

PROMOTING EDUTOURISM AND SUSTAINABLE WASTE MANAGEMENT IN SANTEN ISLAND BEACH, INDONESIA, THROUGH COMMUNITY EMPOWERMENT

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ABSTRACT

Santen Island Beach in the Banyuwangi Regency of Indonesia possesses immense potential for beach tourism. Unfortunately, the charm of this destination has been marred by inadequate waste management. This paper outlines a community service program aimed at enhancing awareness, understanding, and active participation of local community groups in addressing waste management issues by transforming waste into ecobrick greenhouses. The program employed various methods, including lectures, discussions, and brainstorming sessions, which were conducted on Pulau Santen Beach with a focus on the local population. The application of a local development model was central to our community service activities, resulting in increased understanding, awareness, and participation among the target groups. The heightened involvement was marked by enthusiastic participation in ecobrick production, effective household waste sorting (particularly plastic waste), and the formation of committed cadres. The local community exhibited increased knowledge through their ability to respond to questions and plan follow-up actions. This initiative significantly improved the knowledge, awareness, and engagement of the target community in managing waste and converting it into ecobricks.

Keywords: healthcare, beaches, ecobricks, santen island beach

INTRODUCTION

Indonesia, an archipelagic nation with abundant marine resources, boasts a vast coastline and coral reef area. The marine and coastal tourism sector plays a pivotal role in the nation's economic activities, supporting livelihoods and tourism. However, this rapid tourism development has led to an increase in marine debris, resulting from human activities and other factors, which poses a significant environmental challenge. Waste management in coastal areas has become a critical issue, especially in regions like Banyuwangi, where the rapid growth of the tourism industry has led to an upsurge in waste generation. Ineffective waste management adversely affects the environment, public health, and local economies. This paper emphasizes the need to address waste-related challenges in the coastal area, specifically Pulau Santen Beach.

Apart from the many positive impacts obtained, one of the negative impacts that need to be considered is the waste problem. According to the National Oceanic and Atmospheric Administration (NOAA), marine debris is solid material produced either intentionally or unintentionally, wasted or left behind in the marine environment (Pamungkas *et al.*, 2021). The rubbish in several parts of the Indonesian sea is produced by human activities which are influenced by several factors, including rubbish carried by river flows and ending up in the sea, apart from that, rubbish is also carried directly by humans into the sea. The large amount of rubbish in the sea can pollute the ecosystem and marine biota. Besides, seawater pollution due to rubbish can also have an impact on humans; if seawater is polluted, marine biota will also be infected with disease and can transmit disease to humans (Ningsih, 2018).

In 2018, the World Bank reported that the projection of waste in the ocean reached 150 million tons. Of the total 192 coastal countries, several countries such as China, Indonesia, the Philippines, Vietnam and Thailand have the fastest waste production rates compared to other countries. The waste produced by this country exceeds half of the total plastic waste in the sea. A study conducted by Jambeck in 2015 mentioned that Indonesia is a country that is ranked second in the world as the largest producer of plastic

waste in the world's oceans, reaching 187.2 million tons. Plastic waste produces a volume of 25,000 tons every day, of which 20% ends up in Indonesian rivers and seas. Waste that pollutes the sea can come from various types of waste, such as plastic waste, organic waste, wood waste, metal waste and other waste (Ningsih, 2018). East Java ranks second in the province with the most waste generation in 2021, which is around 1.28 million tons. Meanwhile, Banyuwangi is the district ranked first in the district with the largest waste generation in East Java with a total generation of 457 thousand tons per year (SIPSN, 2021).

Pulau Santen Beach, a favored tourist destination in Banyuwangi, has witnessed a surge in tourist numbers, leading to a proportional increase in waste. The predominant type of waste in the area is plastic, while the shoreline is littered with palm leaves and logs carried by the sea. Inadequate waste management diminishes the tourist experience, thus affecting visitor numbers and impacting the livelihoods of the local coastal communities.

The large volume of waste in the environment has adverse effects on public health, contributing to diseases such as diarrhea and rodent-borne illnesses. Additionally, improper waste disposal harms marine ecosystems, affecting biodiversity and the overall stability of marine ecosystems. The impact of waste on human health, the environment, and the economy underscores the importance of effective waste management. In 2018, a World Bank report estimated that 150 million tons of waste had entered the world's oceans. Countries like China, Indonesia, the Philippines, Vietnam, and Thailand were identified as significant contributors to marine waste pollution. Indonesia, in particular, ranked second globally as the largest producer of plastic waste in the oceans, generating 187.2 million tons, with 20% of it ending up in rivers and seas. East Java, where Banyuwangi is located, ranked as one of the provinces with the highest waste generation.

