

Education on the Importance of Maintaining the Cleanliness of the Riverbank Environment to Prevent Potential Flooding Due to Water Overflow

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Abstract

Environmental cleanliness is a basic thing that must be considered. Unfortunately, it is not easy to create a clean and comfortable environment. Many people still ignore this problem. This service aims to educate about the importance of maintaining the cleanliness of the riverbank environment to prevent potential flooding. This service method uses Participatory Rural Appraisal (PRA), with a service team by students of Mathematics Education, FKIP, University of Jember, together with the community of Tegal Gede Village, Jember, which was carried out in 2024. The results show that service through this social service has motivated the community to care more about the environment and minimize the occurrence of disasters. So, this social service activity has provided the community with enthusiasm and motivation to care more about the surrounding environment.

Keywords

Environmental Cleanliness, Community Awareness, River.



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INTRODUCTION

Rivers are one of the vital natural resources for human life. In addition to functioning as a drinking water source, rivers provide a habitat for various types of flora and fauna, support agricultural and industrial activities, and become a recreational place for the community (Anderson et al., 2019). However, in recent decades, river water quality in many areas has decreased drastically due to pollution. Industrial, household, and agricultural wastes indiscriminately dumped into rivers have caused damage to river ecosystems and threatened the health of humans and other living things. Also, now, there are frequent floods in several regions of Indonesia (Ibn-Mohammed et al., 2021).

The cleanliness of rivers depends on the efforts of the government and related

agencies and requires awareness and active participation from the community. Unfortunately, public awareness of the importance of maintaining river cleanliness is still relatively low in many places (Chauhan et al., 2021). The habit of throwing garbage into the river, the lack of understanding of the impact of pollution and floods, and the lack of concrete action to preserve the river are challenges that must be overcome (Aisyiyah & Hakim, 2020).

Increasing public awareness of the importance of river cleanliness is crucial in preserving the environment. Effective environmental education and campaigns can change people's behavior toward more environmentally responsible practices (Aminah et al., 2021). In addition, collaboration between the government, non-governmental organizations, and local communities can strengthen efforts to keep rivers clean (Waham et al., 2023). By increasing public awareness and involvement, it is hoped that rivers can return to cleanliness and sustainability so that there will be no more flood disasters and the benefits can be enjoyed by current and future generations (Nugraha et al., 2022).

Various research and community service activities related to environmental hygiene education have been carried out in various regions, especially those aimed at reducing the potential for flooding due to river pollution. One of the important findings from the service carried out by (Kintu et al., 2021) in Cihampelas Village, West Bandung Regency, revealed that with an integrated and collaborative socialization approach between local governments, students, and the community, the behavior of littering in the river can be significantly reduced. The program succeeded in increasing public understanding of the dangers of river pollution and its impact on floods and quality of life (Lis & Szyszka, 2020). However, the main challenge faced is the program's sustainability after the service period ends, where people tend to return to old habits if there is no ongoing control.

Another finding from community service activities in Purworejo Regency by (Prabowo et al., 2021) shows that education about community-based waste management if carried out continuously and involving all village elements, can increase collective awareness in maintaining the river's cleanliness. However, the main difference with this service program is the existence of infrastructure support, such as waste treatment sites provided by the government, which has yet to be fully implemented in Tegal Gede Village, Jember (Hasanah, 2021). The novelty of this service lies in using the Participatory Rural Appraisal (PRA) method, which involves the community directly in problem identification and solution planning. This approach has proven to be effective in increasing the community's sense of belonging

to the program, thereby encouraging active participation that is more sustainable than conventional approaches.

This service aims to educate about the importance of maintaining the cleanliness of the riverbank environment to prevent potential flooding. The expected impact of this social service activity through this social service can motivate the community to care more about the environment and minimize the occurrence of disasters.

METHODS

This service method uses Participatory Rural Appraisal (PRA) with a service team of FKIP Mathematics Education students of the University of Jember and the people of Tegal Gede Village, Jember, which will be held in April 2024. PRA is used as a method in this service, allowing the community to actively participate in identifying problems and solving solutions (Sandham et al., 2019). In carrying out community service activities, the service team carries out the following activity methods:

Preparation stage: 1) Take care of permits from the campus and RTs from the relevant villages. 2) Direct observation: group members directly come to the location to obtain data. We do this in the run-up to and during the activity. Observation is useful for discovering the conditions of existing problems and resources that can be used in activities. 3) Materials and Tools: Trash bags and tools for cleaning and picking up garbage. Implementation Stage: Carrying out environmental improvement activities, dividing the team into several tasks and activities to clean the riverbanks. Social service activities are divided into two sub-activities. The first is community service work to clean the riverbanks. The cleaning was carried out by group members, who were also assisted by residents, especially gentlemen whose residences are in the riverbank area. Second, the collected garbage is transported from the riverbank using nets, trident sticks, and hoes and put into trash bags. This community service is an activity carried out by students to fulfill the final project of the Environmental Education course through riverbank cleaning activities in the area of Jl Tawang Mangu Gang 3 Tegal Gede Village, Jember. The implementation of this activity is an activity of group members in collaboration with residents of Jl Tawang Mangu Gang 3, Tegal Gede Village. The implementation is carried out after obtaining approval and permission from the relevant parties.

