ISSN No:-2456-2165

Community-Based Waste Management in South Kalimantan

Muhammad Noor Ifansyah
Universitas Diponegoro
Semarang, Indonesia

Hartuti Purnaweni
Universitas Diponegoro
Semarang, Indonesia

Purwanto
Universitas Diponegoro
Semarang, Indonesia

Tri Yuniningsih
Universitas Diponegoro
Semarang, Indonesia

Abstract:- This study is based on an increase in population, which impacts the rapid increase in waste. Efforts to reduce waste at its source are the best way to overcome it. The community as a waste producer is expected to be involved in waste reduction efforts. This research uses a quantitative methodology to analyze data sourced from various documents. It uses the analysis delivered by Miles, Huberman, and Saldana. The results showed that community participation in waste management is in The Waste Banks and TPS3R. These models are widely used because it is easy to apply, and there is an excellent economic turnaround for the community. Nevertheless, private involvement is also still needed in addition to community participation.

Keywords:- *community, participation.*

I. INTRODUCTION

The growth of the world's population is increasing day by day. With the increasing number of people's activities will increase as well. This growth is also accompanied by increasing economic capabilities of the community that will impact consumption patterns. Various activities related to population growth will include various sectors, including the industrial sector, forestry, mining, irrigation, agriculture, infrastructure procurement, housing and settlement, trade, and tourism which will all affect the increase in public consumption.

From year to year, the need for residential land increases along with the increase in population. The high number of residents also affects the volume of domestic waste produced (figure 1)(Kurniawan, Danang Aji. Santoso, 2020; Addahlawi et al., 2020; Purnaweni, 2017; Sudibyo, Irfan and Surya, 2017). Waste is one of the causes of damage to the city environment if not managed properly. The problem of waste cannot be separated from human life and the environment.

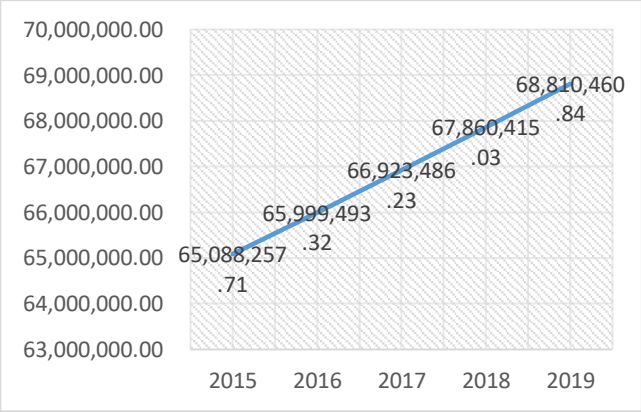


Fig 1:- Projected Waste in Indonesia
Source: KLHK RI, 2021

Recognizing the importance of waste management concerns worldwide, waste management at the international level in the MDGs 2015 Goals and SDGs 2030 Goals, focus on specific waste management on the principle of 3R waste management - Reduce, Reuse, and Recycling (Neriamparampil, 2018).

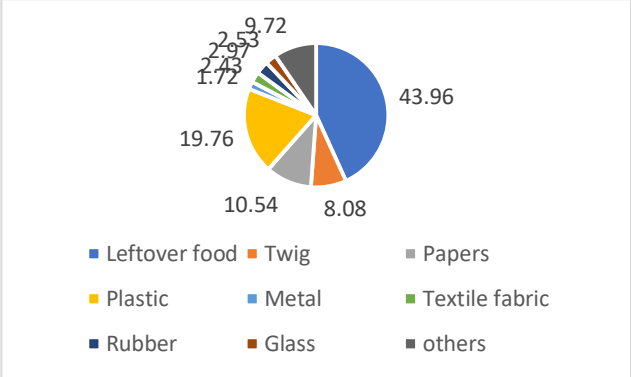
An alternative in tackling the surge in waste is the community's participation to offset the government's limited ability and costs in waste management. So that the target of waste management to be achieved is 100% of waste managed adequately and correctly by 2025 (Indonesia Free of Waste) (Colon and Fawcett, 2006; Wardi, 2011; Saputro, Yuso Eko. Kismartini., 2015; Di Nola, Escapa and Ansah, 2018).

