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City Branding Against Climate Change and Health Disruption in Prone Region: Initial Study From Semarang Citizen Dealing With Specific Waste Management on Pandemic Covid-19

Maryono Maryono[1,2], Hartuti Purnaweni[2,3] Agus Junaedi[4], Glory Nasarani[4], Lintang Noor Prassanty[2], Handri Setiawan[2], Moch Rifky Pradita[2], Diana Rizky[2], Muhammad Dzaky Tagyuddin[2]

[1] Department Urban and Regional Planning, Faculty Engineering, Diponegoro University; e-mail: maryono@pwk.undip.ac.id
[2] Center for Green Infrastructure Resilience Development, Diponegoro University
[3] Public Administration Dept, Faculty of Social Science and Political Science, Universitas Diponegoro
[4] Doctoral Program Environmental Science, School of Postgraduate Studies, Diponegoro University.

ABSTRACT

City branding has been explored worldwide. In the early investment and attracting places were dominant topics. They were then continuing with tourism, sport, identity, and culture. Recently citizens stressed climate change issues. In line with this, healthy cities intensively encourage promoting safe urban life. After the Covid-19 pandemic, marketing the city is not only for the economy. Residents' preparedness against climate change and the pandemic will be crucial. Reshaping collaboration between city managers and citizens is needed. This study examines four components that influence, namely, 1) regulation creativity, 2) controlling implementation, 3) citizen support, and 4) environmental risk control. Collaboration Semarang City government and citizens deal with specific waste during the COVID-19 pandemic. Methods for data collection are waste policy mapping, questionnaires, measuring covid waste (mask waste) generation, and transport. Study results show no local regulation for covid-waste. Dropbox system applied to control household covid waste. The citizen support score is 177, min 55 (0-180 scale). Mask waste generation is 3,2 tons/day, and found in the Jatibarang landfill is 51,05 kg/day. The environmental risk score on mask waste management is high Impact at 7250. Integrating city branding against climate hazards and health disruption is possible.

Keywords: City Branding, Climate Change Hazard, Disruption Health, Prone Regions, Semarang

ABSTRAK

City branding telah didiskusikan secara luas. Pada awal bagaimana menarik investasi di suatu lokasi mendominasi. berikutnya dibahas pariwisata, olahraga, identitas dan budaya. Akhir akhir ini, warga menekankan isu perubahan iklim. Sejalan dengan itu, kota sehat intensif dibahas untuk mengembangkan kota yang aman. Pandemi Covid-19, mengingatkan bahwa pemasaran kota tidak hanya untuk ekonomi. Kesiapsiagaan warga terhadap perubahan iklim dan pandemi sangat krusial. Pengubahan kolaborasi pengelola kota dan warga diperlukan. Studi ini mengkaji empat komponen yang mempengaruhinya, yaitu 1) kreativitas pengaturan, 2) pengendalian pelaksanaan, 3) dukungan warga, dan 4) pengendalian risiko lingkungan. Kolaborasi Pemerintah Kota dan warga dalam mengelola sampah spesifik Covid-19 dipilih sebagai studi kasus. Metode pengumpulan data yang digunakan yaitu kebijakan pengelolaan sampah, kuesioner, dan pengukuran timbulan sampah covid (limbah masker) dan pengangkutannya. Hasil kajian menunjukkan Pemerintah Pusat yang mengeluarkan kebijakan. Pengelola kota mengontrol melalui penyediaan drop box untuk penanganan sampah masker. kapasitaas dukungan masyarakat dalam implementasi kebijakan adalah score maks 177, min 55 (skala 0-180). Timbulan limbah masker adalah 3,2 tons/hari. Sebanyak 51,05 kg/hari ditemukan di TPA. Score resiko lingkungan pada penanganan sampah masker adalah tinggi dengan skor sebesar 7.250. prospek untuk mengintegrasikan city branding yang menggabungkan kepedulian tantangan perubahan iklim dan kesehatan sangat mungkin.

Kata kunci: City Branding, Ancaman Perubahan Iklim, Gangguan Kesehatan, Wilayah Rawan, Semarang

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1. Introduction

City branding is developing a city by fostering a marketing perspective. It is formulated from destination branding, which is promoting a place (Kasapi & Cela, 2017). City branding is a strategy to get attention and willingness to take action for citizens and visitors concerning convenience, environment, economic, and other social unique such as identity (Dinnie, 2011; Riza et al., 2012). There are several research studies have been done to discuss it. For example, making the city attractive to live in (Inch, 2011), fostering Inward Investment (Middleton, 2011), increasing stakeholder engagement (Henninger et al., 2016), and tourism activity (Jojic, 2018). It is about maintaining image and reputation (Shirvani & De Luca, 2019). To deal with there are four challenges to manage: marketing the city, stakeholders of the city, governance of the city, and the Impact of the City brand (Oliva et al., 2022).