FINDINGS AND DISCUSSION

The activity of providing socialization on the importance of maintaining the cleanliness of the riverbanks to the community on Jl Tawang Mangu Gang 3, Tegal

Gedhe Village, Jember is an activity to invite the community around the riverbanks always to maintain the cleanliness of the river to prevent water overflow. This activity was carried out to increase public awareness of the cleanliness and health of the surrounding environment. From the implementation of this activity, it is hoped that it can foster a sense of responsibility in the surrounding community for environmental cleanliness. This activity will be held on Sunday, April 28, 2024 from 07.00 WIB.

Socialization activities that took place at Jl Tawang Mangu Gang 3 Tegal Gedhe Jember Village were carried out with several activities, the first of which was to provide an explanation to the community around the riverbank about the importance of maintaining the cleanliness and health of the river environment by not throwing garbage in the river. The second activity gave a direct example of the community's diligence in cleaning the river by holding community service work with several community leaders.



Figure 1. Community Service Activities Carried out by Students and the Community



Figure 2. Installation of Appeal Banners to Maintain Cleanliness



Figure 3. Implementation of Socialization to the Community Around the Riverbank

There are several significant impacts on maintaining the cleanliness of riverbanks: 1) Environmental Impact; Improved Water Quality: River cleanup can remove sewage and pollutants, improve water quality and river ecosystems; better Habitat: Cleaning rivers creates a healthier environment for aquatic flora and fauna, Erosion Reduction: Removing garbage and non-native vegetation helps reduce river bank erosion and maintain the integrity of river structures, Ecosystem Restoration: Cleanup can help restore damaged ecosystems, improve water flow, and improve the quality of natural habitats. 2) Health Impact; Disease Reduction: Clean river water reduces the risk of diseases caused by polluted water, such as diarrhea, cholera, and skin diseases. Air Quality: Cleaning reduces bad odors and harmful gas emissions from decaying waste, improving the air quality around the river. 3) Long-Term Impact; Environmental Sustainability: River cleanup contributes to environmental sustainability efforts by ensuring water resources remain clean and available for future generations; Disaster Mitigation: Clean and well-maintained rivers help reduce the risk of natural disasters such as floods by ensuring smooth water flow and reducing blockages.

Furthermore, the activity carried out is the provision of warning banners not to throw garbage in the river at several points along the river with the hope that the people who read can be educated and increase awareness of the environment, especially the cleanliness of the riverbanks (García-Peñalvo, 2016).

The community service program carried out by Mathematics Education students at FKIP University of Jember in Tegal Gede Village, Jember, focuses on education about the importance of maintaining the cleanliness of the riverbank environment. The service results found that before the program's implementation, the community around the riverbank tended to be less concerned about environmental

cleanliness (Hikmah Harun & Firdaus Mohamad, 2022). Throwing garbage into the river is still quite common, and the lack of public awareness of the negative impact of river pollution is one of the main causes of potential floods.

Participatory Rural Appraisal (PRA) is used as a method in this service, allowing the community to actively participate in the process of identifying problems and solving solutions. Through this approach, public awareness of the importance of maintaining environmental cleanliness begins to increase (Chambers, 1994). One of the positive impacts of this activity is the awakening of collective awareness among the residents of Tegal Gede Village to maintain the cleanliness of the river jointly. In fact, several independent initiatives, such as cooperation to clean the river, have begun to be carried out regularly (Genon et al., 2022).

Theoretically, the Theory of Planned Behavior (TPB) developed by (Mussad, 2022) provides a relevant framework for analyzing changes in community behavior related to environmental cleanliness. TPB explains that a person's behavior is influenced by three main factors: attitudes toward behavior, subjective norms, and perception of behavioral control (Asrijal et al., 2020). In this case, the education provided during the service activities increased the community's positive attitude towards environmental cleanliness (attitude towards behavior). In addition, encouragement from community leaders and local leaders plays a role in strengthening social norms (subjective norms) that support river cleanup activities (Nasution et al., 2021). Lastly, the provision of hygiene tools and technical training helps to increase public perception of their ability to contribute to keeping rivers clean (perception of behavior control) (Sriekaningsih et al., 2019).

