POLICY REFORM TOWARDS THE IMPLEMENTATION OF INTEGRATED WASTE MANAGEMENT (IWM)
(The Case Study of Pontianak Municipality, West Kalimantan, Indonesia)

THESIS

submitted in partial fulfillment of the requirements for the degree

of master of public administration

By :

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The Approval Statement

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PERNYATAAN
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Finally, I wish to present my very special acknowledgment to my family –my parents, brothers, and sisters– for their persistent prayer, love, motivation and encouragement. For those who have indirectly contributed to completing my thesis, your support helped me a lot. Thank you very much.

SUMMARY

Syaiful Rahman, Master of Public Administration Program, University of Brawijaya, Malang, “Policy Reform Towards The Implementation of Integrated Waste Management (The Case Study of Pontianak Municipality, West Kalimantan, Indonesia). Supevisor: Prof. Dr. Bambang Supriyono, MS.; Co-Supervisor: Dr. Alfi Haris Wanto, S.AP, M.AP, MMG.

Background of the research is that the waste problem, as an environmental issue, has always been a serious problem in almost all urban areas over the world especially for many developing countries and cities. In this case, Indonesia is one of those countries that face a problem when it comes to waste management in which waste generation continues to increase year by year. Those phenomena encourage the author to do research about policy implementation on waste management executed by a local government that is Pontianak Municipality. This research is also expected to provide academic, practical and social benefits. Based on the background presented above, then the research questions to be answered in this research are as follows: How is the current state of waste management in Pontianak Municipality, West Kalimantan, Indonesia? What are the supporting and constraining factors in the waste management in Pontianak Municipality, West Kalimantan, Indonesia? What recommendations can be implemented as part of policy reform in municipal solid waste management in Pontianak Municipality, West Kalimantan, Indonesia?

Regarding method of the research, the author conducted a single case study in a qualitative approach by conducting interviews with several informants (local officials of Pontianak municipal government both from bureaucrats and a political representative as well as academics and other stakeholders concerned with environmental issues in Pontianak) and using additional data from various documents such as reports or written documents pertaining to the case studied.

Result of the research indicates that Pontianak Municipality is still running a collect-transport-dispose method in handling the waste. In terms of waste transportation, the government showed a quite positive performance, getting better year by year. However, Pontianak Municipality is facing a serious problem

related to the waste volume that continues to increase rapidly without satisfactory performance in terms of waste reduction. This has an impact on the residual time of the landfill and requires the government to expand the landfill area at certain periods. As a landfill site is not unlimited, there will eventually be a situation where the landfill is no longer able to accommodate waste generation. Considering the basis of what has been concluded above and based on the analysis using Grindle's theory (policy implementation) which also includes a discussion about supporting and constraining factors, it can be said that a policy reform is immediately needed for handling waste, given that the existing policies are outdated and not in accordance with the current situation especially relating to waste reduction effort.

It is recommended that Pontianak Municipality should focus on a number of aspects: organizational aspect, legal and regulatory aspect, operational-technical aspect; and financial aspect. Furthermore, the government needs to set targets in a measurable and realistic manner including the development of baseline data regarding the characterization and quantification of waste, the current waste management system (and gaps therein) and the engagement of local stakeholders –the public and the private sector– in preparing an applicable action plan. This is in order to realize the goal of 3R-based integrated waste management and primarily guarantees good environmental quality for the future.

Keywords: waste management and policy implementation

FOREWORD

First of all, I am very grateful to Allah Subhanahu Wa Ta'ala because of His grace so that I can complete the thesis entitled: "Policy Reform Towards The Implementation of Integrated Waste Management in The Case Study of Pontianak Municipality, West Kalimantan, Indonesia" just in time. The writing of this thesis is carried out in order to fulfill one of the requirements for obtaining a Master of Public Administration degree from Brawijaya University, Malang. I am aware that I would not be able to complete my thesis without the help and support form various parties. Therefore, I would like to express my deepest gratitude to the following parties:

1. Mr. Prof. Dr. Bambang Supriyono, MS, as the Dean of the Faculty of Administrative Science, Brawijaya University and as the Supervisor I, who has taken the time to give me suggestions and advice during the preparation of this thesis;
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As the saying goes, no ivory that is not cracked, I realize that there may be still many shortcomings in this thesis. For this reason, constructive suggestions are really expected. Finally, I hope that this thesis can benefit many people.

Malang, Oktober 2019

Syaiful Rahman

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CHAPTER I

INTRODUCTION

1.1. Background

The waste problem is an environmental issue that has always been a serious problem in almost all urban areas over the world. Amasuomo and Baird (2016), based on thoughts developed by several scholars, remarked that most human activities produced waste. They added that waste has been existing since the prehistoric era and now the waste generation remains a main source of concern. In the prehistoric period, appropriate management was not the main issue since the population was still small and there was a spacious amount of land available to dispose of the waste as well as, at that time, the environment easily absorbed the waste without any efforts to reduce it. However, currently, as the quantity of production of waste generations increases, the variety of waste also experiences an increase.

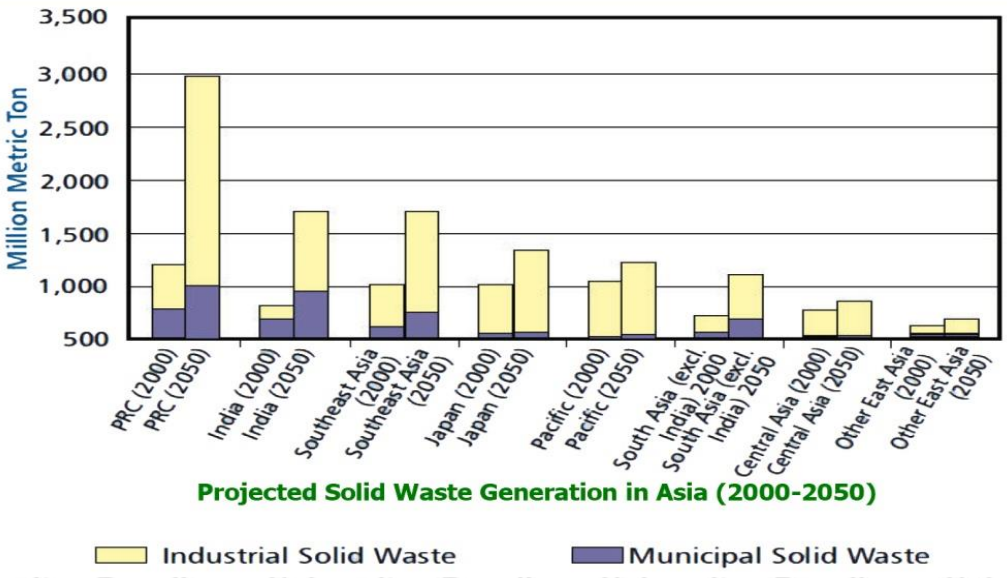

Figure 1.1. **Projected Solid Waste Generation in Asia 2000-2050**
Source: Mohanty (2011)

Figure 1.1 presented on the previous page provides us with Projected Solid Waste Generation in Asia from 2000 to 2050 (Mohanty, 2011). UNEP and ISWA stated that the volume of waste tends to double in low-income cities in Africa and Asia by 2030 because of an increase in population, urbanization, and consumption (The United Nations, 2015). The problem is that managing waste properly remains a challenge for many developing countries and cities (World Bank, 2019).

