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الطلاب

Green School and Its Implementation in Islamic Educational Institutions in Indonesia

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Abstract: Climate change regarding global warming threatens human life on earth, so there needs to be solutions from various parties to reduce the negative effects of climate change. Implementing these principles in Islamic educational institutions in Indonesia still needs to improve understanding, policies, and implementation in the field. Therefore, this study aims to analyse the implementation of Green Schools in Islamic educational institutions in Indonesia, identifying factors that support and hinder its implementation. The research method used is a case study with a qualitative approach—data collection techniques using document analysis from research results published in national and international journals. Data analysis is done through data condensation, data display, and verification. The green school program is a program that must be implemented in educational institutions. Green schools and green buildings can improve teacher performance and academic achievement. Various Islamic educational institutions have carried out green school programs; some have received Adiwiyata awards from the Indonesian Government. However, Islamic education institutions still need to implement green schools properly. Islamic educational institutions should consistently implement green school programs in their respective institutions to reduce climate change's negative effects.

Keywords:
Adiwiyata; Education institution; Green school

Abstrak: *Perubahan iklim dan pemanasan global mengancam kehidupan manusia, sehingga diperlukan solusi dari berbagai pihak untuk mengurangi dampak negatifnya. Salah satu solusi adalah program green school di lembaga pendidikan, termasuk di lembaga pendidikan Islam di Indonesia. Namun, implementasi program ini masih menghadapi tantangan, terutama terkait pemahaman, kebijakan, dan pelaksanaan di lapangan. Penelitian ini bertujuan untuk menganalisis implementasi green school di lembaga pendidikan Islam, serta mengidentifikasi faktor pendukung dan penghambatnya. Metode yang digunakan adalah studi kasus kualitatif dengan teknik analisis dokumen dari jurnal nasional dan internasional. Program green school memiliki manfaat, seperti meningkatkan kinerja guru dan prestasi akademik siswa. Walau beberapa lembaga telah meraih penghargaan Adiwiyata, konsistensi penerapan di lembaga pendidikan Islam perlu ditingkatkan untuk mengurangi dampak perubahan iklim.*

Kata Kunci:
Adiwiyata; Lembaga Pendidikan; Sekolah Hijau

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INTRODUCTION

Among the issues that are now being touted by the world community is the issue of climate change. The climate change issue has been widely discussed for a few years after the emergence of giant industries in the oil, natural gas, and geothermal mining sectors that spread in various countries around the world. In a developing country, integration between policymakers is needed to build climate resilience and reduce disaster risk (Biagini & Miller, 2013).

Green School is an educational concept that emphasises environmental sustainability, wise management of natural resources, and the development of an attitude of caring for the environment. This concept aligns with Islamic teachings, which place humans as caliphs responsible for protecting and preserving nature. In the context of Islamic educational institutions in Indonesia, implementing Green Schools is a challenge and an opportunity to integrate Islamic values in protecting the environment and strengthening ecological awareness among the younger generation (Pujianto et al., 2021).

Environmental issues and climate change have become part of the science curriculum. In some studies (Carman et al., 2021) Educators can develop students' knowledge of climate change by connecting the topic to students' daily lives and ensuring that students feel part of helping to mitigate climate change. Students will likely engage in eco-friendly activities such as recycling, conserving water and energy, using public transportation, and purchasing organic, healthy, and fairly traded products requiring small lifestyle changes (Kagawa, 2007).

Referring to the facts of the current climate change conditions, humans have a responsibility to preserve the earth from damage and preserve it for human survival. Because those who will feel the most significant impact of the destruction of the earth are humans, they must find solutions to minimise or even overcome this global warming. One of the several ways that can be used is by doing reforestation. Trees with green leaves can absorb carbon dioxide (CO2) gas and convert it into oxygen (O2), which can benefit human respiration. Greening will reduce global warming (Muzadi & Mutholingah, 2019). Today, the environmental care movement is making much progress under the framework of the new green paradigm. However, despite the growing national attention and public interest in the go-green mentality, environmental education still seems stuck in the old environmental paradigm (Strife, 2010).

One of the efforts to overcome this climate change problem is to manage the environment to reduce the impact of climate change. This goal will be achieved if there is cooperation from all parties (Mustangin, 2017). Educational institutions are one of the places that can be used as a starting point to overcome current climate change. One of the efforts is the existence of *a green school program*. To realise this program, the Ministry of Education and Culture and Environment and Environment created the Adiwiyata program from elementary to high school (Nuzulia et al., 2019). The program is based on concerns about the lack of community concern for the environment. Teachers and students in schools are part of the community that can be empowered for the adiwiyata program because they gather at school, and it will be easy to carry out the adiwiyata

program. The focus of this Adiwiyata activity is to educate students and teachers to be concerned for the surrounding environment (Rokhmah, 2019).

