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Environmentally Sound Community Empowerment

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Abstract: This research aims to explain the empowerment of environmentally conscious communities through waste management implemented by the Banyumas Regency Government. This study used qualitative research methods. The targets of this research are parties directly related to waste management policies in Banyumas Regency who were selected purposively. Data collection was carried out through observation, interviews and documentation. Data analysis process. Data analysis in this study was carried out using on going analysis (interactive). The results of the study found that the Banyumas community has a waste management capacity that has a cash flow of millions of rupiah. Then, the people of Banyumas have a responsibility to partner with community members in overcoming the waste problem and meeting their daily needs. This is reflected in the operationalization carried out by the community and financed by the community itself.

Keywords: Community Empowerment, Environmental Insight, Waste Management

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Introduction

Optimal waste management is not only aimed at overcoming ecological problems, but also becomes a strategic tool to increase community participation and independence (Putra & Ismaniar, 2020), increase environmental awareness and insight, expand community participation, create jobs, improve the quality of life, and encourage sustainable development. Habermas provides a meaningful "warning" for cross-generations about the need for an ethical foundation that he calls "the ethics of communicative discourse". He distinguishes between "ethical" and "moral" to how empowerment work is implemented (Rizqian, 2023).

Waste management in Banyumas Regency has experienced interesting developments to discuss. Since January 2019, waste management in Banyumas Regency has involved the community, namely through Non-Governmental Groups (KSM) as partners (Priliatama, 2021), after previously still using the "angkut-dispos" system. The change in management has attracted various parties to study it.

A study conducted by Indiahono (2021) highlights shifting waste policy issues at the local level. The study shows that after community-based waste management, there is a new public problem in the waste problem. The problem that initially revolved around the inability to provide landfills, has evolved into the issue of shifting the burden of local governments to the public, the damaged face of the city, bureaucratic egocentrism, and the incompetence of non-governmental groups.

Furthermore, a study conducted by Diyanto & Warsono (2020). This study aims to see how waste management policies in Banyumas Regency are. Conventional waste management is limited to collecting and transferring or disposing of it to the Final Disposal Site (TPA) is only temporary waste handling that will only make a time bomb. It is still hot in the minds of the people of Banyumas what the effect was caused by the rejection of the community around the Gunung Tugel Landfill and the Kaliori Landfill at the end of 2018. For almost 4 months, the community has been confused about throwing garbage, because the temporary garbage shelter is overloaded, which was eventually closed by the surrounding community. As a result, in almost every corner of Banyumas Regency, especially in Purwokerto, piles of garbage can be found and the environment becomes dirty. To overcome this problem, relevant agencies issued a waste management policy independently. However, it is unfortunate that the policy seems hasty and has many

shortcomings. The policy is top-down and does not involve public participation; fast and short policy socialization; reactive and short-term policies.

Still in the policy aspect, Apriana (2020) examines the implementation of the Banyumas Regency Regional Regulation No. 6 of 2012 concerning Waste Management from the perspective of maslahah. The study found that the process of socialization and guidance by the environmental agency to the community regarding Regional Regulation No. 6 of 2012 concerning Waste Management, especially the article that regulates waste management. Then there is still a low level of education of waste management workers in each PDU (Recycling Center) so that for waste management performance there are still tools that have not been used optimally, not only that the community has not been able to change the paradigm of waste sorting to waste separation, and the regeneration system and organizational structure in each PDU have not worked in accordance with the main tasks and functions of each field. This study is quite in line with what was found by (Putranto et al., 2022).

Waste management policies in Banyumas Regency are also highlighted by Pazqara (2022). The study is somewhat contrary to the findings made by (Apriana, 2020), which found that the implementation of policies from the communication aspect is quite good, as seen from the running of the policy socialization mechanism carried out by the agency that is routine and intense to the community. From the aspect of resources, it can be seen from the implementing officials who understand the policy, but are constrained in efforts to change the mindset of the people who are used to being served in managing waste. From the aspect of disposition, it can be seen from the division of authority that runs well and coordinates, including the implementation of the principle of partnership with the community through KSM, but on the other hand it is constrained in terms of lack of experience of partners and limited operational funds. From the aspect of the bureaucratic structure, it can be seen from the availability of policy SOPs, including the running of the supervision and work reporting system.

In the managerial aspect, Widayanti (2021) examines how waste management in Banyumas is managed. This study refers to George Terry's theory which uses management schemes, namely planning, organizing, actuating, and controlling. Based on the analysis using an interactive model, the results of the study show that the planning carried out by the Purwokerto Wetan TPST as a sample, can be said to be good because it follows the

direction of the Banyumas Regency Government's policy regarding waste management and maximizing all waste management support facilities provided by the Environmental Agency. TPST Purwokerto Wetan carries out its duties using the SOP Decree from the Head of the Banyumas Regency Environmental Office. In terms of training and human resource development, the implementer receiving an invitation to become a speaker/resource person at other TPST is one way to improve human resources and understand how well the performance is done. TPST Purwokerto Wetan continues to learn so that their human resources develop despite the fact that there are obstacles.