By definition, based on the Law of the Republic of Indonesia No. 18 of 2008 on Waste Management, waste is regarded as the residual of human daily activities and/or of natural processes in solid form. According to BPS-Statistics Indonesia (2018), the waste generation in Indonesia has reached 65.2 million tons per year. The number is expected to increase by approximately 6 million tons in 2025. Following the mandate of the law, 188 of 355 regencies/cities monitored over the 2016-2017 period no longer use open dumping landfill system. However, the government still has challenges in terms of reducing and recycling waste. Based on the survey in 2017, only 8.7 percent of households always carry their own shopping bags to reduce waste. In addition, households that carry out recycling activities are around 1.2 percent, while 66.8 percent of households still burn garbage to handle their waste (BPS-Statistics Indonesia, 2018).

In the case of Pontianak Municipality, Khatulistiwa, et al. (2015) found out that the average amount of waste disposed to landfill (TPA) is 1,286 m3/day with waste density 248 kg/m3. Furthermore, Table 1.1. illustrates that the waste generation at TPA Batulayang will be experiencing an increase by 1,785 ton every year, from 118,643.27 ton in 2016 to 127,760.92 in 2020. Increased waste

generation can certainly be a serious problem if no waste reduction efforts are made from the source. Based on local mass media, in 2018, there were several protests from residents to the government regarding the handling of waste which had a negative effect on the environment. Therefore strategic measures are really necessary to be arranged to prevent the emergence of more serious problems resulting from improper handling of waste.

Table 1.1. **Projection of Waste Generation at TPA Batu Layang Pontianak Municipality**

Year	Population	Waste Generation Rate (kg/man/day)	Waste Generation (ton/year)
2016	621997	0,52	118,643.27
2017	633947	0,52	120,922.68
2018	645897	0,52	123,202.09
2019	657847	0,52	125,841.50
2020	669797	0,52	127,760.92

Source: Khatulistiwa et al. (2015)

The waste management paradigm relied on throwing away in landfills has to be abandoned and the lifestyle of people who think of waste as something to be discarded and no economic value should be replaced with a new paradigm. The new paradigm that needs to be built is environmental friendly waste management expected to benefit society and the environment. Waste can be regarded as economically assets and converted into fruitful outputs, such as energy, basic materials for industry, and natural fertilizer.

Regarding waste management in Indonesia, at the national level, the government has issued Law No. 18 of 2008 on Waste Management providing legal certainty, clarity of responsibility and authority of central government, local government, and the role of society and business sector so that waste management can run proportionally, effectively and efficiently. The policy adopts

a waste management mechanism with the 3R concept consisting of Reduce: waste reduction, Reuse: limitation of the waste heap, and Recycle: recycling of waste and/or waste utilization. As it is known that so far most people still see waste as useless items, not as resources that need to be utilized. People in managing waste are still based on an old mindset – collecting, transporting, and disposing of waste. Thus, the waste management policy with the 3R principles is expected to be able to reduce waste at source, reduce environmental pollution, provide benefits to the community, and change people's behavior on waste.

Furthermore, as an effort to socialize the change of paradigm about waste management as mandated by the law mentioned above, the government of Indonesia has already issued some derivative rules. First, Government Regulation No. 81 of 2012 on Waste Management of Household Waste and Other Waste Similar to Household Waste. The point is the practice of processing and utilizing waste should be our new real step in managing waste. The waste management policy with an end-of-pipe approach that relies on the existence of final landfill is changed to a new approach –reduce at source and resource recycle through 3R implementation. Second, Regulation of Minister of Environment No. 13 of 2012 on Guidelines of Reduce, Reuse, And Recycle Implementation Through Waste Bank. As a strategy developed at the community level, waste bank is regarded as a social activity that leads people to start sorting, recycling and utilizing the waste, given that waste can have good selling value.

To support the waste management exercised by the government, there is also an effort to involve public participation in managing waste at community level in Indonesia called “waste bank”. Minister of the Environment has developed this method as a national policy by issuing Regulation of the Minister of Environment

Number 13 of 2012 concerning Guidelines of Reduce, Reuse, And Recycle Implementation Through Waste Bank. Simply put, according to Indonesia Waste Bank Profile, waste bank as a strategy developed at the community level is a social engineering activity that leads people to sort waste and raises public awareness in the wise processing of waste and in turn will reduce the waste transported to the landfill. The construction of the waste bank is expected to be the initial momentum of the collective awareness of the community to start sorting, recycling and utilizing the waste, since the waste has good selling value so that environmental friendly waste management becomes the new culture of Indonesia. According to general data obtained from Indonesia Waste Bank Profile 2012, there are already 471 waste banks that have been running in February 2012. The details are as follows: the number of customers or members is 47125 people; the amount of managed waste is 755600 kg/month; and the velocity of money reaches Rp. 1.648.320.000/month. The number of waste bank increased to 886 waste banks, according to data in May 2012, with the number of members amounted to 84,623 people and the volume of managed waste by 2001788 kg/ month and made money of Rp. 3.182.281.000/month. Those figures show that waste bank provides us with promising benefits. Hence, by applying this pattern it is expected that the volume of waste disposed to the landfill is reduced.

According to those regulations presented above, actually, the central government already encouraged a fundamental paradigm shift in waste management. The change is from a paradigm of collecting-transporting-disposing to processing paradigm that relies on waste reduction and waste recycling. Waste reduction activities encourage all levels of society, namely government, business party and the wider community to carry out 3R activities through smart,

efficient and programmed efforts. However, those waste management legislations have not given any significant effect. Waste remains a serious issue. Also, waste management is not yet compatible with environmentally friendly waste management methods and in some places has had a negative impact on public health and the environment. Then, waste becomes a national problem that demands the government to carry out a waste management program comprehensively and integratively from upstream to downstream in order to give healthy for society, safe for the environment, support the formation of environmentally friendly society behavior, and benefit economically,

Moreover, at the local level, there are diversities regarding the implementation of waste management policy due to the availability of infrastructure, human resources, and economic growth rate varying from one place to another. Based on the facts, this study then opted for a local level (Pontianak Municipality located in West Kalimantan Province) as a research object to gain more specific understanding. As it is known that, currently, local governments have a pivotal role in raising sustainable development programs. The United Nations (1992) suggested that local authorities are considered the level of governance closest to the people, playing a crucial role in educating, mobilizing and responding to the public to encourage sustainable development. This is endorsed by competencies local governments pose in various fields including urban planning and management, transportation, waste management, water and air quality management.

In addition, there are several reasons why this research selected Pontianak municipality as research locus. Pontianak Municipality is an emerging city becoming one of the cities included into *New City Program* 2015-2019 by

Bappenas. This program aims to support the realization of habitable and sustainable residential areas including waste management. Besides, Pontianak Municipality through RPJMD 2015-2019 starts to develop a smart city program known as *Pontianak Smart City*. In the development of the smart city, as claimed by Rodriguez-Bolivar (2015), environmental aspect, including waste management, is one of the key factors, along with other important aspects such as management and organization, technology, governance, policy, society, economy, and infrastructure.