Previous research on the implementation of Green Schools in Indonesia has discussed various aspects and challenges. One example is a study at SMP Negeri 9 and SMP Islam Amalina in South Tangerang, which shows the importance of the right strategy to overcome challenges, including lack of environmental awareness and limited resources. The study also highlights that schools in Indonesia must strengthen sustainable environmental education programs to contribute to sustainable development goals (Oknasari et al., 2023).

In addition, the study on "Adiwiyata School" at SD Muhammadiyah 24 Surakarta illustrates how the concept of Green School is applied through institutional strengthening programs. This implementation involves environmental training, the provision of recycling facilities, and improving school management. However, the study also identified challenges, such as lacking human resources and information systems readiness to support the program's implementation (Kuswati et al., 2024). And Previous research related to the empowerment of elementary school teachers' knowledge in supporting green schools shows the importance of increasing environmental competence for teachers as a determining factor in the success of environmentally friendly school programs (Ichsan et al., 2023).

From these various studies, it can be concluded that the implementation of Green Schools in Indonesia still faces significant challenges, including institutional readiness and resources. These studies provide an in-depth picture of the need for increased management, training, and environmental awareness among all stakeholders in public and private schools, particularly in Islamic educational institutions that are beginning to adopt the concept. Referring to the background described above, this study aims to analyse the implementation of green schools in Islamic educational institutions in Indonesia.

METHODS

This study uses a qualitative type of research with a case study method (McMillan & Schumacher, 2014). The data collection technique is to conduct document analysis by collecting secondary data from journal articles or online news sources (Bowen, 2009; Sukmadinata, 2011). The data source for this research is in the form of data or information obtained from national and international journals and some information from trusted websites in the publication range from 2010 to 2022. This research focuses on descriptive analysis by describing the data and then analysing and discussing it so that the data obtained can be studied clearly. Next, identify articles and create systematic categories based on research sub-topics (Hogarth et al., 2005). The data analysis technique of this research consists of 3 analysis steps: data condensation, data display and verification or conclusion-making (Miles et al., 2014).

RESEARCH RESULTS AND DISCUSSION

Basic Concept of Green School

According to *the United States Green Building Council (USGBC), a green school is a school building or facility that creates a healthy environment* conducive to energy-efficient learning and financial efficiency. (Ramli et al., 2012). *Green school* results from an agreement process on environmental planning, design, and construction of physical buildings that considers performance over a life cycle between 50 and 60 years (Ramli et al., 2012). In addition, Earthman defines green schools as mechanisms that conserve energy and water and are designed from materials that do not harm the environment (Earthman, 2009)Green schools must support the natural environment. In addition, the outside world is included in the building's design. Walking down the corridor, one will feel like nature is in charge of its design.

The concept of green schools in educational institutions in Indonesia refers to the Minister of Environment Number 05 Regulation of 2013 concerning Guidelines for the Adiwiyata Program. The Ministerial Regulation states that Adiwiyata schools are excellent and ideal schools as a place to acquire all knowledge, norms, and ethics that can be the basis for creating human welfare and sustainable development models. Green School, also known as the Adiwiyata program, is one of the State Ministry of Environment (KNLH) programs to encourage school residents to have knowledge and awareness in preserving the environment around their respective schools.

The existence of environmental education policies in formal and non-formal and informal educational institutions is expected so that all parties can develop environmental education institutions, improving the quality of human resources, developing facilities and infrastructure to carry out the efficiency of the use of the school budget; developing environmental materials; improve communication and communication; empowering community participation in implementation and development; and developing environmental education methods (Kospa, 2021). Environmental education is an effort to change behaviours and attitudes carried out by various parties or elements of society, aiming to increase public knowledge, skills, and awareness of the value of values (Azkiah, 2021).

Green schools must meet several principles from the physical aspect of school buildings. At least four essential characteristics define a green school: resource-efficient, physically and psychologically healthy, comfortable, adaptable, sensitive and flexible, and containing ecological principles (Edwards, 2006). Various scientific studies have shown a relationship between the physical environment of the school and the performance of teachers and student learning outcomes at school. According to the results of a study by Baker and Bernstein in 2014, when natural light is lost, melatonin cycles in children are disrupted, which affects attention levels in school (Figueiro & Rea, 2010). Teachers are more comfortable in classrooms with access to temperature control, whether thermostats or open classroom windows (Heschong & Mahone, 2003). A study conducted by Oetinger in 2010 that in his research entitled "*Green schools: Constructing and renovating school facilities with the concept of sustainability*"

examined the influence of green schools on the environment, health and education of students and stated that green schools have a positive effect on learning, reduce school financial costs, and reduce student absenteeism at school (Oetinger, 2010).

