Regional Case Study

Plastic Management on the Kelapa Island, Indonesia: Analysis of Community Perception and Participation

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Abstract

Plastic waste is a substance that is no longer used and contains certain elastic materials that require heat energy to decompose. Plastic waste has a longer time to decompose, which is about 20 to 100 years. The purpose of this study is to identify public perception and participation in plastic waste management, analyze the relationship between internal and external factors and perceptions of plastic waste management, and analyze the relationship between public perception and participation in plastic waste management. The research was conducted through explanatory research with a cross-sectional design. The population in this study is the people of Kelapa Island, Seribu Islands, DKI Jakarta with a sample of 300 respondents. The results showed that there was a relationship between knowledge (p-value = 0.001) and the role of government/community leaders (p-value = 0.002) with perceptions of plastic waste management. There is a relationship between public perception and participation in plastic waste management (p-value = 0.000). The conclusion shows that the perception of the community as a whole is positive and community participation in the management of plastic waste is already high. It is hoped that the programs that have been successfully implemented need to be maintained, improved, and monitored regularly.

Keywords: Community participation; community perception; kelapa island; plastic waste management; plastic pollution.

1.   Introduction

The problem in the environment that needs to be considered and handled is waste. The existence of human life that uses various kinds of goods can produce various kinds of waste. Both were sourced from industry and households, and various other sectors. The increasing number of people will use more plastic products for their daily needs, which will result in more waste being generated. Waste is categorized into organic and inorganic waste. Plastic waste is an example of inorganic waste whose use is very high, so it is very important to handle it so as not to cause adverse impacts (Utami & Aprillia, 2020). According to Law Number 18 of 2008 concerning Waste Management, it is stated that waste is the residue

of human daily activities and natural processes that have a solid form. Waste management is a systematic, comprehensive and sustainable activity that includes waste reduction and handling. The purpose of waste management is to improve the degree of public health, environmental quality and make waste a resource (RI, 2008).

Plastic waste is anything that has been left behind and contains certain elastic components that require heat energy to decompose (Utami & Aprillia, 2020). The higher the amount of plastic waste in the environment, the greater the potential to pollute the environment. Plastic waste has a longer time to decompose, which is about 20 to 100 years, so it can reduce soil fertility and make it difficult for plastic to decompose in water (Purwaningrum, 2016). Plastics are composed of synthetic polymer materials whose manufacture through a polymerization process is an unavoidable part of our daily lives. Plastic waste is difficult to decompose in nature, making it the highest waste donation that can damage nature and ecosystems (Arifin, 2017). Plastics have benefits such as durability, corrosion resistance, and persistence. Plastic is also an inexpensive material, which makes it popular for various human endeavors. Due to its excellent quality, the use of plastic is increasing in daily life (Suryono, 2019).

Plastic waste can interfere with water absorption and air circulation in the soil because it is difficult to destroy and elastic and interferes with air movement. Damage to environmental quality can also be caused by the accumulation of plastic waste (Arico & Jayanthi, 2018). This affects the fertility of the soil due to the disruption of air circulation. And the plastic waste that accumulates threatens the lives of animals on the ground and waters because it is trapped in plastic piles. And the plastic can block the flow of the river, so it has the potential to bring flooding and contamination of the water (Septiani et al., 2019). Every day, the impact of garbage accumulation makes the situation worse. In addition, the water is polluted, the recent hot temperatures caused by the clearing of a lot of vegetation, and when it rains, many roads are flooded, damaging the property of residents as they are washed away by the water (Dwiyana Putra et al., 2021).