The legal aspects of waste management in Banyumas were studied by Pamuji et al (2022) who analyzed community-based waste management in the implementation of community participation as stipulated in Law Number 8 of 2008 concerning Waste Management. The results of the study show that from the perspective of environmental law, community-based waste management is strengthened by regulations at the central, district, and village government levels. Regulations on waste management regulate interaction between communities and their environment without causing a negative impact of waste on environmental health and comfort. Waste management regulations have encouraged waste management practices at the community level. Community participation in waste management is found in the waste bank model where people are educated to choose, sort, and appreciate waste. The waste bank model has also had a positive impact on environmental health and comfort, including increasing people's income from saving their waste. Thus, the waste bank model is one of the ideal models to improve community-based waste management practices.

Still in the legal aspect, Prasetyo (2021) examines the effectiveness of law enforcement against alleged violations of Regional Regulation Number 6 of 2012 concerning Waste Management in Banyumas Regency. In order to create a waste management system that is in accordance with environmentally friendly waste management methods and techniques in Banyumas Regency, the Banyumas Regency Government has stipulated Regional Regulation Number 6 of 2012 concerning Waste Management. However, in reality, there are still many people who are suspected of not complying with the provisions that have been regulated in the Regional Regulation. This is based on reports and complaints received by the Environment Agency as the authorized agency in the supervision of waste management. The purpose of this study is to find out the extent of the effectiveness of law enforcement against alleged violations of Regional

Regulation Number 6 of 2012 concerning Waste Management in Banyumas Regency and the factors that affect it. The results of the study show that law enforcement against alleged violations of Regional Regulation Number 6 of 2012 concerning Waste Management in Banyumas Regency is ineffective because the alleged violations that occur have never been processed until the court, so they cannot prevent and reduce the occurrence of violations. The effectiveness of alleged violations of Regional Regulation Number 6 of 2012 concerning Waste Management in Banyumas Regency is greatly influenced by the factors of the legal structure in the form of the implementing institution, namely the limited number of personnel, the lack of ability and integrity of officers and the coordination relationship between agencies that is not optimal.

The study, which aims to find out how the implementation of household-scale waste management in urban areas in Purwokerto is based on the circular economy model and formulates a strategy for developing household-scale waste management with a circular economy model, was carried out by (Purwono, 2022). The results of this study show that the potential for waste generation in the city of Purwokerto is 73,336 kg per day. Household-scale waste management in the urban area of Purwokerto has been based on a circular economy by sorting from home, utilizing kitchen organic waste to be used as compost or maggot feed and utilizing inorganic waste to be sold through waste banks. The circular economy model household-scale waste management strategy in the urban area of Purwokerto based on SWOT analysis was obtained by the SO strategy, which is an aggressive strategy by increasing internal factors of strength, in the form of providing infrastructure facilities and increasing public awareness in waste management. External factors of opportunity are magnified by increasing private participation through CSR.

In terms of community participation, a study conducted by Rahmadani & Rahmawati (2021) revealed the mechanism and form of community participation in waste management at the Srayan Makarya Waste Bank, in Banyumas Regency. The results of the study show that the Srayan Makarya Waste Bank has carried out activities well, such as sorting waste from the source, depositing waste to recording the results of customer savings. In addition, community participation tends to be lacking in some activities. Because basically routine activities are carried out only once a week, and other activities are usually carried out by outsiders. Some activities such as craft training or ecoprints are

carried out only at the beginning. Public awareness is indeed an important role for the lack of community participation in several activities at the Srayan Makarya Waste Bank.

A study on community participation in the management of household waste in the hangar system to support Purwokerto as a green city was conducted by Susanto et al (2020). This study aims to explore factors that can affect community participation in waste management of the hangar system to support green cities; Mapping the factors that hinder community participation in the waste management of the hangar system. Using embedded research, surveys, and content analysis, it was shown that the most dominant influence on waste disposal behavior was 15% knowledge. Meanwhile, the combined influence between knowledge and attitude towards the habit of throwing garbage was 18.20%. The co-influence of the understanding of waste and the hangar system and green cities; Responses or attitudes and behaviors/habits of throwing garbage to participation in waste management in the hangar system of 33% factors outside the three variables of 67% whose type of variable is not yet known. The factor that hinders community participation in the management of the hangar system is that trust in the hangar system is still lacking in rural areas, due to the lack of understanding of the hangar system and economic factors and also does not feel important.

Regarding the performance of waste management, Shabira (2021) carried out. The study found that waste reduction is still less than 30%. This is still less than the waste reduction target contained in the Banyumas Regent Regulation Number 45 of 2018 concerning Banyumas Regency Policies and Strategies in the Management of Household Waste and Household Similar Waste which is 30%. The waste residue produced is still very large, which is above 70%. This is still very far from the target that has been desired by the Banyumas Regency Environment Agency of 10%. Management is still not optimal in carrying out the waste sorting process. This is due to various obstacles, such as the lack of equipment and the number of waste management personnel, insufficient operational costs, and low community participation in management.

