

## Fostering Children to Have Environmental Love Behavior in Facing Climate Change at Densely Population Urban Area

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### ABSTRACT

Cibunut is a densely populated urban area at the center of Bandung City, West Java. This village has been chosen by the district government as a pro-climate area, but this policy was little known to children. This socialization aimed to provide knowledge and foster pro-environmental behavior in children as early as possible so that the values that the children obtained were internalized independently and would have an impact on a sustainable lifestyle after adulthood as a form of mitigation against climate change. This socialization activity used the creative educational approach, namely insight, role models, and conditioning. The results of this activity not only provided knowledge about the impact of supporting cleanliness but also increased the children's motivation to take part in environmental love activities. During the socialization, children were challenged to practice environmentally friendly behavior together. This enjoyable education approach in community service was able to foster children who care about environmental issues can be seen from their awareness of the environment and climate change, ready to contribute toward keeping a clean and sustainable environment.

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## INTRODUCTION

Climate change refers to long-term changes in temperature and weather patterns (Eyring & Gillett, 2023). Such fluctuations may be natural, due to variations in the sun's activity or huge volcanic eruptions. However, since the 1800s, human activities have been the primary cause of climate change, owing to the combustion of fossil fuels such as coal, oil, and gas (Council, 2020). Climate change is a real thing, and its impacts are increasingly being felt all over the world. The average temperature of the earth's surface today is about 1.1 °C warmer than the temperature in the late 1800s before the industrial revolution and warmer than any previous temperature in the last 100,000 years (UN, 2024). The last decade (2011-2020) was the hottest decade on record, and each recent decade has been warmer than the previous decade since 1850 (WMO, 2023). In a series of UN reports, scientists, and representatives of heads of state agreed to limit global temperature rise to no more than 1.5 °C to help avoid the worst climate impacts and support a livable climate. However, current policies suggest a temperature increase of 3 °C by the end of the century (Chevuturi et al., 2022; WMO, 2023).

The impacts of climate change include severe drought, water scarcity, severe fires, rising sea levels, floods, melting polar ice, hurricanes, and declining biodiversity (Eyring & Gillett, 2023; Wuebbles et al., 2017). Climate change can affect our health, our ability to grow food, housing, safety, and jobs. People in certain locations, such as small island nations and impoverished countries, may become more sensitive to climatic consequences. Sea level rise and saltwater intrusion have forced entire villages to evacuate, while protracted drought puts them at risk of hunger. In the future, the number of persons displaced by weather catastrophes is likely to rise (UN, 2024).

The emissions that cause climate change originate from across the world and affect everyone, yet some countries emit more than others. In 2020, the seven major emitters (China, the United States, India, the European Union, Indonesia, the Russian Federation, and Brazil) accounted for roughly half of worldwide greenhouse gas emissions. (UN, 2024).

Every citizen is expected to take action on climate change, but communities and countries that cause or are affected by larger climate change problems such as Indonesia have a greater responsibility to take action first (Napitupulu et al., 2018; Nasucha et al., 2020). Climate change has become a threat to humanity's future. However, there are still many people who do not understand and are not even aware of and consider the impacts lightly or even do not care about the impacts of climate change which occur as a result of low knowledge about climate change (Arwan et al., 2021; Hayatulah et al., 2023). Knowledge and understanding about the dangers of the climate crisis and the importance of mitigating and adapting to climate change in Indonesia is still low. This phenomenon is caused by the lack of discussion about climate change as a topic of learning activities in schools. The dangers of carbon emissions which contribute to global warming, the urgency of good waste management, and the importance of using environmentally friendly energy sources are topics that are not widely discussed or even neglected to be discussed inside and outside the classroom in school activities (Hayatulah et al., 2023; Iklim, 2018).

Efforts that can be a bridge to overcome this gap can be carried out by involving educational channels, either by integrating the theme of climate change into the learning curriculum or through other activities such as extra-curricular activities and outreach that can develop the attitude of love towards the environment for elementary school students level in facing climate change. The formal education community is a strategic target group. Formal education plays a very important role in creating the nation's next generation who will actively overcome the problem of climate change, through instilling life values and implementing environmentally friendly behavior (Hayatulah et al., 2023; Napitupulu et al., 2018). Educators and environmental cadres from students are expected to be agents for implementing environmentally love behavior in schools and the community. Implementing environmentally love behavior will make a real contribution to mitigating climate change.

