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Improving School Sustainability in Indonesia through Green Schools

Summary

Green buildings provide intriguing advantages to both the people and the environment. They are becoming more mainstream due to the rising environmental concerns and the COVID-19 pandemic. As crucial public infrastructure, green schools can positively impact the environment and students' well-being and performance. Several green school certifications and programmes worldwide, such as LEED and BREEAM, have provided examples of implementing the green school concept by considering each school's characteristics. Indonesian schools can learn from these examples and adapt existing standards to improve sustainability and performance.

Rising environmental concerns have pressured humans to switch to more sustainable ways of living, including sustainable infrastructure such as green buildings. It incorporates design and constructions fit for the people and the environment, such as efficient use of energy and water, use of renewable energy, pollution and waste reduction measures, good indoor environmental air quality, with non-toxic, ethical, and sustainable materials (World Green Building Council, 2021). If applied in schools, these measures can positively impact students' well-being and the environment (Center for Green Schools, 2018) while also introducing the concept of environmental awareness and education. The eco-schools programme provides the framework for schools to become models for sustainability in their communities. It aims to involve actions from enhancing green design and promoting healthy living to fostering teaching and learning about sustainable development and climate change. Eventually, students are empowered to take positive action and strengthen their engagement in sustainability initiatives. At the same time, other stakeholders also improve community learning (Gough, Lee, & Tsang, 2020).

Current School Conditions and Green School Practices in Indonesia

There are over 270,400 schools in Indonesia, according to the 2020/2021 Badan Pusat Statistik (BPS) or Indonesian Statistics Data. Most of them require improvement due to deteriorating conditions, even worsened by the COVID-19 pandemic, where schools were closed for a long time. This closure underscores the importance of the physical environment to student well-being and educational success (Gout, Modaffari, & DeGood, 2021). Based on 2020 statistics, damaged classrooms nationwide increased by 26% to 1.222.064 units in one year, and only 14% of classrooms are considered good (BBC Indonesia, 2021). After over a year, students are now slowly returning to school, which puts more demand for better school infrastructure quality. They need to be protected from exposure to indoor air pollution, mould, pests, asbestos, lead, and inadequate lighting. They also need to avoid elevated noise levels that damage their health and learning performance (Harvard T.H. Chan School of Public Health, 2017). Recently, concerns regarding healthy air circulation have also risen due to the pandemic. The ongoing

environmental degradation and climate change also indirectly pressure buildings, including schools, to be constructed more sustainably and environmentally friendly. Those can be measured as low-carbon, efficient resource consumption, and natural lighting utilisation. These issues are addressed in the green school concept, which has been practised in many parts of the world.

In Indonesia, the green school concept is known as Sekolah Adiwiyata (Adiwiyata School). The communities are expected to be involved in activities toward a healthy environment and avoid adverse environmental impacts. It is based on participatory and sustainable principles and environmental education concepts. Only certain schools that have met the established criteria can claim the Adiwiyata award. By 2019, there were only 376 public schools and 58 private schools in Indonesia to achieve the national level Adiwiyata award (Humas KLHK, 2019). It implies that many more schools do not meet this standard yet.

The further improvement for this programme is by establishing specific guidelines and certifications to help green schools adoption become more widespread and raise the urgency. A certification programme is needed to give a concise measured impact of green building implementation, including ensuring legitimate green performance, acknowledging green practices, and providing assurance for building stakeholders (Green Building Council Indonesia). Some of the existing green building standards in some countries have clearly defined school building criteria, while others are still developing their green school programme and rating systems.

Green School Practices in Other Countries

While there are many green building certifications and green school programmes worldwide, two internationally recognised standards are Leadership in Energy and Environmental Design (LEED) and Building Research Establishment Environmental Assessment Method (BREEAM). BREEAM and LEED have been popular for a long time and are constantly improving. BREEAM system was created in 1990 by the UK Building

Research Establishment. LEED appeared eight years later by the US Green Building Council. They are third-party certifications to verify the design and construction by complying with several green parameters, such as energy savings, water efficiency, reduced emissions, and healthier indoor air quality. Although they differ in certification schemes, the systems are almost 70-80% similar (GBRI, 2020). A higher cost might be expected to accomplish those measures. A 2010 research concluded that to achieve a higher BREEAM rating, the extra cost will also increase exponentially, mainly due to installing renewable energy devices such as photovoltaic and biomass (Lockie, Butterss, & Adams, 2012). However, many LEED-certified schools have shown that they are not necessarily more expensive than conventional schools. They yield significant energy and water savings during the operational and maintenance phase, enabling the money to upgrade learning facilities or other needs (Zusman, 2012). Therefore, it is essential to choose green school practices that are suitable and affordable to each school's context.

A successful case of green school practice is Thurgood Marshall Elementary School in Pennsylvania, a 2011 LEED-certified school providing small-effort, high-impact green measures. They upgraded plumbing fixtures to be more water-efficient by installing low-flow aerators and using low-flow showerhead models. These cost less than \$100 and were easy to install by the building engineer. Still, the building uses 17% less water in restrooms than a comparable school. The school staff used Green Seal certified standard cleaning products in local markets. It also adopted a new floor scrubber that reduces potential chemicals contaminations. It also adopted a microfibre cleaning system that reduces water usage and operator fatigue and minimises the potential for slips and falls (US Green Building Council, 2011). In other countries, their version of green school certifications and guidelines also provide promising success stories for more sustainable and high-performing schools. India Green Building Council established its green school rating system, containing similar parameters as LEED and BREEAM. As a result, some schools in India have implemented

extensive rainwater harvesting. They store the water to utilise the Indian monsoon climate with abundant water during the rainy season and a severe dry period afterwards. The water is then used for the swimming pool and watering the garden. As many Indonesian regions have similar monsoon climates, this rainwater harvesting system can yield great benefits regarding water efficiency if widely adopted.

What's Next

As environmental concerns are rising worldwide and the need to provide students with a safe and healthy learning environment, green schools must become more mainstream. Various examples from developed and developing countries have shown that green measures can be very diverse. The standards are according to each school's context to yield optimal results. Indonesian schools have a very high potential to become more sustainable by adopting these practices and establishing their green school rating system to ensure legitimate performance. However, this rating system must not be rigid; it needs constant improvement towards better practices and allows adjustments due to each school's characteristics.

Author

- **Thalia Salsabilla**
(thalia.salsabill@gmail.com)
Resilience Development Initiative
- Supervised by: **Gabriella Laurencia**
Resilience Development Initiative

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