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Plastic Waste Management Education through the Waste Management Unit (UPS) in Borobudur Village

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ABSTRACT

The rapid increase in population and tourist visits can be the basis of an important issue of increasing waste volume as one of the causes of environmental problems, one of which will affect people's consumption patterns so that it has an impact on increasing the volume, type and characteristics of waste. The purpose of this study: how is the level of awareness of community function duties in waste management, how is the role, involvement, participation or participation of the community in supporting waste management, and how is the support or synergy of other stakeholders in waste management in Borobudur Magelang District. The research method used is quantitative ex-post facto in focus group discussion (FGD) activities by presenting 40 people (representatives of 21 hamlets in Borobudur Village). The results of the research on Borobudur Village area-based waste management, waste management policies and regulations, and inorganic waste management (plastic) obtained the results there is a significant difference in changes in insight, knowledge and understanding before and after FGD activities on plastic waste management into various creations. The conclusion is that the level of awareness, understanding, role, involvement and participation of community waste management institutions and the community positively support the wise management of plastic waste in the form of various creations.

Keywords:
Plastic Waste, Waste Management Unit, Borobudur, Various Creations

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A. Introduction

The basis of environmental development in Indonesia is bound to one another and influences each other so that the rapid development in line with the increase in human population can become a global issue as one of the causes of environmental problems, one of which is the problem of waste, especially in Borobudur Tourism Village. In connection with this, improving the quality of village community behavior towards the environment is important. Because, one of the factors that cause environmental change is the increase in population. The increasing population and tourist visits will affect people's consumption patterns which have an impact on increasing the volume, type and characteristics of the waste produced, so it is necessary to take action plans such as those carried out in the National Action Plan for Handling Marine Waste (*RAN PSL*) in accordance with Presidential Regulation No. 83 of 2018 concerning Marine Waste Handling and Implementation of Plastic Waste Management in Marine Tourism Destinations in accordance with the Minister of Tourism and Creative Economy Regulation No. 5 of 2020 concerning Guidelines for Plastic Waste Management in Marine Tourism Destinations, especially marine areas. Plastic is one of the materials that we can find in almost every item of daily life ranging from drinking bottles, food utensils (spoons, forks, containers, cups), product packaging, wrapping / crackle bags, pipes, plastic laminates, toothbrushes, compact disks (CDs), children's toys and others which generally come from land areas. The problem of land-based waste will always be produced as long as human activities continue to exist, it can be imagined that the amount of waste produced by the inhabitants of this earth will increase which has an impact on the land area as well as the accumulation of inorganic plastic waste.

If the land area is not handled effectively and efficiently, the existence of waste in the natural environment will certainly turn back to destroy the surrounding life and reduce the image of Borobudur tourism. The problem of waste is crucial. In fact, waste can be said to be a cultural problem because of its impact on various sides of life, especially such as the Borobudur super priority destination (*DSP*) area which is an icon of the international class destination of Magelang Regency and Buddhist religious worship tourism. Based on Government Regulation Number 50 of 2011 concerning the National Tourism Development Master Plan 2010-2025, Borobudur and its surroundings are designated as one of 88 (eighty eight) national tourism strategic areas. According to Presidential Regulation 79/2019, the Borobudur National Strategic Area (*KSN*) is designated as a super-priority tourist destination or national tourism strategic area (*KSPN*). The problem of tourism development cannot be separated from the problem of waste, so it needs serious handling. The environmental problems experienced in Borobudur Village are the low level of awareness, lack of behavior to maintain cleanliness and the limited economic level of the local community.

Plastic waste is one of the problems that is difficult to handle in Borobudur Village Indonesia because it is difficult to decompose, but its existence is increasing every year. Four countries, namely China, Indonesia, the Philippines,Vietnam, and Sri Lanka. Indonesia is stated to be the country that contributes most to environmental damage in the world (Birawida, 2021). Based on Scince Mag data, waste production is at 381 million tons per year. This figure has increased more than 190 times, with an average increase of 5.8 tons per year (Arisona, 2018). In 2021, it is known that the amount of global waste reached 415 million tons and is predicted to double by 2030. The development of daily activities of local communities and the increasing number of tourist visits (domestic and international) are contributors to plastic waste that cannot be separated from the development of tourism businesses, MSMEs and other consumerism. Law (*UU*) number 18 of 2008 concerning Waste Management, there has been legal direction related to waste management and

strengthened by the mandate of Presidential Regulation number 97 of 2017 in realizing 100 percent waste management in 2025 in the form of Clean and Waste Free Indonesia 2025. Concrete efforts made by the Ministry of Tourism and Creative Economy (*Kemenparekraf*) related to the issue of waste in tourism areas in each region are interrelated with other regions, so it takes not only one approach if the source of waste from upstream is almost all of Java, there must be a more comprehensive handling.

