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## Level of Community Participation in Conducting Waste Sorting in Semarang City

I Ketut Darmawan <sup>1\*</sup>, I Komang Ery Kusnanda <sup>2</sup>, Ni Nengah Sri Labantari <sup>3</sup>,  
Yohanes Parlindungan Situmeang <sup>4\*\*</sup>, I Dewa Nyoman Sudita <sup>5</sup>

<sup>1,2,3</sup> Students of the Masters in Agricultural Science Study Program, Postgraduate Program, Warmadewa University, Denpasar-Bali, Indonesia

<sup>4,5</sup> Lecturer at the Masters in Agricultural Science Study Program, Postgraduate Program, Warmadewa University, Denpasar-Bali Indonesia

\*Corresponding author: \* [darmapuri009@yahoo.com](mailto:darmapuri009@yahoo.com) and \*\* [ypsitumeang63@gmail.com](mailto:ypsitumeang63@gmail.com)

### Abstract

*Waste is unwanted residual material after the end of a process. The problem of waste has become a global issue that is a threat to the environment if it is not properly managed. Based on data from the Klungkung Regency Environmental Service in 2019, from four sub-districts in Klungkung Regency namely Dawan, Banjarangkan, Klungkung, and Nusa Penida, the volume of waste per day is more than 115,000 kg/person/day from a population of more than 230 thousand people, when compared production average waste production weighing 0.5 kg per person/day. Meanwhile, in terms of composition, the highest amount of waste is organic waste (68%), dust, rock and the like (8%), glass and plastic bottles 7%, followed by sheet plastic 5% and plastic 4%. The results of the analysis and depiction on the graph of the survey results were 4 (four) villages that had a high percentage of segregation, namely Semarang Kauh Village (83.33%), followed by Semarang Tengah (82.23%), followed by Semarang Kangin Village (78.87. %) and Semarang Kaja (75.21%). The results of this study prove that two locations have a very low level of sorting waste (less than 50%), namely Jempriring street in Semarang Klod (47.61%), Rama street (42.11%), and Puputan street in Semarang Kangin (44.73%). From this research, it can be concluded that public awareness of sorting waste in the two locations is still lacking.*

**Keyword:** Waste sorting; community, participation.

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### 1. Introduction

The waste problem that is so globalized is an important note for the world to understand. Guinness World Records, which specifically discusses marine debris in the UN Environment Program, reveals that nearly 50% of the ocean is filled with plastic waste with 46,000 plastic pieces for every mile distance. Part of the Pacific Ocean in every 1 kg of marine plants is filled with 6 kg of plastic. An association known as The Blue Ocean Society in marine conservation estimates that more than 1 million birds and 100,000 marine mammals die each year as a result of ingesting plastic scraps mixed in their habitat [1] In Indonesia, waste is also a very serious problem. because it refers to the fact that Indonesian waters are in the dangerous category. His report to the World Bank stated that Indonesia was named the country with the second-largest of 20 countries as a contributor to plastic waste to the sea after China. National solid waste production reaches 151,921 tons per day, and it is even estimated that it can reach 200 thousand tons per day. It is said that every year oceans around the world are filled with plastic waste up to 12.7 million metric tons and Indonesia dumps 3.2 million metric tons of plastic waste with 0.48 million-1.29 metric tons into the sea.

The government has anticipated environmental damage by issuing several regulations related to environmental management, one of which is the Law on Waste Management [2]. The State Minister for the Environment also takes part in describing the handling of waste ranging from

household waste to factory waste containing chemicals that can easily pollute the environment, but in practice, it is still far from expectations.

Especially in Bali Province, the waste problem received serious attention so that a Governor Regulation [3] and technical guidelines on Source-Based Waste Management were issued [4]. Based on data on the generation of waste in Bali Province in 2018, it reached 4,281 tons or 1.5 million tons each year [5]. Of this amount, 2,061 tonnes / day (48%) of the waste handled properly, only 4% (164 tonnes / day) (164 tonnes / day) and 1,897 tonnes / day (44%) disposed of to the TPA. Waste that has not been handled is 2,220 tonnes/day (52%) by burning / dumping it into the environment which causes almost all landfills to experience overload, fire, soil, water, and air pollution. Based on data [6], the amount of waste generated in the Klungkung Regency reaches 340 tons/day. Of this total generation 12 tonnes/day (3%) has been recycled, 32 tonnes per day (15%) per day is transported to the final processing site (TPA), burned 75 tonnes/day (22%), and wasted 156 tonnes/day ( 40%). Seeing this problem, efforts are needed to speed up waste processing by reducing its volume.