The Special Capital Region of Jakarta is the capital city of Indonesia and is a densely populated location, the problem of waste there often arises. In addition, the population continues to grow every year (Nugraha et al., 2018.) According to information from BPS and the Indonesian Plastic Industry Association, there are 64 million tons of plastic waste produced in Indonesia. Every year 3.2 million tons of plastic waste are dumped into the ocean. Every day the amount of plastic waste in the city of Jakarta reaches 34% of the total daily waste in 2019. The average amount of total daily waste in Jakarta in 2019 reached 7,702 and every year 85,000 tons or 10 billion pieces of plastic bags are dumped into the environment. According to a statement from the Ministry of Maritime Affairs and Fisheries, the state of Indonesia is in the second position as the largest contributor of plastic waste in 2019 contributing as much as 3.21 million tons/year (Sari, 2022). Based on the results of the report by Hendiarti revealed that Indonesia now produces 38 million tons of waste annually, 30% of which is plastic. This shows that people continue to use large amounts of plastic and this condition requires the involvement of all social levels in the management of plastic waste in an effort to prevent plastic accumulation. In addition, the government has committed to tackling plastic waste, with a target of reducing 70% by 2025 (Hendiarti, 2018). According to previous research, domestic waste management can be successfully applied as an alternative to the current government waste management method (Hayat & Zayadi, 2018).

The Seribu Islands is a group of islands as well as a marine natural conservation area located 45 km north of Jakarta. Administratively, the Seribu Islands are divided into two sub-districts, namely the North Thousand Islands and the South Thousand Islands. The Seribu Islands cluster has great potential for the development of various industries, especially the fishing and tourism industries. There are 23,000 residents spread across 11 islands, one of which is Kelapa Island, The Seribu Islands are one of the tourist destinations in DKI Jakarta Province because of their beautiful tourist islands. However, there has been accumulation of waste in several Temporary Waste Disposal Sites (TPSS) on each island, especially plastic waste. The Thousand Islands itself does not have a Final Disposal Site (TPA), therefore the community must be made aware and encouraged to participate more in waste management programs through

awareness campaigns for proper waste management developed by the government or non-governmental organizations.

Participation from various parties is one of the keys to the success of an activity or program. (Rosidi & Sumardjo, 2020) explains that there are several important meanings of participation, one of which is community participation in an activity or program which includes decision making, implementation, evaluation, and utilization of the results. Society participation it is influenced by various factors. One of the factors that influence the emergence of community participation is the public's perception of an activity. Perception is an important psychological aspect for humans in responding to the presence of various aspects and symptoms around them. Perception contains a very broad meaning. Various experts have provided various definitions of perception, although in principle it contains the same meaning, namely a direct response (reception) of something and is the process of someone knowing several things through their five senses (Nugraha et al., 2018)

Based on the description given above, the purpose of this study is to identify public perceptions and participation in plastic waste management, analyze the relationship between internal and external factors with perceptions of plastic waste management, and analyze the relationship between public perception and participation in plastic waste management and it is hoped that this research will produce policies to create education programs and technology programs for processing larger plastic waste so that people in the coconut island region can manage plastic waste independently and the problem of accumulation of plastic waste on the island can be resolved in Kelapa Island, Seribu Islands, DKI Jakarta, Indonesia.

2.   Methods

The research used is hypothesis testing or explanatory research using a cross-sectional or cross-sectional design. The study was conducted from September to October 2022. A quantitative research strategy supported by qualitative data is applied in this study. The results of field observations and direct data collection in the field are used to inform the research process for quantitative data using a questionnaire instrument that asks questions about characteristics (age, gender, last education, occupation, monthly income, knowledge, experience, and external factors), perceptions, and community participation in the management of plastic waste. In addition, using the snowball technique for in-depth interviews with selected informants to collect qualitative data. According to the interview rules that have been set, interviews are conducted by asking questions to informants. The population in this study is the people of Kelapa Island, Seribu Islands, DKI Jakarta. Purposive sampling is a sampling technique and the number of samples is 300 respondents. The use of data analysis is univariate and bivariate using the Spearman Rank correlation test. Quantitative data was processed using SPSS version 16.0. To complement the quantitative data, a comprehensive description of the qualitative data analysis is provided.