The results of this service are also in line with research on environmental education's role in increasing public awareness of river cleanliness. The study shows that people exposed to environmental education programs tend to be more concerned about environmental conservation efforts (Asfahani et al., 2023). However, the challenge faced in these two studies is to maintain the sustainability of these behavior changes after the program is completed.

Furthermore, the theory of Eco-Literacy introduced by David W. Orr (1992) states that ecological literacy is a deep understanding of the relationship between humans and their environment, as well as human responsibility in preserving ecosystems (Hussin, 2018). This service program in Tegal Gede Village seeks to build ecological literacy among the community by providing an understanding of the importance of maintaining river cleanliness not only to prevent flooding but also to preserve the river ecosystem that supports human life and other living things (Faisal

& Kisman, 2020).

While the results of the service show increased awareness and community engagement, further efforts are needed to strengthen collaboration between communities, governments, and local organizations to ensure the program's sustainability. (Akinwamide & Oguntade, 2023) Suggests that strong government policy support, including waste disposal and waste management regulations, is critical to strengthening local initiatives and preventing the return of indifferent behavior towards river cleanliness. This multi-stakeholder collaboration is important to ensure that environmental education programs run sustainably and have a long-term impact (Saha, 2023).

Thus, environmental education accompanied by participatory methods and in-depth theoretical approaches can significantly increase public awareness and behavior on the importance of maintaining river cleanliness. However, the sustainability of this behavioral change requires close collaboration between various parties and adequate policy support.

CONCLUSION

The service program carried out by Mathematics Education students at FKIP University of Jember in Tegal Gede Village succeeded in increasing public awareness about the importance of maintaining the cleanliness of the riverbank environment to prevent potential flooding. The positive impact of this activity can be seen in the community's mutual cooperation initiative to maintain the cleanliness of their environment, which at the same time reduces the risk of flood disasters due to river flow blockages. This education also strengthens the community's sense of belonging and concern for the surrounding environment. The activity of providing socialization on the importance of maintaining the cleanliness of the riverbanks to the community on Jl Tawang Mangu Gang 3, Tegal Gedhe Village, Jember, is an activity to invite the community around the riverbank to prevent water overflow. These activities significantly impact the environment, health, and the long term. For the environment, it can improve water quality, create better habitats, reduce erosion, and restore ecosystems. For health, it can reduce diseases and improve air quality. In the long term, it can reduce disaster risk. This activity can also provide education for the community so that it can increase awareness of environmental cleanliness.

More sustainable support is needed for further service, both in terms of education and infrastructure. One of the main suggestions is closer collaboration with local governments and non-governmental organizations to provide facilities such as waste disposal sites or river hygiene monitoring systems. In addition, more in-depth

and sustainable education programs, such as regular training for the community on waste management and environmental management, are highly recommended to ensure lasting behavior change. Applying simple technologies such as water filters or waste treatment equipment can also improve the effectiveness of river cleanliness management in the future.

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REFERENCE

- Aisyyiah, M. N., & Hakim, M. A. (2020). Exploring English Student Teachers' Reading Habits and Preferences. *ELT Echo: The Journal of English Language Teaching in Foreign Language Context*, 5(2), 149–161.
- Akinwamide, T. K. E., & Oguntade, F. M. (2023). Facilitating Independent and Collective Writing Skill Proficiency: The Think-Pair-Share Strategy Involvement. *European Journal of Linguistics*, 2(1). <https://doi.org/10.47941/ejl.1196>
- Aminah, A., Gantiyowati, E., Winarna, J., & Redaputri, A. P. (2021). Implementation of The Effectiveness of Regional Autonomy in Indonesia. *JEJAK: Jurnal Ekonomi Dan Kebijakan*, 14(1), 14. <https://doi.org/10.15294/jejak.v14i1.2681>
- Anderson, E. P., Jackson, S., Tharme, R. E., Douglas, M., Flotemersch, J. E., Zwarteveen, M., Lokgariwar, C., Montoya, M., Wali, A., & Tipa, G. T. (2019). Understanding rivers and their social relations: A critical step to advance environmental water management. *Wiley Interdisciplinary Reviews: Water*, 6(6), e1381.
- Asfahani, A., El-Farra, S. A., & Iqbal, K. (2023). International Benchmarking of Teacher Training Programs: Lessons Learned from Diverse Education Systems. *EDUJAVARE: International Journal of Educational Research*, 1(2), 141–152.
- Asrijal, A., Syahrudin, S., & Amrin, A. (2020). Analysis of the Behavior of Bureaucrats on Service Quality. *J. Ad'ministrare*, 7(2), 245–252.
- Chambers, R. (1994). The Origins and Practice of Rural Appraisal. *World Development*, 22(7), 953–969.
- Chauhan, C., Singh, A., & Luthra, S. (2021). Barriers to industry 4.0 adoption and its performance implications: An empirical investigation of emerging economy.