Recently city branding, which focuses on resilience to climate change, is worldwide discussing. For example, city branding is associated with air pollution in China, which tries to reduce CO2 emissions (Liu et al., 2023). It is associated with preparedness against climate hazards, focusing on why it is essential against climate change impact (Naef, 2020). International Panel on Climate Change (IPPC) led the program at the international level, while in Indonesia Ministry of National Planning led the technical and implementation program. Detail of programs such as building parks, green urban spaces, and maintenance of urban trees (Chan et al., 2018).

Moreover, city branding that discusses resilience is also concerned with healthiness. After the pandemic Covid-19 urban health has become more popular and getting close to the urban health planning stage both in practice cal and theoretically (Green et al., 2016); branding urban health is a promotion of awareness of community health including planning and building health infrastructure (Bonakdar & Audirac, 2020). Medical city industry also affluence for achieving urban health (Kim et al., 2022). Aydoghmish & Rafieian (2022) has developed a logical perspective by using urban planning theory to map a conceptual framework for city branding on health. Even though several research has been debated, the idea is clear to make a position of urban health theory from the perspective of the planning framework. City branding for health helps run programs and develop people's behavior – against stressful events such as -pandemics (Merrilees et al., 2013). It is helpful for city planners to direct imagination related to the space -and health facilities (Bonakdar & Audirac, 2021).

Recently building city branding should consider integrating city resilience programs and urban health. Wan & Choi (2021) developed the concept to integrate it. However, the integration should consider what cities' uniqueness will be provided for and what stakeholders need since city branding is a product determined by supply and demand (Hultman et al., 2016). Understanding health is about the culture, which tends to the community's internal power of citizens to build creativity in the city health brands (Okano & Samson, 2010). Promoting the city for integrating climate resilience and urban health needs by selecting a model of marketing and then developing a brand to encourage citizens (Ma et al., 2021).

Exploring city brands for Indonesia cities has been exploring, for example, from the viewpoint of general competitiveness (Pasande & Suhendra, (2017), cultural identity from the attitude of tourism in Batu Malang (Miftahuddin et al., 2021), from the halal tourism in Demak (Kasdi et al., 2019), and music culinary in Bandung (Bustomi & Avianto, 2022). However, city brand attitudes less discuss environmental concerns attribute. Hasddin et al. (2022) have promoted the integration of green city indicators and sustainable cities as part of integrating resilience and urban health.

City brands are associated with making the environment more attractive. For example study on a clean environment (Merciless et al., 2009). City branding to control air pollution (Liu et al., 2023). City branding to control landscape conservation (Tobias & Wahl, 2013). This study aims to detail the parameter of citizen participation to build a clean environment on specific waste management during the pandemic. Citizen perception of city branding, previous studies have also been run (Kaya & Marangoz, 2014), but it is related to the entrepreneur. Multi-stakeholder cooperation is needed to build a city as the brand decides (Fok & Law, 2018).

2. Methods

This research continues a theme of city branding from the perspective of a resilient city post-pandemic-19 initiated in Bantul Yogyakarta (Setiadi et al., 2021). However, it is not continuing the external such as attracting visitors but focusing on the internal perspective. This research explores the understanding of the preparation for health.

The process for analysis will explore the concept of citizen reaction to government policy concerning the promotion of health and how the citizen deals with it (Kenzer, 1999; Amri et al., 2022). Banai (2020) then analyzed the planning process for cities' resilience against the pandemic base on the regions. Moreover, a study of countries and cities' reactions during the pandemic from the high-level population in Asia, China (Chu, Z., Cheng, M., & Song, M. 2021), India (Mishra, S. V. et al. 2020) and Indonesia (Rachmawati et al., 2021), showing that future city development related to city branding need cross and combination approach from the perspective of environmental climate and health resilience.

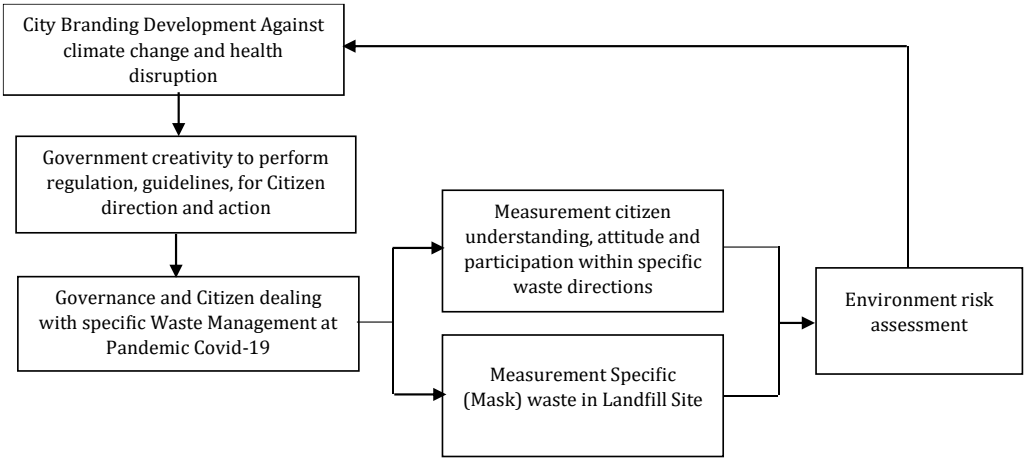

Figure 1. Research framework and methods

Refers to the consideration, this study selects Semarang City, Central Java. Semarang is one of 100RC, a city network of 100 cities worldwide together in cities resilience performing due to climate issues (Leitner et al., 2018). Figure 1 describes the research framework, analysis path, data measurement, and attributes for city selection.