No.	District/City	Waste Handling	Waste Reduction
1	Banjarmasin	68,89%	19,66%
2	Tapin	69,80%	16,54%
3	Banjar	69,67%	17,10%
4	Tabalong	65%	5,5%

Table 1:- Waste Management 4 Cities in South Kalimantan
Source: DLH South Kalimantan, 2021

ISSN No:-2456-2165

The dilemma facing Indonesia is also a matter that the Government of Indonesia considers by issuing Law No. 8 of 2008 on Waste Management. Likewise, one area in Indonesia is South Kalimantan, which faces increasing waste. This is related to the still low rate of waste reduction that has been done; as seen in table 1, the average waste reduction carried out by the four districts/cities with the largest population only carried out a reduction of waste of 14.7% with the composition mostly food waste of 43.96% (figure 2).



Graph 1:- Composition of South Kalimantan Waste 2020 (KLHK RI)
Source: KLHKI RI, 2021

II. LITERATURE REVIEW

The concept of sustainability and sustainable development is a concept that is increasingly being used in the field of public administration. Considering long-term planning, intergenerational fairness, risk reduction, and resource conservation in administrative planning, sustainability may have a significant contributing role. In applying broad-based sustainable development, it is found to reflect the efficiency, effectiveness, and participation of citizens. Sustainable development can be applied to many public sector jobs, including providing transportation, public housing, human services, and environmental protection. Finally, it demonstrates the unique contribution of sustainability to the field of public administration.

Traditional public administration has been criticized both theoretically and practically, giving rise to a new paradigm that came to be known as Public Management, also called New Public Service. When "development administration" becomes the mainstream paradigm of public administration science, the arguments for the importance of the concept and practice of people's participation in development include:

The people are the central focus and the final goal of development, participation is the logical result of the proposition; (b) Participation gives rise to a sense of self-respect and personal ability to participate in important decisions concerning society; (c) Participation creates a feedback loop of information flows about the attitudes, aspirations, needs, and conditions of the region without which it would not be revealed; (d) Development is better carried out by starting from where the people are and from what they have; (e) Participation in expanding the zone (area) of development project acceptance; (f) He shall extend the reach of government services to the whole community; (g) Participation in sustaining development; (h) Participation provides a conducive environment for both the actualization of human potential and human growth; (i) Participation is an effective way to build the ability of the community to manage development programs to meet the typical needs of the region; (j) Last, but not least, participation is seen as mirroring the democratic rights of individuals to be involved in their own development (Tjokrowinoto 1987: 48-49).

Through individual participation, one can vote in government by following democratic ideals, which have been identified as one of uniqueness (Callahan, 2007). However, it seems universal that mutual agreement and citizen involvement in making decisions is one of the good ideas that are meaningful as community involvement. Community engagement is directly reflected in various forms of interaction in making recommendations. However, not always community participation can be routinely involved in decision-making, in this case, related to community participation in waste management.

Participation, according to Hoofsteede (1971) quoted by Khairuddin (2000), is "The taking part in one or more phases of the process" or taking part in a stage or more of a process, a classic concept to represent the phenomenon of the level or level of participation proposed by Arnstein as a ladder of participation (Arnstein, 1969). The problem of waste is the joint responsibility of every community and government. Waste management is done using community-based waste management methods, namely, managed by the community and the community. The primary strategy is to expand community engagement.

The growing problem of waste growth is experienced by Indonesia and more broadly in global issues such as South Asia, which are most urgent on how to address environmental problems related to declining water quality, sanitation, and health and have a direct impact on the urban poor. Natural crises become disasters for human life that are also revealed by themselves (Véron et al., 2018). The occurrence of the climate crisis is a tragedy for the government and, finally, as a party that has the legitimacy of the government using public participation as an option (Moynihan, 2003).

However, sometimes expanding public participation in environmental planning is not always the best option (Rydin and Pennington, 2000). Based on experience in the United States, even public participation is a form of public distaste and distrust of government performance (Innes and Booher, 2004). Waste management based on community participation has been widely done in other countries, with the main target being the reduction of waste products from their source. The power that the community has is a potential that can support the performance of the country's management.

