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Environmental Waste Management to Create A Healthy Environment:
A Policy Study of Sungai Penuh Regional Government

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Abstract

The Incorrect way of waste management will be caused by a harmful effect on the environment. This study is conducted in order to see and review the policies being implemented by Sungai Penuh Regional Government in waste management, in order to create a healthy environment. The goals of conducting this study on to become a legal research, which is based on an empirical research. The result from this study shows that this Regional Regulations (Perda) has not been applied to its maximum capabilities due to the fact that there are still some required Regulations of Mayor (Peraturan Walikota) that has not been implemented yet. The Waste Management Policy in the City of Sungai Penuh has not been implemented thoroughly, there is still no coordination between the related institutions. The Integrated Waste Management Site in Renah Kayu Embun is a rented site by the Regional Government, and the said rent would be up on April 2018. The amount of waste generated per day is up to 36,421 tonnes. 81,496% of those waste is household waste, which amounted up to 29,682 tonnes per day. Estimated waste reduction in the City of Sungai Penuh is as follows: Organic waste amounted up to 2,47 tonnes; Non-organic waste amounted up to 6,25 tonnes; From the total amount of waste per day of 36,421 tonnes, around 15,77 tonnes (43,29%) of it would processed which resulting in the unprocessed waste which has to be dumped at the Garbage Dump Site (TPA/TPST) is amounted to 20,651 tonnes per day (56,71% from the total amount of waste per day).

Key words: Policy Study, Waste Management, Environment.

I. PREFACE

1. Background

The fast-growing numbers of a population will always be followed with the change in consumptive pattern in the society. This change in consumptive pattern will affect and increase the volume, types, and characteristic of waste produced by the

society itself. A proper waste management system is needed to be able to process the waste that is produced daily, whether it's household waste or production waste because an improper waste management would be resulting in an environmental damage which also would disrupt the living comfort and health of the society itself.

Waste dump/waste management is still a prominent problem in Indonesia, including in Jambi, especially in the City of Sungai Penuh. The waste that is produced daily would be collected and transported by specific trucks, and then it would be dumped in the designated waste dumping site without any further waste management/processing. This waste dumping practice would affect the surrounding environment, which caused the environment to become dirty and the rotting wasting could easily become the source of spreading diseases. This inadequate location and waste management (uncontrolled waste dumping practice) could become the breeding ground of various unwanted organisms such as flies and rats, which could spread many kinds of diseases.

A good, neat, and clean city environment is what all of the citizens are wishing for because it would make the residing citizen feel serene and safe living in it. The practice of waste management is vastly different in between developed countries and developing countries. This differences could also be seen between the system applied in urban areas (cities) and rural areas (villages), and also between residential areas and industrial areas. Waste management of non-toxic waste resulted from metropolitan residential and institution areas are usually being handled by the regional government, while waste resulting from commercial and industrial areas are usually being handled by waste management/processing companies.

Currently, in Indonesia, waste management is being regulated through Act No. 18/2008 about Waste Management. (UU No. 18 Tahun 2008 tentang Pengelolaan Sampah). The definition of "waste" in Article 1 No. 1 is stated as follows, "Waste is the residue of human's daily activities and/or natural process, in a solid shape." Furthermore, Article 1 No. 2 stated, "Specific waste is waste which because of its nature, concentration, and/or volume, it needed a specific way of handling

(management).” Waste as the result of human’s daily activities keeps growing in numbers as does the number of populations and variations of human’s activities which needs a specific way of handling. Waste, which is the residue of human’s activities, needs to be managed well in order to prevent environmental pollution and health problems from arising. Waste management in Article 5 No. 5 is stated as follows, “Waste management is the systematic, thorough, and continuous activities, which includes the reduction and handling of the waste itself.” Waste management is related to the collection, transportation, processing, recycle, or disposal of the waste materials, in which is referring to the material waste resulted from human’s activities, and usually is managed in order to reduce its effect on health, beauty, or environment. As seen from the explanation above, it can be summarized that waste management is a way to handle and process the waste in order to eliminate any problems related to the environment, to achieve the goals of creating a clean, healthy, and orderly environment.