To accelerate the role of the education field in creating the next generation who are responsible for preserving the environment, since 2006 the Ministry of Environment and Forestry, Indonesia has launched the Adiwiyata Program as one of the implementations of environmental education through formal education channels, through formal, informal, and non-formal educational channels. This program aims to create a school that cares about and has an environmental culture (Iklim, 2018). Schools are encouraged to integrate efforts to implement environmentally friendly behavior in the curriculum, make efforts to implement environmentally friendly and loving behavior in extracurricular activities and personal education, and invite active participation from all school members including the principal, teaching staff, non-teaching staff, and students in implementing the environmentally friendly and loving behavior. One of its programs is waste processing activities in the environment through the concept of Recycle, Reduce, and Reuse or 3R (Jamhariani, 2019; Setina et al., 2015). In the long term, environmental education that introduces the concept of climate change can help to reduce the impacts of climate change and increase awareness about the importance of supporting a good and healthy environment. Thus, environmental education can be a way to overcome climate change and support environmental sustainability.

Madrasah Ibtidaiyah (MI) Muhammadiyah 2 Bandung City is an Islamic-based elementary school that is located at Cibunut of Kebon Pisang village, Sumur Bandung district, Bandung city, which is a very densely populated area that inhabited by 550 families and consisting of 1,600 people. Cibunut residents have diverse work backgrounds, but most MI Muhammadiyah 2 students come from families with low level status both economically and educationally. At very densely population of Cibunut, waste and climate change can become a major problem if residents are unable to manage and mitigate it properly. Therefore, various efforts to mitigate the adverse impact of climate change need to be undertaken continuously by all parties including the younger generation such as elementary school level students at MI Muhammadiyah 2 Bandung City. Efforts to overcome climate change impact can be conducted through the socialization of mitigation and adaptation, which can be carried out at the individual, group, community, and country levels. Communities can make a significant contribution through behavioral changes that support climate change mitigation and adaptation efforts, for example reducing waste accumulation by avoiding the use of single-use items, utilizing organic waste into compost, recycling items, turning off electronic equipment when it is not needed, replacing electronic equipment with a type that saves more electricity and operates it accordingly, and planting and maintaining plants.

This community service is one of the environmental education practices to develop knowledge, attitudes, and behavior to love the environment for children. The activities were conducted with the theme: "Internalization of attitudes and behavior that love the environment for elementary school students in facing climate change" as a form of community service of Unpad academicist. This activity aimed to foster pro-environmental behavior in children which must be carried out as early as possible so that the values obtained are internalized independently and will have an impact on sustainable living as mitigation on climate change and contributing to the *Sustainable Development Goals* (SDGs).

## METHOD

This community service activity involves lecturers and twenty-seven of freedom students exchange (Pertukaran Mahasiswa Merdeka, PMM) Inbound Padjadjaran University group E39. Two of students are national environmental ambassadors from whom represent the origin university they come. The socialization activities were conducted in three stages, namely preparation, provision, and implementation.

At preparation stage, a field survey was done to find environmental issues at Cibunut Village, Kebon Pisang Village, Sumur Bandung District, Bandung City, West Java. This survey stage was useful for exploring problems and figuring out existing solutions at Cibunut through real action by conducting outreach at the Madrasah Ibtidaiyah Muhammadiyah 2 Bandung.

The provision stage includes various activities including materials preparation, tools and equipment, transportation procurement, consumption, and souvenirs used during socialization at MI Muhammadiyah School 2 Bandung. The main target of this socialization is for school children to be able to take part and contribute as *agents of change* in climate change as well as increased awareness and participation of the alpha generation as the successors of the Indonesian nation in realizing Indonesia's Golden Generation in 2045.

Implementation stage. This stage includes activities that were conducted at MI Muhammadiyah 2 Bandung at Cibunut, Kebon Pisang Village, Sumur Bandung District, Bandung City, West Java. This stage includes activities: 1. Interviewing children for environmental love behavior; 2. Delivering internalization material of climate change; and 3. Practicing the concept of environmental love acquired from socialization activities, playing games about environmental love, and reflection. The method for implementing community service activities was based on *insight*, *role models*, and *conditioning* in encouraging and fostering the children to support in keeping their community clean and healthy.

## RESULTS AND DISCUSSION

### Description of Community Conditions at Locations of Socialization Activities

MI Muhammadiyah 2 Bandung is located at Cibunut, RW (citizen association) 07 of Kebon Pisang village, Sumur Bandung District, in the center of the Bandung City area. Cibunut village consists of ten neighborhood associations (RT) with an area of 2,374 m<sup>2</sup>. Cibunut village is a densely populated area, with the RT 01 to RT 09 organizing an environmentally friendly creative village area program. Meanwhile, RT 10 does not take part in the environmentally friendly creative area program because its area is separated by a large national road, namely Jalan Sunda, and has many trade areas and public facilities. Cibunut village has various regional functions, residential areas, social facilities/public facilities, and open spaces. There are several integrated building functions in Cibunut village, including houses and shops, houses, and services, besides independent houses and schools. Most of the residents of RW 07 Cibunut adhere to Islam which was shown by the existence of mosques in RT 08 and RT 06, namely the At-Taqwa and Al-Jihad mosques. There is an Islamic school that held its collaboration activities places such as the Islamic New Year, and Eid Al Fitr that are regularly held. Most residents of Cibunut village work in the private sector, a small number are civil servants, casual workers, scavengers, and so on. The people of Cibunut do not work in the agricultural sector because the agricultural areas are located far away from settlements.