3.   Result and Discussion

A study was carried out on various characteristics of the people on Kelapa Island regarding the management of plastic waste. Based on table 1, explains that the majority of respondents aged 17-26 years amounted to 76 people (25.3%) which was dominated by female sex as many as 162 respondents (54%), the last education was more dominant high school as many as 130 people (43.3%), more people do not work as many as 180 respondents (60%), low monthly income as many as 247 respondents (82.3%), the most knowledgeable people are 184 respondents (61.3%), community experience in plastic waste management activities dominated by 299 respondents (99.7%), as many as 152 respondents (50.7%) answered that the role of government/community leaders in plastic waste management activities had a high level, and as many as 156 people (52%) thought that infrastructure adequate plastic waste management. For public perception, it shows that people who have positive perceptions in plastic waste management are at most 261 people (87%), respondents who have neutral perceptions are 36 people (12%), and only 3 people have negative perceptions (1%).

People in Kelapa Island agree that plastic waste needs to be managed every day so that there is no pile of garbage that has a negative impact on local residents and the environment. The local community agrees that the management of plastic waste with the principle of recycling is an effective strategy to deal with the problem of plastic waste. In community participation, most people have a high participation category as many as 153 people (51%), while respondents with a low participation rate are 147 people (49%). These results indicate that the majority half of the total number of respondents, have been involved either directly or indirectly in plastic waste management. According to residents in Kelapa Island, reusing used plastic bottles can be used to store containers such as detergent, cooking oil, perfume for clothes, and others so as to minimize waste. And local residents often donate monthly fees to improve plastic waste management facilities. Prevention and control strategies are used to prevent environmental pollution. In theory, preventive strategies reduce pollution at the source to avoid more negative environmental impacts. Reusing, reducing and recycling can help the environment, for example, by reducing the amount of waste generated (Dwiyana Putra, et al., 2021).

Table 1. Distribution of respondents based on community characteristics in plastic waste management (n= 300)

Characteristics	n	%
Age		
17-26 Year	76	25.3
27-36 Year	58	19.3
37-46 Year	67	22.3
47-56 Year	60	20
≥57 Year	39	13
Gender		
Man	138	46
Woman	162	54
Education		
elementary school	100	33.3
junior high school	53	17.7
Senior High School	130	43.3
Diploma/undergraduate/postgraduate	17	5.7
Work		
Doesn't Work	180	60
High	120	40
Monthly Income		
Low < Rp 2.444.301	247	82.3
High > Rp 2.444.301	53	17.7
Knowledge		
Low	116	38.7
High	184	61.3
Experience		
Low	1	0.3
High	299	99.7
Role of Government/Community Leader		
Low	148	49.3
High	152	50.7
Facilities and infrastructure		
Inadequate	144	48
Adequate	156	52
Public Perception		
Negative	3	1
Neutral	36	12
Positive	261	87
Community Participation		

Characteristics	n	%
Low	147	49
High	153	51

public figure (r=0.176) with public perception shows that the strength in the relationship is very weak, and has a positive direction of relationship.

The average age of the community in Kelapa Island is 39 years which is included in the category of late adulthood. Plastic waste management actions can be done by anyone, the age variable has no effect on perceptions with p-value=0.934. Considering that the respondents are still in their productive age, managing plastic waste is not difficult for anyone of all ages. Perception depends on the ability and willingness of the community, waste management can be done by anyone, not determined by age. This condition is in accordance with research conducted by Rahmadda et al that age does not significantly affect perception (Rahmadda et al., 2021).

There are more women in the community because women pay more attention to the environmental conditions around them. Even though there are more women, gender has no relationship

Table 2. Spearman rank correlation test between internal and external factors with public perceptions of plastic waste management

Variable	R	P-value	Status
Internal factors			
Age	-0.005	0,934	Not Related
Gender	0.040	0.495	Not Related
Education	-0.031	0.588	Not Related
Work	-0.007	0.897	Not Related
Monthly Income	0.025	0.670	Not Related
Knowledge	0.184	0.001	Related
Experience	-0.022	0.700	Not Related
External factors			
Role of Government/ Community Leader	0.176	0.002	Related
Facilities and infrastructure	-0.015	0.792	Not Related

