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# Beach clean-up program for environmental awareness and sustainable development at Teluk Gadung Beach, Malaysia

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**Abstract**

Plastic waste pollution seriously threatens coastal ecosystems and undermines sustainable development efforts. This community service program was conducted through an international student mobility collaboration between Universitas Islam Negeri Salatiga (Indonesia) and Universiti Teknologi MARA (UiTM) Terengganu (Malaysia), featuring a beach cleanup at Teluk Gadung Beach, Dungun, Terengganu, on June 12, 2026. The program employed a Participatory Action Research (PAR) approach, involving 130 participants from Indonesia, Malaysia, Thailand, and India alongside the local community group "Geng Plastik Ija" (GPI). The activity comprised pre-implementation, implementation, and post-implementation phases, covering site identification, environmental education, waste collection, sorting, weighing, and evaluation. The activity collected 203.01 kilograms of waste. Beyond ecological outcomes, the activity provided hands-on environmental learning experiences and fostered cross-cultural interaction among participants. Participant reflections revealed heightened awareness of small plastic fragments, often invisible to the naked eye, on beaches that otherwise appeared clean. This program demonstrates that community-based environmental action and transnational collaboration can contribute to SDGs 12, 13, and 14.

Keywords: Beach Clean Up, Sustainable Development Goals, Environmental Awareness, International Collaboration, Coastal Conservation.

**Abstrak**

Plastic waste pollution poses a serious threat to coastal ecosystems and challenges sustainable development efforts. This community service program was conducted through an international student mobility collaboration between Universitas Islam Negeri Salatiga (Indonesia) and Universiti Teknologi MARA (UiTM) Terengganu (Malaysia), featuring a beach clean up at Teluk Gadung Beach, Dungun, Terengganu, on June 12, 2026. The program employed a Participatory Action Research (PAR) approach, involving 130 participants from Indonesia, Malaysia, Thailand, and India alongside the local community group "Geng Plastik Ija" (GPI). The activity comprised pre-implementation, implementation, and post-implementation phases, covering site identification, environmental education, waste collection, sorting, weighing, and evaluation. A total of 203.01 kilograms of waste was collected. Beyond ecological outcomes, the activity provided hands-on environmental learning experiences and fostered cross-cultural interaction among participants. Participant reflections revealed a heightened awareness regarding the presence of small plastic fragments often invisible to the naked eye on beaches that otherwise appeared clean. This program demonstrates that community-based environmental action and transnational collaboration can contribute to SDGs 12, 13, and 14.

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## 1. Introduction

Community Service (PkM) plays a strategic role within the Tri Dharma Perguruan Tinggi (Three Pillars of Higher Education) in fostering tangible social transformation. PkM activities serve as a vehicle for applying knowledge, experiential learning, cultural exchange, and strengthening awareness of environmental issues (Mulyawan et al., 2025). In the context of international programs, Student Mobility offers students opportunities for cross border collaboration while engaging in social activities within the community. Through such a program, students from the Faculty of Islamic Economics and Business (FEBI) at the State Islamic University (UIN) Salatiga had the opportunity to collaborate with Universiti Teknologi MARA (UiTM) Terengganu, Malaysia, gaining firsthand academic and social experience.

One of the PkM activities carried out was a beach clean-up in the coastal area of Teluk Gadung Beach, Dungun, Terengganu, Malaysia. Coastal areas possess both ecological value and tourism potential, yet their integrity can be compromised by the accumulation of marine debris (Wijaya et al., 2026). Non biodegradable materials such as plastics, bottles, cans, and rubber can degrade environmental quality and threaten coastal ecosystems (Johan et al., 2020). Marine debris has been documented on public beaches in Malaysia, originating from both land-based and ocean-based sources (Mobilik et al., 2016). Consequently, beach clean-up initiatives and environmental education serve as relevant forms of direct, community-participatory intervention. Beach clean-up programs elsewhere have also demonstrated that combining cleanup actions with education can effectively foster awareness regarding coastal cleanliness (Nabila & Guritno, 2025; (Maruwemay et al., 2025). A similar beach clean-up in East Lombok, Indonesia, which involved students, local community members, fishermen, and tourists, was reported to raise awareness of coastal cleanliness among participants (Mulyani et al., 2023).