One of the efforts to overcome the problem of plastic waste in the *DSP* area, *Kemenparekraf* tries to require tourism managers, especially *KSN*, to form a Waste Management Unit (*UPS*) said Indra Ni Tua (https://m.medcom.id/gaya/wisata, March 1, 2022). The existence of technical guidelines for plastic waste which is a best practice according to the Decree of the Deputy for Destination and Infrastructure Development number *SK.45/KD.00.01/DPDI/2020* concerning Technical Guidelines for Standard Operating Procedures for Plastic Waste Management in Maritime Tourism Destinations which will be further translated into local conditions of local regulations or Magelang Regent Regulation number 7 of 2017 concerning Waste Management and Magelang Regent Regulation number 39 of 2018 concerning Regional Policies and Strategies for Household Waste Management and Waste Similar to Household Waste

Multi-stakeholder cooperation in plastic waste management is very important at the Borobudur Village level, starting from the Village Government, (*TPS 3R)*, and Waste Bank in order to realize a clean, beautiful, healthy and safe Borobudur Village (*BISA*). If a *UPS* has been formed, the Borobudur village government has the most important role in synergizing *TPS 3R* and Waste Bank to support the sustainability of UPS activities as well as operational support and control of waste generation at the village level. Several things related to the low waste management of the Borobudur Village community managed by TPS 3R Lohjinawi and the Waste Bank to the Pasuruan Magelang landfill are caused by the low level of awareness of the utilization of waste management into more valuable goods in the Borobudur Tourism Village initiated by the Ministry of Tourism and Creative Economy (*Kemenparekraf*) in the form of a community institution called the waste management unit (*UPS*).

The activities of local communities and tourists are close to generating waste, which are two inseparable things. Every time people carry out activities, at the same time waste will arise, both liquid, gas and solid waste (garbage). Heap of household waste and tourist waste can increase along with the increase in society and tourist activities. Community involvement in waste management is very important, because without the participation and support of the community, this research was conducted to 1). The level of awareness and understanding of the duties and functions of the Borobudur Village community on plastic waste management for a clean, beautiful, healthy and safe environment; 2). Analyzing the role, involvement, participation or participation of the community in supporting the Borobudur Village plastic waste management unit; and 3). Synergy of stakeholders in the Borobudur Village plastic waste management unit.

B. Methods

This research was conducted in Borobudur Village of Magelang Regency which has 21 hamlets spread around Borobudur Temple namely *Ngaran I, Ngaran II, Gopalan, Bumisegoro, Sabrangrowo, Tamanan, Tanjungan, Maitan, Gejagan, Kujon, Gendhingan, Bogowanti Lor, Bogowanti Kidul, Kenayan, Janan, Janan Kapling, Cawangsari, Jayan, Jayan Kapling, Kaliabon, Jligudan, Kelon* and *Kurahan* have an area of 421.50 Ha (4.21 km2) conducted in July 2022. The research approach is quantitative ex-post facto which comes from an existing environment of an event that arises without any intervention from the researcher (Ghozali, 2008). Techniques using brainstorming and most commonly used in the implementation of

focus group discussions (FGDs) in the Rapid Assessment of Rural Conditions method using reliability and validity tests then continued paired sample t test on the *IBM SPSS* version 24 program. The research sample was 40 people who were in Borobudur Village and Magelang Regency details as see Table 1. follows :

Table 1. Borobudur Village Waste Management Research Sample

Respondent Identity	Number (Person)
Environment Agency	1
Department of Tourism, Youth and Sports	2
Department of Trade Cooperatives and Micro Small Enterprises (SMEs)	1
Village Community Empowerment Office	1
PT. Taman Wisata Candi Borobudur	1
Borobudur Authority	1
Borobudur Sub-District Head of Magelang District	1
Community Empowerment Expert Coordinator	1
Magelang Regent's Millennial Consultant for Environment	1
Magelang Regent's Millennial Consultant for MSMEs	1
Magelang Regent's Millennial Consultant for Tourism	1
Village Consultative	1
Hamlet Head	10
Village-Owned Enterprises	1
Borodobudur Tourism Awareness Group	1
Borobudur *Balkondes* Manager	1
Charm of Magelang District	1
Youth Organization	1
Village Comunity	1
Family Welfare Empowerment	1
TPS 3R Lohjinawi	2
Waste Bank	2
Borobudur Village General Community Representative	6
Amount	40

Source : Primary Data, 2022

C. Result and Discussion

1. Research Reliability and Validity Test

The reliability of research data is carried out using a questionnaire which is an instrument of the research variable wise village management of plastic waste can be said to be reliable and reliable if the respondent's answer to the question is said to be consistent and stable over time using the Cronbach's Alpha statistical test tool, a construct or variable is called reliable if it provides a Cronbach's Alpha value > 0.70 (Ghozali, 2021). The result of the Cronbach's Alpha coefficient of 0.875 (see Table 2.) which explains the acquisition of results has met the reliability requirements, obtaining a reliable conclusion and is suitable for use as a research variable.

