

Assalaam Islamic Modern Boarding School (PPMI Assalaam) as a Solution for Urban Green Space

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Abstract. Urban planning is a part that must be integrated with environmental planning to achieve sustainable development. Islamic boarding schools are one of the essential actors in achieving the Sustainable Development Goals (SDGs). This research was conducted at the Assalaam Islamic Modern Islamic Boarding School (PPMI Assalaam). PPMI Assalaam is densely populated, so environmental management is more complex than in Islamic boarding schools in rural areas. This research uses a qualitative descriptive research method, using case studies. Data sources used in this research include primary data and secondary data. The research results show that PPMI Assalaam manages the Islamic boarding school environment in various ways, including (1) Islamic Boarding School Land Management, (2) Water Resources Management, (3) Waste and Garbage Management, (4) Use of Renewable Energy, (5) Biodiversity Program. By effectively managing the school's environment, Assalaam Islamic Modern Boarding School promotes sustainable development and contributes to creating a greener urban space.

Keywords: Urban Green Spaces, Environmental Education, Islamic Education, Sustainable Development Goals, Community Empowerment.

1 Introduction

Rapid urbanization is a global phenomenon that has changed urban landscapes worldwide. Currently, more than half of the world's population lives in cities, and UN estimates say that this number will continue to increase to 70% by 2050 [1]–[4]. While urbanization brings economic development and social progress opportunities, it also presents several significant challenges [5]. Uncontrolled urbanization is often accompanied by population density, increased air and noise pollution, loss of green space, and reduced children's access to natural open spaces [3]. In the context of children's development, urbanization can significantly negatively impact their physical growth and cognitive development. Children living in urban environments tend to have limited access to green spaces, which can impact their overall well-being [2], [6]–[8].

Meanwhile, the 2030 Sustainable Development Goals (SDGs) set by the UN aim to address various global challenges, including inequality, climate change, and fulfilling fundamental human rights. One of the critical aspects of the SDGs is creating sustainable and inclusive cities [3], [9], [10]. Urban green spaces, including those around schools and Islamic boarding schools,

have great potential to contribute to achieving the goals of the Sustainable Development Goals (SDGs) [2], [6], [8], [11], [12]. In line with the thoughts of Ban-Kimoon, former UN Secretary-General, that "the fight for global sustainability will be lost or won in the cities" [3], This article attempts to explore the critical role of urban green spaces in the context of schools and Islamic boarding schools in achieving SDGs 2030. Green spaces play a role in maintaining the quality of the urban environment, improving children's welfare and cognitive development, and promoting sustainable lifestyles [2], [13].

With the increasing urban population, a fundamental question that needs to be answered is whether pesantren environments can be utilized as green spaces in urban areas. Furthermore, green spaces in pesantrens can contribute to equitable access to environments that support children's health and development. Therefore, this article formulates an in-depth background of the issue, highlighting the urgent need to understand the role and benefits of urban green spaces in pesantrens in achieving the 2030 SDGs. Religious practices significantly influence human and environmental relationships [14]. The selection of pesantrens compared to regular schools can be justified through the following comparisons: (a) Pesantrens have a more holistic approach with an emphasis on Islamic values, while regular schools focus more on formal education; (b) Pesantrens are more engaged with their surrounding communities in managing the environment; (c) Pesantrens integrate religious activities with environmental management; (d) Pesantrens generally have a smaller scale but face their complexities, especially in urban areas; (e) Pesantrens have distinct cultural and traditional contexts that influence environmental management.

The location selection at PPMI Assalaam is based on the fact that the pesantren is in a densely populated urban area, making its environmental management more complex than pesantrens in rural areas [15]. Additionally, PPMI Assalaam is a Modern Islamic Boarding School with a considerable number of students, exceeding 2,500. PPMI Assalaam obtained the National Adiwiyata Title in 2022, won the Provincial-level Sanitation Competition for Islamic Boarding Schools in Central Java in 2009, and is included among the 50 pesantrens in Java and Sumatra participating in the Ekopesantren Program. PPMI Assalaam adopts an adaptive and dynamic educational concept by combining Islamic teachings with knowledge about nature and the environment.