While waste poses challenges, it also offers opportunities for community development and economic empowerment. Proper waste management can reduce the economic burden associated with waste and contribute to a cleaner and healthier

environment. One of the approaches to tackling this issue is the development of a waste bank system, which has shown positive results in various communities. In response to the waste issues on Pulau Santen Beach, this community service initiative builds on previous programs, with a focus on the "zero waste movement through beach health, ecobrick greenhouse construction, and marine ecosystem conservation." The current program aims to initiate educational tourism on Pulau Santen Beach through community empowerment in waste management, with a view toward supporting the Sustainable Development Goals (SDGs) for 2030.

From the problems that occur on Pulau Santen Beach regarding the large amount of rubbish, alternative solutions can be presented that have been realized in previous community service with the title zero waste movement through beach health, building ecobrick greenhouses and preserving marine ecosystems. So that it doesn't stop there, it will continue with further community service activities with the title Pulau Santen beach educational tourism initiation through empowering community groups in the aspect of waste management to support the achievement of SDGs 2030. Therefore, it is hoped that enhancing awareness, understanding, and active participation of local community groups in addressing waste management issues by transforming waste into ecobrick greenhouses with assistance related to the development/revitalization of local community MSMEs. This paper reports on a community service program aimed at enhancing awareness, understanding, and active participation of local community groups in addressing waste management issues by transforming waste into ecobrick greenhouses.

STAGES OF IMPLEMENTATION OF THE COMMUNITY SERVICE PROGRAM

This community service program is a continuation program of community service in 2022 with the title "Zero Waste Movement through Beach Health, Ecobrick Greenhouse Construction, and Marine Ecosystem Conservation in Efforts to Realize SDGs 2030;" this follow-up program is designed with the hope that the community can support the strategy in processing waste so that people can

process waste on an independent basis and empowering people in managing waste into various recycling creations that have use value and economic value. Each ecobrick has an economic value of IDR 1000. The priority targets are people in the Banyuwangi Pulau Santen Beach area. This activity also supports the sustainable program (SDGs), one of the objectives of which is to protect and preserve oceans, seas and marine resources in a sustainable manner. In overcoming problems that occur in partner communities as previously described, the Community Service Program offers several approach methods that can help in resolving existing problems, namely by providing assistance related to the development/revitalization of MSMEs in local communities. The methods used in implementing this program are lectures, discussions and brainstorming through FGD. The community service program is organized into three stages: Preparation, Implementation, and Follow-up.

Preparation Stage

Land Use Permits: Permits for land use, need to be obtained, recognizing that Pulau Santen Beach is state-owned land managed by the Indonesian Army. The stages of arranging land use permits need to be carried out considering that the coast of Pulau Santen is state-owned land whose management is carried out by the Indonesian Army. The permits we carried out began by coordinating first with Den Zibang Banyuwangi, which was then followed by correspondence and coordination with Kodam V/Brawijaya, to obtain approval from Pangdam V/Brawijaya.



Figure 1. Coordination of Den Zibang Banyuwangi
Note: Photo taken with permission.



Figure 2. Approval of permits for Pangdam V/Brawijaya

Note: Photo taken with permission.

Environmental Survey: Surveying the condition of Pulau Santen Beach and its surroundings to identify waste-related challenges. Observe problems/ constraints that target partners have. The problem/obstacle observation stage is carried out to identify things that are still obstacles for the community to act. Considering that the approach taken in this activity is an empowerment activity for the community, the long-term output of which is that the local community can be empowered, it is necessary to strengthen community groups. One of the ways is by overcoming existing obstacles or problems. It is hoped that this will increase community participation in the program, which will make the target community more independent and empowered.

Weekly Approach Schedule: a schedule for weekly interactions with the local community was established. After identifying several things that hinder community participation, the team then analyzed these problems and developed several alternative solutions that could be applied to the target community. One of the solutions implemented includes intense mentoring every week for community groups. This assistance is aimed at taking persuasive action in the target community, increasing community participation, convincing the community that their participation is significant and needed, and teaching cadres how to manage waste properly starting from sorting, making ecobrick, collecting ecobrick, and exchanging ecobrick into rupiah.