Table 2. Reliability Test for Wise Waste Management in Borobudur Village

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
0.875	0.877

Source : Data Analysis, 2022

Reliability analysis that has met the prerequisites for statistical testing of research data is followed by a validity test. Measuring the research questionnaire validly / whether the questions in the questionnaire have been made, a questionnaire is said to be valid if the questions on the questionnaire are able to reveal something that is measured by the questionnaire to achieve research objectives (Ghozali, 2021), the measurement of the research validity test can be seen in Table 3 as follows:

Table 3. Validity Test of Wise Waste Management in Borobudur Village (N=40)

Observation Variable	R Count	R Table	Conclusion Rcount > Rtab (Valid) Rcount < Rtab (Invalid)
Managing Waste (Before)	0.191	0.264	Invalid
Managing Waste (After)	0.372	0.264	Valid
Village Government Involvement (Before)	0.363	0.264	Valid
Village Government Involvement (After)	0.264	0.264	Valid
Village Regulation (Before)	0.377	0.264	Valid
Village Regulation (After)	0.408	0.264	Valid
Waste Management Techniques (Before)	0.406	0.264	Valid
Waste Management Techniques (After)	0.363	0.264	Valid
Permenparekraf Action Plan (Before)	0.479	0.264	Valid
*Permenparekra*f Action Plan (After)	0.302	0.264	Valid
Regent Regulations No.7 Year 2017 (Before)	0.619	0.264	Valid
Regent Regulations No.7 Year 2017 (After)	0.399	0.264	Valid
Regent Regulations No.39 Year 2018 (Before)	0.729	0.264	Valid
Regent Regulations No.39 Year 2018 (After)	0.254	0.264	Invalid
Main Duties and Function *TPS 3R* Fertile Prosperous (Before)	0.315	0.264	Valid
Main Duties and Function *TPS 3R* Fertile Prosperous (After)	0.312	0.264	Valid
Main Duties and Function of Waste Bank (Before)	0.431	0.264	Valid
Main Duties and Function of Waste Bank (After)	0.375	0.264	Valid
Village Government Synergy *TPS 3R* Waste Bank (Before)	0.404	0.264	Valid
Village Government Synergy *TPS 3R* Waste Bank (After)	0.359	0.264	Valid
Waste Bank and *TPS 3R* Synergy (Before)	0.517	0.264	Valid
Waste Bank and *TPS 3R* Synergy (After)	0.337	0.264	Valid
UPS Pilot (Before)	0.536	0.264	Valid
UPS Pilot (After)	0.359	0.264	Valid
Synergy of Village Government, *TPS 3R*, Waste Bank (Before)	0.578	0.264	Valid
Synergy of Village Government, *TPS 3R*, Waste Bank (After)	0.303	0.264	Valid
Waste Management Inspiration (Before)	0.433	0.264	Valid
Waste Management Inspiration (After)	0.589	0.264	Valid
Waste Management Support (Before)	0.607	0.264	Valid
Waste Management Support (After)	0.679	0.264	Valid

Source : Data Analysis, 2022

The validity test refers to the answers to the questionnaire before and after the implementation of the Borobudur Village waste management wise FGD to obtain the accuracy and accuracy of the measurement results. The meaning of validity can be expressed as the extent to which the apparent score X (R count) has a greater ability than the pure score T (R table = 0.264). The greater the apparent score of the pure score means the higher the validity and vice versa, the lower the validity of the measurement results means the greater the difference in the apparent score from the pure score (Azwar, 2012). Based on the validity test Table 3. explains 30 observation variables obtained the results of 28 valid variables and 2 not variables. Research observation variables with R count > R table 0.264 (Valid) and R count < R table 0.264 (Invalid), invalid research includes Waste Management (before) and Magelang Regent Regulation Number 39 of 2018 (after). Whether the condition of the research sample is homogeneous according to the assumption of homogeneity, it is necessary to conduct a homogeneity test with the F test with the F table (see Table 4).