Regulation creativity is measured in the first (1) path analysis and data measurement related to performing regulation and guidelines for Citizen direction and action. It is documentary research exploring related regulations to specific waste management. An analysis addressing the city government's creativity in dealing with specific waste management at the local level of Semarang. The general framework of evaluation will explore policy evaluation from Haddad (Haddad & Bergek, 2023). The framework of analysis describes the research framework.

Controlling implementation, measure in second (2) path. This study will utilize a method promoted by Fan Xiuhua (Fan Xiuhua et al., 2023). The analysis will measure waste management policy concerning waste management, especially for covid waste management during a pandemic disaster.

Citizen support is analyzed using a questionnaire to understand citizen support for covid waste management policy in path third (3). The purposive random sampling total of 267 respondents will are running. The respondents' distribution is described using Figure 2. Likert scale questionnaire technique was used. Questions related to handling specific household waste (masks) to reduce the spread of COVID-19 are addressed. Total of 15 questionnaires

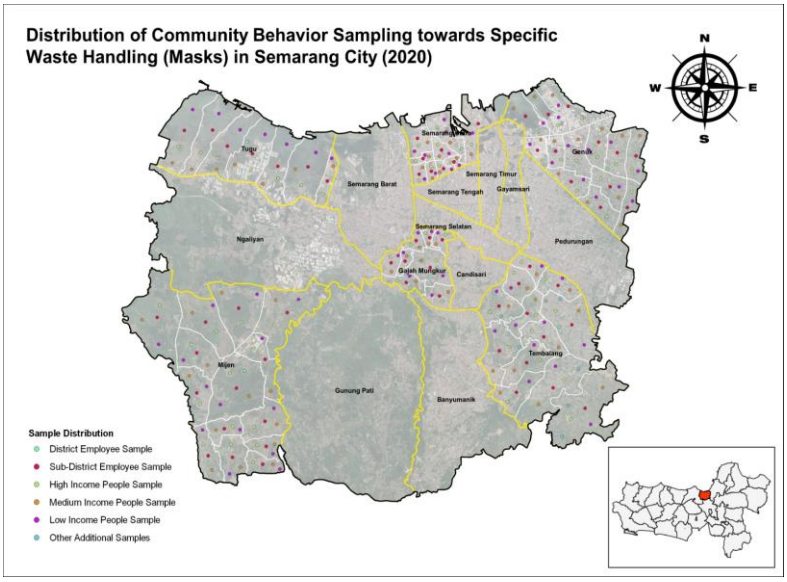

Figure 2. Distribution of citizen responses to measure understanding, attitude, and participation for specific waste management.

which divided into 1) specific waste understanding, 2) attitude and behavior, 3) handling facility, 4) behavior to policy, 5) frequency disposed of covid waste 6) handling development at the community level. The distribution of Respondents describes in Table 1.

Table 1. Respondent distribution in sampling

No	District Selected	Sub District	Respondent
1	Tembalang	12	57
2	Mijen	14	58
3	Tugu	7	30
4	Semarang Utara	9	36
5	Genuk	13	52
6	Gajah Mungkur	8	34
Total Respondent			267

The fourth path is the analysis of the environmental Impact. This analysis is running by continuing the analysis in the second path. The approach to estimating impacts on the environment used in this study is non-experimental quantitative social impact estimation. Impact estimation was carried out using a survey approach to community preferences for the efforts they made by the health protocol to reduce the Impact of COVID-19 self-protection in the household sector. The hypothesis is: 1). Citizens and city government deal with regulation if there is no specific waste (mask) and landfill. 2). Citizens and city government still need to deal with regulation if specific waste (mask) is founded in a landfill. SNI 19-3964-1994 are applied in measurement. To increase the level, measurement runs three times cycles for 29 days. Data analysis is quantitative using a descriptive statistical approach. Table 2 describes the score result analysis to estimate environmental risk due to covid-19 waste handling.

Table 2. Probability Environmental Risk Due to Covid-19 Waste Handling

Probability of environmental Risk due to Covid-19 Waste handling	Government and Citizen Collaboration Score
Low Impact	35.775 – 63.600
Medium Impact	15.900 – 35.775
High Impact	3.975 – 15.900
Very high Impact	less than 3.975

3. Results and Discussion

3.1 Regulation Creativity

Regulation creativity measure from the government understands the policies of the central government. However, the regional government of Semarang City has yet to make a more specific policy to deal with waste that is specific to masks. Central Government Issued Regulation Number 27 of 2020 concerning Specific Waste Management. During the Pandemic Ministry of Environment and Forestry issued letter number SE.2/MENLHK/PSLB3/PLB.3/3/2020 concerning infectious waste management at the household level and infectious waste from the handling of Corona Virus Disease (COVID-19) at the household level. A drop box system is applied for handling specific waste, such as waste from households suffering.