In connection with the policy of waste management, Pontianak Municipal Government has issued at least two regulations, namely the Regional Regulation No. 3 of 2004 concerning Public Order and Mayor Regulation No. 6 of 2006 concerning Waste Disposal Schedule. However, the two rules have not explicitly explained the waste management mechanism in the community. This is understandable since the regulation had been issued several years before the policies from the central government (Law No. 18 of 2008, Government Regulation No. 81 of 2012 and Regulation of the Minister of Environment No. 13 of 2012) was enacted. Until this research proposal and result are written, Pontianak Municipal Government has not issued a derivative policy in the form of local regulation. Accordingly, the policy of waste management in Pontianak City is made directly through the implementation of the tasks and functions of the Environment Agency as contained in Mayor Regulation No. 61 of 2016 concerning the Position, Organizational Structure, Main Tasks, Functions, Job Descriptions and Working Procedures of the Pontianak Environment Agency. In doing so, the Environment Agency refers to regional medium term development plan (*Rencana Pembangunan Jangka Menengah Daerah/RPJMD*) and strategic plan (*Rencana Strategis/Renstra*).

Although Pontianak Municipality has not issued a legal basis –in form of local regulation– as a derivative rule of the central regulation, Pontianak has been carrying out waste management using 3R principles, one of which is an integrated waste treatment plant (*Tempat Pengolahan Sampah Terpadu/TPST)* The government formulated a strategic plan to establish one *TPST-3R* for one district in which there are six districts (Kecamatan in Bahasa Indonesia) within Pontianak Municipality. Currently, there is only one *TPST-3R* built by the government, then known as *TPST Edelweis,* located at Southeast Pontianak District. Also, the government has been engaging community to take part in waste management by carrying out waste bank program as stipulated in the Regulation of the Minister of Environment. Although Pontianak Municipal Government has not made the derivative rules underlying the formation of the waste bank in local level, there are already several waste banks running in Pontianak promoted by the community. This practice is done by abandoning the old way of just throwing waste away in the landfill. It then encourages the community to sort and value the waste, as an effort to to provide benefits to the community.

According to previous paragraph, it can be seen that Pontianak Muninipality showed a willingness to adopt 3R principles but it has not been done in an integrated manner. This makes the researcher interested in conducting a case study about waste management in Pontianak Municipality. This research starts from a comprehensive explanation of how the current situation related to waste management run by the Pontianak Municipal Government. In doing so, the researcher expects to get more insights about factors influencing the implementation of waste management policy. Then, this study tries to provide Pontianak Municipality with strategic measures need to be taken as part of policy

reform in dealing with waste issues. As a basis for describing appropriate waste management, the author discusses a term known as integrated waste management (IWM).

In many countries, Integrated (Solid) Waste Management is taken as being synonymous with traditional Municipal Solid Waste Management (Memon, 2010). In addition to that, the term 'integrated' in association with solid waste management had become standard by the mid-2000s (Wilson et al, 2013). Therefore, in this study, the researcher uses the term Integrated Waste Management (IWM) as a general term for Municipal Solid Waste Management (MSMW) and Integrated Solid Waste Management (ISWM).

Regarding the implementation of IWM that is becoming an interesting theme among scholars across the world, research on this issue has been considerably documented. Those research obviously provide a great deal of pivotal knowledge and insights through its findings, such as systems approaches to integrated solid waste management in developing countries (Marshall and Farahbakhsh, 2103), IWM as a mean to promote renewable energy (Eriksson et. al, 2014), life cycle assessment of IWM systems (Parkes et.al, 2015) and integrated approaches to water resource and solid waste management for sustainable development (Ikhlayel and Nguyen, 2017). Besides, there are several other research regarding IWM that the researcher present in the next chapter. However, most of the research including those mentioned above in great measure focus more on the analysis of how to integrate various technical elements into a more complete or partial system, and sometimes on using computer-aided applications to support that integration (Wilson et. al, 2013). This then invigorates the researcher to a research related to IWM from public administration view.

As it is known that waste management is part of the obligations or services the government has to carry out and the community as well as private sector can also take part in the waste service. This phenomenon is in line with the development of public administration in which there is a willingness of the government to cede or share some responsibilities including performing public service. As stated by Frederickson et al. (2012), there is an enormous amount of variation in rules, procedures, organization, and performance among the dispersed and decentralized entities now involved in public service provision. In a wider scope, it can be conceived as an administrative reform that is an essential function of public administration and governance in developing countries because of the acute problems that most of these governments face on a daily basis (Farazmand, 2002).

Based on the background above, the researcher describes the extent to which the implementation of the current waste management policies waste management policies has been running in Pontianak Municipality. The discussion of the process of policy implementation almost inevitably engages analysis of concrete action programs that have been arranged as a tool for bringing about wider policy objectives. This makes both terms, policy, and program, are often employed interchangeably (Grindle, 2017). Accordingly, this research tried to discuss policy implementation on waste management programs such as waste collection and transportation, 3R promotion, waste bank, and other programs related to waste management conducted by Pontianak Municipality.

Next, this study aims to mainly provide the government with new insights with regard to waste management policy to align programs that are already running in a more integrative direction and rely on the 3R principle. In doing so,

the researcher employed policy implementation model developed by Grindle that focuses on content and context of policy. As Najam (1995) said, amongst the measly efforts to formally conceptualize a model claiming general validity for various kinds of policy fields, in most developing countries, Grindle's (1980) contribution is presumably the most widely adopted. This model promotes some of the same (bottom-up) interests that have been manifested for implementation in industrialized countries and seems as relevant to countries that are recognized as developing ones. Moreover, Akib and Tarigan (2008) remarked that Grindle' model that covers six elements of the content of policy and three of the context of implementation characterizes an interrelationship between policymakers, policy implementers and policy users in an interactive model. This is one of the advantages of the model as a way of measuring the success of policy implementation, along with its output and outcomes. According to the viewpoint of scholars mentioned above the researcher then considers and adopts Grindle's model in developing a research framework.

Finally, The findings generated are expected to be able to contribute to the existing literature on environmental issues related to waste management as well as provide the government with new insights in order to arrange more strategic measures. This background is then processed and used as a reference for making questions in the research.

1.2. Research Questions

Based on the background presented above then the research questions to be answered in this research are as follows:

(1) How is the current state of waste management in Pontianak Municipality, West Kalimantan, Indonesia?

(2) What are the supporting and constraining factors in the waste management in Pontianak Municipality, West Kalimantan, Indonesia?

(3) What recommendations can be implemented as part of policy reform towards the implementation of integrated waste management in Pontianak Municipality, West Kalimantan, Indonesia?

1.3. Research Objectives

Based on the problem formulation as arranged in research questions, the purposes of the study to be achieved in this research are as follows:

(1) To describe and analyze comprehensively the current state of waste management and policies underpinning the waste management in Pontianak Municipality, West Kalimantan, Indonesia.

(2) To find out the supporting and constraining factors in the waste management in Pontianak Municipality, West Kalimantan, Indonesia.

(3) To propose recommendations that can be implemented as part of policy reform towards the implementation of integrated waste management in Pontianak Municipality, West Kalimantan, Indonesia?

1.4. Research Benefits

(1) Academic Benefit

This research is expected to be useful to add new insights and knowledge as well as library treasury for Master Program of Public Administration, Universitas Brawijaya, Malang. In addition, the results of the research can be utilized as reference and or information for other researchers who are interested to explore. similar or further research.

(2) Practical Benefit

This research is also helpful as a guide or advice for the government in developing the implementation model of the program or policy that can generate an effective outcomes regarding waste issue management.