A legal certainty, a clear responsibility, an authority of both central and regional government, and an active role from the citizens and businesses are needed to be able to implement a proper waste management. All of these are to ensure that the implementation of waste management can proceed proportionally, effectively, and efficiently. There are many regulations existing in regards to keeping a healthy environment, such as Act No. 36/2009 about Health (UU No. 36 Tahun 2009 tentang Kesehatan). Article 163 in this act about Environmental Health is stated as follows, “An effort of environmental health is to create a healthy environment, be it physically, chemically, biologically, and socially, which allows all the people living in it to achieve the highest degree of healthiness.” Article 69 of Act No. 32/2009 about Protection and Management of Environment (UU Ri No. 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup) stated, “All people are prohibited from doing any kinds of activities which caused the pollution and/or damage of the environment.” Although the implementation of this act has not met with a delightful result, there is currently a real effort being in the work by both of the groups of citizens and the regional government to implement a proper waste management.

The government's policy through Act No. 18/2008 about Waste Management (UU No. 18 Tahun 2008 tentang Pengelolaan Sampah) and any other policies following that act are still not enough if the government itself doesn't socialize it to the citizens. The government needs to inform the citizens on how the waste should be managed, or at least doing a socialization to turn around the stigma of the waste itself, that it's not a problem but that is a commodity that could be managed and utilized.

The effort of regional/city governments in Indonesia to look for a representative waste dumping site has experienced various difficulties. It's actually because the approach being used by these governments are not to manage the waste, but just to dump the waste. This is resulting in the practice of looking an empty land which can be used as a dumping site, and then looking for another new empty land as soon as the current dumping site has filled to its maximum capability and considered as no longer feasible to accommodate the amount of waste dumped in said site.

Sungai Penuh Regional Government has done various efforts through various policies in order to implement a proper waste management system as a mandate by Act No. 18/2008 about Waste Management. One of this effort was by issuing a Regional Regulation (Perda) No. 9/2013 about Waste Management. This regional regulations stated that any effort to create a healthy environment to develop the cleanliness and beauty of the city sustainably needs to be done by both the regional government and its citizens, so there would be a clean, neat, and beautiful city; That the growth of the city and its populations, and the change of in the consumptive pattern of the society has the effect of increasing the production of waste; That the waste management from upstream to downstream needed to be implemented effectively, efficiently, and environmentally friendly in order to give its economic benefits to its own regions. Furthermore, Article 21 Paragraph (1) stated that household waste and similar waste management are composed of: a. Reduction of the waste; b. handling of the waste. Paragraph (2) stated that regional government is the one to set up the plan of the reduction and handling of the waste, and it's written in the form of strategic plan and yearly plan of Technical Regional

Device Work Unit (SKPD Teknis). Paragraph (3) stated that the plan of the reduction and handling of the waste, as intended in Paragraph (1), is at least contained: a. Waste reduction target; b. Infrastructures provision target which includes the source of waste up to the final waste treatment site; c. Regional cooperation development pattern, partnerships, and the participation of the society; d. The financing provision which would be borne the regional government and the society; e. Development plan and utilization of environmentally friendly technologies in recycling and final handling of the waste. Article 60 stated that management of any residential areas, commercial areas, industrial areas, special areas, public facilities, social facilities, and any other facilities whom has not their areas with an adequate waste segregation facility at the time this regional regulation is issued, are mandated to build and provide a waste segregation facility at maximum of 2 (two) years after this regional regulation is implemented.

Even though this regional regulation has been implemented since 2013, in reality, the condition of waste management in the City of Sungai Penuh is still encountering any problem. This can be seen as how it's reported by Tribun Newspaper. Tribun reported that in several spots such as in Depati Parbo road and Yos Sudarso Road in Gedang Village, there were piles of garbage scattered on the side of the road. Also, the dump truck which was parked in front of the Licensing Office of District of Kerinci was still filled with waste and it left unprocessed. The citizens of Sungai Penuh were complaining about this condition because the said waste had piled up in several waste dumping sites and it had not been transported away to the final waste treatment site by the Governmental Sanitary Agency (Dinas Kebersihan) Officers of Sungai Penuh. It was expected from the Governmental Sanitary Agency (Dinas Kebersihan) of Sungai Penuh and any related institutions to collect and transported the piled up waste because it had caused unpleasant smells to arise in the air. This condition is ironic, considering the fact that Sungai Penuh is one of the cities that has received Adipura Trophy.