Marine debris is also a global issue addressed within the UN Sustainable Development Goals (SDGs), particularly Goal 14 (Life Below Water) which focuses on protecting marine and coastal ecosystems as well as Goal 13 (Climate Action) and Goal 12 (Responsible Consumption and Production), which promote sustainable resource and waste management (Wong et al., 2025). Mismanaged marine debris can degrade coastal environmental quality, disrupt marine habitats, and diminish the appeal of tourism areas. Therefore, addressing coastal waste requires a combination of direct action and the fostering of shared awareness and responsibility (Priatna et al., 2024).

One tangible way to support the achievement of the SDGs is through beach clean-up programs that incorporate education on coastal cleanliness and environmental sustainability (Ichwanto et al., 2026). Beach cleaning has also been found to increase participants' subjective marine awareness and to be rated as a meaningful activity (Wyles et al., 2017). Such activities aim not only to directly reduce waste but also to serve as a learning opportunity for participants and the community. Experience from a previous beach clean-up in Terengganu demonstrates that hands-on education can be

effectively integrated with waste sorting activities and the involvement of the local community group, Geng Plastik Ija (GPI) (Nabila & Guritno, 2025).

Geng Plastik Ija (GPI) served as the local partner for this initiative due to its experience in coastal cleanup activities and environmental education. In a previous event in Terengganu, GPI was reported to be actively collecting waste in coastal areas and expanding its activities across various parts of the region (Nabila & Guritno, 2025). The involvement of the local community was crucial for connecting international participants with local environmental conditions and management practices.

This event was organized by Universiti Teknologi MARA (UiTM) Terengganu, Malaysia, at Teluk Gadung Beach on June 12, 2026, as part of the 2026 Student Mobility Program. It involved 130 participants from Malaysia, Indonesia, Thailand, and India, in collaboration with Geng Plastik Ija (GPI). Unlike a previous beach clean-up that involved 95 participants from three countries, this event saw a larger number of participants and expanded international collaboration to include four countries (Nabila & Guritno, 2025). These factors transformed the event into more than just a beach clean-up; it became a platform for environmental learning and cross-cultural interaction (Lestariningsih et al., 2024). Short-term international mobility programs can also support sustainability-oriented learning among students (Simek & Adhisti, 2026). The event supports the achievement of the Sustainable Development Goals (SDGs) by raising environmental awareness and fostering efforts to conserve coastal ecosystems. Educational activities focused on the importance of maintaining beach cleanliness, understanding the environmental impact of waste, and building a sense of shared responsibility (Unesco, 2017).

Against this backdrop, the event aimed to: (1) reduce waste accumulation at Teluk Gadung Beach through cleanup and waste sorting actions; (2) provide participants with environmental education experiences; and (3) strengthen cross-border collaboration through the engagement of students and the local community in a community service initiative. Based on this content, this community service activity addressed the following questions: (1) How did the beach clean-up activity contribute to reducing coastal waste at Teluk Gadung Beach, Dungun Terengganu, Malaysia? and (2) What environmental and cross-cultural learning experiences emerged from the beach clean-up activity among the participating students and community members?

## 2. Method

The method employed in this Community Service (PkM) activity is the Participatory Action Research (PAR) approach. This approach was selected because it emphasizes the active involvement of participants, the local community, and the service team throughout the processes of situational identification, action implementation, and activity evaluation (Winarno et al., 2025). PAR has likewise been applied in coastal plastic waste programs to involve the community at every stage of the activity (Waldan & Suhrawardi, 2025). The activity took place at Teluk Gadung Beach, Dungun, Terengganu, Malaysia, on June 12, 2026. During implementation, participants and the Geng Plastik Ija (GPI) community engaged in site inspections, the selection of cleanup

locations, the execution of cleanup actions, waste sorting and weighing, and the evaluation of activity outcomes.

Through PAR, local residents, students, and the Geng Plastik Ija (GPI) community were positioned not merely as beneficiaries but as partners involved in executing the action and reflecting on the activity. This participatory model aligns with previous beach clean-up practices involving GPI, students, and lecturers in cleanup efforts, education, waste sorting, and evaluation (Nabila & Guritno, 2025).

The activity was conducted in three main stages: pre-implementation, implementation, and post-implementation. Key performance indicators included the execution of all stages according to plan, participant involvement at cleanup sites, the collection, weighing, and sorting of waste, and the conduct of activity evaluation and reflection.