Table 4. Homogeneity Test for Wise Waste Management in Borobudur Village

No	Observation Group	F count	F table (α = 0.050)	Conclusion Fcount > Ftab (Heterogeneous) Fcount < Ftab (Homogeneous)
1	Before (Control)	8.946	0.441	Heterogeneous
2	After (Experiment)	1.563	0.441	Heterogeneous

Source : Data Analysis, 2022

Based on Table 4. obtained the results of the homogeneity test of the Borobudur Village waste management wise observation group in the condition before (control) Fhit (8.946) > Ftab (0.441) is heterogeneous and after (experiment) Fhit (1.563) > Ftab (0.441) is heterogeneous. The condition of the research sample conducted is heterogeneous in the wise activities of Borobudur Village waste management. Furthermore, analyzing the implementation of FGDs before and after the wise waste management village activities using the paired t test (alpha α 5%) answers the hypothesis:

a. H0 : There is no significant difference between the results before and after the FGD activity on wise waste management in Borobudur Village (H0 is accepted, Ha is rejected if t count < t table).
b. Ha: There is a significant difference between the FGD results before and after the Borobudur Village wise waste management activity (H0 is rejected, Ha is accepted if t count > t table).

2. Waste Management Based on Borobudur Village Area

Segregated waste requires a sorting place and final disposal residue, because management cannot be separated according to the type of waste, namely organic waste, inorganic waste, hazardous waste (B3) and residual waste. Environmental management and waste management by community institutions have not been carried out properly and are not integrated, resulting in various problems such as air pollution (odor), damaging the aesthetics of the Borobudur environment, inconvenience, dirty and causing disease. The expectation of good *UPS* Borobudur activities seeks to realize a clean, beautiful, healthy and safe environment. There needs to be an active role of *UPS* management, synergy of Borobudur waste management institutions (*TPS 3R Lohjinawi* and *Kalpataru* Waste Bank), management of Borobudur tourism awareness groups with the support of local communities, tourists, village governments, local governments, and other stakeholders in maintaining a clean environment (see Table 5.)

Table 5. Mean and Standard Deviation of Borobudur Village Waste Management

Observation Variable	Mean	Standard Deviation
Managing Waste (Before)	3.18	0.874
Managing Waste (After)	4.35	0.483
Village Government Involvement (Before)	3.13	0.883
Village Government Involvement (After)	4.48	0.506
Main Duties and Function *TPS 3R* Fertile Prosperous (Before)	2.93	0.971
Main Duties and Function *TPS 3R* Fertile Prosperous (After)	4.48	0.506
TPS 3R Synergy and Waste Bank (Before)	2.80	0.823
TPS 3R Synergy and Waste Bank (After)	4.38	0.628
UPS Pilot (Before)	2.95	0.846
UPS Pilot (After)	4.45	0.552
Waste Management Inspiration (Before)	2.78	1.025
Waste Management Inspiration (After)	4.43	0.501

Source : Data Analysis, 2022

Based on Table 5. explains the level of knowledge of the target object on waste management in Borobudur Village before 3.18 (deviation 0.874) in sufficient condition obtained an increase in knowledge after 4.35 (deviation 0.483) to know plastic waste management activities. The form of community involvement that produces waste with knowledge can manage household and tourism business waste properly. The involvement of the village government in waste management before 3.13 (deviation 0.883) in neutral conditions of involvement and participation in waste management increased to after 4.48 (deviation 0.506) that there is involvement and participation of the village government in waste management through involvement and participation in the socialization of plastic waste management with village / hamlet officials and the surrounding community in Borobudur Village. Understanding of waste management to maintain environmental cleanliness based on the Borobudur Village area carries out the duties and functions of *TPS 3R Lohjinawi* to provide services to village community beneficiaries before 2.93 (deviation 0.971) with an increase in understanding of the duties and functions of *TPS 3R Lohjinawi* 4.48 (deviation 0.506) that the community's understanding of the management of regional cleanliness by *TPS 3R Lohjinawi* becomes understood. There is a change in the paradigm of waste management from the previous one, namely collecting, transporting, disposing of waste to managing waste handling in reducing waste residue. Waste sorting is part of the waste management process at a *TPS 3R Lohjinawi* and *Kalpataru* Waste Bank shows an understanding of the form of work synergy to maintain a clean environment before 2.80 (deviation 0.823) increased after 4.38 (deviation 0.628) that there is an increase in the level of understanding of the form of synergy cooperation with there is still a lack of concrete actions of cooperation between the village government, *TPS 3R* and waste banks in maintaining a clean Borobudur Village environment.