Meanwhile, Mr. Munasri, the Head of Environmental, Cleanliness, and Parks Agency (Badan Lingkungan Hidup, Kebersihan, dan Pertamanan) of Sungai Penuh stated to Tribun that the piled up waste was not being transported was due

to the problems existed with the Integrated Waste Treatment Site (Tempat Pengolahan Sampah Terpadu — TPST). This problem displayed why household waste management, especially in urban areas (cities), needs a thorough cooperation by all the stakeholders, from the government up to the involvement of the citizens. An integrated approach with proper technology is the main component in resolving the waste problem that existing in society. A proper utilization of the waste would be resulting in many benefits. One of the alternative ways that can be done to implement a society-based waste management program is to minimize the production of waste and to implement the 3R (Reuse, Reduce, and Recycle) program. Reuse is directly re-using any kinds of waste, be it for the same function or different function altogether. Reduce is minimizing any kinds of activities that could create waste. Recycle is utilizing waste after the said waste went through some sort of treatment process. This condition was the one that pushed the regional government to set up and issue the Regional Regulation No. 9/2013 about Waste Management. Article 5 of this act stated that in order to reach the goals as stated in Article 3, the regional government has to do its duty to ensure the implementation of a good and environmentally friendly waste management system. This study is conducted in order to see and review the policies implemented in the City of Sungai Penuh in regards to waste management, in order to create a healthy living environment.

2. Research Questions

Based on the explanation about the various problems of waste management described in the previous part above, then the problems in this study can be formulated as follows:

1. How is the empirical condition of the implementation of waste management in the City of Sungai Penuh, in order to create a healthy environment?
2. How are the policies implemented by the regional government of the City of Sungai Penuh as the follow up of Regional Regulations No. 9/2013 about Waste Management in order to create a healthy environment?

II. FINDINGS AND DISCUSSION

1. Empirical Conditions of The Waste Management in Sungai Penuh

Based on Article 28 of the Regional Regulation of the City of Sungai Penuh No. 5/2012 about Urban Spatial Planning of the City of Sungai Penuh Year 2011-2013 (Peraturan Daerah Kota Sungai Penuh Nomor 5 Tahun 2012 tentang Rencana Tata Ruang Wilayah Kota Sungai Penuh Tahun 2011-2031), it is stated that Waste Management System in the City of Sungai Penuh covers about the Integrated Waste Treatment Site (Tempat Pengolahan Sampah Terpadu — TPST) and the location of the said TPST is regulated in the Detailed Plans of Spatial Planning (Rencana Detail Tata Ruang — RDTR).

The book of Strategic Sanitary of the City of Sungai Penuh in 2012 stated that the city of Sungai Penuh has the vision of, "Creating a clean and healthy city of Sungai Penuh, through development and enhancement of the sanitary services and infrastructures with the best quality, which also sustainable and environmentally friendly in the year of 2021." Following this vision and in order to actualize it, a set of missions is also created. One of the mission in the waste management and drainage field is as follows:

1. Increasing the quality and the quantity of the waste management infrastructure development;
1. Increasing the institutional and regional regulation function in waste management;
2. Increasing the empowerment of the society and the socialization in waste management;
3. Increasing the financing ability for waste management sector;
4. Increasing the participation of businesses in the development and management of waste management sector.

According to the Head of Environmental, Cleanliness, and Parks Agency (Badan Lingkungan Hidup, Kebersihan, dan Pertamanan — BLHKP) of Sungai Penuh, waste produced within the city of Sungai Penuh is quite high in amount, which can be up to 36 tonnes per day. The city government is conducting the waste management in Sungai Penuh through the Environmental, Cleanliness, and Parks Agency (Badan Lingkungan Hidup, Kebersihan, dan Pertamanan — BLHKP). According to the study being conducted, the implementation of waste management

by the Government of Sungai Penuh in order to create a healthy environment is conducted through these steps as follows:

a. Reduction of the waste. It includes the reduction the of activities that could create waste, the limitation of waste sources, the recycle process of the waste, and re-utilizing of waste (3R).
b. Handling of the waste. It includes the segregation, collection, transportation, processing, and final processing of the waste.