1. Pre-implementation phase: opening and coordination with the Geng Plastik Ija (GPI) community; site inspection to identify areas requiring attention; preparation of cleaning equipment such as trash bags, protective gloves, and grabbers; and division of the beach area into specific cleanup zones.
2. Implementation Phase: distribution of equipment to participants, followed by education and outreach regarding the importance of maintaining coastal cleanliness; participants then combed designated areas to collect trash and bring it to a centralized collection point. The educational material emphasized the importance of beach cleanliness, the environmental impact of waste, and the shared responsibility of preserving coastal areas. This direct educational approach was also employed during a previous beach clean-up activity conducted in collaboration with Geng Plastik Ija (GPI) (Nabila & Guritno, 2025).
3. Post-Implementation Phase: Following the event, every bit of collected refuse underwent weighing and documentation, aligning with the classifications established during the initiative. Subsequently, a comprehensive review of the operation's performance was undertaken. This assessment scrutinized the progress through the distinct phases of the project, the level of engagement from those involved, the outcomes of the waste gathering, and the personal insights shared by participants regarding their involvement.

   To gather these personal insights, brief, loosely structured discussions were held virtually via WhatsApp once the participants had made their way back to Indonesia. These discussions centered on the participants involvement in the shoreline cleanup effort, the heightened environmental consciousness developed from the undertaking, and the exchanges experienced across different cultures. The gathered feedback was then analyzed in a descriptive manner to pinpoint consistent themes and reflections pertaining to ecological consciousness and intercultural education. The concluding segment of this phase was marked by a communal meal and a group photograph featuring everyone who participated.

Table 1. Summary of Beach Clean-Up Activity Implementation Stages

| Pre-implementation | Implementation | Post-Implementation |
|---|---|---|
| 1. Opening and coordination with the Geng Plastik Ija (GPI) community<br>2. Site survey to designate distribution points<br>3. Equipment preparation and distribution | 1. Education and outreach by representatives of the Geng Plastik Ija (GPI) community<br>2. Implementation of a beach clean-up activity | 1. Weighing and sorting waste<br>2. Activity evaluation<br>3. Shared meal<br>4. Group photo |

## 3. Result and Discussion

The beach clean-up activity took place from 07:00 to 09:30 MYT and involved 130 participants, consisting of 62 students from Indonesia, India, Thailand, and Malaysia and 68 members of the local community group Geng Plastik Ija (GPI)cross. The event began with an opening session led by GPI and a site survey to assess conditions around Teluk Gadung Beach. Subsequently, GPI representatives provided an overview of the activity's objectives, the importance of coastal cleanliness, and the operational procedures.



Figure 1. Equipment distribution and briefing session

The cleanup was carried out by dividing participants into groups and assigning them to designated locations. Each group was provided with one or two trash bags and grabbers, while individual participants received gloves to minimize direct contact with the waste. This distribution strategy ensured comprehensive coverage of the cleanup area. The approach to site allocation and equipment distribution aligned with practices from previous beach clean-up activities conducted in collaboration with Geng Plastik Ija (GPI) (Nabila & Guritno, 2025).

The waste found in the coastal area consisted of various types including plastic, organic matter, and other materials such as cans, glass bottles, and rubber as observed during the activity. Participants combed through various parts of the beach and gathered the waste at a centralized collection point. Through the collaborative efforts of the participants and with guidance from GPI, all the collected waste was weighed and recorded as the activity's outcome. At Labuan Petung Beach in Indonesia,

the collected waste was reported to be dominated by single-use plastics such as plastic bags, beverage bottles, and styrofoam (Marzuki et al., 2026).



Figure 2. Participants collecting waste along Teluk Gadung Beach

The results indicate that dividing participants into groups and stationing them at various locations helped ensure a more even coverage of the cleanup area. Field observations revealed a variety of coastal waste types that required sorting prior to further management. The active involvement of the community and university students was a crucial element in the execution of this participatory cleanup initiative. These findings align with a previous beach clean-up in Terengganu, which also engaged GPI, students, and university representatives as joint implementers (Nabila & Guritno, 2025).



Figure 3. Sorted and weighed waste collected during the beach clean-up activity at Teluk Gadung Beach.