One of the efforts to solve the problem of high waste being disposed of in TPA is by implementing Bali Governor Regulation Number 47 of 2019 [3] through community participation/participation in carrying out waste management by sorting household waste and other types of household waste from waste-producing sources. Sources of waste can come from households, offices, schools, places of worship, and others. Based on data from the Environmental Office of Klungkung Regency [6, 7], from four sub-districts in Klungkung Regency namely Dawan, Banjarangkan, Klungkung, and Nusa Penida, the volume of waste per day is more than 115,000 kg/person/day from a population of more than 230. thousand people, when compared to the average production of 0.5 kg of waste per person/day. Meanwhile, in terms of composition, the highest amount of waste is organic waste (68%), dust, rock and the like (8%), glass and plastic bottles 7%, followed by sheet plastic 5% and plastic 4%. This study aims to determine the level of obedience and the basic reasons for community compliance in sorting waste in Semarapura City and to formulate the recommendations needed to encourage waste sorting in Semarapura City.

## **2. Materials and Methods**

This research activity was carried out from 2 to 24 September 2020, which took place in the City of Semarapura. The method used in this research is through questionnaires and interviews with respondents in six sub-districts, each of which takes three roads where waste transportation services are taken, except for Kelurahan Semarapura Kaja which is taken two roads with the number of respondents (location points) of 532 people.

## **3. Results and Discussion**

Based on the results of a survey which was carried out for three days at 18 location points spread over six sub-districts in Semarapura City by using direct interview method with respondents in 17 (seventeen) roads. The number of respondents reached 532 respondents who responded to the question of whether they sorted/did not sort the waste, the results are presented in Table 1. While the level of compliance with waste sorting according to urban villages in Semarapura City can be seen in Figure 1.

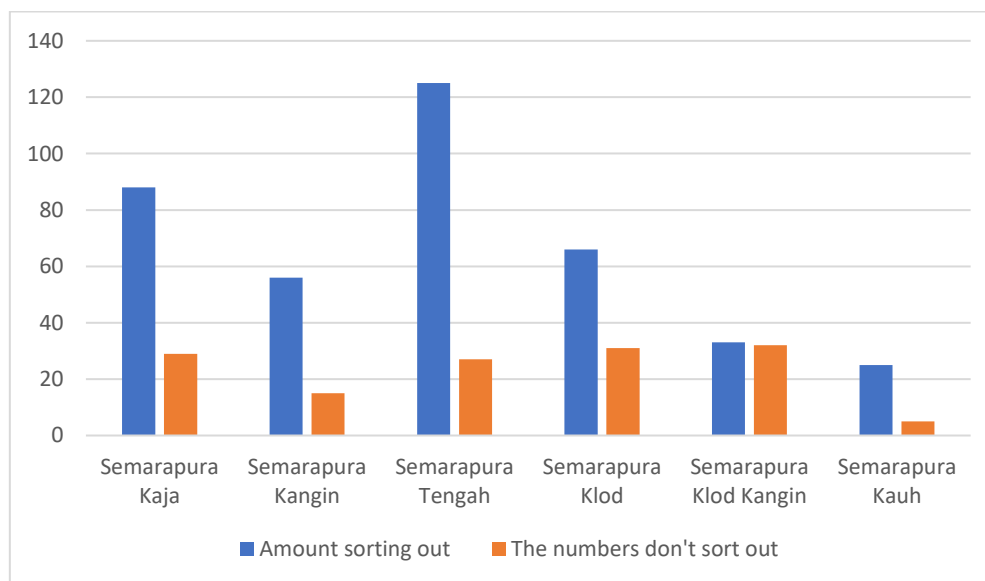
Based on the survey results, it shows that 26.12% of the population of Semarapura City still do not sort their waste. This is very unfortunate because the Klungkung Regency government has carried out persuasive steps which were emphasized by not taking the waste if it is not sorted by the garbage transport officer.

When analyzed more deeply, three locations have a very low level of sorting waste (less than 50%), namely Semarapura Klod Village, Jempiring Street (47.61%), Semarapura Klod Kangin Village, Rama Street (42.11%), and Puputan Street, Klod Kangin, Semarapura village (44.73%), so that a temporary assumption can be drawn that the awareness of the community in the two locations in sorting waste is very lacking, so it is necessary to take a persuasive approach through

socialization involving village heads and neighborhood heads, considering that the population is very heterogeneous and many migrants from outside Klungkung Regency and Bali Province.