Studies on waste management in Banyumas are also penetrated in the context of digitalization. A study conducted by Rusmawan et al (2022) highlights collaborative governance in digital-based waste management in Banyumas Regency. The process found that collaborative governance was running quite well. The collaboration process carried out can be seen from the dialogue carried out between sectors, the building of trust and

commitment between each stakeholder, and the existence of mutual understanding, as well as the temporary results and collaboration processes carried out.

Still related to digitalization, a study conducted by Abdallah et al (2020) explained that waste management techniques usually involve various technical, climate, environmental, demographic, socio-economic, and legislative parameters. Such complex nonlinear processes are challenging to model, predict, and optimize using conventional methods. Recently, artificial intelligence (AI) techniques have gained momentum in offering alternative computational approaches to solving waste management problems. AI has been efficient at addressing obscure issues, learning from experience, and dealing with uncertainty and incomplete data.

Based on various studies that have been carried out previously, it is still dwell on the aspect of waste management policy in Banyumas Regency. Therefore, this study will highlight in different aspects, namely in the aspect of community empowerment as a result of changes in the waste management system that is currently based on the community. The aspect of community empowerment in this study refers to the concept put forward by Bell & Morse (2012), namely: 1) having self-capacity, namely an independent attitude, being able to meet needs according to their potential, solving the problems they face, and economically being able to produce to meet their living needs, and being able to control in the community, 2) having collective responsibility, namely the development of cooperation and partnerships between community members in overcoming problems and meeting their living needs and developing social networks to access various opportunities, 3) having the ability to think and act sustainably, namely maintaining the quality of the environment and maintaining resources in a sustainable and environmentally friendly manner.

After providing an explanation of how to empower environmentally minded communities in waste management in Banyumas Regency, a SWOT analysis was then carried out to find out the empowerment potential that can be further developed from the efforts that have been carried out previously. SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis is a common study method used in the strategic planning development process, developed by Albert Humphrey, a professor at Stanford University in the late 1960s and early 1970s. SWOT analysis is a strategic posture and can

be divided into two parts, namely: analysis of the internal conditions of the organization and analysis of the external environment (Tao et al., 2023).

Internal condition analysis includes discussing the competitive advantage and weaknesses of the target, while the external environment analysis involves the opportunities that exist in the external environment and the threats posed to the external environment. SWOT analysis systematically identifies internal strengths and weaknesses, external opportunities, and threats by analyzing and summarizing the internal and external environment and strategic capabilities of the subject, and then matching them to each other in the form of a matrix, which allows the manager or investor to define four strategies, namely SO (strength-opportunity), ST (strength-threat), WO (weakness-opportunity) and WT (weakness-threat).

Today, SWOT analysis has been widely used in the fields of general management, education, marketing and social media, health and sustainable tourism. Therefore, the study adopts a SWOT analysis to identify strengths, weaknesses, opportunities, and threats. This SWOT analysis is then simplified into: internal potential which includes infrastructure and programs and external potential which includes partnership and comparative advantage. The analysis of internal potential and external potential was used to analyze environmentally friendly empowerment in waste management in Banyumas Regency.

Departing from this description, this study specifically aims to describe the empowerment of environmentally friendly communities through waste management and conduct a SWOT analysis to determine the potential for empowerment that can be further developed from the efforts that have been implemented by the Banyumas Regency Government. The contribution of the study in the context of environmentally friendly empowerment is expected to enrich the lack of existing literature, because so far empowerment is often understood as limited to increasing economic capacity, and less touching in improving sustainable environmental insight.

Methodology

This study uses qualitative research methods. In this method, process and meaning are the main emphasis. The process and meaning are obtained through the investigation of reality that has value (Denzin & Lincoln, 2009). Thus, this study seeks to

find answers about how to empower environmentally friendly communities in waste management, as well as the potential that can be further developed in Banyumas Regency.

The research target in this study is parties directly related to waste management policies in Banyumas Regency who were selected purposively. These parties are the Head of the Laboratory of the Environment Agency and the Head of the Banyumas Regency Final Waste Treatment Site. The two research targets were chosen based on the consideration that they are the subjects who understand the most about how waste management in Banyumas Regency is carried out. The two objects understand waste management in the realm of policy and its implementation in the field.

Related to data collection, it is carried out through observation, interviews and documentation. The observation was carried out by the author by visiting the laboratory of the Environment Agency and the Banyumas Regency Final Waste Treatment Site. Meanwhile, interviews were conducted with the Head of the Laboratory of the Environment Agency and the Head of the Banyumas Regency Final Waste Treatment Site. The data that has been collected is validated by triangulation through sources obtained from both sides of the subject and the existing literature.