Nevertheless, the diversity of human resource capabilities can lead to ineffective community waste management (Sakawi, 2011).

That means that the community's involvement needs a model that is by following under the conditions of society so that the model implemented is effective. It is necessary to consider strategies to adopt models that are already running elsewhere (Rydin and Pennington, 2000). The social culture approach can be adopted in waste management. Socio-cultural-based waste management patterns should be done synergistically (integrated) from various elements or collaboratively (Wardi, 2011).

Optimization of adaptive approaches leads to a broader pattern of participation. Environmental issues need to strengthen various actors leading to collaborative patterns for the optimization of sustainable development (Lestari et al., 2020; Imam et al., 2021). Private sector participation in waste management is also carried out in Dar es Salaam City. However, the activity has not proven effective because there is still a lack of public awareness in terms of financing (Kirama and Mayo, 2016). This shows that the Implementation of waste management policies will not be effective if it does not involve the community as the main subject (Charis et al., 2021).

Collaborative participation can solve complex and controversial problems such as budget decision-making and create a conducive climate when there is a dispute (Innes and Booher, 2004), in other words, the desire to understand each other in the form of collaboration (Véron et al., 2018).

Community-based waste management is urgent to be implemented and is the responsibility of the community and the government.

The pattern is to use the governance methods of the community ole and for the community. The model proposed by the Indonesian government in waste management is with the practice of 3R (Reduce-Reuse-Recycle) as stated in Law No. 18 of 2008 on Waste Management. With many management model practices with the concept of 3R, the author wants to yearn for community-based waste management practices in South Kalimantan Province.

III. PAPER OBJECTIVE

This article discusses community-based waste management in South Kalimantan by analyzing the problem of community participation so that later it can explain the factors that support and the factors that inhibit waste management. This article is the original author's writing and has never been published before.

IV. METHODOLOGY

Using a qualitative approach is the way to write this article. Data from the results of previous research is the main source in the review literature review. In addition, it is also used analysis of primary data obtained by primary data and documents in the South Kalimantan Environment Office. The data collected was analyzed with data triangulation techniques using an approach developed by Miles-Huberman (Miles, Matthew B. Huberman, A Michael and Saldana, 2014)

V. RESULT AND DISCUSSION

- *Waste Governance*

The legal basis implemented for the management of Kalimantan community-based waste is Law No. 8 of 2018 on Waste Management. The local government then adopted it by issuing Governor Regulation No. 8 of 2018 on the Implementation of Waste Management. Community participation is listed in Chapter XII Article 50, which regulates the form of community participation as (1) the provision of proposals, considerations, and suggestions to the Local Government; (2) formulation of waste management policies; and (3) the provision of advice and opinions in the resolution of disputes.

Following the rules in the South Kalimantan Plan of years, 2016-2021visi which is carried out means blue development towards sovereignty and sustainable sustainability, spelled out as (1) blue development is development paying attention to environmental rescue efforts; (2) blue economy is an economic system based on the utilization of natural sources productively and efficiently; (3) sovereignty and sustainable capabilities, meaning sustainable development that pays attention to environmental aspects. This shows that the direction of development is carried out towards the direction of Good Environmental Governance (Nugroho, Anam Hady. Setiyono, 2015; Vatn, 2018; Prihatiningtyas and Airlangga, 2019; Addahlawi et al., 2020).

The incidence of waste that is too high requires the government to think again to reduce the incidence of waste. Some landfills have even reached the maximum level of capacity, so innovation is needed in waste management. However, it has been built several new landfills with greater capacity but not the best solution. The construction of the Banjarbakula landfill is an innovation in waste management in South Kalimantan. This landfill model is a model of interconnection between several districts/cities adjacent to the distance (Irawanto and Muluk, 2016).

Accommodating waste disposal in Banjarmasin City, Banjarbaru City, Banjar Regency, Tanah Laut Regency, and Barito Kuala Regency is located in Banjarbaru City with a capacity of 790 tons per day. Other interconnection landfills that are trying to be developed are Tabalong regional landfill and Hulu Sungai Utara Regency, still not continuing due to technical problems with landfill locations. Final processing site development innovation is not easy, and without obstacles, so it needs community involvement.