Journal of Cleaner Production, 285, 124809.

- Faisal, P., & Kisman, Z. (2020). Information and communication technology utilization effectiveness in distance education systems. *International Journal of Engineering Business Management*, 12, 1–9. <https://doi.org/10.1177/1847979020911872>
- García-Peñalvo, G. (2016). Future Trends in the Design Strategies and Technological Affordances of E-Learning. *Springer*, 1–23. <https://doi.org/10.1007/978-3-319-17727-4>
- Genon, J., Mabunay, J., Opsima, J., Zamora, R., Repaso, J., & Sasan, J. M. V. (2022). Solutions and Strategies to Reduce Damaging Impact of Single-Use Plastic Bag in Toledo City. *Amalee: Indonesian Journal of Community Research and Engagement*, 3(1), 59–70.
- Hasanah, Y. (2021). Eco enzyme and its benefits for organic rice production and disinfectant. *Journal of Saintech Transfer*, 3(2), 119–128. <https://doi.org/10.32734/jst.v3i2.4519>
- Hikmah Harun, N., & Firdaus Mohamad, M. (2022). The Immunomodulatory effects of Zingiber officinale (Ginger): A Systematic Review. *Research Journal of Pharmacy and Technology*, 3776–3781. <https://doi.org/10.52711/0974-360x.2022.00634>
- Hussin, A. A. (2018). Education 4.0 Made Simple: Ideas For Teaching. *IJELS: International Journal of Education and Literacy Studies*, Vol 6 No.3.
- Ibn-Mohammed, T., Mustapha, K. B., Godsell, J., Adamu, Z., Babatunde, K. A., Akintade, D. D., Acquaye, A., Fujii, H., Ndiaye, M. M., & Yamoah, F. A. (2021). A critical analysis of the impacts of COVID-19 on the global economy and ecosystems and opportunities for circular economy strategies. *Resources, Conservation and Recycling*, 164, 105169.
- Kintu, T. M., Ssewanyana, A. M., Kyagambiddwa, T., Nampijja, P. M., Apio, P. K., Kitaka, J., & Kabakyenga, J. K. (2021). Exploring drivers and barriers to the utilization of community client-led ART delivery model in South-Western Uganda: patients' and health workers' experiences. *BMC Health Services Research*, 21(1), 1–14.
- Lis, M., & Szyszka, M. (2020). *Innovation and Entrepreneurship: Theory and Practice*. Logos Verlag Berlin.
- Mussad, M. (2022). *Implementation of the Papua Province Special Autonomy Policy in a Public Policy Perspective*. 4(2).
- Nasution, M. A., Siregar, Z. M. E., & ... (2021). Strengthening Bumdes through Customer Satisfaction and Loyalty as the Defense of the Bumdes Business in Indonesia Post-Covid-19. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 4(3), 3962–3970.

- Nugraha, A. P., Wibisono, C., Satriawan, B., Indrayani, Mulyadi, & Damsar. (2022). The Influence Of Transformational Leadership, Job Crafting, Job Satisfaction, And Self-Efficacy On Job Performance Through Work Engagement Of State Civil Apparatus As An Intervening Variable In The Digital Era Of Cases In The Local Government Of Karimun R. *Central European Management Journal*, 30(3), 2336–2693.
- Prabowo, P. A., Supriyono, B., Noor, I., & Muluk, M. K. (2021). Special autonomy policy evaluation to improve community welfare in Papua province Indonesia. *International Journal of Excellence in Government*, 2(1), 24–40. <https://doi.org/10.1108/ijeg-06-2019-0011>
- Saha, M. (2023). English teachers' attitudes towards learners: Effects on the rural pedagogies in Bangladesh. *Ampersand*, 10, 1–9. <https://doi.org/10.1016/j.amper.2022.100107>
- Sandham, L. A., Chabalala, J. J., & Spaling, H. H. (2019). Participatory rural appraisal approaches for public participation in EIA: Lessons from South Africa. *Land*, 8(10), 150.
- Sriekaningsih, A., Sarmauli, & Yovania Karubaba, H. (2019). *Teacher Personality Competency In Improving the Interest of Learning Education of Christian Religious In Class Study Xi.1 Senior High School 1 Palangka Raya*. <https://doi.org/10.2991/iclick-18.2019.86>
- Waham, J. J., Asfahani, A., & Ulfa, R. A. (2023). International Collaboration in Higher Education: Challenges and Opportunities in a Globalized World. *EDUJAVARE: International Journal of Educational Research*, 1(1), 49–60.