3.2 Controlling implementation

A drop box system was applied to control regulations for handling mask waste. The drop box is a facility to collect and handle household mask waste. Semarang City Government built a Drop Box facility located in Sub District. Semarang City Government build Drop Boxes, Several Community associations (Rukun Warga), and Household associations (Rukun Tetangga). The citizen must drop their household mask waste into the drop box; citizens must separate mask waste and not treat it as household and domestic waste.

3.3 Citizen Support

Citizen support measures by analysis of citizens' knowledge, attitude, and behavior, mask handling facilities, how citizens use drop boxes, frequently discharge household mask waste, and the local and the community handles mask waste. Analysis of Citizen supports is as follows.

It was concerning to Knowledge citizens to mask waste—the questionnaire survey results on 267 respondents. As many as 56.1% of the public had not heard of waste masks in the first month of the COVID-19 pandemic, March 2020. Then in the second month of the COVID-19 pandemic, namely April 2020, it decreased to 47.4%. The people who had heard about mask waste were 35.1% in the first month and 31.6% in the second month. The number of people who find out more about mask waste in the first month is 5.3%, increasing to 17.5% in the second month. Meanwhile, the % of people who studied more about handling mask waste in the first month was the same as in the second month, namely 3.5%.

They are concerned with attitudes and behavior in handling mask waste. Community attitudes and behavior towards handling mask waste according to the protocol at the beginning of the pandemic and now. With 267 respondents, 54.4% of the public did not understand how to handle mask waste at the start of the pandemic, which has now fallen to 50.9%. People who sometimes practiced handling mask waste at the pandemic's beginning were 24.6%; now, it is down to 17.5%. There has been an increase in people who often practice how to handle mask waste from as much as 14% at the beginning of the pandemic to 17.5% now. Likewise, people who routinely

Table 3. Detailed description of citizen support score in Mijen District

No	Sub-district	Score				total score
		1	**2**	**3**	**4**	
1	Wonoplumbon	40	14	20	15	89
2	Ngadirgo	33	17	28	22	100
3	Wonopolo	33	52	40	9	134
4	Pesantren	6	39	37	86	168
5	Kedungpane	12	36	35	66	149
6	Jatibarang	14	51	28	39	132
7	Mijen	37	27	4	29	97
8	Jatisari	36	35	1	23	95
9	Tambangan	34	25	16	31	106
10	Cangkiran	45	17	1	21	84
11	Purwosari	46	10	8	22	86
12	Bubakan	32	32	8	34	106
13	Polaman	34	25	16	26	101
14	Karangmalang	36	24	5	35	100
		max				168
		min				84

practice how to handle mask waste have increased from 7% at the start of the pandemic to 14% now.

Scoring using questionnaire results calculated to measure citizens' support for the policy. For example, table 3 describes the result in significant districts in Mijen districts. After the calculation for each district assessment, they were followed by the calculation total for all respondents. Table 4 describes the Semarang citizen's total score and the sample detail score in Mijen District.

Concerning mask handling facilities development Community knowledge of the mask waste handling facility from 267 respondents, 75.4% of the public have yet to hear of special facilities for handling mask waste. As many as 17.5% of the people heard that there was a particular facility for handling mask waste but had never seen it around their residence. For people who know the location of special facilities for handling mask waste, there are as many as 5.3%. Furthermore, the remaining 1.8% of people know the location of exceptional facilities and can easily access them. The survey results show that many people still have not heard of special facilities for handling mask waste.

They are concerning using the Dropbox system. The way people dispose of mask waste. Of the 267 respondents, 73.7% of the community did not separate masks and ordinary waste. As much as 22.8% of the community has separated mask and ordinary waste, but transportation is still shared with other waste to the same place. Furthermore, as much as 3.5% of the community has separated mask waste

Table 4. Total score citizen support policy-specific waste management (mask waste)

No	District	The score of Citizens Support to Specific Waste Policy	
		Max	Min
1	Tembalang	177	55
2	Mijen	168	84
3	Tugu	152	91
4	Semarang Utara	138	87
5	Genuk	156	83
6	Gajah Mungkur	154	83

Table 5. Estimation of Specific Waste (mask waste) in Semarang (October 2020)

Mask-specific waste generation components	Total (Kg/Day)
Specific waste of masks from residents who are positive for COVID-19	62,31 Kg/day
Specific waste masks for residents with suspected COVID-19	0,61 Kg/day
Specific waste of masks for healthy residents	1.345,38 Kg/day + 1.614,45 Kg/day + 269,07 Kg/day
Total Estimation of Mask-Specific Waste Generation in Semarang City	3.291,82 Kg/day or 3,2 tons/day

from ordinary waste, with different transportation from ordinary waste and to a different place from ordinary waste.