(3) Social Benefit

This research is worthwhile to increase knowledge and insight of the wider community about the importance of IWM in handling waste problems. Hopefully, this will encourage community awareness to take part in succeeding government programs and policies related to waste treatment.

CHAPTER II

LITERATURE REVIEW

2.1. Previous Research

As mentioned in the Introduction chapter, the problems addressed in this study are related to the implementation of waste management which covers how waste management is handled and how waste processing programs are run, either by the government itself or by the community. It is important to take advantage of relevant research results that have been done before, especially to understand some matters relating to the implementation of IWM. Therefore, the researcher needs to select a number of previous studies that which can provide an overview and direction for the research that is being undertaken. Some previous studies are presented in the table below.

Table 2.1. **Previous Research**

No.	Title, Name, Year	Method	Result	Research Gap
1	Integrated Models for Solid Waste Management in Tourism Regions: Langkawi Island, Malaysia **Shamshiry et al. (2011)**	American Society for Testing Materials (ASTM) with 35 samples (questionnaires).	The problem in regulations of Langkawi Island has not been very effective according to questionnaire because inadequate institutional and human resource capacities to enforce them. Insufficient Facilities to storage and disposal of hazardous wastes is the problem too in Langkawi Island.	The research is conducted by not using a particular approach in social sciences, such as qualitative or quantitative. The methodology used rely upon ASTM that is a standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services.

No.	Title – Name – Year	Method	Result	Research Gap
2	Governance on the Ground: A Study of Solid Waste Management in Addis Ababa, Ethiopia **(Bjerkli, 2013)**	The data were collected through interviews with various actors operating within SWM in which during data collection, the researcher used a constant comparative method (CCM),	Good governance principles (partnerships with non-state actors) promoted by international donors does not necessarily result in improved service delivery on the ground.	The author focused on analyzing the current state of governance covering political context, administration/ bureaucracy as well as the development of good governance and decentralization.
3	Integrated Solid Waste Management: an approach for enhancing climate co-benefits through resource recovery **Menikpura et al. (2013)**	Life Cycle Assessment (LCA)	A properly designed integrated system with high but fully realistic recovery rates can drastically reduce the climate impact of waste management	The research more technically examined the waste management by assesing environmental impacts related to all stages of development, production, use, and disposal of materials and energy.
4	Integrated waste management as a mean to promote renewable energy **Eriksson et al. (2014)**	Life Cycle Assessment (LCA) and financial cost calculation by computer modelling – ORWARE (Organic Waste Research) and MARTES (district heating system)	A conclusion from this is that minimization of the increase of waste is essential for a more sustainable development of the society.	The author, similar to the previous one, carried out the research by employing computer based tools rather than using approaches referring to social sciences, qualitative or quantitative.
5	Waste Bank as Community-based Environmental Governance: A Lesson Learned from Surabaya **Wijayanti and Suryani (2014)**	This study is conducted using descriptive-analytics based on informant interviews, desk study, and field observation	Waste Bank has instruments that can establish self-reliance in a community supported by culture as software in governance system. There should be further development of waste bank management (by issuing regulation/ SOP).	The research concentrated on the roles of community in terms of improving waste management and the relationships established among community itself, government and private in succeeding waste bank program.

No.	Title, Name, Year	Method	Result	Research Gap
6.	Public Involvement in Waste Management Research and Decision-Making: A Case Study **Youngquist, et al. (2015)**	The case study through in-depth data collection and analysis over 32 months by engaging in participant observation and conducting a mail survey of 374 households.	This project serves as an example of the benefits of high waste visibility and awareness within a community. Public forums could have provided an opportunity for positive public-expert interaction and direct public involvement in identifying and framing risks and solutions.	Rather identical to the previous one, this case study is intended to investigate more deeply public's concern on environmental issues especially about composting operations and public involvement in terms of decision making related to waste management.
7.	Household Cooperation in Waste Management: Initial Conditions and Intervention **(Briguglio, 2016)**	Literature Review	The first, household cooperation in waste management is stimulated by members' desire to fulfill their moral (environmental, social, political) preferences. Secondly, households have limited space and time that constrains cooperation in waste management. Thirdly, this review confirms that intervention may incur unintended consequences.	This is also a kind of research focusing more on public engagement particularly household cooperation. Also, the research established the analysis by employing only literature review technique.
8.	Analysing efficiency of Waste to Energy Systems: Using Data Envelopment Analysis in Municipal Solid Waste Management **Albores et al. (2016)**	Data Envelopment Analysis (DEA)	Presents a method based on Data Envelopment Analysis that can be used to analyze the efficiency of Waste to Energy systems, looking not only at maximizing the positive outputs (energy), but also minimizing the negative ones (emissions).	The research is relied on Data Envelopment Analysis to assess the efficiency of Waste to Energy systems, in which the focus is only on the performance of incineration plants.

No.	Title – Name – Year	Method	Result	Research Gap
9.	Consideration of Stakeholder Interests in the Planning of Sustainable Waste Management Programmes **Lopez-Toro et al. (2016)**	Focus Grup Discussion (FGD)	The results reflect the fact that the social effects group is considered most important (50.7%), followed by environmental effects (40.6%), whereas less importance is given to economic effects (9.1%).	This research focuses on analyzing the effects of waste management activities and evaluate their impacts on stakeholders. This stakeholder's interests become an emphasis of the research.
10.	Integrated Approaches to Water Resource and Solid Waste Management for Sustainable Development **Ikhlayel and Nguyen (2017)**	Library Research	Integrated thinking can help in achieving sustainable development. Then the authors present recommendations for possible implications to the integrated approach in order to accelerate the process of sustainable development.	The author conducted the research without seeing specifically the locus. The research sought to generate in-depth evaluation only refer to library research or literature review in various journals.

Source: Elsevier, Proquest, Sage Publications, and Wiley Online Library

Those mentioned above are a little part of the previous research regarding IWM. Based on the previous research, it can be seen that much of them have produced interesting and informative results as well as showed evidence of the importance of the IWM's implementation. Moreover, there are also a few research carried out by scholars to develop conceptual frameworks of IWM (Gopal et. al, 2017; Singh and Sushil, 2017). The research employed total interpretive structural modeling (TISM) that contributes to the development of important links and the hierarchical relationships among the factors. However, TISM fails to come up with the relative weightings of drivers and barriers used in the study (Gopal et. al, 2017). By conducting a rather different method, Elsaid and

Aghezzaf (2015) develop a framework for sustainable waste management by using an in-depth analysis is exercised for the existing models for waste management. This then led to the development of a new framework which can be implemented.

Also, there are several comparative analysis carried out by scholars that can be utilized as a comparison or benchmark for this research. For instance, Wilson et al. (2012) use the perspective of integrated and sustainable waste management (ISWM) to analyze the new data set compiled on 20 cities in six continents for the UN-Habitat flagship publication Solid Waste Management in the World's Cities. Key insights include the variety and diversity of successful models – there is no 'one size fits all'; the necessity of good, reliable data; the importance of focusing on governance as well as technology; and the need to build on the existing strengths of the city. Owolabi et al. (2016) employing existing data from major scientific journals from 2005 to 2015 to draw experiences from developed countries for improving solid waste management efficiency in lesser developed and developing countries claimed that solid waste management in lesser developed and developing countries is not well established and inefficient. Zaman (2010) conducting a comparative study of municipal solid waste treatment technologies use life cycle assessment tool in which sanitary landfill, incineration, and gasification-pyrolysis of the waste treatment technologies are studied in SimaPro software based on input-output materials flow. The findings indicate that different waste treatment options have the different type of impacts.

