

Waste Management and Environmental Awareness Improvement Through Independent Community Service Program in Medan Krio Village

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ARTICLE INFO

ABSTRACT

Keywords

Waste Management,
Environmental Awareness,
Medan Krio Village, 3R

Article history

Received: October 10, 2025

Revised: October 30, 2025

Accepted: November 10,
2025

Available online: November
24, 2025

Medan Krio Village, with a relatively high population density, faces serious challenges related to waste management and low environmental awareness, often leading to environmental problems such as clogged drains and flooding. The Independent Community Service Program (KKN) aims to increase community understanding and participation in organic and non-organic waste management. The methods used include direct observation, community interviews, and outreach. The main program implemented included the creation of separate waste bins (organic and non-organic) and the socialization of the 3R concept (Reuse, Reduce, Recycle). The program also utilized plastic bottles to create unique piggy banks for students. The results showed that the program successfully established visible waste sorting facilities and provided practical education on recycling, instilling values of creativity and savings habits in children. The KKN program has proven effective as a first step towards a cleaner and more sustainable village environment, although community awareness needs to be further enhanced.

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Introduction

The rapid population growth in the area around Medan City, including Medan Krio Village, has significantly increased the volume of waste generation (Peraturan Pemerintah (PP) 2020). Initial data indicates that waste handling in this village is still dominated by a system of collection, transport, and disposal without effective sorting at the source level (Salsabila and Rialdy 2024). Field observations highlight that a lot of waste, especially plastic, ends up in ditches and irrigation channels, which is the main cause of standing water and local flood risk.

The waste problem in Medan Krio Village is not only an issue of physical facilities but also a socio-cultural problem (Nainggolan et al. 2025). Low awareness and minimal community knowledge about the adverse effects of littering, as well as the economic potential (Hutabarat et al. 2024) of recycling, cause handling efforts to stagnate (Rialdy and Melisa 2023). This condition urgently requires intervention from external parties, one of which is through the Independent Community Service Program (KKN), which is expected to be a bridge between academic theory and community empowerment practices (Fahmi, Yani, and Rialdy 2025).

The waste problem is a crucial issue in Indonesia, especially in areas with high population density, including Medan Krio Village. Initial observations show that some residents of Medan Krio Village still have the habit of littering, which leads to clogged ditches and standing water, making the village environment less comfortable (Aliyyah, Fauziah, and Asiyah 2018). The lack of simple education regarding the sorting of organic and non-organic waste at the household level is one of the root causes. Therefore, this Independent Community Service Program (KKN) activity adopts an environmental theme titled "Waste Management and Environmental Care Awareness" (Apriyani, Putri, and Wibowo 2020).

Based on this background, three main problems are formulated:

1. What is the strategy for implementing education and providing effective waste sorting facilities to change the behavior of the Medan Krio Village community?
2. What is the role of KKN students in fostering collective awareness and active community participation, especially among the younger generation, related to the 3R concept?
3. What are the constraints and potentials faced in the efforts to manage waste and increase environmental awareness in Medan Krio Village?

The objectives of implementing this Independent KKN are to create Sorted Trash Bins (TST) facilities that are easily accessible and used by the community as a means to start sorting organic and non-organic waste. To improve the understanding, attitude, and practical skills of elementary school students regarding the 3R concept through creative recycling activities. To encourage the formation of initiatives and active participation of the Medan Krio Village community in maintaining environmental cleanliness and sustainability. The main

goal of this program is to provide real intervention and practical education to foster awareness and active community participation in managing waste.

Modern waste management does not only focus on final disposal but includes a series of integrated activities, starting from reduction at the source, sorting, collection, transportation, to final processing. Law Number 18 of 2008 concerning Waste Management mandates the 3R principle (*Reduce, Reuse, Recycle*) as the main priority in efforts to reduce waste generation (18 2008). The implementation of 3R requires active community participation and the availability of supporting facilities, such as sorted trash bins (Damanhuri and Padmi 2016).

Kuliah Kerja Nyata (KKN), or Community Service Program, is a tangible manifestation of the Tri Dharma of Higher Education, namely service to the community. KKN functions as a social laboratory where students apply the knowledge gained to solve real problems in society. In the environmental context, KKN programs often focus on education, socialization, and the facilitation of simple infrastructure that can trigger behavioral change and community-based empowerment (Aliyyah, Fauziah, and Asiyah 2018). The success of KKN is measured by its sustainable impact after the program ends (Hutabarat et al. 2022), not only during the activity period.