Concerning to Frequency of disposing of mask waste, the way people dispose of mask waste. Of the 267 respondents, 73.7% of the community did not separate mask waste from ordinary waste. As much as 22.8% of the community has separated mask waste from ordinary waste, but transportation is still shared with other waste to the same place. Moreover, as much as 3.5% of the community has separated mask waste from ordinary waste, with different transportation from ordinary waste and to a different place from ordinary waste.

It is concerning how the community handles mask waste. Of the 267 respondents, 71.9% threw masks directly into the regular trash. 26.3% cut the mask before disposal and throw it in the regular trash. As much as 1.8% cut, then give disinfectant and use a particular container marked when discarded. The survey results show that many people still need to handle mask waste before it is disposed of. Handling this mask waste needs to be done to reduce health risks and avoid recycling by irresponsible people.

3.4 **Environmental Risk Control.**

Calculating mask waste generation is the first step to controlling environmental risk during specific waste management. COVID-19 medical waste comes from several sources, including COVID-19 referral hospitals, facilities used for quarantining COVID-19 patients, healthcare facilities other than hospitals, and households and public facilities. The increased use of PPE caused increased medical waste generated during the COVID-19 pandemic. Estimated mask generation can be calculated with the following equation (Prihartanto, 2020): Mask waste generation (Kg/day) = Number of residents x weight of medical masks x use of medical masks per day. Number of positive residents for COVID-19 in Semarang City (October 23, 2020): 9736 People. The medical mask weight is 3,2 grams. Assuming the use of masks is two times/day. The generation of medical waste is 62.31 Kg/day.

The calculation of estimated mask waste generation from suspected COVID-19 residents in Semarang City is as follows; Number of residents suspected of COVID-19 in Semarang City (October 23, 2020) is 192. People's Medical mask weight is 3,2 grams. Assuming the use of masks is one time/day. The generation of medical waste is 0,61 Kg/day

mask waste is measured by assessing residents, the weight of mask waste, and the number of mask waste used daily. Measurements were conducted in Semarang City from during the pandemic covid until October 23, 2020. The total number of residents is 9736 people. Mask waste weight is 3,2 grams. The population of Semarang City years (2019) is 1.681.720 people. Assuming the use of masks is (1) 25 % of the population uses masks every day; (2) 60 % of the population uses masks every two days (3). 15 % of the population uses masks every three days. According to the condition, the generation of mask waste in detail is described in Table 5.

Mask waste can add to huge plastic waste and plastic particles in the environment. Some of these materials enter waterways, reaching the freshwater and marine environments, thereby increasing the presence of plastics in aquatic media (Fadare & Okoffo, 2020). Another implication of face masks being discarded carelessly in the environment is the possibility of acting as a medium for disease outbreaks because plastic particles are known to spread microbes such as invasive pathogens (Reid et al., 2019).

An increase in medical waste generation during the COVID-19 pandemic occurred in various countries; in Jordan, medical generation during the pandemic was 14.16 kg/patient/day or 3.95 kg/bed/day, which increased ten times greater than the level of hospital medical waste generation, before the COVID-19 pandemic (Abu-Qdais et al., 2020). In Penang, Malaysia, medical waste generation was recorded at 0.4–1.0 kg/bed/day (Agamuthu & Barasarathi, 2020). There were 240 tons per day in Wuhan, which increased 6 times before the pandemic (Singh et al., 2020). Two hundred six tonnes per day of medical waste is generated due to the COVID-19 pandemic in Dhaka, India (Rahman et al., 2020). In South Korea, around 295 tons of medical waste related to COVID-19 were generated from early February 2020 to early March 2020. This medical waste was generated from public hospitals (61%), temporary isolation facilities for people arriving from overseas South Korea (21 %), isolation treatment