2 Methods

This research focuses on people who live in the Assalaam Islamic Modern Islamic Boarding School (PPMI Assalaam) environment in Pabelan Village, Kec. Kartasura, Sukoharjo Regency, Central Java. PPMI Assalaam is an Islamic boarding school in densely populated urban areas. This research uses a qualitative descriptive research method, data in the form of written or spoken words or the behavior of the people observed [19]. The research approach uses case studies; case studies can present views from the researched subject and provide in-depth descriptions useful for assessment or transferability [20]. Data sources used in this research include primary data and secondary data. The interview uses a semi-structured approach so researchers can ask additional questions outside the guidelines to obtain more detailed and comprehensive data and information [21]. The informants for this research are the PPMI Assalaam community, including the head of the Research and Development Sub-Division, the

Coordinator of Environmental Activities, the Principal of MTs, the Head of the General Sub-Division, the Head of the Facilities and infrastructure Sub-Division, the Head of the Restaurant Section, Waste Bank Coordinator, Environmental Cadre Advisor and Santri. The analysis technique used is a single case analysis; the data analysis process consists of four stages: data collection, data reduction (data simplification), data presentation, and conclusion [22].

3 Results

Urban Green Spaces at PPMI Assalaam are open areas consisting of parks, gardens, green fields, or other natural elements in or around the Islamic boarding school environment in urban areas. This green space is designed and managed to improve children's well-being and create a learning environment that supports their physical and mental development. Urban Green Spaces at PPMI Assalaam play an essential role in reducing the negative impacts of urbanization, such as pollution, dense population, and limited access to nature, thereby helping to achieve the 2030 Sustainable Development Goals (SDGs) in social, economic, and environmental aspects. These green spaces can include school gardens, green play areas, vegetation, and other natural facilities that provide opportunities for children to interact with nature and improve the quality of their education and well-being.

3.1 Management of Islamic Boarding School Land

Management of Islamic boarding school land is an essential topic in the context of nature conservation and creating a friendly and sustainable environment.

“The estimated area of the pesantren is 10 hectares, with approximately 5 hectares located on the east side of the highway and around 4 hectares on the west side. A garden in each alley between the classrooms, totaling approximately 15 garden spots throughout Pondok Assalaam.” Interview Result with Ustadz Gunawan, Head of General Subdivision at PPMI Assalaam, Sukoharjo, January 18, 2023.

The land area at PPMI Assalaam is around 10 Ha, divided into the east and west parts of the highway. Islamic boarding school land management is essential to preserving nature and creating a sustainable environment. With a deep understanding of the land area owned, PPMI Assalaam can plan and optimize land use.



Fig. 1. Garden at PPMI Assalaam

The existence of parks throughout the Islamic boarding school area, with around 15 park spots, shows great attention to creating a green and comfortable environment. These parks act as recreation areas and contribute to the beauty of the Islamic boarding school environment. The existence of parks in various locations creates a relaxed and natural atmosphere for the Islamic boarding school community. Land management at PPMI Assalaam includes multiple aspects, such as building roofs with solar panels, efficient waste management, and implementing energy efficiency practices. This creates a cool and refreshing environment that supports students' mental and physical health. The green environment around the classroom also provides opportunities for students to interact with nature, which positively impacts their well-being [12].

PPMI Assalaam's role as a model for local communities in sustainable land management can be seen in various programs and activities that support nature conservation. This Islamic boarding school collaborates with local governments, environmental services, and various private parties to support more effective land management. Harmony between education and the environment is reflected in land management at PPMI Assalaam. Islamic boarding schools not only provide religious education but also integrate an understanding of a sustainable environment into their curriculum. This creates awareness and responsibility for nature among students, a valuable asset in maintaining environmental sustainability.

In the overall context of Islamic boarding school land management, emphasis on nature conservation, creating a comfortable environment, and learning about sustainability are strategic steps. PPMI Assalaam provides an overview of how Islamic boarding schools can become centers of environmentally solid education and have a positive impact. Effective and sustainable land management is an essential step towards a sustainable and excellent future for the Islamic boarding school community and surrounding communities [16].

3.2 Water Resources Management

“Water resources management at PPMI Assalaam focuses on drinking water filtration, rainwater harvesting, and making infiltration wells and bio pore holes to ensure safe and sustainable water availability in the Islamic boarding school environment.” Interview Result with Ustadz Gunawan, Environmental Activities Coordinator at PPMI Assalaam, Sukoharjo, December 6, 2023.