A clean beach area has the potential to enhance tourism appeal and visitor comfort (Fathurrahmah et al., 2025). Existing literature on coastal community engagement suggests that beach cleanliness and environmental education are linked to maintaining tourism appeal and supporting the local economy (Nabila & Guritno, 2025; Suri et al., 2025) In this activity, the directly observable benefits included a reduction in waste within the cleaned areas and an improved understanding of coastal waste issues

among participants. However, changes in tourist numbers or economic revenue were not directly measured during this activity.

The consequences of the undertaking are evident not just in the quantity of refuse gathered but also in the educational takeaways for the global attendees. Following the event, interviews conducted via WhatsApp once the attendees had journeyed back to Indonesia revealed that Nidhish, an Indian student, was taken aback by the presence of minute plastic shards embedded in the sand, despite the shoreline initially seeming pristine. This encounter expanded his comprehension of waste forms that are frequently overlooked and inspired contemplation on personal accountability for preserving shared environments. Involving volunteers in beach sampling has been shown to make otherwise unseen microplastic pollution visible and to raise public awareness (Dimante-Deimantovica et al., 2023). Furthermore, he emphasized the swift camaraderie that emerged among individuals from varied countries during the occasion.

Insights from the volunteer "buddies" who assisted the participants further underscored the advantages of inter-cultural education. Mimi, a buddy from UiTM who guided the Indonesian participants, noted that the attendees received commendation from residents and the wider community for their genial disposition and collaborative approach. The exchanges conducted in English also presented a chance to hone communication and cooperative abilities. These observations suggest that the Beach Clean-Up initiative furnished environmental education alongside avenues for multicultural engagement.

Based on participant feedback, future programs could be enhanced by including sessions to share experiences regarding waste management in their respective countries and by providing clearer explanations of the waste disposal process following the event. From a program management perspective, the schedule could be better balanced to ensure proportional time allocation for preparation, environmental action, reflection, and other Student Mobility activities. Furthermore, continued communication with GPI could be developed to support the sustainability of environmental education and coastal cleanup initiatives.

Overall, the Beach Clean-Up activity yielded ecological results through the collection of waste from the coastal area, as well as educational outcomes by providing hands-on experience in identifying, collecting, sorting, and weighing the waste (Sugianto et al., 2026). Participant reflections also revealed a learning process regarding small-sized plastic waste and the importance of shared responsibility. Beach clean-up activities involving volunteers are also regarded as a way to remove debris while raising public awareness of plastic pollution (Mayoma et al., 2019). Furthermore, the event served as a platform for cross-cultural collaboration among participants from four countries.




Figure 4. Participants from UIN Salatiga, Indonesia, with members of the Geng Plastik Ija (GPI) community

Following the activity, the collected waste was sorted into three recording categories: inorganic (plastic), organic, and other. All waste was then weighed to determine the activity's total output. These categories corresponded to the field recording methods used during the event.

Table 1. Composition of Collected Waste

| No | Types of Waste | Weight (kg) |
|---|---|---|
| 1. | Inorganic Waste (Plastic) | 10.10 kg |
| 2. | Organic Waste | 85.06 kg |
| 3. | Other | 107.85 kg |
| | Total | 203.01 kg |

The remaining 107.85 kg is classified as "Other," consisting of non-plastic and non-organic materials found during cleanup activities including cans, glass bottles, rubber, textiles, cigarette butts, medical waste, batteries, and various other mixed materials.

## 4. Conclusion

The Beach Clean-Up program at Teluk Gadung Beach, Dungun, Terengganu, was successfully executed as a cross-border community service initiative supporting the Sustainable Development Goals (SDGs) specifically Goals 12, 13, and 14. Utilizing a Participatory Action Research approach and involving 130 participants from Indonesia, Malaysia, Thailand, and India alongside the Geng Plastik Ija (GPI) community, the activity successfully collected 203.01 kilograms of waste. Beyond this ecological achievement, the event provided hands-on environmental learning experiences and fostered opportunities for cross-cultural collaboration. Participant reflections revealed a heightened awareness regarding the prevalence of small plastic fragments and the importance of maintaining coastal cleanliness.

This activity demonstrates that beach clean-up initiatives can evolve into platforms for environmental education and international collaboration when accompanied by education, local community participation, waste sorting, weighing, and reflection. To ensure sustainability, future activities should incorporate sessions on sharing cross

border waste management practices, explanations of post event waste processing, and continued communication with Geng Plastik Ija (GPI). Furthermore, if similar programs are conducted in the future, more quantifiable evaluations such as pre and post test instruments or participant perception surveys should be implemented.

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