Based on table 2, the findings of the Spearman rank test show that there is no relationship between the variables of age (p-value=0.934), gender (p-value=0.495), latest education (p-value=0.588), occupation (p-value=0.897), monthly income (p-value=0.670), experience (pvalue=0.700), facilities and infrastructure (pvalue=0.792) with public perception of plastic waste management. Meanwhile, the knowledge variable (p=0.001) and the role of government/community leaders (p=0.002) showed a relationship with public perception. The correlation value obtained between knowledge (r=0.184) and the role of government or with perception because all people in Kelapa Island get the same information about this waste management. Even if the gender of the respondent is different, if the information comes from the same environment, a perspective that tends to be the same will develop. Therefore, gender does not have much influence on how the general public perceives the management of domestic waste with p-value=0.495. According to Nugraha et al, there is no correlation between gender and the perception of waste management (Nugraha et al., 2018).

Table 3. Spearman rank test between public perception and participation in plastic waste management

Participation	Perception						R	P-value	Status
	Negative		Neutral		Positive				
	n	%	n	%	N	%			
Low	0	0	7	19.4	140	53,6	-0.241	0.000	Related
High	3	100	29	80.6	121	46.4			

The last education level of the community is mostly high school, the first is high school and the second most is elementary school. It shows how people are becoming more aware of the need to prepare for their schooling as life progresses. The most recent education level of respondents is in the high school category, in this variable it is known that there is no relationship with public perception of plastic waste management with p-value=0.588 .The results of the study differ from those of Rahmadda et al, according to which there is a relationship between education and public perception, which means that the public's perspective on waste management increases along with the increase in education level (Rahmadda et al., 2021). Study about works, most respondents do not work because many are still students and work as housewives. How much free time a person can use may depend on their job position. Naturally there will be more free time for respondents who do not work than respondents who work so it doesn't have a significant effect with p-value= 0.897. As with the management of plastic waste with 3R, this can be applied with an unrestricted or flexible time, for example the use of used bottles that are no longer used as perfume containers or other activities such as community service which is usually carried out on holidays. In line with research by Nugraha et al which explains that there is no relationship between perception and employment status (Nugraha et al., 2018).

The number of people's monthly income is also low because many people do not have permanent jobs and salaries are below the minimum wage. The monthly income of the people on Kelapa Island is lower, because the people there work more as fishermen whose income is not much, and there are also some residents who do not have permanent jobs. The existence of a waste bank system that can be carried out by the community will certainly be an additional result of the community's money, even though it is not much. In this variable, it is known that there is no relationship between income and perception with p-value=0.670. This study is in line with Nugraha et al who said that there was no significant correlation with perception. Although the income of respondents is low, the perception of plastic waste management is positive and the level of participation is high (Nugraha et al., 2018). The majority of public knowledge is high about plastic waste management, that people know that waste generation that is left unmanaged will bring flooding, pollution, and sources of disease. Respondents also know that plastic is difficult to destroy and requires a long process and waste management with 3R principles can help waste management quickly, reduce costs, and does not require a lot of land. Knowledge has a relationship with public perception with p-value= 0.001, this is because people are aware and know that there are many benefits to plastic waste management, and people also know the dangers that occur when managing waste properly. Due to the assistance of the government and local community leaders by conducting counseling, it changes the respondents' views or perceptions of plastic waste. Therefore, encouragement or support given by someone who can be trusted or has an important role in a group will lead to positive results. Effective waste management can not only improve the cleanliness and attractiveness of the environment but also stop the spread of infectious disease vectors that are harmful to human health (Singh & Sharma, 2016).