**Table 1.** Survey results on community compliance in sorting waste in Semarapura City

No	Urban Villages	The number being monitored	Amount sorting out	Unsorted amount	The percentage voted
1	Semarapura Kaja	117	88	29	75,21%
	- Ahmad Yani Street	96	67	29	69,79%
	- Arief Setia Budi Street	21	21	0	100,00%
2	Semarapura Kangin	71	56	15	78,87%
	- Gajah Mada & G.Semeru Street	43	38	5	88,37%
	- Diponegoro Street	17	11	6	64,70%
	- G. Agung & G. Batur Street	11	7	4	63,63%
3	Semarapura Tengah	152	125	27	82,23%
	- Gajah Mada & Pattimura Street	48	36	12	75,00%
	- Ngurai Rai & Untung Surapati Street	59	52	7	88,13%
	- Dewi Sartika Street	45	37	8	82,22%
4	Semarapura Klod	97	66	31	68,04%
	- Flamboyan & Kecubung Street	48	33	15	68,75%
	- Puputan Street	28	23	5	82,14%
	- Jempiring Street	21	10	11	47,61%
5	Semarapura Klod Kangin	65	33	32	50,76%
	- Diponegoro Street	8	8	0	100,00%
	- Rama Street	19	8	11	42,11%
	- Puputan Street	38	17	21	44,73%
6	Semarapura Kauh	30	25	5	83,33%
	- Waturenggong Street	12	12	0	100,00%
	- Pudak Street	8	7	1	87,50%
	- Flamboyan Street	10	6	4	60,00%
<b>Total</b>		<b>532</b>	<b>393</b>	<b>139</b>	<b>73,87%</b>



**Figure 1.** The level of compliance with waste sorting according to urban villages in Semarapura City

The results of the analysis and depiction in the graph above can be conveyed that there are 4 (four) villages that have a high percentage of segregation, namely Semarapura Kauh Village (83.33%), followed by Semarapura Tengah (82.23%), followed by Semarapura Kangin Village (78.87%) and Semarapura Kaja (75.21%). According to the table above, it can be seen that the number of people sorting waste in Semarapura Village, Arief Setiabudi street reaches 100%, this is because the population is homogeneous consisting of one Adat Banjar and the implementation of Awig-awig (customary agreement) on the schedule for disposal and sorting of waste. According to Duncan's theory, environmental problems (especially the urban environment) have an interdependent relationship with demographic, organizational, and technological aspects known as the POET model. Garbage is part of an environmental problem that is strongly influenced by population and its socio-economic and cultural activities, technology, and developing social organizations [8].

Another thing is also seen the high awareness of the community in sorting waste, namely in the Street Shopping Complex in Diponegoro (88.37%) and Waturenggong street (100%) and also Puputan street, Semarapura Klod (82.14%) considering the existence of inspections by the Regent of Klungkung and Units. Civil Service Police and the application of strict sanctions against the enforcement of the Klungkung Regency Regulation on Waste Management [9].

One of the roles of custom or belief in society is in terms of sanitation or environmental health. These customs and beliefs are not only in the form of written regulations, but can also be in the form of slogans, mottos, appeals, and so on. An example is a motto "Cleanliness Is Part of Faith". By including the word "Faith" in the motto raises hope for the motto maker so that if the reader does not maintain cleanliness then he has not enough faith or has not carried out his religious commands properly [10, 11].

Meanwhile, the results of the opinion collection conducted by the extension officer of the Klungkung Regency Environment and Land Service in September 2020 regarding the absence/lack of sorting waste, namely a lack of understanding of the types/categories of waste produced, namely organic, inorganic, and residual waste. and B3 waste. To keep the waste transported, several people have implemented a strategy, namely by placing inorganic waste at the bottom and organic at the top, and vice versa according to the transportation schedule, thus tricking the officers and finally being transported. The transportation schedule consists of Monday and Friday in-organic waste, the rest is organic waste and residue. There is tolerance by the transportation officer that there is still organic waste mixed with inorganic with a little composition, especially the servant lanes in the alleys. The pattern of transporting waste from the transfer location or directly from the waste source to the final disposal site is carried out according to the Indonesian national standard [12].

#### **4. Conclusion**

The lowest percentage level of community participation in sorting waste is in Kelurahan Semarapura Klod Kangin (50.76%), especially on Rama street (42.11%) and Puputan street (44.73%). The percentage of community participation with the highest level of awareness in sorting waste is in Semarapura Kauh Village (83.33%), Waturenggong street (100%), and Moh. Thamrin street which reached 100% and Semarapura Tengah Village (82.23%), Ngurah Raid and Untung Surapati street (88.13%). The role of customary institutions, population homogeneity, and enforcement of regulations is very significant in increasing community participation in sorting waste as discussed above.

It needs to be more optimal in encouraging the involvement of traditional villages to increase the percentage of sorting waste, this has been proven by the results of sorting in Semarapura Kaja Village, Arief Setiabudi street due to the implementation of awig-awig by Banjar Adat Besang Kawan. There needs to be guidance and enforcement of Klungkung Regency Regulation No. 07/2014 concerning waste management so that there is a deterrent effect for people who are not disciplined in obeying the hours of garbage disposal and sorting waste. Research needs to be

carried out regularly to measure the level of community compliance in sorting waste so that the results of the development of participation levels are known as a comparison.

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