### Children's Enthusiasm and Joy in Socialization to Encouraging Environmentally Love Behavior

This socialization activity on the internalization of environmentally love behavior for children facing climate change was attended by fifty-six grade 4 and 5 students at MI Muhammadiyah 2 Bandung City. The location of the activity was taken place at the school's multi-purpose hall. The implementation of socialization was carried out with a creative educational approach. This approach not only provides knowledge about the impact of supporting cleanliness but also increases children's motivation to participate in environmentally love activities. In this activity, children are invited to conduct the practice of loving the environment together, starting from education on the material for forming pro-environmental behavior that can be applied to children. Firstly, insight into understanding the importance of keeping a clean and healthy environment. Secondly, using role models (pandora), for example, a live model such as a public figure who has made excellent contributions in related fields. Thirdly, conditioning (habituation), for example by giving rewards (gifts/praise) to appreciate children's activity in socialization. In daily life, this action cannot be separated from the guidance and role of parents in everyday life to foster pro-environmental behavior in

children, it must be done as early as possible so that the values they acquire can be internalized independently and will have an impact in adulthood.

At the understanding stage activity, all participants gathered at the multi-purpose hall of MI Muhammadiyah 2 Bandung City to take part in activities that started at 08.00 WIB. The event began with an opening, a reading of the holy Qur'an, and a brief introduction from the community service team of Padjadjaran University in front of the school principal, teachers, and students who participated in the activity. Thereafter, the main event began by presenting students of PMM Inbound Padjadjaran University belonging to the E39 group who came from various provinces in Indonesia outside Java, to introduce the environmental riches, its characteristics, and efforts to love and preserve the environment in their areas of student's origin. The children got the socialization material that can foster children's understanding of environmental concepts locally, regionally, and globally, to build children's awareness of the negative impacts that arise from not protecting the environment. By providing an in-depth understanding of how their behavior can affect the natural environment around them, children become more sensitive to their responsibilities towards the environment. This approach provides a strong foundation for positive behavior.

The students of MI Muhammadiyah 2 Bandung City the majority of whom, in fact, around 80%, come from parents with lower educational and economic status categories, are very enthusiastic about in participating the interactive presentations and activities of the environmental and climate change material which was discussed starting from a local, national, regional, and international scale. The students of MI Muhammadiyah 2 Bandung City were also motivated to study harder and love the high-achieving environment by the role model of the national level environmental ambassador students who stood for their university from PMM students who took part in this activity.



**FIGURE 1.** The students of MI Muhammadiyah 2 Bandung City enthusiastically attended the interactive presentation of regarding of climate change mitigation.

At the role model stage, students interactively use a role model approach by introducing inspirational figures, or people around them who have made a real contribution to the environmental sector in their activities. By introducing positive examples of successful involvement in environmental conservation, children are motivated to follow in their footsteps. At this stage, also introduced two PMM students Inbound Unpad from the E39 group who were national environmental ambassadors representing the university and province. With role models, children not only learn about the importance of protecting the environment but also feel inspired to become agents of change in their environment.



**FIGURE 2.** One of the presenter who is an environmental ambassadors delivered material interactively to the students at MI Muhammadiyah 2 Bandung City.

At the conditioning stage, an approach was implemented to strengthen positive behavior in protecting the environment. The presenters create positive stimuli and rewards for children who actively take part in environmental conservation activities, ensuring that children feel satisfaction and pride in their contributions. This conditioning process helps form good habits that children can internalize. The participants were divided into groups consisting of eight to ten people to express their creativity in expressing their understanding of the concept and love of the environment. Two students accompany each group. Each group sits in a circle formation. Each group received a set of media in the form of a sheet of Manila cardboard and markers and crayons of assorted colors. Each group was allowed to discuss and determine a theme in expressing concepts and passions, then take action in efforts to preserve the environment as mitigation for climate change. After agreeing on the theme, each person in the group expresses it by creating a picture together. The children in a group taking turns in sequence according to their sitting position in the circle for drawing a picture reflected their theme decided together. Each child can paint their picture and color it several times according to their turn until the specified time runs out so that all groups of participants start and end their drawing activity at the same time.