Focus Group Discussion (FGD): Scheduling FGD sessions with the Pulau Santen community was conducted with the aim to dig deeper into what the community wants and expects from the formation of this edutourism. Apart from that we also tried to increase their understanding of the importance of the role and commitment of the target community in this activity. Based on the final results of the FGD, currently an educational tourism cadre for waste management and turtle conservation has been formed on Santen Island and this was formalized through a declaration and signing of a joint commitment.

Resource Person Selection: Identifying the appropriate resource persons to provide material for community service.

Planning: Developing a comprehensive plan for the implementation of the community service program.

Implementation Stage

This community service program will be implemented from January to December 2023, starting with the preparation stage, implementing interventions, monitoring evaluation, and producing output. This community service was attended by 40 target participants, consisting of tourism managers, MSMEs, fishermen, and youth organizations.

The Process of Implementing Community Service Programs, including: During the first month, materials for making Greenhouse Ecobrick in the form of empty bottles in each stall or partner MSME will be prepared so that they can be filled with waste by both partners and visitors.

Intensive Mentoring: Regular mentoring sessions are conducted to enhance community engagement, knowledge, and awareness, emphasizing practical aspects of waste management.

Ecobrick Production: Local community members actively participate in the creation of ecobricks using collected waste materials. The appropriate model for empowering community groups in waste management is the local development model. The application of this model is by making visits twice a week. This assistance is carried out to increase community capacity through increasing awareness and community participation in this activity. Participation is measured through the presence

of community groups and activeness in participating in activities. This enthusiasm indicates that the people who take part in empowerment activities are interested in beach health. The types of activities carried out during the mentoring include direct visits to residents' homes when they create ecobrick together as a form of assistance. Apart from that there is also a gathering through regular recitations once a week at one of the residents' homes as a forum for discussion and assistance regarding the achievements during one week in collecting ecobrick. This mentoring activity is to check the ecobrick materials that have been collected. Through routine recitations every Wednesday for women's community groups and every Friday for men's community groups, the collection of ecobrick can be monitored. This material can then be cashed in at a nominal value of IDR 1,000.00 per kilogram. The exchange of bottles that had become ecobrick was coordinated by one of the community members; there was the lady from RT Pulau Santen Beach as a collector of ecobrick that had been made by the community.



Figure 3. Visit to check Ecobrick materials
Note: Photo taken with permission.

Collaboration with Waste Management Groups: Collaboration with local waste management groups to facilitate the collection and proper disposal of waste. For two months assisting in making Greenhouse Ecobrick materials **Design and Budget Planning:** Planning for the construction of an ecobrick greenhouse, including designing, material preparation, budgeting, and resource allocation. **Focus Group Discussion (FGD):** Involving community members and partners to

gain insights and feedback for program improvement.

Before the implementation of FGD, there are some materials given in this activity including: Managing plastic waste into ecobrick that can be created with various items such as buckets, seats, and others. This material was provided by BSB (Banyuwangi Waste Bank).



Figure 4. Community Education
Note: Photo taken with permission.

The second community service material is about handling waste by making paving from waste and plastic waste. This material was delivered by K3 (Karangrejo Social Welfare Group) Banyuwangi.



Figure 5. Community Education
Note: Photo taken with permission.

Implementation of FGD sessions was facilitated by a moderator from SIKIA Public Health Airlangga University students which was attended by 20 target groups of mothers and partners. The 20 female respondents were

representatives of community groups formed into cadres. One of the reasons that the cadres were deliberately formed was so that they could become role models for the surrounding community. Apart from that, the cadres formed are a group of mothers who actively participate in community activities. In the future, the 20 cadres of women who have been formed are expected to be able to apply the knowledge and skills that have been given to socialize, motivate and provide skills to other communities to actively participate in waste management.



Figure 6. Implementation of FGD

Note: Photo taken with permission.

FGD asked questions to the target group and were agreed upon by all and justified by the partners. The result of this FGD is a mutual agreement. Declaration of Commitment: The formation of a cadre group committed to waste management and turtle conservation on Pulau Santen, formalized through a declaration and signing of a joint commitment.