Next is the data analysis process. The data analysis in this study was carried out by on going analysis (interactive) (Miles et al., 2014). This analysis process is carried out through the following stages: the collected data is grouped into main findings that are relevant to the study material and presented descriptively. Data grouping and data presentation are two components of analysis that are carried out in conjunction with the data collection stage. The next stage is drawing conclusions, namely the interpretation of data through interpretation. The activities of the three components take place interactively and are then analyzed and interpreted according to the context of this study.

Results and Discussion

Changes in Waste Management in Banyumas Regency

The problem of waste management in Banyumas Regency peaked in 2018, where water pollution caused by leachate reservoirs leaking caused the well water to brown so that it could not be consumed, besides that rice fields were also polluted so that they could no longer be planted (Purwendah et al., 2020). This was then followed by blockades and

demonstrations carried out by the community at the Waste Disposal Site in Kalibagor District (Ridlo, 2018). The emergency situation then led the Banyumas Regency Government to change the old waste management system, namely open dumping, to community-based waste management.

Community-based waste management in Banyumas Regency can be understood as an effort to reduce and manage waste, where the community as part of the waste producer itself can be actively involved in the management process (Ismail, 2019). This management can empower in increasing economic coffers as well as becoming a vehicle for the process of internalizing environmental insights as an obligation to protect the nature where the community lives and settles.

Changes in waste management in Banyumas Regency which previously ran from just throwing it away to a production process, from problem solving to environmentally friendly socio-economic empowerment. This was conveyed by the Head of the Laboratory of the Environmental Service and the Head of the Banyumas Regency Final Waste Processing Site, that the juridical basis for waste management carried out in Banyumas Regency is Banyumas Regent Regulation Number 45 of 2018 and Banyumas Regency Regional Regulation Number 9 of 2020 concerning Amendments to Banyumas Regency Regional Regulation Number 6 of 2012. The regulation refers to Law of the Republic of Indonesia Number 18 of 2008, Government Regulation, Presidential Regulation on Waste Management (Interview, May 31, 2023).

Through the same data source, there are currently workers who manage Waste Processing Sites (TPS), Integrated Waste Processing Sites (TPST), Recycling Centers (PDU), and Hangars in Banyumas Regency with a total of 929 workers. Data on the number of available workers can be seen in the table below:

Data on the Number of Workers of TPS/TPST/PDU/Hangar

Banyumas Regency Area

No.	Facility Name	KSM Manager	Total Workforce	Number of Managers
1	Hanggar Ajibarang	KSM Sejahtera	33	5
2	Hanggar Pekuncen	KSM Sumber Rezeki Abadi	23	4
3	Hanggar Cilongok	KSM Sumber Makmur	23	3
4	Hanggar Rempoah	KSM Berkah Maju Bersama	22	2
5	Hanggar Sokaraja Kulon	KSM Gawa Berkah	26	4

6	Hanggar Kedunggede	KSM Kedung Mas	26	4
7	Hanggar Karangcegak	KSM Mekar Sari	52	5
8	Hanggar Sumpiuh	KSM Sumber Rejeki	31	4
9	Hanggar Kedungrandu	KSM Randu Makmur	31	3
10	Hanggar Wangon	KSM Maju Mandiri	25	4
11	Hanggar Rawalo	KSM Karya Mandiri Sejahtera	18	4
12	PDU Pabuwaran	KSM Migunani	13	13
13	PDU Karangwangkal	KSM Sregeprawat	15	9
14	PDU Purwanegara	KSM Sejahtera	25	3
15	PDU Bobosan	KSM Kamandaka	13	20
16	PDU Purwokerto Lor	KSM Resik Mandiri	10	4
17	PDU Purwokerto Wetan	KSM SAE	16	3
18	PDU Sokanegara	KSM Soka Bersimpah	16	9
19	PDU Tanjung	KSM Brayan	13	13
20	PDU Kedungwuluh	KSM Wulan Sari	10	3
21	PDU Kober	KSM Gempar	10	4
22	PDU Pasir Kulon	KSM Paku Mas	21	25
23	Rumah Kompos Grendeng	KSM Greensaber	14	4
24	TPS 3R Sumampir	KSM Sumber	29	3
25	TPS 3R Kranji	KSM Bersih Mandiri	6	4
26	TPS 3R Mersi	KSM Adipati Mersi	4	4
27	TPS 3R Teluk	KSM Mulya Sejati	4	4
28	TPS 3R Berkoh	KSM Berkah	6	3
29	TPS 3R Karangpucung	KSM Mugi Resik	12	4
30	TPS 3R Karanglewas Lor	KSM Rahayu	4	4
31	TPS 3R Pasir Kidul	KSM Ceria	22	25
32	TPS 3R Rejasari	KSM Barokah	22	22
33	TPS 3R Bantarsoka	KSM Wahana Hijau	3	3
34	TPS 3R Arcawinangun	KSM Arcasatria	27	3
35	TPS 3R Pasir Muncang	KSM Bumi Indah Lestari	2	4
36	TPS 3R Karangmangu	KSM Jadi Mulia Bersama	7	7
37	TPS 3R Pesawahan	Bumdes Cikal Pambagyan	2	6
38	TPS 3R Pancasan	KSM Berkah Runtah	7	7
39	TPS 3R Margasana	KSM Gotongroyong	3	5
40	TPS 3R Piasa Kulon	KSM Piasa Kulon	2	2
41	TPS 3R Klapasawit	KSM Sawit Berkah Usaha	2	6
42	TPS 3R Pancasan	KSM Berkah Runtah	8	3
Jumlah			**658**	**271**
Total				**929**