Goals of Green School

Among the goals of *Green School* is to maintain the school area and build school conditions. The Green School program also aims to create a good environment for schools to become a place of awareness and education for the entire school community so that the school community can be responsible for efforts to save the environment in the future and carry out long-term development (Hafidhoh, 2015).

According to Soeriatmadja, in the Adiwiyata Guidelines, environmental education must contain several objectives, (Rahmah, 2017) namely to help students have awareness and sensitivity to the environment and natural resources in totality and to help students have a basic understanding of the mutual relationship between the environment and natural resources (Fathurrahman et al., 2022).

Green schools are not limited to a green environment but are energy-efficient and clean. They can reduce or use the quantity of waste, such as recycling non-organic waste and utilising organic waste as compost (Salsabila, 2021) In the concept of adiwiyata, green schools must be able to optimise various potential natural resources to solve environmental problems faced by residents around them (Fathurrahman et al., 2022).

There are various advantages of having a green school. Among the advantages of green schools are improved student performance comfort, increased literacy and understanding of the environment and, increased resource efficiency and reduced carbon footprint (Taylor et al., 2013). Adanya ruang hijau di sekolah terbukti sangat berpengaruh terhadap prestasi dan kinerja akademik di sekolah (Browning & Rigolon, 2019). Academic ability is important because it predicts future health, welfare, social status, and economic conditions (Caro et al., 2015). Learning carried out in green spaces has been proven to positively impact students in terms of seriousness and student learning outcomes. Mason's research in 2022 revealed that after one lesson was taught in a green school park, children had better attention and better math learning outcomes in two tasks than after a similar lesson in a classroom setting (Mason et al., 2022).

Implementation of *Green Schools* in Islamic Educational Institutions in Indonesia

The Green School Program is an internationally recognised effort that transforms schools into environmentally friendly entities and engages the school community in efforts that have an impact on the environment (Dupuis & Durham, 2024). Several Islamic educational institutions have started *green school* programs. Information about the development of *green schools* in each school can be easily obtained in various online literature. However, in this article, the author

only selects some of the research results that are considered the most relevant about *green schools* in Islamic educational institutions in Indonesia.

MIN Tegalsari Wlingi Blitar, East Java, has implemented the Green School or Adiwiyata program at the primary level. This school uses the Adiwiyata program to strengthen students' love for the environment (Widiyaningrum et al., 2016) At the beginning of this program, ten schools around the island of Java became models or pilots for Adiwiyata schools (Wardani, 2023). MIN Tegalsari Wlingi Blitar, East Java, is a madrasah that received the adiwiyata award in 2013. The school adiwiyata program was then developed to instil the values of caring for the environment.

In its implementation, MIN Tegalsari integrates adiwiyata into learning so that learning is carried out in and outside the classroom. This learning is called Environmental Learning (PLH). This PLH learning was then revealed to several other activities such as writing scientific papers on the environment, waste recycling, *farmer club*, and Friday Loyal Clean Friday activities. As a complement to the Adiwiyata program, this school provides a greenhouse building in the form of a garden and fish pond for the preservation of plants and fish. The adiwiyata activities at MIN Tegalsari in order to strengthen the character of caring for the environment are carried out with four activities: the first is a policy regarding environmental insights, the second is an environment-based curriculum, the third is participatory-based environmental activities, and the fourth is environmentally friendly facilities and infrastructure in schools (Rokhmah, 2019).

The results of this study also mention four main activities in the Adiwiyata program at MIN Tegalsari, which include environmental insight policies, environment-based curriculum, participatory environmental activities, and environmentally friendly facilities and infrastructure. Research by Nuraeni (2022) supports these findings, suggesting that a holistic approach that includes school policies, curriculum, and community participation is essential for the success of environmental education programs (Nuraeni, 2022). There is growing evidence that green schoolyards, as school environments, can contribute to children's physical, mental, social and spiritual well-being (Bell & Dyment, 2008).

