

## Research article

# Environmental Education at Adiwiyata Schools and the Conservation of the Brantas Watershed in Indonesia

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## Abstract.

In Indonesia, the Adiwiyata schools' development program has implemented environmental education. These schools have a responsibility to preserve the environment, especially around school grounds. One of the elements of the Adiwiyata schools' conservation program is the conservation of the Brantas watershed area which is currently experiencing degradation due to human activities. This study aimed to explain how environmental education in schools contributes to students' knowledge, and to examine the efforts made by the Adiwiyata schools in the conservation of the Brantas watershed area. This research used quantitative and qualitative research methods. The quantitative method was carried out through a survey of 254 students at Adiwiyata schools through an online questionnaire. Qualitative data were collected through observations of school programs and policies as well as semi-structured interviews with teachers, students, and principals. The results of this study indicated that environmental education in Adiwiyata schools contributes to strengthening students' cognitive and affective competencies towards the conservation of the Brantas watershed but not yet in the psychomotor domain. The Brantas watershed conservation efforts carried out by the Adiwiyata schools consist of monitoring river water quality, restoring riverbanks, and cleaning the river from pollutant waste. The realization of these efforts is the result of collaboration between the school and external parties, namely the Environment Agency, Jasa Tirta, the Tunas Hijau NGO, and the JKPKA Organization.

**Keywords:** environmental education, Adiwiyata, Brantas watershed, conservation, senior high school

## 1. Introduction

Environmental education is one approach that aims to reduce environmental damage from climate change and other external factors. Environmental education is education that seeks to build awareness and mutual interest in the environment and its problems. This awareness includes knowledge, behavior, motivation, commitment, and skills individually and collectively. Currently, the era of education is entering the 21st

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century where efforts to maximize environmental education are one of the main goals, as manifested in skills in maintaining health and environmental sustainability as well as growing communal economic prospects [1]. Environmental education provides integrated learning, improves academic performance of school institutions, and improves student health through the creation of a healthy environment.

Acceleration of environmental education through school institutions can be realized in the Adiwiyata program. This program was launched on February 21, 2006 by the ministry of environment and ministry of education and culture [2]. In simple terms, the adiwiyata program contains strengthening the knowledge and awareness of school residents through learning, habituation, participation, and the application of environmental sustainability principles. One of the Adiwiyata school concepts is the application of non-waste management in schools by minimizing the use of plastic waste and recycling waste into items of sale value [3].

The implementation of the adiwiyata program should not only be limited to instilling students' awareness of the sustainability of the school ecosystem. However, it should be able to develop in a wider realm such as making the environment outside of school a source of learning. Especially regarding ecosystems that are experiencing environmental degradation, one of which is the Brantas watershed area. Currently the condition of the Brantas watershed is experiencing concerns due to pollution caused by industrial and domestic waste, which has an impact on decreasing water quality [4]. Many conservation efforts have been carried out by various parties, including policy makers [5], non-governmental organizations [6], as well as environmental organizations consisting of school members such as the Water Quality Monitoring Community Network (JKPKA) [7].

This study aims to explain how school environmental education contributes to the formation of students' knowledge and competence towards the environment. In addition, this study also explains their efforts to do conservation through environmental education in the school.

## 2. Method

This research used descriptive qualitative and quantitative methods. The research subjects consisted of teachers, students, and authorized institutions such as the Environment Agency and the Education Office. Meanwhile, the object of the research is the implementation of environmental education in the Brantas watershed which is spread across upstream, middle, and downstream schools in the Brantas watershed.

This research was carried out from May - July 2021. The research locations were carried out in high schools in Batu City, Malang, Kediri, and Surabaya City, all three of which represent the Brantas watershed area, starting from upstream, middle, and downstream. The schools included in the upstream area of the Brantas watershed are SMA 2, 3, 4, 5, 8, 10 Malang, SMAN 1 Batu, and MAN Kota Batu. The schools included in the middle area of the Brantas watershed are SMAN 1 Puncu, SMAN 3 Kota Kediri, and SMAN 5 Taruna Brawijaya, East Java. Meanwhile, schools that are included in the downstream area of the Brantas watershed are SMAN 3 and SMAN 8, Surabaya. The schools selected are schools that hold the title of Adiwiyata School.