Waste reduction management is one form implementation of the new paradigm in waste management (Meidiana *et al*., 2020) in Borobudur Tourism Village with the support of *Kemenparekraf* piloting of *UPS* and plastic waste management campaigns run by Waste Management Specialists (WMS) with Local Facilitators before 2.95 (deviation 0.846) did not understand and after 4.45 (deviation 0.552) increased to understand the existence of *UPS* with socialization/plastic waste management campaigns. Efforts to reduce waste include the *3R* concept (*reduce, reuse*, *recycle*) which prioritizes waste management activities and reduces plastic waste generation, reuses waste and recycles waste (Trisnawati & Agustana, 2018). Providing inspiration and ideas for plastic waste management before 2.78 (deviation

1.025) and after 4.43 (deviation 0.501) has increased inspiration and ideas for managing plastic waste and strengthening village economic resilience into various plastic creation products in the super priority destination Borobudur. Changes in implementation before and after the wise plastic waste management activities were carried out paired t test (see Table 6.)

Table 6. Paired T Test of Waste Management Wisdom in Borobudur Village

Observation Variable	Paired Tcount	T Table (α = 0.050)	Conclusion Tcount < Ttab (No Difference) Tcount > Ttab (There is a Difference)
Managing Waste (Before) Managing Waste (After)	-9.945	-1.685	There is a difference
Village Government Involvement (Before) Village Government Involvement (After)	-11.094	-1.685	There is a difference
Main Duties and Function *TPS3R* Fertile Prosperous (Before) Main Duties and Function *TPS3R* Fertile Prosperous (After)	-11.196	-1.685	There is a difference
TPS 3R Synergy dan Waste Bank (Before) *TPS 3R* Synergy dan Waste Bank (After)	-11.615	-1.685	There is a difference
UPS Pilot (Before) *UPS* Pilot (After)	-11.619	-1.685	There is a difference
Waste Management Inspiration (Before) Waste Management Inspiration (After)	-10.699	-1.685	There is a difference

Source : Data Analysis, 2022

The results of the paired t test Table 2.5. obtained the t-count results of 6 observation variables, namely waste management (-9.945), village government involvement (-11.094), *TPS3R Lohjinawi's* main task (-11.196), TPS3R and waste bank synergy (-11.615), *UPS* pilot (-11.619), and waste management inspiration (-10.699) greater than the t table -1.685, then H0 is rejected and Ha is accepted, concluding that there is a real difference between the FGD results before and after the Borobudur Village waste management wise activities. Explaining waste management by involving the village government with the help of the main task of *TPS 3R Lohjinawi* in maintaining the cleanliness of the Borobudur Village area, then there are synergy efforts with waste banks. Borobudur tourist village according to the Minister of Tourism and Creative Economy Regulation number 5 of 2020 concerning Guidelines for Plastic Waste Management in Maritime Tourism Destinations is carried out in the land area of Borobudur Village which focuses on plastic waste in tourist villages. Efforts to reduce the generation, pollution and environmental damage due to plastic waste from Borobudur tourist destination activities are carried out on an ongoing basis including the reduction and handling of plastic waste through the Borobudur Village of *UPS*. Article 6 explains the obligation of Borobudur Tourism Village to be given the responsibility for the formation of UPS which is carried out in an integrated manner with the waste management system, namely *TPS 3R Lohjinawi* and *Kalpataru* Waste Bank. Activities are carried out with technical instructions according to the Regulation of the *Deputy* for Destination and Infrastructure Development (*DPDI*) number *SK.45 / KD.00.01 / DPDI / 2020* concerning Technical Guidelines for Standard Operating Procedures for Plastic Waste Management in Maritime Tourism Destinations *UPS* activities are carried out systematically, thoroughly and continuously with Borobudur Village waste management institutions that concentrate on reducing and handling plastic waste through various creations with efforts to increase value competitiveness in the form of crafts

aimed at domestic / foreign guests and Borobudur tourists.

3. Waste Management Policies and Regulations

Waste management in Magelang District is regulated in Magelang District Regional Regulation number 39 of 2018 concerning Regional Policy and Strategy for the Management of Household Waste and Waste Similar to Household Waste which adopts the above regulations, namely Law No. 18 of 2008 concerning Waste Management and Government Regulation No. 81 of 2012 concerning the Management of Household Waste and Waste Similar to Household Waste. The legal basis and regulations on waste management are indispensable in the implementation of the waste management system in Magelang District, which contains supporting aspects of waste management implementation, including institutional aspects, financing, technical operations, and community and private participation (see Table 7.)