PPMI Assalaam carries out various activities to conserve water resources. This is in line with the teachings of Islam, which teaches environmental values. By utilizing rainwater, infiltration wells, and biopore holes, PPMI Assalaam proves its commitment to protecting water resources and managing them sustainably. Water is an integral part of Islamic boarding school life. This understanding ensures the fulfillment of quality water needs in everyday life [17]. PPMI Assalaam ensures a safe and clean drinking water supply through drinking water filtration equipment. This step is an excellent example of how Islamic boarding schools can maintain water sustainability for consumption by the Islamic boarding school community. Collaboration with related parties, such as the Health Service, to maintain and test water quality is an essential step in maintaining the cleanliness of drinking water.



Fig. 2. Drinking Water Filtration and Infiltration Wells

Using rainwater as an additional water source is an excellent initiative in reducing the burden on the primary water source of Islamic boarding schools. Rainwater harvesting and the creation of infiltration wells are good examples of efficient and sustainable water resource management practices. Biopore holes help absorb water into the soil, overcoming the problem of standing water in the Islamic boarding school environment. There are 18 absorption wells and biopore holes in 20 places. The number of absorption wells and biopore holes in Islamic boarding schools can provide information about the Islamic boarding school's commitment to maintaining water and environmental sustainability. The support provided by local governments and ecological institutions is a critical factor in the success of water resources management in Islamic boarding schools. This collaboration ensures the maintenance and testing of water by quality standards and suitability for consumption. PPMI Assalaam can be an excellent example of managing water resources efficiently, conserving water, and maintaining a healthy environment. This effort also illustrates the Islamic boarding school's social responsibility to maintain the environment's quality and the surrounding community's health. This research illustrates how schools or Islamic boarding schools can actively manage water resources and maintain environmental sustainability [18]. These practices are not only beneficial for the Islamic boarding school itself but also have a positive impact on the surrounding community.

3.3 Waste Management Program

Waste management at PPMI Assalaam is crucial to maintaining the cleanliness and sustainability of the Islamic boarding school environment. Research data reveals that in the 2019-2020 academic year, PPMI Assalaam generated significant waste, around 259.9 tons/year. This condition triggered PPMI Assalaam's awareness of the importance of taking concrete steps to reduce the amount of garbage. They initiated the "Gerakan Peduli dan Berbudaya Lingkungan Hidup (GPBLH)" to implement better waste management practices.

“For the waste management process at PPMI Assalaam, waste collection personnel enter the pesantren complex. At the waste collection point, the waste is segregated into organic and inorganic waste. Organic waste, such as food leftovers, is processed at the waste collection point southwest of the boarding school to be turned into fish feed. Inorganic waste, such as plastic bottles, paper, and cardboard, is further sorted at the Waste Bank.”
Interview Result with Abdul, Head of the Waste Bank at PPMI Assalaam, Sukoharjo, January 26, 2023.



Fig. 3. “Laboratorium Pusat Pengolahan Sampah Assalaam (LP2SA)”

The "Gerakan Peduli dan Berbudaya Lingkungan Hidup" at PPMI Assalaam covers various aspects of waste management, including collecting, sorting, processing, and appropriately disposing waste. PPMI Assalaam views waste management as important in maintaining the Islamic boarding school environment's cleanliness, health, and sustainability. They optimized waste management using the Reduce, Reuse, and Recycle approaches based on the 3R principle. For example, waste from Islamic boarding schools, such as food waste, is used as feed for catfish and catfish, avoiding waste and still utilizing resources. Also, waste such as bottles, paper, and electronic goods that can still be recycled is processed through the “Laboratorium Pusat Pengolahan Sampah Assalaam (LP2SA)”. “LP2SA” is a critical infrastructure in sustainable waste management. Through "GPBLH," implemented in the 2021-2022 academic year, PPMI Assalaam significantly reduced the amount of waste piled up, reducing the amount from 48.1 tonnes/year to more efficient.