Figure 7. Signing of cadre commitments

Note: Photo taken with permission.

Follow-up Stage:

Evaluation of the community service program, encompassing input, process, and output.

RESULT OF THE IMPLEMENTATION OF THE COMMUNITY SERVICE PROGRAM

The community service program was successful in enhancing awareness, knowledge, and participation in waste management and ecobrick production among the local community. It has contributed to the development of Pulau Santen Beach as an edutourism destination, fostering a cleaner and healthier environment while creating economic opportunities through the marketing of edutourism products. The first stage in this community service program is the preparation stage. This preparation stage consists of three steps, namely environmental survey, determining the approach schedule, and planning the community service program. Waste management is an activity that regulates waste from generation to disposal, including collection, transportation, maintenance, and processing, as well as supervision and regulation of waste management (Marifah & Fitriana, 2020). This community service program focuses on beach-healthy activities by empowering the community to care for and take part in waste management. This activity is in line with the community service program by Subiantoro *et al.* (2022) where it is hoped that the community service activities mean respondents can at least change the behavior of the people of Labu Beach gradually so that they are more aware of the 3Rs and start becoming customers or even establish a Waste Bank. Waste management into ecobrick, which has been implemented in some coastal areas in Indonesia, is one of the efforts to improve beach health. The program implemented (Fauzi *et al.*, 2020) aims to help people use waste to produce useful goods.

This community service program is a form of advanced program. The application of science and technology to create innovation cannot be separated from the natural environment of society, so when implementing innovation, you must always pay attention to the development environment, not just economic aspects (Qadri *et al.*, 2020). It is important to pay attention to environmental

aspects to maintain the sustainability of society, namely maintaining the continuity of life for future generations (Padil & Antin, 2018). The implementation of the community service program shows that there is attention to health in the Pulau Santen Beach area. This program is in line with the program (Kuswara *et al.*, 2022) which states that in its activities several efforts can be made to change this situation, including providing knowledge to the community about how to make houses and settlements on the coast healthy, despite the condition of the houses. This is simple, if cleanliness and a healthy lifestyle are guaranteed. One of how community service is carried out is through activities in the field of education (Aliyyah *et al.*, 2021). The way forward is to seek support from the government coupled with periodic ongoing awareness-raising activities so that the level of awareness about healthy living increases and knowledge about healthy homes increases (Mardiah, 2021).

The first step of doing this community service, is to conduct a survey on the beach condition, mapping out the distribution of trash, many of which that were found near mangrove trees are plastics, while those found on a seaside consist of leaves and logs carried by the current. Improper waste management will bring many disadvantages such as causing a foul smell, disturbing the beauty of a place, causing a flood, increasing climate temperature, worsened sanitation, and bringing forth threats of various diseases. This will also cause discomfort to tourists who come to the site. The discomfort felt by the tourists obviously influences the probability of them coming back to visit. The second step is to create a schedule to meet and converse with locals every week; this is done to discuss plan of actions and to observe the implementation of collecting ecobrick materials. The third step is to plan the community service program; this includes scheduling FGD sessions with locals and partners. Mentoring activities are carried out intensely every week. Mentoring is done to both male and female Quran's study groups separately. Mentoring sessions are very effective in increasing awareness, knowledge, and locals' participation. All three are the base to build an empowered and independent society. To this day, mentoring is still being done and we plan to do it continuously till the

locals are empowered and independent. Waste management is an activity that regulates waste from its appearance to its disposal, consisting of collection, transportation, maintenance, processing, as well as supervision and waste management regulation (Marifah & Fitriana, 2020).

The second step of this community service is the implementation step. Our community service program did not only teach the locals how to make an ecobrick as it was already taught in 2022, so the 2023 community service program is a continuation of the projects we have implemented in 2022. Community service starts with preparation, intervention, monitoring, evaluation, and then output. Community services were joined by tourism manager, UMKM, fishermen, and karang taruna.