- *Community Participation in Waste Management*

Community-based waste management in south Kalimantan in the form of The Waste Banks and IWM 3R (Integrated Waste Management 3R) is contained in the Regulation of the Minister of Environment No. 13 of 2012 on the Implementation of 3R through the Implementation of Waste Bank. This is in line with the Millennium Development Goals (MDGs) 2015 and the Sustainable Development Goals

ISSN No:-2456-2165

(SDGs) 2030, one of which is a sustainable waste management program. The 3R concept implemented seeks to reduce the problem of waste and reduce the burden on the government (Neriamparampil, 2018).

Natural crises were due to soaring waste caused by humans themselves (Véron et al., 2018). So community involvement in the problems caused is a formula that may be able to achieve the goal of effective waste reduction and handling (target 30% waste reduction 2025). Until 2021 the Government of South Kalimantan has established 7 and in 2020 have 10 unit main Waste Banks spread across several districts/cities.

As for supporting the main waste bank they also made a unit waste bank. Until 2020 there were 596 units, mainly in Banjarmasin as many as 200 units, and in Barito Kuala as many as 113 units. The government continues to increase the number of waste bank units the following year. This shows that the government is serious about handling waste, the amount of which is increasing every year. The government through the environmental service appreciates community-based waste management by giving awards. Waste bank awards with assessment indicators including the existence of a waste bank building, the number of customers, standard operating procedure and management of incoming waste capacity from customers, the environment around the waste bank, to the cash flow of the waste bank.

No.	Years	Facility
1	2020	Main Waste Bank of Panggung Berseri
2	2020	Main Waste Bank of Bakunci
3	2020	Main Waste Bank of Kuala Lupak
4	2020	Main Waste Bank of Mulia Abadi
5	2020	Main Waste Bank of Tapin
6	2020	Main Waste Bank of Hulu Sungai Selatan
7	2020	Main Waste Bank of kapar
8	2020	Buncu Elha
9	2020	Main Waste Bank of Dewa Ruchi
10	2020	Main Waste Bank of Batulicin
11	2021	Main Waste Bank of Mulia Abadi
12	2021	Main Waste Bank of Kuala Lupak
13	2021	Main Waste Bank of Tapin
14	2021	Main Waste Bank of Hulu Sungai Selatan
15	2021	Main Waste Bank of Batulicin
16	2021	Ulin Jaya
17	2021	Main Waste Bank of Banjarbaru

Table 2:- List of South Kalimantan Main the Waste Banks 2020-2021
Source: SIPSN MenLHK, RI 2021

Waste management through a waste bank system or saving waste is synonymous with saving money in the bank. Waste management is expected to solve the problem of waste by involving all citizens of the community. This model is the potential that can improve the economy of the community. In addition to a clean environment, people also get economic benefits from waste sorting activities carried out. The application of The Waste Banks, starting from sorting, and waste management to sales through The Waste Banks, urgently needs to be done to increase awareness of the importance of a healthy environment (Towolioe et al., 2016; Wulandari, Utomo and Narmaditya, 2017; Saputro, Yuso Eko. Kismartini., 2015; Affandy, Isnaini and Laksono, 2017).

No.	District/City	Unit
1	Banjarmasin	200
2	Banjarbaru	45
3	Banjar	25
4	Tanah Laut	20
5	Barito Kuala	113
6	Tapin	80
7	Tabalong	17
8	Hulu Sungai Utara	6
9	Hulu Sungai Tengah	2
10	Hulu Sungai Selatan	28
11	Tanah Bumbu	4
12	Kotabaru	30
13	Balangan	26
Amount		596

Table 3:- List of South Kalimantan Unit the Waste Banks 2021
Source: SIPSN MenLHK, 2021

But its Implementation is not without obstacles, although it has an economic impact on many people who are still reluctant to participate in waste management. The traditional paradigm in waste disposal is still dominantly carried out by the community. People think they have paid a levy on managing waste and do not need to be directly involved.