To sum up, although much previous research have produced valuable insights and informative results, most research depicts IWM in a largely technical perspective, focusing on how to integrate various technical elements into a more

complete or regional system, and sometimes on using computer-aided applications to support that integration (Wilson et. al, 2013). In this research, the use of the term integrated to describe solid waste management systems is explored by considering governance aspects related to administrative process, particularly in policy implementation.

2.2. Public Policy Implementation

2.2.1. Public Policy

To begin, in the third millennium era, it can be seen that the position of public administration becomes very strategic, especially with the challenge of strengthening the private sector and shrinking the role of government. In this case, Nugroho (2014), according to Kettl (1996), claimed that three critical issues faced by public administration are as follows: *process*, public administration confronted with the fact that the largest source of deficit in any country is the process of administering public administration; *value*, one of which concerns the emergence of the entrepreneurial government icon; and *capacity*, which deals with the public administrator's ability issues in managing public affairs. In addition to that, Nugroho (2014) stated that it is necessary to add one more factor, that is public policy.

Next, the most important to understand is the meaning of policy and particularly public policy. There are many definitions are provided in the development of policy studies as part of public administration concern. Partly, the diversity has to do with semantics, others with the variety in the emphasis on a certain aspect of the events that become a focus of research in the real life (Hill and Hupe, 2002). From the variety of sources concerning policy sciences, first the researcher is interested in discussing public policy term by employing Hill and

Hupe's (2002). Their textbook showed that there are several definitions developed by scholars such as Hogwood and Gunn (1984) and Heclo (1972). Hogwood and Gunn claimed that any public policy is generally conceived as compising a series of patterns of pertaining decisions to which many situations or conditions and individual, group, and organizational leverages have contributed. In addition to that, Heclo said that what is 'policy' and certainly what is 'the policy' depends upon the one conducting the observation towards the policy. Moreover, Smith and Larimer (2009), summarizing some notions developed by scholars, claimed that some definitions are broad. Those are that policy is whatever governments choose to do or not to do (Dye, 1987); the relationship of governmental unit to its environment (Eysestone, 1971); the actions, objectives, and pronouncements of governments on particular matters, the steps they take (or fail to take) to implement them, and the explanations they give for what happens or does not happen (Wilson, 2006).

Furthermore, rather different from the earlier definitions, Anderson defined the term policy as a purposive course of action undertaken by an actor or group of actors in coping with a matter of concern, while public policies are those policies arranged by governmental bodies and officials (Hill and Hupe, 2002). Furthermore, Theodoulou (1995) using Anderson's approach added that public policy has different objectives, namely resolving the conflict over scarce resources, regulating behavior, motivating collective action, protecting rights, and directing benefits toward the public interest (Smith and Larimer, 2009). Similar to that, there is another kind of definition summarized from various public policy works of literature (Kuypers; Hoogerwerf; Van de Graaf and Hoppe) that proposed that public policy is about means and ends, that must have a

relationship with each other. On one hand, the political functionaries provide the goals, on the other hand, it is then the task of administrators to arrange the proper instruments (Hill and Hupe, 2002).

To summarize, the researcher concluded that, according to Birkland (2001), although there is no precise and universal definition of public policy, there is still a general agreement that public policy includes the process of making choices and the actions of particular decisions; that what makes public policy “public” is that these actions are supported by the coercive forces of the state; and that public policy is essentially a response to a perceived problem (Smith and Larimer, 2009).

Furthermore, regarding the importance of studying public policy Wahab (2012) following Anderson (1978) and Dye (1978) suggested that there are three rationales to deal with why public policy needs to be studied. Those are as follows: (1) *Scientific reason.* In this case public policy is studied in order to gain a deeper knowledge of the nature and origin of public policy and the processes that deliver its development and its impact on society; (2) *Professional reason.* Policy studies are intended as an attempt to apply scientific knowledge in the field of public policy in order to solve social problems on a daily basis. (3) *Political reason.* From a political point of view, studying public policy is basically to improve the quality of public policy made by the government.

2.2.2. Policy Implementation

2.2.2.1. Definition

After understanding the concept of policy particularly public policy, it is also crucial for us to understand the term policy implementation that is an important aspect of the policy process. Also, learning from implementation issues can improve the comprehension concerning with better ways to arrange policies in

order to make sure that they have the effects as desired. Winter (2006) remarked that implementation is a relatively new research in the course of public administration and public policy. It has a pivotal contribution in adding a public policy perspective to public administration during the execution process till (even after) delivery (Peters and Pierre, 2006). In addition, there are at least two types of public policies based on how they are implemented. The first type of public policy that requires public policy explanatory or implementing regulations such as Law or local regulations. Second, public policy that can be directly operationalized, for example Presidential Decree, Ministerial Decree, Decision of Governor / Mayor / Regent, decision of Head of Institution and so on (Nugroho, 2014).

Table 2.2. **Defining the term Implementation**

No.	Scholar	Concept of Implementation
1	Pressman and Wildavsky (1973)	Implementation is the ability to forge subsequent links in the causal chain so as to obtain the desired result.
2	Van Meter and Van Horn (1975)	Policy implementation encompasses those actions by public or private individuals (or groups) that are directed at the achievement of objectives set forth in prior policy decisions.
3	Bardach (1977)	The concept of 'games' as "classified according to the nature of their stakes as a "master metaphor" to understand, what he calls, the "implementation problem.
4	Rein and Rabinovitz (1978)	Implementation is described as the point at which intent gets translated into action. Their conceptual definition of implementation is a declaration of government preferences, mediated by a number of actors who create a circular process characterized by reciprocal power relations and negotiations.
5	Grindle (1980)	Implementation is an ongoing process of decision making by a variety of actors, the ultimate outcome of which is determined by the content of the program being pursued and by the interaction of the decision makers within a given politico-administrative context.

No.	Scholar	Concept of Implementation
6	Berman (1978); Nakamura and Smallwood (1980)	Implementation is simply defined as the process of carrying out an authoritative decision-i.e. a policy choice.
7	Edwards (1980)	Implementation is simply defined as the stage of policymaking between the establishment of a policy-such as the passage of a legislative act, the issuing of an executive order, the handing down of a judicial decision, or the promulgation of a regulatory rule-and the consequences of the policy for the people whom it affects.
8	Mazmanian and Sabatier (1983)	The concept of policy implementation is those events and activities that occur after the issuing of authoritative public policy directives, which include both the effort to administer and the substantive impacts on people and events.
9	Hargrove (1983)	The 'working definition' of implementation includes two components: the actions required by law are carriedout and those actions encompass both formal compliances with the law and organizational routines consistent with compliance.
10	Goggin, Bowman, Lester, and O'Toole (1990)	Implementation is defined as a process, a series of decisions and actions directed toward putting an already-decided mandate into effect.

Source: Najam (1995)

Moreover, Wahab (2012) explained that in a broader sense, implementation is often regarded as a form of organizing activities that have been established under the law and be mutual agreement among various stakeholders, actors, organizations, procedures and techniques in order to apply policies in a synergetic way to the desired direction. In conclusion, based on the various concepts of experts above, the implementation can be interpreted as an activities/actions or process to carry out a policy set forth in a regulation or the like issued by the government and other state institutions in order to achieve the goals arranged in the policy. Smith and Larimer (2009) added that the key issue for implementation studies is figuring out how a policy works or more accurately given the often noted failure bias of implementation studies, how a policy does not work.