(Source: Banyumas Regency Environment Agency Laboratory)

Regarding the relationship between the Banyumas Regency Government and the management community, it can be explained as follows:

First, location and infrastructure. The Banyumas Regency Government provides Waste Processing Sites (TPS), Integrated Waste Processing Sites (TPST), Recycling Centers (PDUs), and Hangars. In it, the Government provides a waste sorting tool. Second, operational. The implementation of waste sorting is carried out by the community and financed by the community itself through citizen contributions that are situational and flexible.

After the process is passed, if there is still waste residue, it will be taken to the Final Processing Site in Kalibagor District, which then carries out a waste sorting process between organic waste and inorganic waste. Organic waste is then processed through magot cultivation and inorganic waste is processed into paving blocks. As for the distribution of magot cultivation, the Banyumas Regency Government sells it in the marketplace, while the production of paving blocks, so far the Banyumas Regency Government has collaborated with relevant agencies to be used in Government offices. Regarding waste that cannot be processed, the Banyumas Regency Government collaborates with a cement factory in Cilacap as engine fuel (Interview, May 31, 2023).

At the beginning of the implementation of the waste management process, especially at landfills which currently implement a "manufacturing" system, it had received criticism from the Ministry of Public Works and Public Housing (PUPR), but over time it received a positive response from various parties, especially the Ministry of Environment and Forestry (KLHK) (Masyrafina, 2023). In fact, waste management in Banyumas Regency was proclaimed as a national waste management capital.

Reflecting on the concept put forward by (Bell & Morse, 2012), the people of Banyumas have the capacity to be independent, able to meet their needs according to their potential, solve the problems they face, and economically able to produce to meet their living needs, and be able to control the community. This was said by the Head of TPA, that the management of TPST has a cash flow of millions of rupiah, where workers get income above the UMR.

Still reflecting on (Bell & Morse, 2012), the people of Banyumas have a collective responsibility with the development of cooperation and partnerships between community members in overcoming problems and meeting their living needs and the development

of social networks to access various opportunities. This is reflected in the operationalization carried out by the community and financed by the community itself. The people of Banyumas factually have the ability to think and act in a sustainable manner, namely maintaining the quality of the environment and maintaining resources in a sustainable and environmentally friendly manner. This can be seen from the change in behavior that at first was "reluctant" to manage waste, now it is actually "scrambling" to become a waste manager.

Talking about changes in waste management, it has experienced developments that are conceptually quite close to what is done in Croatia. Where municipal waste previously mostly still ended up in landfills in waste management centers based on mechanistic-biological treatment, and where mixed waste was collected and processed into fuel derived from waste and disposed of in so-called Landfill bioreactors. The waste management sector in Croatia underwent a substantial restructuring to achieve a circular economy, which was substantially modified during adoption, preserving the concept designed a decade and a half ago (Luttenberger, 2020).

Banyumas Regency as part of the Republic of Indonesia, which is a developing country, is recorded as one of the districts that had experienced a complicated waste problem. This is a kind of "identity" that environmental pollution due to the mismanagement of solid waste is a global problem (Navarro Ferronato & Vincenzo Torretta, 2019). Open discharge and open incineration are the main applied waste treatment and final disposal systems, especially seen in low-income countries. The management system that Banyumas Regency currently has can be said to meet the elements of comprehensiveness of an integrated waste collection and processing system in accordance with the principles of sustainable development.

Realizing a Zero Waste city is the dream of all regional leaders, including the Regent of Banyumas. Achieving Zero Waste in urban centres remains a utopian quest, unless it gains a good understanding of the inputs and outputs, of how waste is managed. In addition, coordinated efforts must always be needed by stakeholders, including consumers. A better strategic policy and regulatory framework must still be considered (Awasthi et al., 2021).

The mission to achieve zero waste requires a strategy for green supply chain management with minimized energy consumption. Banyumas Regency must continue to

develop what they have decided, namely community-based waste management. Attention to the definition of zero waste expressed by the Zero Waste International Alliance (ZWIA), that zero waste is the conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning, and with no discharges to land, water, or air that threaten the environment or human health (zero waste is the conservation of all resources through production, consumption, reuse, and recovery of responsible products, packaging, and materials without incineration, and without discharge into soil, water, or air that threatens the environment or human health) (Iqbal et al., 2020), is a principle that must be continuously maintained.