Other green school *programs* that are almost the same are also carried out at MI Negeri 1 Ponorogo, East Java. The activities carried out are the same as those carried out at MIN Tegalsari; the difference is in the activities in the program. The environment-based curriculum in MIN 1 Ponorogo emphasises the active involvement of teachers in learning. Teachers communicate the latest issues, both local, national and international, related to the environment in learning. Likewise, with participatory activities, teachers are actively involved in a special team called *a green club,* which is tasked with maintaining, managing, arranging and collecting used goods for recycling. The items used are then recycled and used as accessories in the classroom, such as vases, figures, and others. Participatory-based activities at MIN 1 Ponorogo are carried out by developing extracurricular activities and self-development and involving school residents and the involvement of outside parties such as coaching from Koramil in making bipori infiltration and collaborating with MAN 1 Ponorogo for waste

management training activities and making organic fertilisers. In terms of facilities and infrastructure that support *green schools*, MIN 1 Ponorogo is almost the same as MIN Tegalsari, such as appeals to save water and electricity, the presentation of balanced nutritious food and the provision of organic and inorganic waste bins (Wardani, 2020).

The study's results show that MI Negeri 1 Ponorogo implements the Green School program with a similar approach to MIN Tegalsari, but there are some significant differences in the implementation and involvement of teachers. In MIN 1 Ponorogo, the emphasis on an environment-based curriculum prioritises the active role of teachers in communicating relevant environmental issues. This is in line with the findings by (Nurzaelani, 2017), which states that teacher involvement in integrating environmental issues into learning can increase students' awareness of the community's environmental challenges.

The green school *program* is used to strengthen the character of caring for the environment. This also happened at MTsN 6 Sleman, stated in one of the madrasah missions: "Cultivating Caring Behavior for a Clean, Healthy, Beautiful and Grounded Environment to Participate in Preserving Nature." In the policy aspect of this madrasah, rewards *and punishments* are imposed for those who can carry out environmental care programs. The vision and mission of the madrasah are then lowered into the curriculum, and among them is an environment-based curriculum whose goal is to form a clean, healthy and environmentally friendly Muslim personality with *a bottom-up approach* (Nasir, 2009). In support of environmental concern, a hidden curriculum was created at MTsN 6 Sleman. This curriculum accommodates the problem of waste management and environmental cleanliness, as well as various invitations or warning stickers regarding cleanliness and maintaining school facilities so that they can still be used properly (Al Mawangir & Puspita, 2020).

The research results at MTsN 6 Sleman show that implementing the Green School program is integrated through policies, curriculum, and hidden curriculum. This madrasah emphasises strengthening the character of caring for the environment in its vision and mission and involving students and teachers in environmental programs that support awareness and positive action towards the environment.

Regarding facilities and infrastructure, the green school at MTsN 6 Sleman has various public facilities such as green parks, organic vegetable gardens, medicinal plants, and adequate waste disposal sites in every corner of the school. The madrasah provides an ablution place in a particular place, and then the water discharge is used for aquaponics, science learning, Bipori, and automatic garden irrigation. In the participatory aspect, MTsN 6 Sleman involves all parties in supporting *the green school program*. This participatory activity is carried out regularly, daily, weekly and monthly. These routine activities include classroom picket activities, waste management, and maintaining the cleanliness of the madrasah environment. With this routine activity, the school environment becomes very clean and maintained (Al Mawangir & Puspita, 2020).

Several factors support the *Green School program*. First, policies to build pro-environmental behaviour have become integral to strengthening character

education based on classes, schools, and community environments. In addition, it was also mentioned that pro-environmental behaviour had met the characteristics of character education, especially in terms of student integrity. The effectiveness of the strategic energy framework depends on significant efforts in enforcing behavioural and attitude changes among people (Farrow et al., 2017).

Second, the strong and passionate desire shown by the school to build behaviour (internal motivation) has been reflected by the 'personnel' who are mandated to realise and strengthen the sense of pro-environmental behaviour among school residents. Schools' high motivation to realise pro-environmental behaviour among school residents is most likely due to the contributions of the parties involved (Nurwidodo et al., 2019). Other factors are financial support, school environmental conditions, and support from outside parties interested in the school. The appreciation factor from external parties also affects the school's performance in obtaining Adiwiyata.

The results of this study conclude that the success of building pro-environmental behaviour in the Adiwiyata Green School is highly dependent on the active and sincere participation of all school residents, initiatives from management, full support from school leaders, integrated programs with character education enforcement, external support, and environmental conditions. The school environment, such as building arrangements and physical environments, enhances and reinforces pro-environmental behaviour. Therefore, the school is highly facilitated to achieve the status of an independent Adiwiyata green school successfully. The daily activity, the Adiwiyata learning club, intended to raise knowledge about pro-environmental behaviour with a religious touch, is an effort to strengthen pro-environmental behaviour throughout the school community (Nurwidodo et al., 2019).