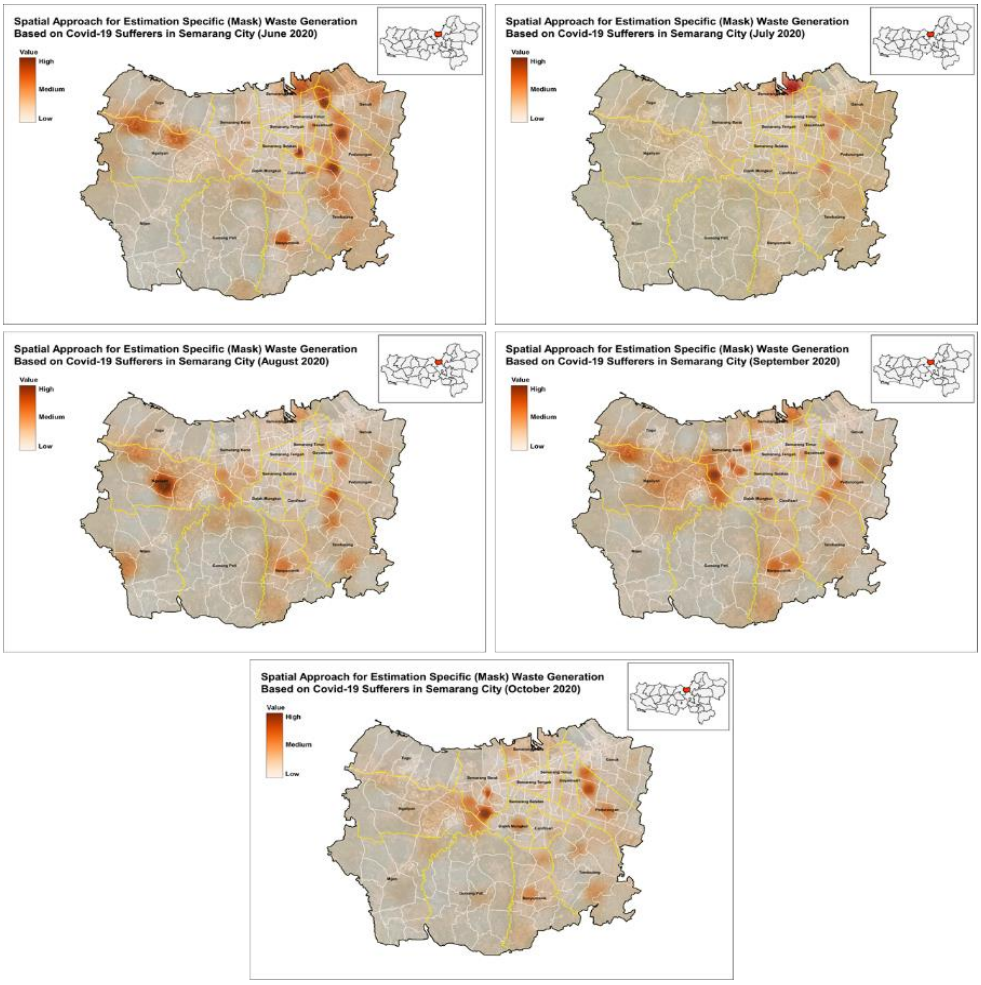

Figure 3. Spatial Approach for Estimation Specific Waste (Mask) Generation based on Covid-19 Suffers in Semarang City in June-October 2020

centers for patients with COVID-19 (13%), and community care centers (5%). In April, South Korea's Ministry of Environment reported that 20 tons of waste related to COVID-19 were generated every day (Rhee, 2020). By using a spatial approach, the distribution of covid waste (mask waste) during time measurement in the six districts selected describe in Figure 3.

Investigating mask waste in landfill sites is the second step to understanding policy impact. Observations on the transfer and transport of solid waste to the landfill were also conducted at the point of origin to collect solid waste in Semarang. During the observation period, 922 solid waste points of origin were founded. The distribution of waste collection points is classified into three color points: red points with low accuracy, yellow points with medium accuracy, and green points with high accuracy. Figure 4 shows the distribution of 3 red, yellow, and green dots throughout Semarang.

Sampling temporary storage needs to estimate the condition of municipal waste transport and transfer during a pandemic. The survey investigates citizen transfer household waste. The citizen behavior for separating domestic waste and mask waste is shown.

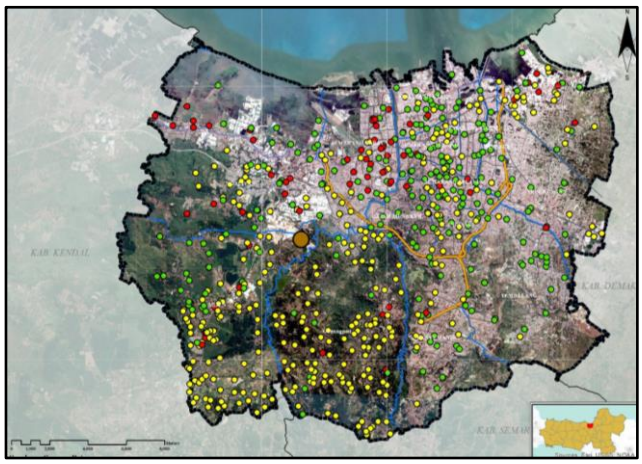

Figure 4 Map of distribution for the temporary site in Semarang

Two officers appointed by the team measured specific waste generation for mask waste at the landfill. The 2 officers were specifically given training in 1 day to collect specific waste from trucks that came to the Jati Barang Landfill and explore the possibility of its distribution in the Jati Barang Landfill Area. The measurement results show that mask waste is still mixed with domestic solid waste. Within 29 days of measurement, 51.05 kg of mask waste was found, which means that the generation of mask waste that entered the landfill was 1.76 kg/day. Detailed mask waste measurement results are shown in Figure 5. Referring to the research hypothesis, these results show that (1) The Drop Box System is still Ineffective in Handling Specific Waste Mask Waste from the community in Semarang City. When converted into the population, the waste generation that has yet to be effectively managed during the measurement period comes from 15,953 residents.