Currently, the Integrated Waste Treatment Site (Tempat Pengolahan Sampah Terpadu — TPST) in Sungai Penuh is located in Renah Kayu Embun. Renah Kayu Embun is a village located in the district of Kumun Debai, in the city of Sungai Penuh, in the province of Jambi. This location is a replacement location from the previous one in KM 14. The location of TPST is moved to this current one after the citizens living in KM 14 refused the existence of this TPST in KM 14. The system used to manage the waste in TPST Renah Kayu Embun is to pile the waste up and once the waste turned into compost, then the piles would be dismantled.

Compost is a type of fertilizer made from organic waste such as vegetables, leafs, twigs, and animals feces, which then turned into fertilizer through the process of degradation and decomposition by certain types of microorganism. Compost is very useful to repair the structure of the soil and to provide food substances which are needed by the plants, while the microbes existing in the compost also help the absorption process of the said food substances. The making process of compost is one of the best way to reduce the existence of organic waste. This process is very suitable to be implemented in Indonesia, because the process is relatively easy and it doesn't need a big budget in order to complete the process. Compost can also be sold as fertilizer, making it as one of the alternative way to make income. (Idfi Safarnadi, 2013)

Field study conducted in the city of Sungai Penuh shows that the waste management system through reduction and handling of the waste of 3R (Reuse, Reduce, and Recycle) has not been fully implemented. Around 45% of the total waste management system is using the said 3R system, while for the rest 55% is still using the conventional waste management system.

One of the obstacles in waste management system is the mayor regulation that still has not been issued yet, even though this mayor regulation supposed to be one that further regulated the implementation of waste management in the city of Sungai Penuh. Another problem is the limited infrastructure being developed in the city of Sungai Penuh to be able to fully implement the waste management system through 3R. This caused the implementation of the 3R system to not reach its full capability, with more than half of the processing of the waste is still using the conventional waste management system. It is advised to the City Government of Sungai Penuh to issue a mayor regulation regarding waste management as soon as possible, so that any kinds of action being taken by the government in relation to waste management has a legal force in its implementation. Furthermore, it is also advised to maximized the utilization of all the infrastructure and was management system through the implementation of 3R (Reuse, Reduce, and Recycle) system.

These are the total amount of waste sources in the city of Sungai Penuh in 2016. Data is taken from the Environmental Agency (Badan Lingkungan Hidup) of the city of Sungai Penuh.

Table 1:
Amount of Waste in the City of Sungai Penuh (in Kg)

No.	Sample Category	Total weight/day (Kg)
1	Permanent Households	7,931 tonnes/day
2	Semi-permanent Households	10,378 tonnes/day
3	Non-permanent Households	11,373 tonnes/day
4	Offices	0,125 tonnes/day
5	School	0,236 tonnes/day
6	Shops/Stores	1,011 tonnes/day
7	Markets	1,990 tonnes/day
8	Roads	3,291 tonnes/day
9	Hotels	0,019 tonnes/day
10	Restaurants	0,067 tonnes/day
	Total	**36,421 tonnes/day**

Source: Environmental, Cleanliness, and Parks Agency (Badan Lingkungan Hidup, Kebersihan, dan Pertamanan — BLHKP) of Sungai Penuh, field research conducted in October 2017.

The amount of waste produced daily in the city of Sungai Penuh is up to 36,421 tonnes per day. Household waste, be it from permanent, semi-permanent, and non-permanent households, are the biggest source of waste, which amounted up to 29,682 tonnes or 81,496% from the total amount of waste produced daily. Even so, the Secretary of Environmental Agency (Dinas Lingkungan Hidup) of Sungai Penuh stated that there is a significant increase in the development of hotels and restaurants in Sungai Penuh. This means that the increase of waste volumes from those two sources should also be monitored.