Indonesia is actively carrying out large-scale development. Across the country, national strategic projects continue to emerge—from toll roads, dams, ports, to airports and bridges connecting the region from Sabang to Merauke. This row of infrastructure is not only a symbol of progress, but also a reflection of economic growth and equitable distribution efforts between regions (Kusumawardhani et al., 2025a). However, in the midst of the rush of physical development, an important question arises: what is the fate of waste management infrastructure? It must be well realized that along with Indonesia's economic growth, it is simultaneously and driven by high levels of consumption which causes large amounts of waste. Education is needed to increase environmental awareness among the population because it is one way to overcome the problem of waste, especially in urban areas, which are the engine of economic growth. A study conducted by (Brotosusilo et al., 2022) revealed whether higher levels of education have a greater impact on residents related to environmental problems such as littering. Based on a logistic regression analysis of 7 cities (Jakarta, Jambi, Muaro Jambi, Ambon, Padang, Surabaya, and Tasikmalaya) in Indonesia during 2019-2021, it was found that education did not affect the decline in the value of littering behavior as expected.

Formal education indicators are not enough to reduce the likelihood of littering behaviors at the individual level. In contrast, informal education is taught to maintain a clean environment better than conventional formal education. In addition, having self-initiative in caring for the environment and good habits from childhood will reduce the possibility of littering at the individual level. An individual has their own initiative, the probability of littering will be 0.1732 times lower than those who do not have their own initiative.

The study (Brotosusilo et al., 2022) also found that per capita income and per capita expenditure in major cities in Indonesia ranged between USD 156,903 and USD 116,857. These economic factors affect the behavior of residents not to litter. An increase in per capita expenditure of USD 1 per person per day will reduce the likelihood of littering by -0.0468. However, these factors are not enough to minimize littering behavior because the availability of landfills is another key factor in reducing littering behavior in urban residents. Therefore, the Government must also focus on building citizens' behavior regarding waste management awareness, especially building habits both from childhood and individual initiatives, as well as implementing programs to reduce waste production.

Attention to women's empowerment in waste management is also important. A study conducted by (Estrada et al., 2023) analyzes how grassroots activism, NGOs-municipality collaboration, and women's empowerment lead to the realization of transformative potential for waste management and social inclusion in the city of Pune, India. Above all, this study shows how working with informality rather than trying to eradicate it can result in a beneficial movement in moving towards the legitimacy and gradual institutionalization of pro-poor urban waste management systems where women's empowerment is expressed not only for their benefit but also for the state, citizens and the environment.

In the same attention to the role of women, a study conducted by (Asteria & Haryanto, 2021) empowerment activities is key in building individual awareness and capacity in household waste management, especially for women as the main actors. This study aims to explore empowerment activities as a key factor in shaping women's awareness about household waste management. Through the Ordinary Least Square regression analysis, it was found that women who had good adaptability to technology tended to have a greater chance score of 0.908. Education in school was also found to have a positive impact on the score of opportunities to get a good living environment. It was found that an increase of 1 school year would increase the chance score by 0.0755 (estimate 5). This is not significantly different from the estimate of 4 which would increase the odds by 0.0745. In waste management training, women's participation tends to increase the chance of having a good environment score by 0.944 points (estimate 5). In addition, women's participation was found to be statistically significant at a 95%

confidence level in all estimates, especially in waste management training. Empowerment activities that utilize access to education and are easily adaptable to technology, may have a significant correlation with women's involvement in waste management training. This is the basis for building awareness to carry out more sustainable household waste management and achieve changes to get a good living environment.

Changing Behavior Patterns of Waste Management from Passive to Participatory

The description of the changes in waste management carried out in Banyumas Regency above, brings us to the next discussion, namely the change in the behavior pattern of waste management from passive to participatory. The running of government, development, and community programs is based on common interests and efforts to encourage community participation (Khumaidi et al., 2024). The change in the waste management system to be community-based has been proven to have an impact on changing people's behavior in waste management.

Every upright and durable structure has the same characteristics, which begins with a solid foundation (Kusumawardhani et al., 2025b). Community-based waste management is one of the efforts to reduce and manage waste. Gramsci argued that every individual has an intellectual capacity in essence, but not all play an active role as an intellectual in the social sphere. To make the community play a participatory role in waste management, organizations consisting of community members are needed in the joint use of waste which then provides benefits to themselves. The study conducted by (Ismail, 2019) has proven to be successfully applied to those who are educated in elementary school and are classified as productive age, namely 31-40 years old. When community involvement is broadened, for example from children to the elderly, it is not impossible that the level of community participation will increasingly show satisfactory results.

The amount of waste grows along with the increase in wealth and population. To curb this trend and reduce adverse environmental impacts, reducing food waste has sat on the political agenda, along with ambitious material recycling and greenhouse gas emission targets (de Sadeleer et al., 2020). Community-based waste management carried out in Banyumas Regency, operationalized using costs driven from residents' contributions, in the future needs to be further developed towards financial independence obtained from financing based on waste recycling products.