The measurements show that mask-specific waste treatment is still mixed with household solid waste and non-hospital public facilities. This study still needs to calculate the total amount of Specific Total waste transported at the Jati Barang Landfill. In order to calculate the total amount of Specific Waste Generation transported at the landfill, a different Measurement Approach and Methodology is required. This study measures the effectiveness of the application of the drop box system in handling specific waste in the city of Semarang. The measurement results show that: a Dropbox system has been applied in handling specific waste mask waste but has yet to be effective.

In handling the specific mask waste from the general public, the Ministry of Health of the Republic of Indonesia has provided guidelines for managing mask waste from the community. Masks used by the public are not included in the category of medical waste, which is treated like medical waste in Health Facilities, so it is included in the category of domestic waste. Thus the treatment is the same as domestic waste management according to Law Number 18 of 2008 concerning Waste Management. However, to reduce health risks, handling used masks is carried out by collecting used masks, disinfecting them, changing the shape of the masks by damaging the straps and tearing them masks, throwing them in the trash, and washing hands.

In South Korea, household-made masks can be thrown into trash bags using a volume-based waste fee (VBWF) system. Recyclable waste must be separated from the bag in the VBWF system for transport to the recycling facility. However, waste, including used masks, must be incinerated or landfilled without recycling. All PPE, including used masks, gloves, and personal clothing associated with COVID-19 infection in households, should be disposed of separately. All closed waste bags, such as incineration facilities, should be safely taken to final processing. In South Korea, regular non-color-coded trash bags under the VBWF system separate them from recyclable waste. If VBWF systems are not implemented in some countries, household waste associated with COVID-19 infection should be separated from recyclable waste by all types of waste bags (Rhee, 2020).

Several factors affect the level of waste generation in healthcare facilities, including the type of healthcare service, the size of the healthcare facility, occupancy rate, geographic location, the number of medical devices that can be disposed of or reused, the level of enforcement of regulations at the national and local levels, the definition medical. Waste, medical waste management training, and types of medical waste management and disposal policies (Jang, 2019).

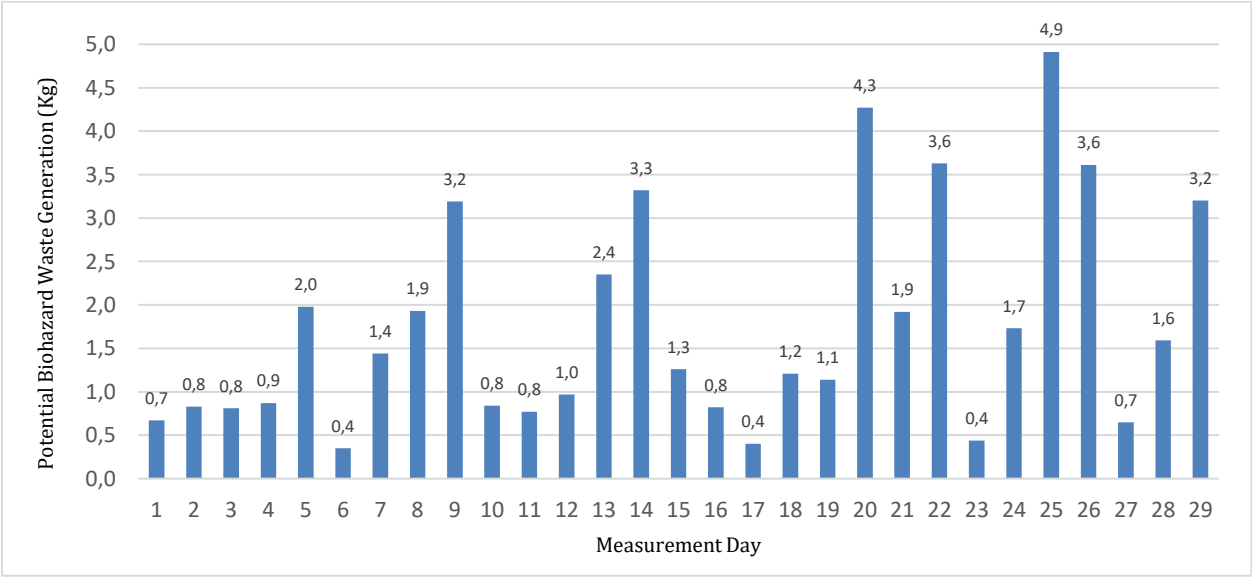

Figure 5 Measurement Result of Waste Mask Entering to the Jatibarang Landfill

The third step for estimating environmental risk is assessing the survey score. Specific waste during a pandemic, especially mask waste, must always be considered as having the potential to contain various pathogenic microorganisms because the presence or absence of pathogens cannot be determined from the time the goods are produced until they are disposed of (Emmanuel et al., 2001). Medical waste can cause serious public health effects. Such waste contains potentially infectious and harmful microorganisms (Jang, 2019). In addition to causing problems for the health of workers, patients, and the community, because of the toxic nature of medical waste, if mishandled, it can cause environmental damage. This can ultimately disrupt the balance of the existing ecosystem (Bokhoree et al., 2014).