Environmental Awareness is defined as a person's knowledge, attitude, and sensitivity towards the environment and the problems within it. (Marliani 2014) mentions that a good level of knowledge will encourage positive attitudes, which will ultimately be reflected in responsible waste management behavior (Mulasari 2012). Socialization targeting children is important because they are future agents of behavioral change (Susantiningrum et al. 2021).

Method

This Independent KKN activity was carried out in Medan Krio Village using three main methods:

1. **Initial Survey and Observation:** Conducted to map problems (Agustini and Widarti 2025), determine strategic locations for the placement of Sorted Trash Bins (TST), and identify key partners (such as Al-Asyariyah Foundation).
2. **Structured Interviews:** Conducted with the Village Head/Village Officials and several community leaders to collect data on waste policy and participation levels.
3. **Action and Physical Implementation:** Realization of the main programs (creation of TST) and supporting programs (community service/mutual cooperation).
4. **Education and Socialization:** Lecture methods, discussion, and direct practice (*learning by doing*) (Hutabarat, Harahap, and Siregar 2022) were applied in the 3R socialization to elementary school students.

Results and Discussion

The implementation of the Independent KKN in Medan Krio Village involved two main programs and several supporting activities.

Creation of Organic and Non-Organic Trash Bins

This activity was carried out as a direct response to the need for basic waste sorting facilities. The trash bins were produced and placed in strategic locations around the village. The sorted trash bins created are a crucial initial step to accustomed the community to separating waste types from the source. This sorting is the key to the 3R concept and enables effective waste utilization.



Figure 1: Making Organic and Non-Organic Waste Bins

The provision of TST in public areas is a clear visual sign for the community to start the habit of sorting. This is in line with the theory of Integrated Waste Management which emphasizes sorting at the source (Pratama and Ihsan 2017). Although this program is micro-scale, the strategic placement of TST serves as a visual reminder and behavioral trigger. The weakness that emerged is the challenge of maintaining the consistency of sorting by all segments of society after the KKN ends.



Figure 2: Painting Organic and Non-Organic Trash Bins=

Socialization on the Utilization of Used Goods (3R Concept)

Socialization activities were carried out at the Al-Asyariyah Medan Krio Foundation for 6th-grade students. The material presented focused on the 3R concept (*Reuse, Reduce, Recycle*) with practical demonstrations (Tampubolon et al. 2025). The core activity was creating unique piggy banks by utilizing used plastic bottles. Practical recycling activities have three dimensions of benefit:



Figure 3: Socialization of Utilization of Used Goods

Environmental Education, where students learn that plastic waste has a use value (*reuse*). Character Education, which instills the values of creativity and saving habits. Skills Empowerment, where students directly apply the 3R concept (Nurazizah et al. 2021). The main target of this program is to change the mindset of children, who are more adaptive to new information (Hutabarat et al. 2023) compared to the adult age group. The success of the activity is measured by the high enthusiasm and the results of the piggy bank crafts made independently. The result was the creation of various unique piggy banks that attracted students' interest for routine use.

Supporting Programs

In addition to the main programs, supporting activities such as Community Service Cleaning the Al-Ikhlas Mosque were also carried out as a form of social care and maintaining the comfort of the place of worship. This program also included the Creation of Google Maps for MSMEs around Medan Krio as an initial step for digital transformation for MSME actors in the village (Sunarto and Setyo 2013).

Conclusion

The Independent KKN activity with the theme "Waste Management and Environmental Awareness Improvement" in Medan Krio Village has been

successfully implemented. The main goals of creating sorted trash bins and educating on waste utilization were achieved, providing tangible examples and facilities for the community. Although there were constraints such as limited funds and time, as well as low awareness from a small part of the community, these constraints were overcome by prioritizing simple programs that have a direct impact and providing real examples through environmental cleaning actions. The Independent Community Service Program activity in Medan Krio Village has successfully provided real contributions in the form of waste sorting facilities and environmental education, especially for the younger generation. Main programs such as the creation of Sorted Trash Bins and 3R socialization proved effective as a first step to trigger community awareness and participation in better waste management. The success of this program depends on the active collaboration between students, village officials, and community leaders. Nevertheless, a more structured and continuous effort is needed to ensure that sorting and recycling practices can become a collective culture.

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