After providing an explanation of how to empower environmentally minded communities in waste management in Banyumas Regency, a SWOT analysis was then carried out to find out the empowerment potential that can be further developed from the efforts that have been carried out previously. Internal condition analysis includes discussing the competitive advantage and weaknesses of the target, while the external environment analysis involves the opportunities that exist in the external environment and the threats posed to the external environment. SWOT analysis systematically identifies internal strengths and weaknesses, external opportunities, and threats by analyzing and summarizing the internal and external environment and strategic capabilities of the subject, and then matching them to each other in the form of a matrix, which allows the manager or investor to define four strategies, namely SO (strength-opportunity), ST (strength-threat), WO (weakness-opportunity) and WT (weakness-threat).

Based on observations made at the final waste management site, or referred to as the Environmental and Education Final Processing Site (TPA BLE) in Banyumas Regency, it can be seen that the infrastructure that has been available is quite adequate. As seen in the image below:

Entrance to the BLE Landfill in Banyumas Regency

(Source: Author Documentation)

Inorganic Waste Shredding Machine

(Source: Author Documentation)

Paving Block Making Process

(Source: Author Documentation)

Magot Cultivation Process

(Source: Author Documentation)

Waste Sorting Process at TPST Purwokerto Wetan

(Source: Author Documentation)

Then based on the results of interviews conducted with the Head of the Laboratory of the Environment Agency and the Head of the Banyumas Regency Final Waste Management Site, data was obtained which was then analyzed in accordance with the SWOT matrix developed by the author as follows:

a) Internal Potential

1) Infrastructure

In the aspect of infrastructure, there are two elements, namely systems and facilities. In the system element, it is contained in the juridical basis of Banyumas Regent Regulation Number 45 of 2018 and Banyumas Regency Regional Regulation Number 9 of 2020 concerning Amendments to Banyumas Regency Regional Regulation Number 6 of 2012. The regulation refers to the Law of the Republic of Indonesia Number 18 of 2008, Government Regulation, Presidential Regulation on Waste Management.

Then in the facility elements, which consist of 1 BLE Landfill (Environmentally Friendly and Educational Final Processing Site), 11 Hangars, 11 PDUs (Recycling Centers), 1 Compost House, 19 TPS 3R (Reduce-Reuse-Recycle Waste Processing Sites), which are spread throughout Banyumas Regency.

2) Program

In terms of the program, waste management in Banyumas Regency includes technical guidance, socialization and assistance intensely and routinely by the Banyumas Regency Environmental Service, approximately once (one) month.

In the digital context, there is the Salinmas application and the Jeknyong application which accommodates waste shuttle services in the community based on android.

b) External Potential

1) Partnership

In the aspect of partnership, the Banyumas Regency Government collaborated with the Cilacap cement factory as a waste container to be produced as fuel. Then in terms of production, organic waste is then processed through magot cultivation and inorganic waste is processed into paving blocks. As for the distribution of magot cultivation, the Banyumas Regency Government sells it in the marketplace, while the production of paving blocks, so far the Banyumas Regency Government has collaborated with relevant agencies to be used in Government offices.

2) Comparison of Advantages

In the aspect of comparative excellence, based on the results of an interview with the Head of the Final Processing Site with an Environmental and Education Perspective (TPA BLE) of Banyumas Regency, it is said that waste management carried out by Banyumas Regency is intended to be used as capital for other regions.

From this, it can be said that there is no other region that is "better" conceptually or technically in its management.

SWOT Analysis

Internal Potential	External Potential
Infrastructure In the aspect of infrastructure, there are two elements, namely systems and facilities. In the system element, it is contained in the juridical basis of Banyumas Regent Regulation Number 45 of 2018 and Banyumas Regency Regional Regulation Number 9 of 2020 concerning Amendments to Banyumas Regency Regional Regulation Number 6 of 2012. The regulation refers to the Law of the Republic of Indonesia Number 18 of 2008, Government Regulation, Presidential Regulation on Waste Management. Then in the facility elements, which consist of 1 BLE Landfill (Environmentally Friendly and Educational Final Processing Site), 11 Hangars, 11 PDUs (Recycling Centers), 1 Compost House, 19 TPS 3R (Reduce-Reuse-Recycle Waste Processing Sites), which are spread throughout Banyumas Regency. **Program** In terms of the program, waste management in Banyumas Regency includes technical guidance, socialization and assistance intensely and routinely by the Banyumas Regency Environmental Service, approximately once (one) month. In the digital context, there is the Salinmas application and the Jeknyong application which accommodates waste shuttle services in the community based on android.	**Partnership** In the aspect of partnership, the Banyumas Regency Government collaborated with the Cilacap cement factory as a waste container to be produced as fuel. Then in terms of production, organic waste is then processed through magot cultivation and inorganic waste is processed into paving blocks. As for the distribution of magot cultivation, the Banyumas Regency Government sells it in the marketplace, while the production of paving blocks, so far the Banyumas Regency Government has collaborated with relevant agencies to be used in Government offices. **Comparison of Advantages** In the aspect of comparative excellence, based on the results of an interview with the Head of the Final Processing Site with an Environmental and Education Perspective (TPA BLE) of Banyumas Regency, it is said that waste management carried out by Banyumas Regency is intended to be used as capital for other regions. From this, it can be said that there is no other region that is "better" conceptually or technically in its management.