Referring to the results of the scoring assessment of the questionnaire that has been carried out to the community in Semarang City, which is discussed, This sub-section examines the description of the Impact of specific wastes during the pandemic, especially on people's understanding, knowledge, attitudes, behavior in handling specific waste masks and other specific wastes in their environment. a scoring calculation is then carried out for the overall score both for each surveyed sub-district or for the overall total score in all surveyed sub-districts. The highest score is for the Mijen sub-district, with a value of 1,549, while the lowest score is for the Tugu sub-district, with a score of 800. The overall score from the community behavior questionnaire survey results is tabulated in Table 6.

Table 6. Total score environmental risk assessment due to Covid-Waste handling

No	District	Number of Respondents	Total Respondent Score
1	Mijen	57	1.549
2	Tugu	29	800
3	Semarang Utara	37	995
4	Genuk	53	1.440
5	Gajah Mungkur	33	930
6	Tembalang	58	1.536
Total Overall Score			7.250

The total score for the questionnaire results for the whole is 7.250. Referring to the classification of predictions, the environmental Impact of Specific Waste on the Environment in Semarang City is included in the high level. Some points of founding and the related need to be improved are:1) The community already understands that there is mask waste. However, the community still needs to care about managing waste properly. 2)The community still needs to understand that mask waste needs to be separated from other waste. 3) At the level of Neighbourhood and Hamlet. Waste handling activities have been going well, but handling mask waste requires special procedures and equipment. 4) The waste bank in the community's daily life has been running well, even though it could be more optimal. However, in daily life, waste banks have yet to introduce specific waste, particular waste that must be explicitly handled. Waste segregation by waste banks focuses on the waste that has economic value.

The total score of the questionnaire results illustrates that people's knowledge and behavior regarding handling and managing specific waste still needs to improve. So many specific wastes are not handled properly and correctly. Thus the risk of environmental Impact that can occur due to handling that could be better and right is high. Especially in the community as a specific waste-producing source where the first handling is carried out.

The use of PPE and single-use plastic during the pandemic increased the amount of medical waste and changed the average density of medical waste. Waste accumulation amid COVID-19, especially discarded PPE and single-use plastic, has become an environmental and public health crisis worldwide, especially in countries with developing economies and countries in transition. Safe, solid waste management is already a key concern in these countries where safe and sustainable practices are scarce, and healthcare waste is not adequately regulated. (Singh, Tang, & Ogunseitan, 2020). The Impact of COVID-19 on waste management is on changes in waste composition, amount of waste, Frequency and timing of disposal (temporal), distribution (spatial), and risk of infection (Fan et al., 2021).

Improper hospital waste management will be a good place for disease vectors such as flies and rats. Dengue hemorrhagic fever is caused by a disease vector that lives and reproduces in used cans or standing water (Putri, 2018). In addition to the risk of spreading pathogens, infectious waste can cause adverse environmental impacts such as eutrophication and changes to the aquatic microenvironment (Albihn, 2019).

Procedures to follow for sustainable waste disposal during the COVID-19 pandemic: 1) For municipal waste service providers: Mixed collection of recyclables should be discontinued, and manual handling should replace manual-mechanical mixed handling systems. Expanding storage facilities can help maintain a safe waiting period before handling recyclables by professionals to avoid service outages (Tripathi et al., 2020). Adding more bins for used masks with attractive logos in public places can reduce mask waste from being disposed of carelessly and mixing with municipal waste (Tan et al., 2020). 2) For the community: Recycled materials must be

segregated from their source. Recyclables can be stored in paper bags (virus residence time on paper: 24 hours) because plastic packaging retains viruses for longer. The packs can be stored for a minimum of three days before being given out for collection. If plastic bags are used for storage, it is best if they are in another plastic container with a date stated to the recycling center (Tripathi et al., 2020). 3) For COVID-positive patients: Waste should be packaged twice in single-use plastic bags and disinfected. For recycling companies and operators: Increase the capacity of waste storage facilities so that storage duration can be increased before the manual handling of waste (Tripathi et al., 2020).

The main thing that must be kept in mind is that waste management is not only the responsibility of collectors, but residents also need to be aware of the safety of frontline workers. Accordingly, instructions to minimize waste generation, i.e., siltation of waste for at least 72 hours before final disposal, disinfection of disposal bags, etc., should be carried out (Tripathi et al., 2020). Leaving waste for 72 hours is related to the stability of the virus on different surfaces (van Doremalen et al., 2020).

4 Conclusion

Potential implementation for Branding the city against climate change hazards and health disruption in Semarang is possible. Semarang City government still needs to perform local regulations. So by increasing capacity, the specific regulation should be performed. To control regulation implementation, facility such as drop box is used fully. The citizen support score is between 177 to 55, with a scale of 0-180. Environmental risk assessment due to covid waste management is high, with a score of 7250.

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