The average waste produced amount per capita in the city of Sungai Penuh is 1,517 litres per person per day, which means that it needed around 340 units of waste dumping containers, 32 units of 3-wheeled wagons, and 17 units of dump trucks. Meanwhile, the empirical condition of equipments and medias of waste transportation currently available in Sungai Penuh is as follows:

Table 2:
Waste Transportation Equipments

No.	Types of Equipments	Amount (units)
1	Dump Trucks	13
2	3-wheeled wagons	4
3	2-wheeled carts	26
4	1-wheeled carts	2
5	Temporary Waste Dumping Sites	36

Source: Environmental, Cleanliness, and Parks Agency (Badan Lingkungan Hidup, Kebersihan, dan Pertamanan — BLHKP) of Sungai Penuh, field research conducted in October 2017.

Looking at the content of the table about the equipments and medias shows that the condition of these infrastructures are still not ideal, but it is pretty adequate to be able to transport the waste produce in city of Sungai Penuh. In order to be able to utilize these equipments and medias to its maximum capabilities, adequate workers/officers are needed to operate these equipments and medias. The condition of how many waste collection and transportation workers in Sungai Penuh is already adequate, as it can be seen in the table below:

Table 3:
Waste Collection and Transportation Workers

No.	Type of Workers	Amount
1	Supervisors	13
2	Dump Truck Drivers	13
3	Dump Truck Loaders	39
4	Sweepers	170
5	3-wheeled Wagon Drivers	15
6	3-wheeled Wagon Loaders	15
7	Final Waste Treatment Site Officers	4
8	Cart Operators	12
9	Sewer Cleaners	3
10	River Cleaners	25
11	Compost Makers	6
	Total	**315**

Source: Environmental, Cleanliness, and Parks Agency (Badan Lingkungan Hidup, Kebersihan, dan Pertamanan — BLHKP) of Sungai Penuh, field research conducted in October 2017.

The condition of the equipments and the amount of collection and transportation workers are currently adequate, even though it still needs to be increased. This means that the problem in the waste management in Sungai Penuh is not due to the equipments nor its workers, but due to the lack of the Integrated Waste Treatment Site (Tempat Pengolahan Sampah Terpadu — TPST). TPST Renah Kayu Embun is a rented land, which the rent would be up on April 2018. The other site in KM 14 is currently still under preparation. It has already passed its

environmental impact assessment and the land acquisition of the site has already been done, but this site in KM 14 is only a Final Waste Dumping Site (Tempat Pembuangan Akhir — TPA) while the people of Belui Village is asking for an Integrated Waste Treatment Site (TPST) instead of a TPA. If a TPST can be built instead, then it would bring a more positive effects for the surrounding societies. For example, there will be a creation of a new area of employment such as dump truck carwash, waste segregation services, etc. This waste management is run by the Ministry of Public Works and Housing (PUPERA), due to the fact that the budge for this program is included in PUPERA's annual budget.

Based on the calculation and utilization of the facilities owned by the Regional Government of Sungai Penuh, the reduction of waste in Sungai Penuh can be estimated as follows: Organic waste amounted to 2,47 tonnes; Non-organic waste amounted to 6,25 tonnes; Which the total waste amounted in Sungai Penuh is 36,421 tonnes per day (142,809 litres per day). 15,77 tonnes of the total amount of waste (43,29%) are the waste that has been processed, which leaves 20,651 tonnes per day (56,71% of the total daily waste) being left unprocessed and needs to be piled up on the TPA/TPST site.

2. Sungai Penuh Regional Government's Policy for Waste Management

Sungai Penuh Regional Government's policy about waste management is implemented through Regional Regulation No. 9/2013 about Waste Management (Perda No. 9 Tahun 2013 tentang Pengelolaan Sampah). This regulation is made with the consideration of creating a healthy environment, in order to develop the city's cleanliness and beauty sustainably. This regional regulations stated that any effort to create a healthy environment to develop the cleanliness and beauty of the city sustainably needs to be done by both the regional government and its citizens, so there would be a clean, neat, and beautiful city; That the growth of the city and its populations, and the change of in the consumptive pattern of the society has the effect of increasing the production of waste; That the waste management from upstream to downstream needed to be implemented effectively, efficiently, and

environmentally friendly in order to give its economic benefits to its own regions. Article 3 regulates the goals of waste management:

a. The making of an integrated and comprehensive waste management;
b. Increasing its citizens' health;
c. Maintaining the quality of the environment;
d. Turning waste into a resource.