Regarding evaluating the adiwiyata program in Indonesia, the author refers to the research results presented by Warju and Soenarto in 2017. This research is an evaluation research. The evaluation was carried out in 33 selected schools in Indonesia. The adiwiyata schools evaluated consisted of six elementary schools (SD), 15 junior high schools (SMP/MTs), nine high schools (SMA) and three vocational high schools (SMK). The research was conducted from June 2012 to June 2014.

From this research, several important conclusions can be drawn regarding evaluating the Adiwiyata program. The evaluation of *the "context" package* consisting of three aspects concluded that public awareness and expectations were excellent. Second, the relevance of the Adiwiyata program is categorised as very good and relevant to the community's needs, local potential, and environmental issues. Third, from the aspect of government regulations and policies, the central, provincial, or regional governments (districts/cities) are classified as strongly supporting implementing the Adiwiyata program in Indonesia. In general, the context of evaluation can be categorised as very good.

The evaluation of "*input*" consisting of four aspects concluded that: first, regarding the characteristics of the school principal, teachers, administrative staff, individual service officers, and school committees, all of them know and understand the vision, mission, and goals of education (100%), and are

categorised as very good. Second, regarding student characteristics, only 60%-73.33% of students know and understand the school's vision, mission, and environmental protection and management goals, which are categorised as good. Third, regarding the curriculum, the curriculum structure containing environmental protection and management has been included in the required subject syllabus, namely normative subjects and adaptive subjects integrated with environmental education and local content subjects applied monolithically and categorised as good. Fourth, regarding the characteristics of environmentally friendly infrastructure and school facilities that are considered safe. In general, the evaluation of feedback is considered good.

The evaluation from the side of *the "process"* consisting of three aspects concluded that learning preparation, first, there were only 8-12 subjects integrated with environmental education out of 15 subjects, only 53.33%-80% of the total subjects. Second, 57.14%-71.42% of teachers develop local (regional) and global environmental protection and management issues. Third, 57.14%-71.42% of teachers in each school have developed learning indicators and assessment instruments related to environmental protection and management, which is considered good. Regarding the learning process, 50%-60% of students have produced real works related to environmental protection and management. Second, 40%-50% of students presented environmental learning results through several media. These media are wall magazines, newsletters, tabloids, magazines, educational exhibitions, school websites, radio, television, and newspapers. Third, on average, there are three environmental actions organised by school partners that are followed by teachers and four by school partners that students follow, so this aspect is considered a good (Warju & Soenarto, 2017).

Conceptually, it can be used in implementing *green schools*, including three steps. First, in the curricular field, environmental learning is carried out in an integrated manner with existing subjects. Teachers must be good at packaging learning with an applicative understanding and learning experience. Second, the extracurricular field aims to form students' concerns for environmental conservation through environmental counselling activities and environmental work competitions. Third, the field of school environmental management, namely through (a) the use and arrangement of school land into natural laboratories such as gardens and medicinal plants, invitations to save energy and water, waste recycling through *the process of reduction*, *reuse*, and *recycle*, and (b) social, environmental management in the form of habituation of positive natural behaviours including discipline, cooperation, care, honesty, and appreciation Local Wisdom (Jamora Nasution, 2018).

Regarding physical development, buildings in Indonesia use *the green bullying model* every year. The International Finance Corporation (IFC), a member of the World Bank Group, has collaborated with *the Green Building Council Indonesia* (GBCI) to develop the EDGE (*Excellence in Design for Greater Efficiencies)* certification. This certificate will be given to *green buildings* in Indonesia (https://www.rei.or.id/). According to the GBCI report, every year, the number of physical buildings based on Green Building increases by 50%. One of the results of a study on school physical buildings in Turkey revealed that there

needs to be a thorough evaluation of planning, design, material selection, and exterior shape, and there needs to be an analysis of characteristics by the climate and surrounding natural conditions. The physical construction of schools in Turkey has not fully considered the principles of green building (Çakır & Tuna Taygun, 2021).

CONCLUSION

Regulations on green school programs in Indonesia have existed for a long time, but in their implementation, all educational institutions have not carried out the green school program. The implementation of green schools in Islamic educational institutions has taken place, but not all have implemented the green school program. Its implementation is carried out through policies that accommodate green schools, develop a curriculum integrated with green schools, maximise the participation of all school residents to implement the green school program, and provide all facilities and physical means to support the green school program. The implementation of green schools in Islamic educational institutions is almost the same as other institutions because it refers to the green school indicators determined by the Ministry of Environment and Forestry. Further research is recommended to compare the implementation of the Green School program between Islamic educational institutions and general education institutions. This research can identify factors that affect differences in program implementation and best practices that Islamic educational institutions can adopt.

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