No.	District/City	Unit
1	Banjarmasin	20
2	Banjarbaru	4
3	Banjar	20
4	Tanah Laut	2
5	Barito Kuala	7
6	Tapin	4
7	Tabalong	6
8	Hulu Sungai Utara	10
9	Hulu Sungai Tengah	6
10	Hulu Sungai Selatan	4
11	Tanah Bumbu	6
12	Kotabaru	0
13	Balangan	10
Amount		99

Table 4:- TPS3R South Kalimantan Year 2020
Source: SIPSN MenLHK, 2021

In addition to waste, banks also built Integrated Waste Management 3R with a pattern of community participation with a form of communal participation. Until 2020, there are 99 IMW 3R units have been built in South Kalimantan. The direction of the IMW 3R concept is to strive for the reduction of waste from its source on a communal scale or area to reduce the burden of waste processed in landfills.

ISSN No:-2456-2165

In addition to the waste bank, the government's effort to involve the community in waste management is to build a compost house. Until 2021, 125 compost houses have been built in districts/cities in South Kalimantan. With the compost house, efforts are made to make the maximum use of this waste that can be processed, such as plastic waste which is now being sorted in The Waste Banks and Integrated Waste Management 3R.

No.	District/City	Unit
1	Banjarmasin	6
2	Banjarbaru	29
3	Banjar	2
4	Tanah Laut	6
5	Barito Kuala	45
6	Tapin	9
7	Tabalong	0
8	Hulu Sungai Utara	0
9	Hulu Sungai Tengah	8
10	Hulu Sungai Selatan	20
11	Tanah Bumbu	0
12	Kotabaru	0
13	Balangan	9
Amount		125

Table 5:- Composting Scale RTRW South Kalimantan
Source: SIPSN MenLHK, 2020

Having similar concepts to The Waste Bank, Integrated Waste Management 3R applies the concept of sorting, composting, and reuse. The allocation of funds from the government in infrastructure development and maintenance distinguishes it from The Waste Banks. Waste recycling activities and The Waste Banks, are most in demand by the community because these activities do not embrace high costs. In addition to getting environmental hygiene benefits, people get economic benefits in practice. It means that economically it can improve the welfare of the community. This is the attraction of recycling activities and The Waste Banks (Towolioe et al., 2016; Wulandari, Utomo and Narmaditya, 2017; Wulandari, Utomo and Narmaditya, 2017; Sudibyo, Irfan and Surya, 2017). From the phenomenon that occurs, it can be seen that the public wants to participate in an economic motive and social motive (Bachtiar, 2014).

But the levy system is still an obstacle because there is still a lack of community existence. The community complains about the overlapping levy system, namely waste collection dues and waste transportation levy (temporary collection point -landfills). In addition, there is rampant disposal of unhealthy waste, such as removing waste in the river. The assumption that the community disposes of waste in the river will not damage the ecosystem because it will decompose by itself. Burning waste is also a way for people to reduce waste, even though leaving residues also causes air pollution. Public awareness is key to community participation. Efforts to increase public awareness are made by socializing about the correct waste governance. The openness of information becomes a factor that can encourage an increase in the level of community participation.

With the openness of public knowledge about the importance of waste management will increase (Bachtiar, 2014; Dhokhikah, Trihadiningrum, and Sunaryo, 2015; Riswan, Sunoko, and Hadiyanto, 2015; Sulistiyorini, Darwis and Gutama, 2015). The correct delivery of information must also be supported by human resource capabilities. Therefore, reliable human resources are needed in increasing community participation.

Waste management that has been implemented will also not work well if the involvement of other actors is not considered like private parties that always assist in the form of funding for the development of Integrated Waste Management 3R. The collaborative concept is the answer to the problem of waste in South Kalimantan.

VI. CONCLUSION

Through the participation of the community, the problem of waste in South Kalimantan will be overcome. By enabling individual participation as well as community participation, the community is involved through The Waste Bank and Integrated Waste Management 3R. In addition to community collaboration with private parties also need to be involved.

REFERENCES

[1]. Addahlawi, H. A. *et al.* (2020) 'Implementasi Prinsip Good Environmental Governance Dalam Pengelolaan Sampah Di Indonesia', *Jurnal Green Growth dan Manajemen Lingkungan*, 8(2), pp. 106–118. doi: 10.21009/jgg.082.04.