Regional Government of Sungai Penuh ensured that there is an implementation of environmentally friendly waste management as regulated in Article 5, that in order to reach the goals as stated in Article 3, regional government has to do its duty to ensure the implementation of a good and environmentally friendly waste management system.

This regional regulation also regulating about the task of the regional government in waste management. In Article 6, it is explicitly stated that the task of the regional government is as follows:

1. To develop and increase the awareness of the citizens about waste management;
2. To facilitate and develop a waste reduction and handling technology;
3. To implement a waste management system and facilitate the development and provision of any related infrastructures needed to implement the system;
4. To push and facilitate the development of benefits from waste utilization;
5. To facilitate the implementation of local-specific technology which is developed in and by the society of Sungai Penuh in order to reduce and handle the waste;
6. To coordinate between governmental institutions, citiznes, and businesses to create an alignment in the wast management system.

Article 7 No. 6 stated that regional government is obliged to provide an Integrated Waste Management Site (Tempat Pembuangan Sampah Terpadu — TPST).

Currently, the Integrated Waste Treatment Site (Tempat Pengolahan Sampah Terpadu — TPST) in Sungai Penuh is located in Renah Kayu Embun. Renah Kayu Embun is a village located in the district of Kumun Debai, in the city of Sungai Penuh, in the province of Jambi. This location is a replacement location from the previous one in KM 14. The location of TPST is moved to this current one after the citizens living in KM 14 refused the existence of this TPST in KM 14. The system used to manage the waste in TPST Renah Kayu Embun is to pile the waste up and once the waste turned into compost, then the piles would be dismantled.

Furthermore, Article 7 Paragraph (2) stated, "The appoinment of the integrated waste treatment site, as stated in paragraph (1) letter d, is the part of the city's spatial planning." Paragraph (3) stated, "Any further regulations, as stated in paragraph (1) letter a and f, is regulated by the mayor regulation."

Regional Regulation No. 5/2012 about Detailed Plan of Spatial Planning of Sungai Penuh (Perda No. 5 Tahun 2012 tentang RDTR Kota Sungai Penuh) stated in Article 28:

(1) A Waste Management System, as stated in Article 25 letter c, is including:
    a. Planning of the Temporary Waste Dumping Site (Tempat Pembuangan Sementara — TPS);
    b. Planning of the Integrated Waste Treatment Site (Tempat Pengelolaan Sampah Terpadu — TPST);
    c. Planning of the Final Waste Treatment Site (Tempat Pemrosesan Akhir — TPA);
    d. The increase and development of waste management technology.
(2) A Temporary Waste Dumping Site, as state in Paragraph (1) letter a, is developed in every residential areas and any activities centers.
(3) An Integrated Waste Treatment Site, as stated in Paragraph (1) letter b, is in the form of development and provision of the said site.
(4) The location of Integrated Waste Treatment Site, as stated in Paragraph (2), is regulated in the Regional Regulation about Detailed Plan of Spatial Planning.
(5) A Final Waste Treatment Site, as stated in Paragraph (1) letter c, is a Regional Final Waste Treatment Site with the district of Kerinci.
(6) The increase and development of waste management technology, as stated in Paragraph (1) letter d includes:
    a. A waste management system with a sanitary landfill/
    b. A waste management through 3R system (Reuse, Reduce, and Recycle) is implemented on the source of the waste itself, in the Waste Dumping Site, and in the Integrated Waste Treatment Site.
(7) The development of partnership with private sector and cooperation with the regional government is the surrounding area, in order to develop and manage the Regional Final Waste Treatment Site, will further be regulated in accordance to the law and regulations applied.