In addition, another scholar from Indonesia, Nugroho (2014), remarked that in principle, policy implementation is a way for a policy to achieve its objectives. There are at least two options for implementing policies, which are implementing policies directly in the form of programs and implementing policies through the formulation of derivative policies. Indonesia generally still adopt the second model then known as the continentalist model.

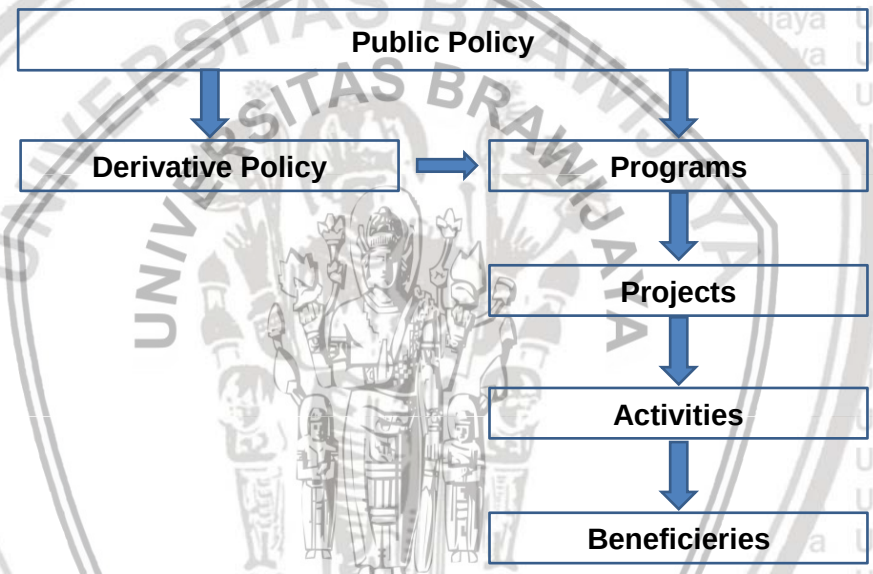

Figure 2.1. **Sequence of Policy Implementation**
Source: Nugroho (2014)

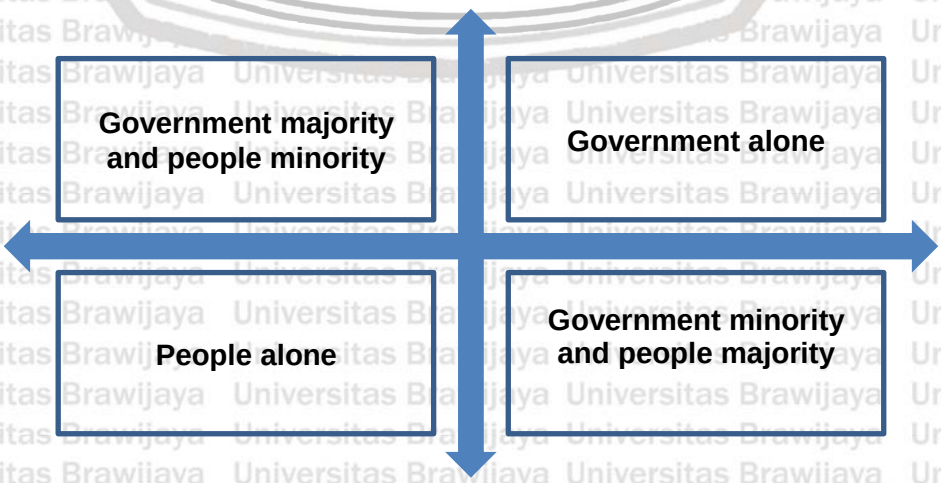

Figure 2.2. **Policy Implementation Actors**
Source: Nugroho, 2014

Regarding policy implementation actors (figure 2.2), the executive of the policy starts from a state or government actor as an executive agency. However, according to Nugroho (2014), it can be seen that there are four real implementation actors. Those are as follows: *Government,* this includes policies relating to the existence of the state, hereinafter referred to as the existential driven policy. For example, policies in the areas of defense, security, and justice. Despite efforts to involve the public, its role is often categorized as peripherals; *the Government as the main actors and the community as the companion*. The point is that policies are made in the category of government-driven policy such as ID card service where there is involvement of non-government network at the community level; *the community as the main actors and the government as the companion*. The policies created are included in the category of societal driven policy. Examples are social institutions, art foundations, and non-government schools, where the government only subsidies and does not participate directly; And the last, *the community itself*, which can be called people driven policy.

2.2.2.2. Model of Policy Implementation

Policy implementation is one of the most crucial stages of the policy cycle, Nugroho (2014) said that having a good concept or planning will promise sixty percent success, but that number will not matter if the remaining forty percent (implementation) is inconsistent. And unfortunately, many researchers find that the average of consistency of implementation is between ten to twenty percent. Udoji (1981) firmly stated that the execution of policies is as important if not more important than policymaking. Policies will remain dreams or print in file unless they are implemented (Wahab, 2012).

Academically, implementation, according to Winter (2006), has been investigated from a variety of viewpoints detonating different research designs, evaluation types, concepts, key subject areas, and methodologies (Peters and Pierre, 2006). In addition to that, Goggin et al. (1990) claimed that implementation research appeared as a reaction to increasing attention upon the effectiveness of wide-ranging reform agenda within the United States by 1970s (Fischer et al, 2007). At least, there are three approaches to policy implementation, namely, bottom-up, top-down and syntheses that incorporate both values to be one model.

To begin, one of the first comprehensive model of the policy implementation that is still notably robust was a model developed by Smith (1973). This model may be regarded one of the earliest bottom-up models of implementation. In his model the implementation of any policy is perceived as "old patterns of interaction and institutions are abolished or modified and new patterns of action and institutions are created" by addressing implementation from a social and political change angle in which implementation is then considered a tension generating force in society. Furthermore, Smith view policy as a continuous process without a definite end or “end products” in which the transaction phase will feed back into the implementation process as well as policy (re-) design. Thus, the implementation process is the synergy among four components: 1) the idealized policy and the patterns of interactions that the policy wants to induce; 2) the target group; 3) implementing organization’s structure, leadership, and capacity; and 3) environmental factors through which the policy implementation must be imposed. (Najam, 1995).

