbing labor and developing social activities in the environment, increasing social and economic interaction is expected to improve community health and reduce social disparities.

## CONCLUSIONS

The implementation of sustainable construction in construction work is through the concept of green construction as a building concept that pays attention to environmental aspects, and efficiency in the use of energy and resources throughout the building cycle. The three main pillars in the implementation of sustainable construction are: first, economically feasible, and improving community welfare. Second, maintaining environmental conservation, and third reducing social disparities in the community. Sustainable construction regulations are regulated in several provisions, including Law Number: 32 of 2009 concerning Environmental Protection and Management, Law Number: 2 of 2017 concerning Construction Services, Presidential Regulation Number: 111 of 2022 concerning the Implementation of the Achievement of Sustainable Development Goals, Regulation of the Minister of PUPR-RI Number: 9 of 2021 concerning Guidelines for the Implementation of Sustainable Construction *jo* Regulation of the Minister of PUPR-RI Number: 21 of 2021 concerning Performance Assessment of Green Buildings.

The benefits of sustainable construction for environmental and social sustainability include environment, reducing carbon emissions and resource efficiency, maintaining the continuity of the carrying capacity and accommodating capacity of the environment, minimizing environmental impacts such as appropriate land use, energy conservation, water conservation, material sources and cycles, comfort, health, and environmental management. Social includes: reducing inequalities or disparities in society, increasing social and cultural interaction, and contributing to moving the wheels of the economy.

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