Table 7. Mean and Standard Deviation of Waste Management Policies and Regulations

Observation Variable	Mean	Standard Deviation
Village Regulation (Before)	2.08	1.023
Village Regulation (After)	3.35	0.483
Action Plan of the Minister of Tourism and Creative Economy Regulation No 5 of 2020 (Before)	1.93	1.023
Action Plan of the Minister of Tourism and Creative Economy Regulation No 5 of 2020 (After)	3.20	0.464
Regent Regulation No 7 Year 2017 (Before)	2.18	1.059
Regent Regulation No 7 Year 2017 (After)	4.30	0.464
Regent Regulation No 39 Year 2018 (Before)	2.13	1.042
Regent Regulation No 39 Year 2018 (After)	4.25	0.543

Source : Data Analysis, 2022

Based on Table 7. waste management policies and regulations that explain before the condition of not knowing 2.08 (deviation 1.023) with the condition that the community does not know the village regulations that discuss Borobudur Village waste management, then the village government submits the preparation of a village regulation plan on waste management with the village consultative body (*BPD*) in the Borobudur Village administrative area. The submission of Borobudur Village government support in the form of village regulations governing the cleanliness of the village area is carried out in synergy with *TPS 3R Lohjinawi*, *Kalpataru* Waste Bank and *UPS Polah Bareng* with after the acceptance activities of the village community and stakeholders hesitating 3.35 (deviation 0.483), based on the conditions obtained, the Borobudur Village government steps need to realize and issue village regulations on waste management and environmental response of Borobudur Village to the local community.

Borobudur Tourism Village is part of the Borobudur super-priority destination which implements the Action Plan of the Minister of Tourism and Creative Economy Regulation number 5 of 2020 concerning Guidelines for Plastic Waste Management in Maritime Tourism Destinations, especially Borobudur Village in the land area before 1.93 (deviation 1.023) conditions do not know and after activities 3.20 (deviation 0,464) do not know explains the acceptance of local communities and waste management stakeholders regarding the action plan of the Minister of Tourism and Creative Economy Regulation number 5 of 2020 regarding the management of potential plastic waste originating from tourism business activities to tourist village managers and strengthens the awareness and mindset of the community along

with stakeholder cooperation to maintain a clean, beautiful, healthy and safe environment.

The Magelang District Government supports local waste management through the Magelang District Regional Regulation number 7 of 2017 concerning Waste Management. The explanation of the waste management regulation in order to realize a healthy, beautiful and clean area from waste, waste management is carried out comprehensively and integrated from upstream to downstream so that it provides economic benefits, is safe for the environment and can change people's behavior before 2.18 (deviation 1.059) did not know to manage waste based on the Borobudur Village area to after 4.30 (deviation 0.464) knew that waste can have a negative impact on public health and the environment. Waste management regulations require a follow-up from its derivatives, the issuance of Regent Regulation number 39 of 2018 concerning Regional Policies and Strategies for Household Waste Management and Waste Similar to Household Waste explains the direction of policies and strategies in reducing and handling household waste and household waste in Magelang District in an integrated and sustainable manner carried out by the implementer of regional cleanliness, namely the Environmental Agency (*DLH)* together with the community, especially in Borobudur Village, obtained before the activity 2.13 (deviation 1.042) did not know changed after 4.25 (deviation 0.543) the real difference test obtained there is a policy and waste management can be seen in Table 8. as follows :

Table 8. Paired T Test of Waste Management Policies and Regulations

Observation Variable	Paired Tcount	T Table (α = 0.050)	Conclusion Tcount < Ttab (No Difference) Tcount > Ttab (There is a Difference)
Village Regulation (Before) Village Regulation (After)	-16.988	-1.685	There is a difference
Action Plan of the Minister of Tourism and Creative Economy Regulation No 5 of 2020 (Before) Action Plan of the Minister of Tourism and Creative Economy Regulation No 5 of 2020 (After)	-14.981	-1.685	There is a difference
Regent Regulation No 7 Year 2017 (Before) Regent Regulation No 7 Year 2017 (After)	-14.750	-1.685	There is a difference
Regent Regulation No. 39 Year 2018 (Before) Regent Regulation No. 39 Year 2018 (After)	-13.208	-1.685	There is a difference

Source: Data Analysis, 2022

The results of the paired t test Table 2.7. obtained the t-count results of 4 observation variables, namely village regulations (-16.988), action plans for *Menparekraf* regulations number 5 of 2020 (-14.981), regent regulations number 7 of 2017 (-14.750) and regent regulations number 39 of 2018 (-13.208) greater than t table -1.685, so H0 is rejected and Ha is accepted, concluding that there is a real difference between the results of FGDs before and after Waste Management Policies and Regulations. Waste management policies and regulations are very important for the benefits of establishing a regular, systematic, comprehensive, and sustainable order in the community environment to keep it clean and

reduce pollution and environmental damage due to plastic waste in Borobudur tourist village. The action plan for *Menparekraf* regulation number 5 of 2020 in Articles 2 and 3 explains the reduction and handling of plastic waste through activities to limit waste generation recycle waste and reuse waste which is the responsibility of the Borobudur tourist village manager. The existence of a *UPS* is very important and must be formed in the Borobudur tourist village. Borobudur tourism village waste management is supported by the local government of Magelang Regency in Regent Regulation Number 7 of 2017 concerning Waste Management and Regent Regulation Number 39 of 2018 concerning Regional Policies and Strategies for Household Waste Management and Waste Similar to Household Waste, so there needs to be a follow-up by the Borobudur village government to issue a Village Regulation on Waste Management at the Borobudur Village Level as a tangible form of support and protection for the workforce, participants and volunteers of Borobudur Clean Village to remain enthusiastic about carrying out routine and planned activities to protect the surrounding environment.