[2]. Affandy, N. A., Isnaini, E. and Laksono, A. B. (2017) 'Analysis on 3RWB model (Reduce, reuse, recycle, and waste bank) in comprehensive waste management toward community-based zero waste', *AIP Conference Proceedings*, 1855. DOI: 10.1063/1.4985507.

[3]. Arnstein, S. R. (1969) 'A Ladder Of Citizen Participation. Journal of the American Institute of Planners, *Journal Of The American Institute Of Planners*, 35(November 2012), pp. 37–41. DOI: 10.1080/01944366908977225.

[4]. Bachtiar, H. (2014) 'Pengembangan Bank Sampah Sebagai Bentuk Partisipasi Masyarakat Dalam Pengelolaan Sampah (Studi Pada Koperasi Bank Sampah Malang)', *Jurnal Administrasi Publik Mahasiswa Universitas Brawijaya*, 3(1), pp. 128–133.

[5]. Callahan, K. (2007) 'Citizen participation: Models and methods, *International Journal of Public Administration*, 30(11), pp. 1179–1196. DOI: 10.1080/01900690701225366.

[6]. Christiani, C. *et al.* (2021) 'Implementation of Desa Tangguh Bencana policy in Magelang Regency', *Management and entrepreneurship: trends of development*, 2(16), pp. 18–30. DOI: 10.26661/2522-1566/2021-1/16-02.

[7]. Colon, M. and Fawcett, B. (2006) 'Community-based household waste management: Lessons learned from EXNORA's "zero waste management" scheme in two South Indian cities', *Habitat International*, 30(4), pp.