PPMI Assalaam's efforts to manage waste align with Islamic values , which encourage environmental care. MUI Fatwa Number 41 of 2014 guides their actions, emphasizing the obligation of Muslims to maintain ecological cleanliness, avoid waste, and manage waste wisely. PPMI Assalaam views waste management as part of its social and religious responsibility to protect the environment and natural resources. Through solid efforts in waste management, schools or Islamic boarding schools can create a cleaner, healthier, and more sustainable environment and positively contribute to nature conservation and resource sustainability for future generations [18]. In a broader context, PPMI Assalaam provides a concrete example of how educational and religious institutions can play an active role in maintaining environmental sustainability and implementing cleanliness values in religious teachings. Thus, waste management at PPMI Assalaam is not only a practical action but also embraces the spiritual dimension of protecting the earth as a mutual trust and responsibility.

3.4 Energy Resources Management

Management of energy resources at PPMI Assalaam is essential to preserving Islamic boarding schools' environment and sustainability.

“PPMI Assalaam engages in energy conservation efforts by installing two solar panels on the buildings of MTs and MA. These solar panels have a total capacity of 25 kWp (Kilowatt Peak) and can store electrical energy.” Interview Result with Ustadz Setiawan, Head of MTs at PPMI Assalaam, Sukoharjo, November 16, 2022.

One of their main breakthroughs is using solar energy through solar panels. With solar panels installed on the Madrasah Tsanawiyah (MTs) and Madrasah Aliyah (MA) buildings, PPMI Assalaam produces 25 kWp of electrical energy from renewable solar energy sources. This decision reflects the Islamic boarding school's commitment to reducing dependence on conventional energy sources based on fossil fuels, which generally hurt the environment. Regarding renewable energy management, PPMI Assalaam received assistance from the Ministry of Energy and Mineral Resources in 2019. The Solar Power Plant (PLTS) at PPMI Assalaam uses an on-grid system, which allows excess electricity production to be sent back to the national electricity grid (PLN) and used for other purposes. In this way, they participate in the electricity buying and selling process, which supports using renewable energy.



Fig. 4. Solar Power Plant and Solar Electric Bike at PPMI Assalaam

Apart from PLTS, PPMI Assalaam is also innovating by using solar-powered electric bicycles and Smart Electric Cars, which utilize solar energy as the primary means of transportation within the Islamic boarding school environment. PPMI Assalaam, with its innovations in renewable energy and environmentally friendly mobility, provides a clear example of how this approach reflects environmental awareness and religious values. This approach also reflects the active role of schools or Islamic boarding schools in protecting the environment, providing inclusive energy access, and contributing to reducing greenhouse gas emissions in supporting sustainable development goals [18]. In its overall context, energy resource management at PPMI Assalaam is not just a practical action but rather an in-depth effort to utilize the potential of renewable energy as a more sustainable environmental solution and play a role in facing future energy challenges.

3.5 Biodiversity Program

The biodiversity program at PPMI Assalaam is a crucial step in efforts to protect the environment amidst limited land in urban areas. PPMI Assalaam is taking concrete steps to utilize every inch of available land for reforestation. Understanding the importance of vegetation in facing the challenges of climate change and maintaining environmental ecosystems is reflected in their commitment to carrying out three main activities in reforestation: seeding, planting, and maintenance [6].



Fig. 5. Planting and caring for plants in the Islamic boarding school environment

“At PPMI Assalaam, a voluntary community work and greening activity called "kerja bakti" and "penghijauan" is conducted three times a year. This activity typically takes place near the end of each holiday period, and it involves the participation of all staff members, including the Director, in cleaning and greening the pesantren environment.”

Interview Result with Ustadzah Kustati, Environmental Cadre Advisor at PPMI Assalaam, Sukoharjo, April 7, 2023.

This greening activity involves all components of the PPMI Assalaam community, from students, caregivers, and ustadz to employees and boarding school leaders. PPMI Assalaam makes reforestation a sustainable process involving all parties' involvement in environmental conservation efforts. In this case, school principals, ustadzah, and student guardians provide direct examples through concrete actions in ecological conservation efforts.

There are 39 types of plants, with a total of 3,660 plants at PPMI Assalaam. This plant not only has an essential role in providing oxygen, absorbing CO₂, and storing water but also has other roles, such as using fruit and flowers as a wind barrier [3]. This is a concrete effort that reflects PPMI Assalaam's commitment to facing the challenges of global warming and environmental conservation. Through this biodiversity program, PPMI Assalaam not only improves the ecosystem and natural beauty in the Islamic boarding school environment but also uses this action as a form of worship and responsibility for the creation of Allah SWT. With their commitment and actual actions, PPMI Assalaam is a clear example of awareness of the importance of environmental conservation in limited urban land. It emphasizes their essential role in upholding ecological values and environmental protection for a better future.