Meanwhile, the responsibility of the regional government is regulated in Article 8 as follows:

1) Regional government has to provide the infrastructure for waste segregation in regional scale.
2) The Regional Device Work Unit (Satuan Kerja Perangkat Daerah — SKPD) is responsible to run and implement the waste management in the region.
3) The head of the district (camat) is responsible to nurture the citizens in regards of waste management in their respective authoritative regions.

4) The head of administrative sub-district (Lurah/Kepala Desa) is responsible to nurture the citizens in regards of waste management in their respective authoritative regions.
5) The nurture process, as stated in Paragraph (3) and (4), includes the nurture of the citizens' conformity in regards of waste management in their own regions.

The Household Waste and Similar Waste Management is regulated in Article 21.

It stated as follows:

(1) Household Waste and Similar Waste Management is consisted of:
    a. Waste reduction;
    b. Handling of the waste.
(2) Regional government is the one to set up the plan of the reduction and handling of the waste, and it's written in the form of strategic plan and yearly plan of Technical Regional Device Work Unit (SKPD Teknis).
(3) The plan of the reduction and handling of the waste, as intended in Paragraph (1), is at least contained:
    a. Waste reduction target;
    b. Infrastructures provision target which includes the source of waste up to the final waste treatment site;
    c. Regional cooperation development pattern, partnerships, and the participation of the society;
    d. The financing provision which would be borne the regional government and the society;
    e. Development plan and utilization of environmentally friendly technologies in recycling and final handling of the waste.

Reduction of the waste:

Article 22

(1) Waste reduction, as stated in Article 21 Paragraph (1) letter a, includes these activities:
    a. Limitation of waste produced;
    b. Recycling process of the waste;
    c. Re-utilizing of waste.
(2) Regional government, in doing the activities as stated in Paragraph (1), it's being conducted through the means as follows:
    a. To set up a target of waste reduction periodically in a set period of time;
    b. To facilitate the implementation of environmentally friendly technology;
    c. To facilitate the implementation of labelling system for environmentally friendly products;
    d. To facilitate the recycling activities of the waste;
    e. To facilitate the marketing of the recycled products.

(3) Various businesses in doing their activities, as stated in Paragraph (1), is obligated to use minimum-waste production materials, can be reused, can be recycled, and/or easy to be degraded by nature.
(4) The citizens in doing their activities, as stated in Paragraph (1), is obligated to use materials which can be re-used, can be recycled, and/or easy to be degraded by nature.

Article 23

(1) In order to increase the participation of the citizens in waste management in their region, the regional government can give out: a. A type of incentive to the citizen who managed to do waste reduction; b. A type of disincentive to the citizen who does not do any kinds of waste reduction.
(2) The type, form, and procedure of giving out the incentive and disincentive, as stated in Paragraph (1), is further regulated by the mayor regulations.

Handling of the waste:

Article 24

(1) Waste management activities, as stated in Article 21 Paragraph (1), includes:
    a. Segregation of the waste in the form of groups, according to the the type, amount, and/or nature of the waste;
    b. Collection of the waste in the form of collection and transportation of the waste from the waste sources to the temporary waste dumping site or integrated waste treatment site;
    c. Transportation of the waste in the form of carrying out the waste from its source, and/or from the temporary waste dumping site, and/or from the integrated waste treatment site to the final waste treatment site;
    d. Waste management in the form of changing the characteristic, composition, and amount of the waste;
    e. Final processing of the waste in the form of safely returning the waste and/or its residue after being processed to the environment.
(2) Further regulations on how to handle the waste, as stated in Paragraph (1), is regulated in the mayor regulations.

Citizens' involvement in waste management is an important strategy in the waste problem existing in our society, especially in regards of household waste. Citizens' comprehension of the 3R concept, which is Re-use (to use again any products that can still be used), Reduce (to minimize the production of the waste itself), and Recycle (to recycle the waste in order to make it usable again), are still inadequate. The habit to burn down the waste has become some sort of a culture in this country, be in in rural area or in urban area. This habit has its root planted deep down in the