916–931. doi: 10.1016/j.habitatint.2005.04.006.
[8]. Dhokhikah, Y., Trihadiningrum, Y. and Sunaryo, S. (2015) 'Community participation in household solid waste reduction in Surabaya , Indonesia', *'Resources, Conservation & Recycling'*, 102, pp. 153–162. doi: 10.1016/j.resconrec.2015.06.013.
[9]. Imam, R. *et al.* (2021) 'Public administration', 2, pp. 55–67. doi: 10.26661/2522-1566/2021-3/17-05.
[10]. Innes, J. E. and Booher, D. E. (2004) 'Reframing public participation: Strategies for the 21st century', *Planning Theory and Practice*, 5(4), pp. 419–436. DOI: 10.1080/1464935042000293170.
[11]. Irawanto. Muluk, M. R. K. (2016) 'Inter-Regional Cooperation On Regional Landfill Management In Urban Area: A Case Study In Southern Kalimantan Indonesia', *Russian Journal of Agricultural and Socio-Economic Sciences*, 11(59), pp. 138–147.
[12]. Kirama, A. and Mayo, A. W. (2016) 'Challenges and prospects of private sector participation in solid waste management in Dar es Salaam City, Tanzania', *Habitat International*, 53, pp. 195–205. doi: 10.1016/j.habitatint.2015.11.014.
[13]. Kurniawan, Danang Aji. Santoso, A. Z. (2020) 'Pengelolaan Sampah Di Daerah Sepatan Kabupaten Tangerang', *ADIMAS: Adi Pengabdian Kepada Masyarakat*, 1(1), pp. 31–36.
[14]. Lestari, A. W. *et al.* (2020) 'Actor network in tourism management based on sustainable development (Case study of tourism development in Batu City, Indonesia)', *Management and entrepreneurship: trends of development*, 3(13), pp. 8–15. DOI: 10.26661/2522-1566/2020-3/13-01.
[15]. Miles, Matthew B. Huberman, A Michael. Saldana, J. (2014) *Qualitative Data Analysis*. 3rd edn. Arizona: SAGE Publication, Inc.
[16]. Moynihan, D. P. (2003) 'Normative and Instrumental Perspectives on Public Participation: Citizen Summits in Washington, D.C.', *American Review of Public Administration*, 33(2), pp. 164–188. DOI: 10.1177/0275074003251379.
[17]. Neriamparampil, C. C. (2018) 'Zero Waste Kerala: An Innovative Model for Waste Management in India.', *Rajagiri Journal of Social Development*, 10(2), pp. 161–172. Available at: https://search.ebscohost.com/login.aspx?direct=true&db=sih&AN=136488468&lang=pt-br&site=ehost-live.
[18]. Di Nola, M. F., Escapa, M. and Ansah, J. P. (2018) 'Modelling solid waste management solutions: The case of Campania, Italy', *Waste Management*, 78, pp. 717–729. doi: 10.1016/j.wasman.2018.06.006.
[19]. Nugroho, Anam Hady. Setiyono, B. (2015) 'Evaluasi Prinsip Good Environmental Governance (GEG) dalam Penerapan Kebijakan Pengelolaan Sampah di Kabupaten Kendal', *Journal of Politic and Goverment Studies2*, 4(3), pp. 1–10. Available at: https://ejournal3.undip.ac.id/index.php/jpgs/article/view/8737/8497.
[20]. Prihatiningtyas, W. and Airlangga, U. (2019) 'Pengelolaan Wilayah Laut oleh Pemerintah Daerah Berdasarkan Prinsip-Prinsip Good Environmental Governance Wilda Prihatiningtyas : Pengelolaan Wilayah Laut', 2(2), pp. 279–300. doi: 10.20473/mi.v2i2.14744.
[21]. Purnaweni, H. (2017) 'Bom Waktu Sampah', *Suara Merdeka*, 21 February, p. 2017. Available at: https://fisip.undip.ac.id/wp-content/uploads/2017/01/2017_02_21-hal.04_Bom-Waktu-Sampah.pdf.
[22]. Riswan, Sunoko, H. R. and Hadiyanto, A. (2015) 'Kesadaran Lingkungan', *Jurnal Ilmu Lingkungan*, 9(1), pp. 31–39.
[23]. Available at: https://ejournal.undip.ac.id/index.php/ilmulingkungan/article/view/2085.
[24]. Rydin, Y. and Pennington, M. (2000) 'Public Participation and Local Environmental Planning : The collective action problem and the potential of social capital', *Local Environment : The International Journal of Justice and Sustainability*, (November 2013), pp. 37–41. DOI: 10.1080/13549830050009328.
[25]. Sakawi, Z. (2011) 'Municipal solid waste management in Malaysia : Solution for sustainable waste management', *Journal of Applied Sciences in Environmental Sanitation*, 6(December), pp. 29–38.
[26]. Saputro, Yuso Eko. Kismartini., S. (2015) 'Pengelolaan Sampah Berbasis Masyarakat Melalui Bank Sampah', *Indonesian Journal of Conservation*, 4(1), pp. 83–94.
[27]. Sudibyo, H., Irfan, A. and Surya, Y. (2017) 'Technological Evaluation of Municipal Solid Waste Management System in Indonesia', *Energy Procedia*, 105, pp. 263–269. DOI: 10.1016/j.egypro.2017.03.312.
[28]. Sulistiyorini, N. R., Darwis, R. S. and Gutama, A. S. (2015) 'Partisipasi Masyarakat Dalam Pengelolaan Sampah Di', *Share social work*, 5(1), pp. 71–80.
[29]. Towolioe, S. *et al.* (2016) 'The Rukun Warga-Based 3RS and Waste Bank as Sustainable Solid Waste Management Strategy', *PLANNING MALAYSIA: Journal of the Malaysian Institute of Planners*, (Iv), pp. 181–196.
[30]. Vatn, A. (2018) 'Environmental Governance – From Public to Private ?', *Ecological Economics*, 148(January), pp. 170–177. doi: 10.1016/j.ecolecon.2018.01.010.
[31]. Véron, R. *et al.* (2018) 'Social processes in post-crisis municipal solid waste management innovations : A proposal for research and knowledge exchange in South Asia', *Research Ideas and Outcomes*. doi: 10.3897/rio.4.e31430.
[32]. Wardi, I. N. (2011) 'Upaya Mengatasi Masalah Lingkungan Di Bali', *Jurnal Bumi Lestari*, 11 No 1, pp. 167–177. Available at: http://ced.petra.ac.id/index.php/ind/article/viewFile/17683/17594.
[33]. Wulandari, D., Utomo, S. H. and Narmaditya, B. S. (2017) 'Waste Bank : Waste Management Model in Improving Local Economy', *International Journal of Energy Economics and Policy*, 7(3), pp. 36–41.