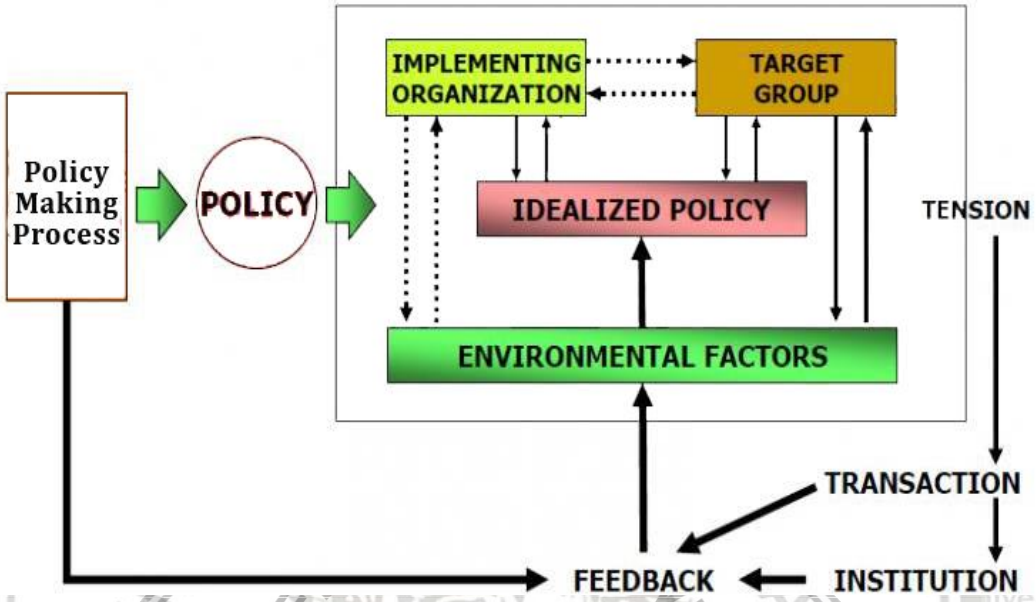

Figure 2.3. **Smith's (1973) Model of the Policy Implementation Process**
Source: Najam (1995)

Next, departing from top-down mainstream, a much more widely cited early model is Van Meter and Van Horn (1975). According to Najam (1995), Van Meter and Van Horn employed the three causes of non-implementation developed by Kaufman (1973). Those are as follows: subordinates don't know what their superiors want, subordinates can't do what their superiors want, or subordinates refuse to do what their superiors want. These are then labeled as problems of communication, capacity, and implementer disposition. In addition to that, the model of Van Meter and Van Horn include six variables and the relationships among them which shapes policy and performance. The variables consist of: a) the relevance of policy standards and objectives; b) policy resources; c) inter-organizational communication and enforcement activities; d) the characteristics of the implementing agencies; e) the economic, social, and political environment; and f) the disposition of implementers.

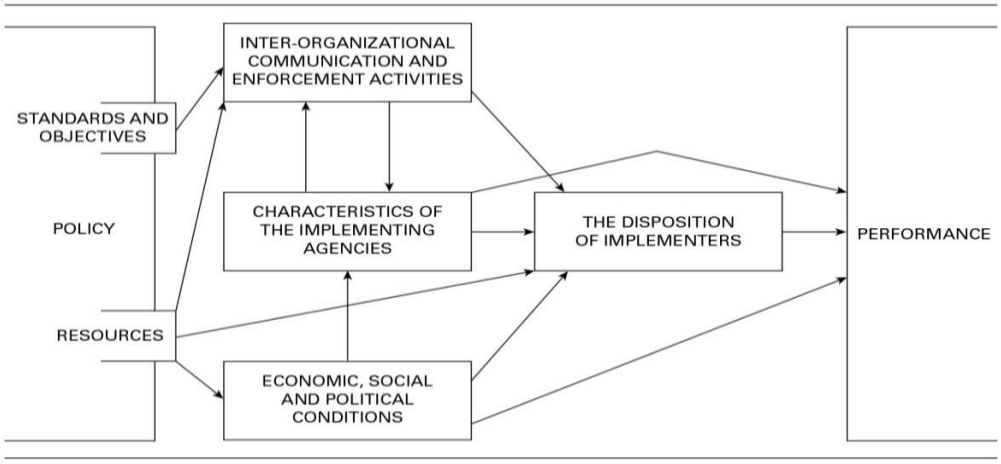

Figure 2.4. **Van Meter and Van Horn's Model of the Policy Implementation Process**
Source: Hill and Hupe (2002)

Moreover, Fischer et al. (2007), in his textbook, remarked that in the implementation model of Van Meter and Van Horn, the extent of policy change has an important influence on the prospect of the effective implementation as well as the standard of consensus on desired objectives or goals is crucial. For that reason, the compelling policy change will be only possible if goal consensus among actors is also high. Different from other the top-down representatives, the model of Van Meter and Van Horn is considered less concerned about giving policymakers recommendation for fruitful implementation but rather to provide a sound basis for scientific analysis.

The top-down and bottom-up approaches are helpful in attracting attention to the evidence that both perspectives play significant roles in the process of implementation, but in the long run, the debate upon two approaches is not worthwhile (Peters and Pierre, 2006). Elmore (1985), according to Peters and Pierre (2006), suggested using both forward mapping and backward mapping for policy analysis because both tend to provide policymakers with a good understanding of.

One of the attempts at building a hybrid theory is carried out by Sabatier (1986). He proposed an advocacy coalition framework of policy change. The focus is advocacy coalitions that mean actors from various public and private organizations who share a set of beliefs and make efforts to achieve their shared goals over time –in some ways the 'glue' that incorporates the top-down and bottom-up values within its coalitions.

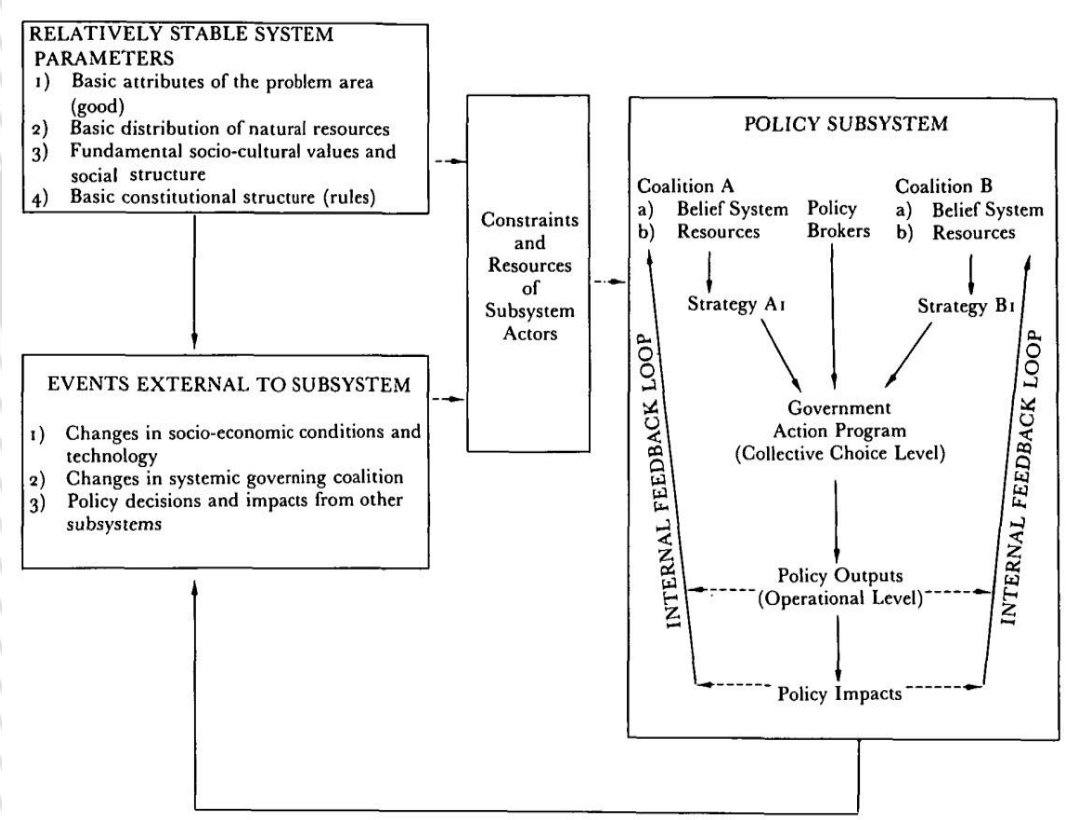

Figure 2.5. **Sabatier's Advocacy Coalitions Framework of Policy Change**
Source: Najam (1995)

Fischer et al. (2007) concluded that at least there are two essential innovations from the "hybrid theories or synthesis. First, they tried to deal with the conceptual weaknesses of the polarized debate between bottom-up and top-down scholars by focusing on empirical arguments about the appropriate conceptualization of the implementation process and integrating the extreme

arguments of both sides into models that grasped both central authorities and local autonomy. Second, some of the hybrid theorists led to crucial aspects that had previously drawn inconsiderable attention.

