School infrastructure green environment

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Abstract. School infrastructure that reflects environmental management efforts really needs attention. This study aims to analyze the importance of green environmentally friendly school infrastructure development in supporting the learning process in schools. The object of this research is Junior High School at Salatiga. This research is descriptive qualitative research. The parameters in this study are implementation and strategy in creating an environmentally friendly school environment. Data collection is done through interviews, documents, and observations. The results of this study indicate that green school infrastructure must have clean water, rubbish (the provision of separate bins, composters), feces, wastewater/ drainage, green open space (RTH), noise/ vibration/ radiation. The realization of a green environment also needs to be maintained by planting trees, contest, strict sanctions, slogan, galactic activities that are fostering a love for the environment, and defend grass fields.

1. Introduction

Global Warming is a natural phenomenon that really worries all inhabitants of the earth caused by human activity. Emissions from burning by large industries, uncontrolled logging, reforestation failures, and energy waste are examples of mismanagement of nature. Indonesia has the second-largest area of tropical forest after Brazil. As an archipelago with 65 percent of the population living on the coast, global warming certainly has an impact on rising sea levels to threaten survival. Only with a temperature increase of 4°C Celsius worldwide, sea level will be 5 meters higher than now. Entire cities will be flooded [1]. While on the agrarian side, climate change will reduce yields directly because farmers have difficulty in managing land and plants.

The anomaly source is believed by scientists to be due to the high emission of greenhouse gases such as Carbon Dioxide (CO₂), Chlorofluorocarbons, Ozone, Methane, and Nitrogen Dioxide (NO₂) which accumulates and closes the layers of the atmosphere so that the sun reaching the earth's surface is confined in the atmosphere [2]. And what happens is global warming along with the adverse effects that follow. The occurrence of floods, rising sea levels, and the drought has now hit are the effects of global warming. It is time to carry out concrete steps to minimize the consequences.

Additionally, a study by the Centers for Disease Control in New York [3] found that moisture and dampness can cause growth and proliferation of dust mites, which can produce respiratory symptoms and foster infections, poor ventilation enables particulates, pollutants, and allergens to accumulate inside
school buildings, and inadequate water circulation increases transmission. For example, a study of 409 classrooms in Idaho and Washington in 2004 [4] found that student absences were jumped by 10–20 percent in rooms with poor ventilation.

Environmental education is key. The environmental movement, most schools have promoted greening. For example, each student is given the task to bring plants to school. This is a step that needs to be praised. Environment and education are two things that link. Education about the environment is time for practical matters. Not just a theory. For example, we all know that littering is polluting the environment but still doing it. The quality of educational infrastructure, especially in the planning and design of building educational facilities that are appropriate and focused on child development, has been widely discussed in recent years. Recent studies have shown that student achievement at school can improve with the support of a better physical environment where learning can be found. Many non-experimental studies have shown that investment in quality school infrastructure is strongly associated with improving learning outcomes even after controlling for the socio-economic background of students and other related covariates.

New technologies and emerging pedagogical practices have created new requirements for educational buildings. As a result, new approaches to building a learning environment must be developed both of which will create better spaces for children and increase the efficiency of investment in educational infrastructure. In a closed environment, breathing problems seem to be the main cause of absence. The environmental protection agency estimates that more than 10 million school days are lost each year in the US due to asthma attacks among students [3]. For example, a study of 409 classrooms in Idaho and Washington in 2004 [5] found that student absence jumped 10-20 percent in poorly ventilated classrooms.

Several authors [6,7] have agreed on the need for schools to provide recreational and physical education activities to balance more intellectual school work because games have a significant impact on almost every aspect of child development. However, schools cannot always give children this opportunity. For example, in Latin American countries, 35 percent of students have no room for sports in their schools which have serious negative consequences on learning outcomes in the region. In urban areas, where land is scarce and green areas are not widely available, vertical gardens and "ecological trees" in the yard can be developed to provide shade, natural cooling, and pleasant views. This kind of initiative will give students the opportunity to learn how to care for plants and plants.

In urban areas, where land is scarce and green areas are in short supply, technical gardens and "eco-trees" in courtyards could be developed to provide shade, natural cooling, and pleasant views. These types of initiatives would give students the chance to learn how to look for first-hand plants and seeing how they grow, are harvested, and recycled. Botany, physics, chemistry, biology, and other lessons could be held outside. Green infrastructure is a concept, effort, or approach to maintaining a sustainable environment through structuring green open spaces and maintaining natural processes that occur in nature such as rainwater cycles, soil conditions, etc. The concept of green infrastructure is to shape the environment with a maintained natural process; covering rainwater management, water quality management, and flood mitigation. The direction of implementing green infrastructure is to support community development by improving environmental conditions and maintaining green open spaces [8].