4. Inorganic Waste Management (Plastic)

The waste problem in the tourist area around Borobudur temple in Magelang district assessed by UNESCO is a cause for concern. The average waste composition in Magelang district based on Magelang district waste data consists of 53.6% organic waste and 46.4% inorganic waste. Most of the people in Borobudur Village have not done segregation from household sources, low public awareness of paying the waste service retribution rate and the lack of added value generated from waste that is not managed properly. Considering that Borobudur Sub-district is located in the Tourism Strategic Area (*KSP*), the management and development of tourism village potential must be in line with sustainable tourism environmental management. *TPS 3R Lohjinawi* Borobudur keeps the area clean by collecting waste from households, tourism businesses, schools, MSMEs, and so on only with the support of funds from beneficiary contributions from surrounding residents. *TPS 3R Lohjinawi* has difficulty maintaining waste management operations due to the relatively large costs incurred, while the existence of the *Kalpataru* waste bank has so far had problems only limited to being a picky eater or picking up plastic waste that has economic value and non-valuable waste cannot be optimized for utilization. Not to mention, the waste bank has a long chain with a small storage capacity, so it needs a new breakthrough suggested by *Kemenparekraf*, namely the *UPS* pilot that concentrates on the utilization of plastic waste into various creations by paying attention to waste management techniques, socialization support, carrying out the main tasks and functions of the waste bank, the synergy of the Borobudur village government between *Kalpataru* waste bank and *TPS 3R Lohjinawi* Borobudur and increasing inspiration and support for waste management in the existence of the Borobudur *UPS* pilot named *Polah Bareng* (see Table 9.).

Table 9. Mean and Standard Deviation of Organic and Inorganic Waste Management

Observation Variable	Mean	Standard Deviation
Waste Management Techniques (Before)	2.50	1.155
Waste Management Techniques (After)	4.38	0.490
Socialization Support (Before)	3.38	0.868
Socialization Support (After)	4.78	0.432
Main Duties and Function UPS Polah Bareng (Before)	2.68	0.859
Main Duties and Function UPS Polah Bareng (After)	4.25	0.742
Village Government Synergy, *TPS 3R* and Waste Bank (Before)	2.65	0.864
Village Government Synergy, *TPS 3R* and Waste Bank (After)	4.25	0.742

Continued **Table 9**

Observation Variable	Mean	Standard Deviation
Waste Management Inspiration (Before)	2.78	1.025
Waste Management Inspiration (After)	4.43	0.500
Waste Management Technique Support (Before)	2.43	1.106
Waste Management Technique Support (After)	4.38	0.540

Source: Data Analysis, 2022

Based on Table 9. explains changes in waste management in waste management techniques before not knowing 2.50 (deviation 1.155) people still do not know the waste management carried out by *TPS 3R Lohjinawi*, *Kalpataru* Waste Bank and *UPS Polah Bareng* in Borobudur Village. The explanation of waste management conveyed by the managers of *TPS 3R*, Waste Bank and *UPS* which is useful for maintaining the cleanliness of rural areas by applying the 3R principle, namely reducing (reduce), reusing (reuse), and recycling (recycle) turns into knowing 4.38 (deviation 0.490) waste management activities in containerization activities, waste collection, waste transfer activities, waste transportation to final residue disposal. The utilization of organic and inorganic waste can be done by reducing through reducing the volume of waste, including compaction (*ecobricks*) and composting (organic fertilizer) *reuse* through reusing or reusing materials from waste disposal that can be reused (various creations) and recycle through the separation of inorganic objects (used bottles, cans, cardboard, bottle caps, etc.) from piles of waste to be resold and then processed into more useful raw materials