society, it makes it really hard to be stopped. The citizens still has not realized that the type of waste they are producing now are different from the type of waste they used to produced back in the days. The types of waste existing today is dominated by chemically synthetic waste such as plastic, rubber, Styrofoam, metal, glass, etc. If these type of waste were to be burned, it would create a toxic fumes that could harm the health of surrounding societies. These fumes/gases would also worsen the quality of the air. For example, burning plastic waste would create dioxin gas which has the level of toxicity of 350 times greater than cigarette smokers. Dioxin is super toxic, which if it enters the system of human body, especially the nerves system and lungs, it could disturb the nerves and respiratory system. It is also carcinogenic, which means it is one of the cause of cancer in human. Another example, burning Styrofoam would create CFC gas which can damage the ozone layer of the earth and it is also dangerous if inhaled by humans. This caused the produces waste by the citizens kept piling on and there are a lot of unlicensed waste dumping site being created everywhere. This is why the involvement of the citizens in waste management is very important, starting from managing the waste produced at home. By doing this management of household starting from their own home, the citizens helped by minimizing the amount of final waste that is dumped to the Final Waste Dumping Site. It also helped to reduce the pile of waste being stack on the said site.

Society-based waste management that is implemented through the the society's own awareness and not giving the whole managing process of the waste to the regional government is the best step there is. Society-based waste management system is a strategic plan in order to deal with the waste problem existing in the society. The citizens whom has not been given a nurturing and understanding regarding ways of doing waste management would try to look for their own ways to resolve this waste problem. These ways including ways that is harmful to the environment such as dumping the waste to the river, piling the waste on the side of the road, or burning the said waste.

It can been from the result of this study that the regional regulations has not been implemented to its maximum capability. One factor that caused this problem is

that the mayor regulations that has not been issued, even though this mayor regulations is required in order to able to fully implement the regional regulations. These mayor regulations would act as the follow up regulation that would further regulate the implementation of the regional regulation. Based on this explanation, to be able to fully implement the regional regulation about waste management, it needed at least another 7 (seven) mayor regulations to be issued. In reality though, none of these 7 (seven) needed mayor regulations are issued up until now.

The policy about waste management in the city of Sungai Penuh needs to be done in in an integrated and thorough way because the success on managing the waste doesn't only rely on just one governmental agency, but it's the responsibility of all of the related agencies.

III. SUMMARY

1. Conclusion

a. The mayor regulations which has not been issued yet until now, is one of the problem that prevents the regional regulations still has not been fully implemented.

b. The policy about waste management in the city of Sungai Penuh needs to be done in in an integrated and thorough way because the success on managing the waste doesn't only rely on just one governmental agency, but it's the responsibility of all of the related agencies.

c. The condition of the equipments and the amount of collection and transportation workers are currently adequate, even though it still needs to be increased. This means that the problem in the waste management in Sungai Penuh is not due to the equipments nor its workers, but due to the lack of the Integrated Waste Treatment Site (Tempat Pengolahan Sampah Terpadu — TPST). TPST Renah Kayu Embun is a rented land, which the rent would be up on April 2018. The other site in KM 14 is currently still under preparation. It has already passed its environmental impact assessment and the land acquisition of the site has already been done, but this site in KM 14 is only a Final Waste Dumping Site (Tempat Pembuangan Akhir — TPA) while the

people of Belui Village is asking for an Integrated Waste Treatment Site (TPST) instead of a TPA.

d. The amount of waste produced daily in the city of Sungai Penuh is up to 36,421 tonnes per day. Household waste, be it from permanent, semi-permanent, and non-permanent households, are the biggest source of waste, which amounted up to 29,682 tonnes or 81,496% from the total amount of waste produced daily.

2. Suggestions

a. To increase the policies issued as the base and reference of implementation of the waste management. In this case, the mayor regulations would act as the follow up regulation that would further regulate the implementation of the regional regulation. This would create a coordinated waste management system in between related governmental institutions.

b. To increase the quality and quantity of the equipment/infrastructure and resource of the waste management, so that the waste that has been processed now, amounted to 43,29% (of the total amount waste produced daily) can be increased. It would also make the residue of unprocessed waste and needs to be piled up in the Final Dumping Site and Integrated Waste Treatment Site (TPA/TPST) (amounted to 20,651 tonnes/day or around 56,71% of the total amount of waste produced daily) can be decreased.

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