The empowerment model chosen is through a direct approach to the target community. This model is hoped to be able to motivate, better plan, and choose the right action accordingly so that the locals may reach the goal of empowerment. This community service model is according to what has been used by Widjajanti (2011) and which involves local empowerment through active participation and evaluation. The first step that was taken was to identify waste conditions and the site's potential with the locals, observing locations that have been able to manage their waste, such as Krajan Karangsari, that were chosen as waste management drivers. With the locals, we improve awareness. Waste management and organic fertilizer training were given to Karangsari people so that not only they became aware but were also able to manage waste on their own. Plastic tools are easy to find, even so they should be used for at least some time and not be easily thrown away unless they were broken (Septiani *et al.*, 2019). The right empowerment model for waste management is locality development model which consists of activities focused on the process, with the goal to give an interactive learning space for the locals that stresses on the importance of consensus, cooperation, and concern for one another. This model is hoped to be able to motivate, better plan, and choose the right action accordingly so that the locals may reach the goal of empowerment. Hence why, implementation of this model entails

carrying out a visit twice a week to monitor ecobrick results.



Figure 8. Collecting Ecobrick
Note: Photo taken with permission.

Other than that, we also conducted a Focus Group Discussion (on Saturday, August 12th, 2023, at Santen Island Beach pavilion, joined by locals and partners. Discussion started with materials taught by BSB and K3 that explained ecobrick usage as a seat, ecoblock, and many more. Other things explored during FGD were about waste management, and discussion was done in the presence of locals and our partners, Bank Sampah Banyuwangi (BSB) and Yayasan Eco Laku Lestari. FGDs were started by asking the audience of their hopes in participating in waste management activities and provision of edutourism in Pulau Santen Beach. Many positive Responses were given by the audience. Our partners, BSB and K3, also gave their opinion and validated their responses based on the knowledge they have. It can be concluded that ecobrick management and edutourism are hoped to raise awareness of Pulau Santen's locals, but also admitting the setbacks such as local's awareness, will, and time.

Last step of the FGD was to form an Ecobrick and Edutourism Committee in Pulau Santen, consisting of chairman, deputy chairman, and secretary. The committee will discuss the plan to go forward after the community service period is done. The result is that they will continue the making of ecobrick. There is also a sharing session from SIKIA Universitas Airlangga that hopes the committee will be able to continuously improve Pulau Santen's image and establish

edutourism that can't be found yet in Banyuwangi beach. There is also a suggestion to add more sections such as collection section, treatment section, and many more. A declaration and signing of commitment by cadre presents symbolically shows their will in doing community service.

Another important thing that we have done is prepare the design and raw material to build NyuBrick edutourism. Things that were prepared include edutourism buildings design, display pavilion, NyuBrick tower, NyuBrick portal, and guardrail made from used tires. In the future, this community service will add a greenhouse as a new icon of Pulau Santen Beach; it will be managed directly by the edutourism cadre. The greenhouse will be filled with educational materials about plastic waste and display of goods made from plastic waste.

The third step of this community service was evaluation. Evaluation was done to judge the implementation of the plans that were agreed upon, to see whether the program has worked and to estimate its result (Andriani & Afidah, 2020).

CONCLUSION

The community service program has achieved its primary objective of empowering the local community in Pulau Santen to manage waste effectively, resulting in tangible improvements in beach health and the potential for sustainable edutourism. The concept of ecobrick management and edutourism is expected to raise awareness among Pulau Santen's residents, contributing to a more attractive and informative tourist destination. The commitment of the local community to continue collecting ecobricks and their pledge to manage waste autonomously is a positive step forward.

SUGGESTION

It is recommended that the local community continues implementing the plans discussed during the community service program to sustain the positive momentum. Further innovations and support from organizations such as FIKKIA Universitas Airlangga should be considered to enhance the branding and promotion of Pulau Santen as an edutourism destination. Ongoing awareness campaigns and government support are vital to

maintaining a heightened level of awareness about healthy living and the significance of healthy homes in coastal areas. The development of new edutourism sections and activities could further improve Pulau Santen's image and appeal to a wider audience.

By fostering community empowerment and promoting sustainable waste management practices, Pulau Santen Beach can become a model for responsible tourism and environmental conservation in Indonesia.

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CONFLICT OF INTEREST

This community service program has no conflict of interest.

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AUTHOR CONTRIBUTION

Author Jayanti Dian Eka Sari and Yunika Tri Yulianti writers served as collectors of community service results, analyzing results and writing manuscripts. Author Januar Firmansyah, Faisal Fikri, Aditya Yudhana, Ratih Novita Praja, Ayik Mirayanti Mandagi, Farizah Mohd Hairi, as study design, supervised and reviewed the writing of the manuscript, and revised the manuscript.

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