Borobudur Village waste management requires socialization support, village government (*Pemdes*) synergy, *TPS 3R* and waste banks, and waste management technique support to support plastic waste management for economic resilience with previous conditions on socialization support that looks neutral 3.38 (deviation 0.868), village government synergy *TPS 3R*, 2.65 (deviation 0.864), and support for waste management techniques 2.43 (deviation 1.106), it can be seen that there is direct participation in plastic waste management in the process of sorting waste directly with the increasing amount of time and the needs of the population are increasing with the waste produced increasing. The community supports the socialization (campaign) of plastic waste management and the synergy of keeping the hamlet area clean based on the area experiencing changes in socialization support strongly supports 4.78 (deviation 0.432), the synergy of village government, *TPS 3R*, waste bank knows 4.25 (deviation 0.742) changes in knowledge, insight and understanding of the group and support for waste management techniques support plastic waste management for economic resilience 4.38 (deviation 0.540) seen in the direct involvement of socialization, campaigns and waste activists carried out by the community in the Borobudur priority supre destination. Socialization and support for proper waste management, good material and can be done with a gradual time span can increase the participation of the Borobudur Village community (Firdausi et al., 2018)

The management of plastic waste that can drive the local economy requires special skills and creativity of various creations that require waste management inspiration is still lacking 2.43 (deviation 1.106) and does not understand the main tasks and functions of *UPS Polah Bareng* to manage plastic waste 2.68 (deviation 0.859) due to limited knowledge, knowledge and skills to manage plastic waste into various creations with the support of the Ministry of Tourism, and Creative Economy (*Kemenparekraf*) at the Deputy for Destination and Infrastructure Development providing assistance to explore the potential and provide inspiration for plastic waste management through various creations to be able to know and master the inspiration for waste management 4.43 (deviation 0.500) and increase knowledge.

Various efforts and ways of the main task of *UPS Polah Bareng* to be able to increase the understanding of the existence of UPS to tackle plastic waste 4.25 (deviation 0.742) managing plastic waste suppresses the generation of plastic waste into high-value creation products as typical souvenirs and has an impact on the welfare of the local community of Borobudur Village. Real difference test in paired t test of inorganic waste management (plastic) in Table 10. as follows:

Table 10. T *Paired Test* Waste Management Inorganic (Plastic)

Observation Variable	Paired T-count	T Table (α = 0,050)	Conclusion Tcount < Ttab (No Difference) Tcount > Ttab (There is a Difference)
Waste Management Techniques (Before) Waste Management Techniques (After)	-11.117	-1.685	There is a difference
Socialization Support (Before) Socialization Support (After)	-9.837	-1.685	There is a difference
Main duties and Functions of UPS (Before) Main duties and Functions of UPS (After)	-11.619	-1.685	There is a difference
Village Government, *TPS 3R* and Waste Bank Synergy (Before) Village Government, *TPS 3R* and Waste Bank Synergy (After)	-11.615	-1.685	There is a difference
Waste Management Inspiration (Before) Waste Management Inspiration (After)	-10.699	-1.685	There is a difference
Waste Management Technique Support (Before) Waste Management Technique Support (After)	-11.624	-1.685	There is a difference

Source: Data Analysis, 2022

Based on Table 10. The results of the paired t test obtained the results of t counts on 6 observation variables, namely waste management techniques (-11.117), socialization support (-9.837), *UPS* duties (-11.619), synergy of village governments, *TPS 3R*, waste banks (-11.615), waste management inspiration (-10.699) and the existence of support for waste management techniques (-11.624) greater than t table -1.685 then H0 is rejected and Ha is accepted, it can be concluded that there is a real difference between the results of FGDs before and after inorganic waste management (plastic). Plastic waste management needs to be managed properly with socialization, support, mastery of management techniques, UPS duties and the establishment of good and responsible synergy in the TPS 3R, waste bank and UPS to keep the Borobudur Village environment clean, beautiful, healthy and safe.

D. Conclusions

The conclusions of this research :

1. The level of awareness and understanding of the duties and functions of the Borobudur Village community in plastic waste management activities has changed to have awareness and increased understanding of area-based waste management with the village government of Borobudur, *TPS 3*R *Lohjinawi*, *Kalpataru* Waste Bank and UPS *Polah Bareng*.
2. The role, involvement, participation or participation of the community in supporting waste management in Borobudur Sub-district includes in the form of understanding the Magelang Regent Regulation number 7 of 2017; Magelang Regent Regulation number

39 of 2018, support for socialization and /or plastic waste management campaigns in the Borobudur Superpriority Destination carried out by TPS 3R *Lohjinawi*, *Kalpataru* Waste Bank and UPS *Polah Bareng*.

3. The support or synergy of other stakeholders in waste management in Borobudur Village in the form of synergy between community institutions and village government includes the Borobudur Village Government with TPS 3R *Lohjinawi*, *Kalpataru* Waste Bank and UPS *Polah Bareng*.

E. Advice

There is a need to strengthen the *UPS Polah Bareng* institution, improve waste management and its application in waste management institutions to the village villagers, periodic support by stakeholders related to waste management in the form of operational infrastructure, routine cleaning activities and marketing of various creations produced to sustain daily operational costs.

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