Almost 100% of the people have done or participated in activities to reduce plastic waste, such as processing it into compost, making handicrafts, saving plastic waste in the waste bank, and doing community service to clean up the surrounding environment. Almost all of the community experiences in waste management activities on Kelapa Island have participated in activities held by the local area. Most people participate in socialization or counseling activities, sorting organic and non-organic waste, and transferring plastic waste to TPS, and others. This shows that the act of community participation is high, although there are still many people who take part in one or two activities from the role of local stakeholders in making efforts to manage plastic waste is quite high. The role of stakeholders is important in developing a waste management plan, so that an effective and efficient plan can be drawn up (Karl et al., 2019). According to the community, the efforts that are often carried out by the government are counseling on waste selection and training on the manufacture of plastic waste recycling products. According to some respondents, the role of the government or community leaders plays an important role in waste management with p-value=0.002, because it can provide important information about waste

problems and the community is also motivated to be motivated to do things that can reduce waste. According to Nugraha et al (2018), there is a correlation between the role of government/community leaders and public perception. The role is very influential with the perception and participation of the community to do it, because they are people who are respected. Support from the government and toma is very helpful in the urgency of reducing plastic waste (Nugraha et al., 2018); (Sighicelli et al., 2018).

The infrastructure facilities provided in the management of plastic waste are adequate, such as the presence of separate organic and non-organic waste bins, sufficient number of trash cans, and there is also an integrated waste disposal site. The infrastructure in this study did not have a significant correlation with p-value= 0.792. Not in line with research which argues that infrastructure has a correlation with public perception of waste management. According to the study, if the facilities are adequate then the public perception is positive. Because infrastructure is a facility that can support success in waste management efforts (Nugraha et al., 2018). However, in this study it was found that there are still some people who think that the infrastructure is inadequate. According to some people, there are no administrators or institutions that are specifically engaged in the management of plastic waste. That the completeness of infrastructure facilities can support success in waste management and is an important factor for the problem of plastic waste.

Based on table 3, the results show that there is a significant relationship between public perception and participation in plastic waste management in Kelapa Island, Seribu Islands, DKI Jakarta with a significant value (p-value 0.000 < 0.05). The result of the correlation coefficient (r) between perception and community participation is -0.241 which means that if the individual's perception of plastic waste management is negative, the participation will be low, and vice versa. This means that there is a very weak relationship strength in the two variables, and the direction of the relationship is negative. This study agrees with Nugraha et al (2018), that a person's participation is based on perception, so that perception has a relationship with participation. A person's activity will not necessarily be realized because it requires supporting components in order to be realized. The manifestations of these actions are supported by perception, which makes them directly tied to one's actions. People who live in a supportive environment will have a good opinion about the overall management of plastic waste and can serve as a motivator or supporter of community initiatives to reduce plastic waste (Nugraha et al., 2018); (Hazah et al., 2022). By changing the consumptive lifestyle, namely changing habits from exaggeration and throwing away a lot of waste to being efficient so that it only produces less waste, reducing waste generation is one way that people can participate in household waste management (Findy et al., 2022). Perception is the ability of humans to feel various elements and symptoms around them and have an important psychological role in how they react to them. The definition of perception is quite broad. According to various experts, there are many different understandings of what perception is, although in principle it contains the same meaning. Perception is a direct response to something as well as a method in which a person acquires certain knowledge through his five senses (Nugraha et al., 2018). Even by looking at people's perceptions, policy making can be used as a reference by functional elements that function to show positive and negative aspects of the perception of waste management and what things are obstacles in waste management in the community. This approach is fully adapted to the context of the situation and conditions of the community (Janah, 2021).

One strategy to prepare for the increasing amount of urban waste due to population growth is to arrange a waste management plan that involves the community. Starting with waste management practices such as collection, storage, sorting, and recycling that can involve the role of the community. Participation is the direct or indirect involvement of the community in determining the direction of activities and implementation plans (Suminto, 2017); (Rahmadda et al., 2021). Candra in Rahmadda reveals that community involvement in waste management is seen not only in their involvement in the implementation process of waste management, but also in their involvement in being members of an organization related to waste problems that also actively participates in planning good waste management procedures (Rahmadda et al., 2021). Increased public awareness and attention to waste will result in

community support for government initiatives to address the waste problem, which will be something essential to do to cut waste output (Widaningsih & Meitriana, 2022).