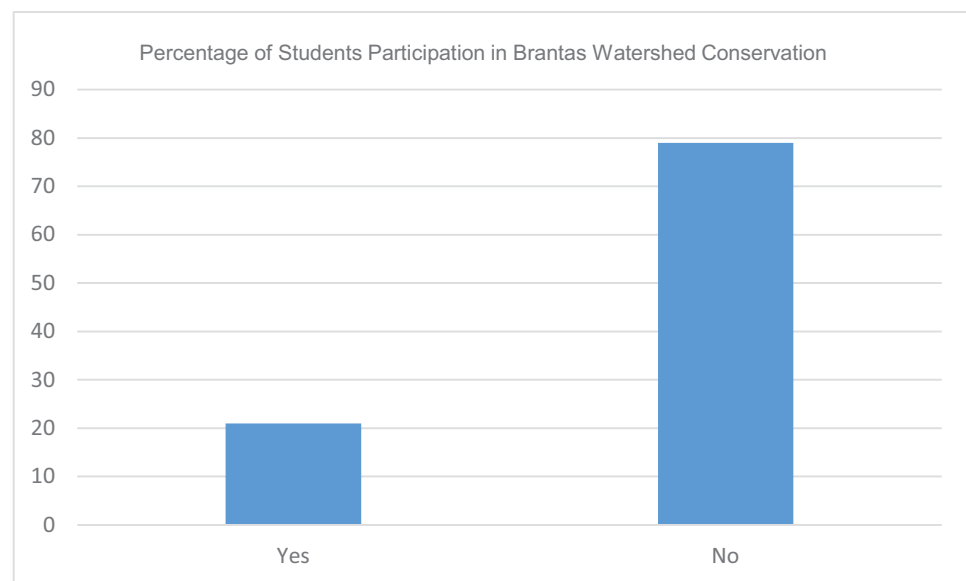
### 3. Result and Discussion

Basically, Adiwiyata School's concern for the environment is represented in the school's vision. Every school with adiwiyata status includes a vision of environmental insight or culture as its policy orientation. The consequence of this is the allocation of a minimum of 20% of funds for the development of environmental education, both for curriculum needs, student activities, and environmental infrastructure. This is in accordance with the regulation of the Minister of Environment and Forestry number p53 regarding the Adiwiyata award. In the realm of curriculum, the implementation of environmental education in Adiwiyata schools is shown by the integration of environmental issues in all subjects. In some subjects such as chemistry, biology, geography, economics, and sociology, the internalization of environmental issues is realized as a source of learning and teaching materials. While in subjects that are not so related to the environment, the application of integration is realized through learning assessments.

The implementation of an environment-based curriculum has been proven to contribute to students' competence on the environment in general. When viewed more specifically, the effect of environmental education in schools on student competence regarding environmental conservation in the Brantas watershed is only at the cognitive and affective levels, not yet included in the psychomotor domain. In the context of global problems, students understand the issue of climate change (60%), deforestation (10%), plastic waste pollution in the sea (27%), and biodiversity (3%). In the crisis area of the Brantas watershed, students are able to identify types of pollutants (78% plastic waste, 7% diapers, 6% chemical waste, and 9% domestic waste) and local community activities.

The implementation of environmental education in Adiwiyata schools also contributes to fostering a pro-environmental attitude in the minds of students. Students have an

attitude of openness to accept (83%) and discuss (52%) environmental issues, as well as encouragement to others to preserve the environment (77%) both in the general and specific contexts of the Brantas watershed. This attitude arises because of the habit of caring for the environment in everyday life at school, both individually such as reducing the use of single-use plastic bags or collectively through the Adiwiyata working group. However, the relevance of environmental education in Adiwiyata schools has not yet reached the psychomotor aspects of students. The involvement of students in the conservation of the Brantas watershed is still lacking. Only 24% of students have ever conducted field investigations and 21% are involved in the conservation of the Brantas watershed.



**Figure 1:** Percentage of Students Participation in Brantas Watershed Conservation.

If formulated, the concrete efforts to conserve the Brantas watershed through environmental education in Adiwiyata schools can be viewed from the perspective of cognitive and affective enhancement. In the internal domain of the school, students' cognitive improvement is realized through the integration of environmental education into all subjects, and the development of learning tools based on the Brantas watershed ecosystem. While externally, it is realized through participation in competition activities, namely environmental-themed scientific writing competitions and environmental poster competitions. The teachers were also given reinforcement regarding the sustainability of the adiwiyata school's existence by the education office and the district/city environment office through workshops. Affective improvement is created by growing school communities that care about the environment through strengthening character education, instilling the importance of maintaining the existence of vegetation for future

sustainability, enforcing regulations or rules relating to environmental protection, and fostering active school community participation both within the school and beyond local communities.

The active involvement of students in the preservation of the Brantas watershed environment when viewed from a psychomotor perspective still shows a low degree as described in the previous diagram. The lack of active involvement of students in the preservation of the Brantas watershed is driven by several factors, including: (1) the absence of a school program specifically aimed at preserving the Brantas watershed, (2) limited budget allocations for environmental conservation and, (3) limited time. So far, students' psychomotor competence is formed through the existence of adiwiyata working group (POKJA), UKS, and nature lovers extracurricular.

The conservation of the Brantas watershed that Adiwiyata schools strive for involves external parties such as the government, non-governmental organizations (NGOs), and the general public in order to preserve the Brantas watershed. The Environment Agency (DLH) and the Waste Bank are working on workshops, training, and research related to waste management in schools. School residents are also involved in cleaning the Brantas River which is a work program for the City Government of Malang, Kediri, Surabaya together with Perum Jasa Tirta. Some adiwiyata schools also collaborate with the Tunas Hijau (Surabaya) NGO, upstream JPKKA (Malang City), and local communities in the context of preserving the Brantas watershed area through monitoring river water quality, restoring riverbanks, and maintaining drainage channels leading to the Brantas River.

## 4. Conclusion

This study shows that the implementation of environmental education in Adiwiyata schools has relevance to strengthening environmental competencies in cognitive, affective, and psychomotor aspects. However, in the context of the Brantas watershed conservation, it has not touched the psychomotor aspect. Cognitive strengthening is sought through the integration and internalization of environmental issues in each subject. Meanwhile, effective strengthening is pursued through the habit of protecting the environment which can develop pro-environmental characters. However, most students have not been involved in concrete actions to preserve the Brantas watershed. On the other hand, in implementing environmental education, the school collaborates with several elements of the government (Environmental Service and Perum Jasa Tirta), environmental organizations (JPKKA and Tunas Hijau), and the general public.

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