When the specified time was up, all groups stopped drawing, then each group appeared in front of the room explaining the work they had done to the Unpad community service team and other participants in front of the room. The jury team selected the winners based on the children's creativity. All groups of children received appreciation and gifts. The group that won first to third place received additional rewards in the form of stationery. The activity ended with conveying impressions and messages from the children in a series of socialization activities, handing over ornamental plants to the school, certificates, and mementos, as well as friendly hospitality.

At the end of socialization, reflection was conducted. Based on the reflections from the children as the socialization participants, this community service activity was not only limited to understanding environmental concepts but also a positive mindset for elementary school-age children toward a love of a healthy environment and climate change. This will create a real impact on the daily lives of the children of MI Muhammadiyah 2 Bandung. Children in grades 4 and 5 not only become more aware of their responsibilities towards the environment but are also actively involved in efforts to preserve the environment. This was the straightforward evidence that these social contributions not only provide knowledge but also encourage positive actions that can shape a more sustainable future. It is hoped that this awareness and love of the environment behavior will continue to be embedded in children's perceptions as they grow into adult individuals so that it becomes ingrained in their daily life behavior (Jamhariani, 2019; Setina et al., 2015). This can be supported by the role of the MI Muhammadiyah 2 school which is actively campaigning for a culture of clean and healthy living in schools and implementing the concept of zero waste

and zero plastic in the school environment. The designation of Cibunut as a “Proklim” village (Pro Climate Change) by the Ministry of Environment and a Colored Village by the West Java Regional Government is a synergistic condition for its residents, including school children from an early age.

The Indonesian Plastic Bag Diet Movement, which helps educate the people of Kampung Cibunut to educate residents to reduce plastic bags and start carrying their shopping bags, as well as making Kampung Cibunut a model area for plastic-free villages, will also support the sustainability of environmental care not only for adult residents but also for children from an early age to become an environment that becomes a model in waste management in the West Java area. Starting from children, teenagers, to the elderly will have a good awareness and mindset regarding waste management and protecting the environment. This is in line with previous reports especially concerning climate change being effective in increasing literacy and mastery as well as encouraging students' motivation to make contributions and even overcoming concerns about the impact of climate change (Arwan et al., 2021; Liyun et al., 2004; Nasucha et al., 2020. This can be done through formal education that is integrated with the curriculum or in other forms (Pertwi et al., 2020).



**FIGURE 3.** Students grades 4 and 5 of MI Muhammadiyah 2 Bandung City along with their mentors looked happy and active in showing their creativity about loving the environment and climate change mitigation.

Initially, the people of RW 07 Cibunut at Kebon Pisang village, Sumur Bandung District, Bandung City, known as a village with a densely populated, slum area. However, now Cibunut village has turned into a creative, environmentally friendly village. Currently, Cibunut Village is an area that is one of the assessment monitoring points for ADIPURA (awards for cities in Indonesia that are successful in cleanliness and management of the urban environment) and is a model for environmentally sound housing management known as Waste Free Zone (Pertiwi et al., 2020). Nowadays, the environment of the houses in RW 07 Cibunut is well arranged and integrated with ornamental plants and small trees that use limited space. The activities of Cibunut residents to save waste at the waste bank every Saturday and Sunday contribute positively, socially, and economically which can extend to the children. Therefore, understanding and love for a clean and healthy environment and its contribution to climate change mitigation for Cibunut residents will become a culture for all levels of society, from adults to young children such as MI Muhammadiyah 2 students. Prior studies have indicated that providing education on maintaining a clean and healthy lifestyle, which is closely linked to environmentally friendly behavior, is suitable for elementary school children. This education can enhance students' awareness and knowledge, enabling them to adopt clean and healthy habits in their daily routines. (Hananto et al., 2024; Shiddiqa et al., 2023). Ultimately, this effort can help to establish a sustainable environmental consciousness among children. In addition, the reports conveyed by some studies that cultivating the character of loving the environment is the responsibility of all citizens, and planting it at an early age is very appropriate to do considering the urgency related to climate change conditions which have a real impact on human life (Arwan et al., 2021; Setina et al., 2015; Suryani et al., 2019).

## CONCLUSION AND RECOMMENDATION

This community service not only provides an understanding of environmental concepts but also provides positive thinking among children at the elementary school level about the love for a healthy environment and climate change. This mindset will have a real impact on the daily lives of the children of MI Muhammadiyah 2 Bandung. Children in grades 4 and 5 are not only aware of their responsibility towards the environment but also actively take part in protecting the environment. It is expected this awareness and love for the environment will remain in children's minds until they grow up, taking root in their daily lives. The program organized by MI Muhammadiyah 2 to actively advocating students for the promotion of a hygienic and health-conscious lifestyle within educational institutions, alongside the implementation of eco-friendly practices such as zero waste and zero plastic within the surrounding ecosystem should be maintained, supported continuously by university through further community service program and by local government program.

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