4.   Conclusions

Based on the results of the research conducted, it can be concluded that public perception is positive. The participation of respondents in the management of plastic waste has a high level. The environment is supportive and most people already know the benefits of plastic waste management, but there are things that become the focus of attention is the internal factor of the individual that is relevantly correlated with public perception is knowledge. The knowledge variable is known to have a relevant relationship with perception because the basis for individuals to build perceptions of events in the surrounding environment is knowledge. Because looking at the characteristics of community education, very few enter the university level and most only complete education at the elementary school level. This low education is what ultimately causes knowledge about plastic waste processing to be very lacking, moreover not all levels of education have a curriculum on plastic waste processing.

While the external individual factors that have a relationship with public perception are the role of the government and community leaders. Public perception and participation in plastic waste management has a correlation. This shows that someone will participate more actively in plastic waste management if they have a good impression of it. Based on the conclusions, it is very important to continue to involve community leaders who function as pioneers for the progress of a region, for example, the government has a program to recycle plastic waste into goods that can be reused by people on the island and can be resold so as to increase income and increase the economic level of the community or other programs that are of interest to the island community in processing the plastic waste they produce.

Moreover programs are holding monthly monitoring and outreach sessions to ensure that the handling of the problem of plastic waste is running smoothly or less effectively, and it requires stability and continuous development of programs and programs that have been functioning successfully.

References

Arico, Z., 2018. Pengolahan Limbah Plastik Menjadi Produk Kreatif Sebagai Peningkatan Ekonomi Masyarakat Pesisir. Jurnal Pengabdian Kepada Masyarakat , Volume I, pp. 1-6.

Arico, Z. & Jayanthi, S., 2018. Pengolahan Limbah Plastik Menjadi Produk Kreatif Sebagai Peningkatan Ekonomi Masyarakat Pesisir. Martabe : Jurnal Pengabdian Kepada Masyarakat, Volume 1(1), pp. 1-6.

Arico, Z. & S, J., 2018. Pengolahan Limbah Plastik Menjadi Produk Kreatif Sebagai Peningkatan Ekonomi Masyarakat Pesisir.

Arifin, M. Z., 2017. Dampak Sampah Plastik Bagi Ekosistem Laut. Buletin Matric, Volume 14 No.1, pp. 1-5.

Dwiyana Putra, I. M. O., Sugiartha, I. N. G. & Suryani, L. P., 2021. Pengelolaan Sampah Plastik Rumah Tangga dalam Rangka Pencegahan Pencemaran Lingkungan (Study di Lingkungan Kelurahan Pedungan Kecamatan Denpasar Selatan Kota Denpasar). Jurnal Konstruksi Hukum, Volume 2 No.1.

Hayat, H. & Zayadi, H., 2018. Model Inovasi Pengelolaan Sampah Rumah Tangga. Jurnal Ketahanan Pangan, Volume 2 No.2, pp. 131-142.

Hazah, H., Syarifuddin, H. & HD, E., 2022. Persepsi dan Partisipasi Masyarakat dalam Pengelolaan Sampah Rumah Tangga Kecamatan Tungkal Ilir Kabupaten Tanjung Jabung Barat. Pembangunan Berkelanjutan, 5 No.1(https://online-journal.unja.ac.id/JPB/issue/view/1361), pp. 41 - 45..

Hendiarti, N., 2018. Combating Marine Plastic Debris in Indonesia', Coordinating Ministry For Maritime Affairs Republic Of Indonesia. Coordinating Ministry For Maritime Affairs, pp. 1-18.

Holmberg, K., Stripple, J., T. & N., 2019. Need a bag? A review of public policies on plastic carrier bags – Where, how and to what effect?. Waste Management: international journal of integrated waste management, science and technology, Volume 87, pp. 428-440.

Janah, F. M., 2021. Kajian Persepsi Masyarakat tentang Pengelolaan Sampah di Hilir Daerah Aliran Sungai Brantas. Environmental Pollution Journal, Volume 1 No.2.

Nugraha, A., Suhatjo, S. H. & Amin, A. A., 2018. Analisis Persepsi Dan Partisipasi Masyarakat Terhadap Pengelolaan Sampah Rumah Tangga Di Jakarta Selatan. Jurnal Pengelolaan Sumberdaya Alam dan Lingkungan (JPSL), 8 No.1(Vol. 8 No. 1 (2018): Jurnal Pengelolaan Sumberdaya Alam dan Lingkungan (JPSL)).