3.6 Linkage to Sustainable Development Goals (SDGs)

PPMI Assalaam programs and initiatives are closely linked to several Sustainable Development Goals (SDGs), showcasing their commitment to sustainable development.

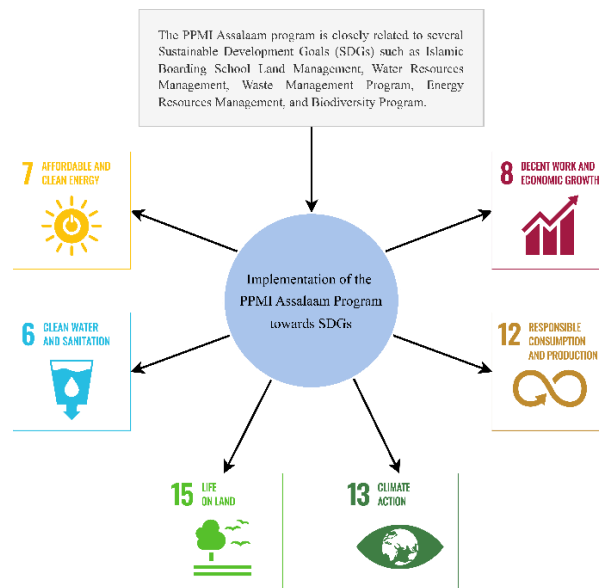


Fig. 6. Implementation of the PPMI Assalaam Program towards SDGs

Regarding managing the pesantren's land (SDGs 13 and 15), PPMI Assalaam focuses on the layout of various buildings, such as offices, classrooms, gardens, and pavilions. The goal is to ensure a well-planned and harmonious arrangement that respects the environment. In managing water resources (SDG 6), PPMI Assalaam implements various measures, including drinking water purification, to provide clean and safe water for the community. They also employ rainwater harvesting, infiltration wells, and biopores to manage water resources and promote sustainable water usage effectively. To foster biodiversity (SDG 15), PPMI Assalaam engages in activities like seedling cultivation, tree planting, and ongoing maintenance. By actively participating in these efforts, they contribute to preserving and enhancing the diversity of plant species within their environment. PPMI Assalaam strives to ensure affordable, sustainable, modern energy access (SDG 7). They achieve this by implementing renewable energy solutions such as solar panels and conducting research and innovation projects related to electric bikes and cars. In pursuing sustainable economic growth and waste reduction (SDGs 8 and 12), PPMI Assalaam focuses on waste management. They promote the principles of the 3R (reduce, reuse, and recycle) to minimize waste generation and implement a waste bank program to encourage proper waste management practices. Through these programs and initiatives, PPMI Assalaam demonstrates its commitment to the SDGs by actively incorporating environmental considerations into its actions.

4 Conclusion

Urban green space is essential in looking at environmental balance amidst rapid urban development. In this context, PPMI Assalaam, an Islamic boarding school in Sukoharjo, provides a concrete example of integrating the urban green space concept in various environmental and resource management aspects. Management of Islamic boarding school land,

which includes reforestation, efficient water resource management, waste management programs with a 3R approach, utilization of renewable energy resources such as solar panels, and biodiversity conservation programs are all connected in PPMI Assalaam's vision towards a cooler, greener and sustainable. Regarding Islamic boarding school land management, emphasis on nature conservation, creating a comfortable environment, and learning about sustainability are strategic steps that create awareness and responsibility for nature among students and the wider community. Regarding water resource management, efficient water use and utilization of rainwater sources support access to clean water and better sanitation, which aligns with SDG number 6. Responsible waste management programs support responsible production and consumption, in line with SDG 12. Renewable energy and innovations such as electric bicycles and Smart Electric Cars help reduce greenhouse gas emissions and support SDG 7 regarding renewable and affordable energy. In addition, the biodiversity program, through greening Islamic boarding schools and preserving plants, creates an environment that promotes biodiversity and contributes to preserving ecosystems and species, per SDG 15. PPMI Assalaam, with this holistic approach, is a model for integrating various aspects of sustainability and provides concrete evidence of how urban green space can support overall sustainable development goals.

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