(Source: Data Processed by the Author)

The complexity of waste management makes this problem unsolvable in the short term. Therefore, to solve this problem in the long term, it needs community participation. Not a few leaders today are faced with a big dilemma related to the direction and leadership approach they need to take (Suhardiman, 2025), but the Banyumas Regency Environment Agency can be said to be not dilemmatic in terms of policy by highlighting the lack of public awareness in sorting waste between organic and inorganic. The study conducted by (Brotosusilo et al., 2021) identified factors that affect the level of individual participation related to waste sorting. An individual's enthusiasm and participation in social activities held in their neighborhood will increase their waste sorting, such as local gatherings, village rehabilitation, youth group activities, religious activities, and family

welfare training. Therefore, community empowerment can be one of the efforts to solve the complexity of waste management.

Attention to the digital economy is also important. A study conducted by (Hsieh et al., 2022) revealed psychological empowerment and user satisfaction to then investigate the influence of online brand community participation. It is known that the exponential growth of the online brand community has created a platform where empowered consumers can share knowledge and experiences, as well as participate in community activities. Based on psychological empowerment theory, this study proposes a comprehensive framework that integrates social and functional views to investigate the determinants that increase psychological empowerment and user satisfaction, which consequently influences online brand community participation. By explaining the route of the explanatory pathway and highlighting the underexplored and distinctive role of psychological empowerment, this study makes a theoretical contribution to illustrate how enabling environments can be developed to encourage consumer participation in the co-creation of brand value. The Banyumas Regency Government should be able to adapt the enthusiasm of this online-based consumer, to market more massively the products that have been produced from waste processing.

Conclusion

Good waste management is not only about solving environmental problems, but also a means of empowering the community, increasing environmental awareness and insight, expanding community participation, creating jobs, improving the quality of life, and encouraging sustainable development. Waste management in Banyumas Regency has experienced interesting developments to discuss. Since January 2019, waste management in Banyumas Regency has involved the community, namely through Non-Governmental Groups (KSM) as partners after previously still using the "angkut-trajectory" system.

Reflecting on the concept put forward by (Bell & Morse, 2012), this study found that the Banyumas people have the capacity to be independent, able to meet their needs according to their potential, solve the problems they face, and economically able to produce to meet their living needs, and be able to control in the community. This was said by the Head of TPA, that the management of TPST has a cash flow of millions of rupiah, where workers get income above the UMR.

Still reflecting on (Bell & Morse, 2012), the people of Banyumas have a collective responsibility with the development of cooperation and partnerships between community members in overcoming problems and meeting their living needs and the development of social networks to access various opportunities. This is reflected in the operationalization carried out by the community and financed by the community itself. The people of Banyumas factually have the ability to think and act in a sustainable manner, namely maintaining the quality of the environment and maintaining resources in a sustainable and environmentally friendly manner. This can be seen from the change in behavior that at first was "reluctant" to manage waste, now it is actually "scrambling" to become a waste manager.

Then based on the SWOT analysis developed by the author, it was concluded that waste management in Banyumas Regency has:

a) Internal Potential

1) Infrastructure

In the aspect of infrastructure, there are two elements, namely systems and facilities. In the system element, it is contained in the juridical basis of Banyumas Regent Regulation Number 45 of 2018 and Banyumas Regency Regional Regulation Number 9 of 2020 concerning Amendments to Banyumas Regency Regional Regulation Number 6 of 2012. The regulation refers to the Law of the Republic of Indonesia Number 18 of 2008, Government Regulation, Presidential Regulation on Waste Management. Then in the facility elements, which consist of 1 BLE Landfill (Environmentally Friendly and Educational Final Processing Site), 11 Hangars, 11 PDUs (Recycling Centers), 1 Compost House, 19 TPS 3R (Reduce-Reuse-Recycle Waste Processing Sites), which are spread throughout Banyumas Regency.

2) Program

In terms of the program, waste management in Banyumas Regency includes technical guidance, socialization and assistance intensely and routinely by the Banyumas Regency Environmental Service, approximately

once (one) month. In the digital context, there is the Salinmas application and the Jeknyong application which accommodates waste shuttle services in the community based on android.

b) External Potential

1) Partnership

In the aspect of partnership, the Banyumas Regency Government collaborated with the Cilacap cement factory as a waste container to be produced as fuel. Then in terms of production, organic waste is then processed through magot cultivation and inorganic waste is processed into paving blocks. As for the distribution of magot cultivation, the Banyumas Regency Government sells it in the marketplace, while the production of paving blocks, so far the Banyumas Regency Government has collaborated with relevant agencies to be used in Government offices.

2) Comparison of Advantages

In the aspect of comparative excellence, waste management carried out by Banyumas Regency is intended to be used as capital for other regions. From this, it can be said that there is no other region that is "better" conceptually or technically in its management.

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