Nugraha, A., Suhatjo, S. H. & Amin, A. A., 2018. Persepsi dan Partisipasi Masyarakat Terhadap Pengelolaan Sampah Rumah Tangga Melalui Bank Sampah di Jakarta Selatan. Jurnal Pengelolaan Sumberdaya Alam dan Lingkungan, Volume 8 No. 1, pp. 7-14.

Purwaningrum, P., 2016. Upaya Mengurangi Timbulan Sampah Plastik di Lingkungan. Journal Of Urban and Environmental Technology, Volume 8 No.2, pp. 141-147.

Rahmadda, A. L., Simarmata, M. & Brata, B., 2021. Persepsi Dan Partisipasi Masyarakat Terhadap Pengelolaan Sampah Rumah Tangga Di Kota Bengkulu. Penelitian Pengelolaan Sumberdaya Alam dan Lingkungan, Volume 10 No.2.

RI, P. P., 2008. Undang-Undang Republik Indonesia Nomor 18 Tahun 2008 Tentang Pengelolaan Sampah. pp. 1-46.

Rosidi, I. & Sumardjo, S., 2020. Partisipasi, Keefektifan Program, dan Keberdayaan Ekonomi Masyarakat dalam Implementasi Program Corporate Social Responsibility. Jurnal Sains Komunikasi dan Pengembangan Masyarakat [JSKPM], Volume 4 No.5, pp. 635-649.

Sari, G. F., 2022. The effect of proportion of ganyong starch and waste of straw rice. Earth and Environmental Science, pp. 1-9.

S, A. Z. a. J., 2018. Pengolahan Limbah Plastik Menjadi Produk Kreatif Sebagai Peningkatan Ekonomi Masyarakat Pesisir. Jurnal Pengabdian Kepada Masyarakat, Volume 1, p. 1.

Septiani, B. A. et al., 2019. Pengelolaan Sampah Plastik Di Salatiga: Praktik, dan tantangan. Jurnal Ilmu Lingkungan, Volume 17 No.1, p. 90.

Sighicelli, M. et al., 2018. Microplastic pollution in the surface waters of Italian Subalpine Lakes. Environ Pollut, Volume 236, p. 645–651.

Singh, P. & Sharma, V., 2016. Integrated Plastic Waste Management: Environmental and Improved Health Approaches. Procedia Environmental Sciences, Volume 692 – 700, p. 35.

Sompie, F. E., Olfie, B. L. S. & Timban, J. F. J., 2022. Partisiapsi Masyarakat dalam Pengelolaan Sampah di Kelurahan Singkil. Jurnal Agribisnis dan Pengembangan Pedesaan, Volume 3 No.4, pp. 528-540.

Suminto, S., 2017. Ecobrick: solusi cerdas dan kreatif untuk mengatasi sampah plastik. Jurnal Desain Produk, Volume 3 No.1, pp. 1-10.

Suryono, D. D., 2019. Sampah Plastik di Perairan Pesisir dan Laut : Implikasi Kepada Ekosistem Pesisir Dki Jakarta. Jurnal Riset Jakarta.

Utami, M. I. & Aprillia, D. E., 2020. Proses Pengolahan Sampah Plastik di UD Nialdho Plastik Kota Madiun. Journal of Conservation, Volume 9 No.2, p. 89–95.

Widaningsih, N. K. A. & Meitriana, M. A., 2022. Persepsi dan Partisipasi Masyarakat Terhadap Penerapan Program Bank Sampah di Desa Penyaringan. Jurnal Pendidikan Ekonomi, Volume 10 No.1, pp. 115-121.

Z, A. & S, J., 2018. Pengolahan Limbah Plastik Menjadi Produk Kreatif Sebagai Peningkatan Ekonomi Masyarakat Pesisir. Martabe : Jurnal Pengabdian Kepada Masyarakat, Volume 1(1), p. 1.