Green infrastructure networks are systems of natural and open spaces that are interrelated and maintain the value of ecosystems, maintain air and water conditions, and provide benefits to residents and other living beings [9]. Green infrastructure networks, once formed, can become a reference framework for future development and as an effort to conserve land to accommodate the growth of the population, while maintaining the preservation of natural resources and public assets. School environment-friendly green infrastructure is very helpful in achieving student achievement and supports the improvement of natural conditions so that harmony in needs and nature can be maintained.
2. Method
The method in this research is qualitative research. Descriptive research is a method used to describe or analyze a research result but is not used to make broader conclusions [10]. The object of this research is Junior High School at Salatiga. This research analyzes a problem with observation and in-depth interviews. The parameters in this study are implementation and strategy. Data collection is done through interviews, documents, and observations. The data analysis technique uses descriptive qualitative analysis. Then, the data validity uses source triangulation.

3. Discussion
Schools have the potential to give a direct role in instilling the love of students for the preservation of the environment. School infrastructure that supports the formation of a green environment needs to be prepared properly. The following are strategies so that school infrastructure can be properly formed. *Permendiknas* No. 24, 2007 standards and infrastructure such as; clean water, garbage (provision of separate bins, composters), feces, wastewater/ drainage, green open space (RTH), noise/vibration/ radiation, etc. The availability of six standards supporting the infrastructure for environmental learning, including; composting, utilization and water treatment, forest/ garden/ school gardens, greenhouses, family medicinal plants, fish ponds, biopore holes, infiltration wells, biogas, etc. The maintenance of the environmentally friendly and child-friendly facilities and infrastructure according to their functions, among others.

The room has natural light and air ventilation settings are 1) Maintenance and arrangement of shade and green trees; 2) Using paving clubs blocks; 3) The availability of 4 elements in the management and maintenance of school sanitation facilities, including the person in charge, executor, supervisor, and order. Canteen makes 3 in order to improve the quality of healthy and honest and environmentally friendly and child-friendly canteen services, including; 1) Canteen does not sell food/ drinks that contain preservatives/ thickeners, colorings, flavorings that are not in accordance with health standard; 2) Canteen does not sell food that is contaminated/ contaminated, expired; 3) Canteen does not sell food that is packaged not environmentally friendly such as; plastic, styrofoam, and aluminum foil. Here are some steps of strategies that can be taken at school in order to provide environmental education.

![Diagram](image)

**Figure 1.** The strategies
• Tree planting

Planting in a school should be done to maintain the ecological balance in the school environment. Here is also a way of planting habits in all elements of the school to plant trees. It is hoped that this practice will also be practiced in all elements of the residential school. Many schools routinely hold class hygiene competitions. This is a motivator for the student.

• Contest

Many schools routinely hold class hygiene competitions. This is a motivator for students to be able to better maintain the cleanliness of the classroom environment. So they are not too dependent on school cleaners. Because clean is a shared responsibility. Because it is a shared need and enjoyed together.

• Strict sanctions

Give strict sanctions on every actor in environmental pollution, for example, academic sanctions for students who throw trash everywhere. And schools can give prizes to students who dare to report the perpetrators of pollution to the school. This is also a form of educations about honesty.

• Slogan

Installation of environment-themed slogans at school Environment-themed slogans can be posted strategic places in the school. Many schools routinely hold class hygiene competitions. This is a motivator until the student a love of cleanliness and the environment. The following is an example of a slogan; "green is beautiful", "my school shaded my soul", "cool earth starting from my school", "one tree for my earth" and many other examples of slogans that can be posted as a socialization step about the importance of environmental sustainability.

• Galactic activities foster a love for the environment.

Extra school curriculum activities can also be a means of instilling a love of the environment. The activities such as Boy Scouts, Youth Red Cross, Nature Lovers. Making the school garden, this program deserves to be redeveloped, seeing the enormous benefits. The benefits that arise between them; for the coolness and freshness of the school environment, for biology practicum facilities, stimulating the creativity of teachers and students to design gardens in accordance with their wishes, training students to enjoy gardening, and producing garden products. With this environmental education has been applied.

• Defend the grass field.

Many schools for hygiene reasons sacrifice grasslands by installing paving blocks. To some extent, this step reduces the soil's absorption of water and reduces CO₂ absorption, as well as the oxygen produced.

4. Conclusion

The promotion of environmentally friendly education needs to be encouraged early on. Green school infrastructure must have clean water, rubbish (the provision of separate bins, composters), feces, wastewater/ drainage, green open space (RTH), noise/ vibration/ radiation. The realization of a green environment also needs to be maintained by planting trees, contest, strict sanctions, slogan, galactic activities that are fostering a love for the environment, and defend grass fields. If all that is achieved then an environmentally friendly infrastructure will be formed and will make the air cool and clean.

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