Regarding this study, the researcher will employ Grindle's model. As claimed by Najam (1995), amongst the very limited efforts to formally conceptualize a model claiming general validity for various kinds of policy fields, in most developing countries, Grindle's (1980) contribution is presumably the most widely adapted. This model promote some of the same (*bottom-up approach*) interests that have been manifested for implementation in industrialized countries and seems as relevant to countries that are recognized as developing ones. Therefore, this research will be carried out by employing Grindle's Model.

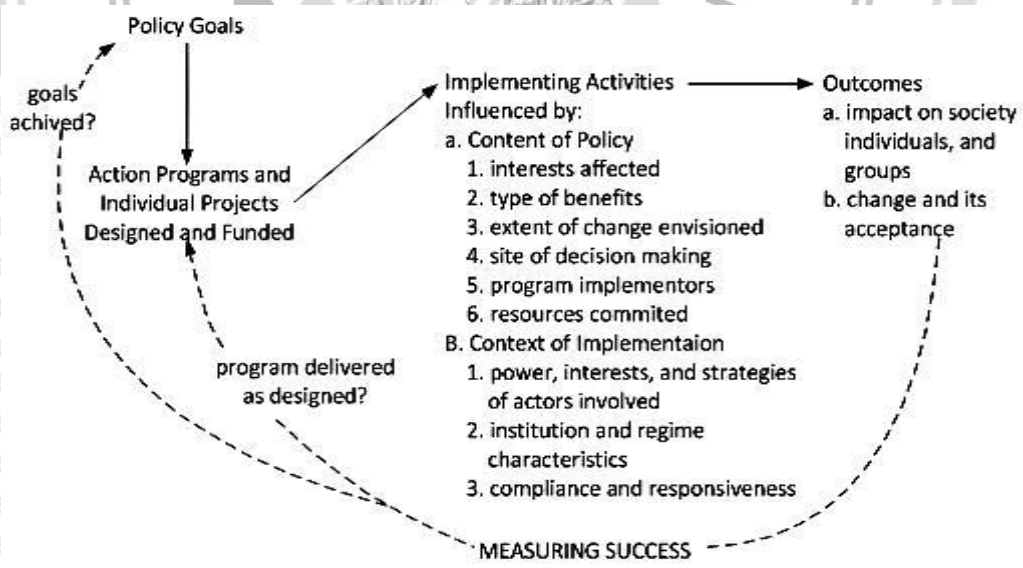

Figure 2.6. **Implementation as a Political and Administrative Process**
Source: Grindle (2017)

Based on Figure 2.6, it can be seen that policy implementation is influenced by two variable, namely, content of policy and context of implementation. In details, these variables consist of some indicator as follows : (1) Content of policy

covering: interests affected, types of benefits, degree of change desired, site of decision making, program implementor, and resources committed; and (2) context of implementation embracing: power, interests and strategies of actor involved, institution and regime characteristics and compliance-responsiveness. Nugroho (2014) added that the uniqueness of the Grindle's model is demonstrated by its comprehensive understanding within the policy context, particularly with respect to implementers, implementation recipients, and the arena of conflict that may occur between the implementing actors and the resource conditions required for implementation.

To sum up, Jann and Wegrich, in Fischer et al.'s (2007) textbook, noted that implementation research was interested in developing theories about what works. One way to do this has been to assess the effectiveness of different types of policy instruments based on particular theories about cause and effect relations. Grindle's model of implementation is one of the important theories that can be utillized to analyze the success of policy. In addition to that, Grindle (1980) concluded that the performance of the field administrator-as-implementer is a variable that can determine whether or not programs arranged will reach beneficiaries as desired. Moreover, whether or not he fulfills the expectation that he carry out programs depends on the force of other demands made upon him and his own perceptions of how best to attain his personal objectives, whatever they may be (Najam, 1995). Furthermore, there is not the best model. What we have is the choice of model that we must choose wisely in accordance with its own policy needs. This means that policy implementation should display the effectiveness of the policy itself (Nugroho, 2014).

2.2.3. Policy Reform

Cerna (2013) said that policy change goes hand in hand with policy implementation. Cerna added that 'policy change' and 'policy reform' as the terms are often used interchangeably in the literature. As Berman (1995) remarked, policy reform is the process of improving the performance of existing systems and of assuring their efficient and equitable response to future changes (Cerna, 2013). Furthermore, there are several theories explaining about policy reform or policy change.

Table 2.3. **Theories of Policy Reform**

Theory	Description
Path dependence	It is generally difficult to change policies because institutions are sticky, and actors protect the existing model (Greener, 2002). Public policies and formal institutions are usually designed to be difficult to change so past decisions encourage policy continuity (Pierson, 2000). In addition, to introduce a major change, policy-makers have to wait for a critical juncture (Capoccia and Kelemen, 2007) or a window of exceptional opportunity called conjuncture (Wilsford, 1994).
Advocacy coalition framework	There are sets of core ideas about causation and value in public policy; these coalitions form because certain interests are linked to them. Policy change occurs through interactions between wide external changes or shocks to the political system and the success of the ideas in the coalitions, which may cause actors in the advocacy coalition to shift coalitions.
Policy learning	Policy learning refers to relatively enduring alterations of thought or behavioural intentions which result from experience and which are concerned with the attainment (or revision) of policy objectives (Heclo 1974). Learning is considered a process by which networks learn from past experiences, and thus is mostly about techniques and processes in order to improve policy (Bennett and Howlett 1992). Therefore, policy-makers learned from previous experiences and included new information obtained when considering reforms.

Theory	Description
Policy diffusion	Shipan and Volden (2008) propose that policy diffusion is a process in which policy innovations spread from one government to another. They added that there are four mechanisms of policy diffusion: learning from earlier adopters, economic competition, imitation, and coercion.
Punctuated equilibrium	Punctuated equilibrium model (Baumgartner and Jones, 1991) proposes that once an idea gets attention it will expand rapidly and become unstoppable. The process comes about from external events that disrupt the political system, particularly the ones that are big enough to disrupt or punctuate its equilibrium.
Institutional change	Institutions are formalised rules that may be enforced by calling upon a third party (Streeck and Thelen, 2005). A typology of the results and processes of change indicate either an incremental or abrupt process of change. The result of change is divided into continuity or discontinuity.
Multi-level governance	It has been evident that change is a multi-actor and multi-dimensional process. Most of the literature has thus pointed to the need to consider policy change processes from a multi-level perspective involving a variety of actors. Policy-making has increasingly become complex where actors move between different levels of action and authority is dispersed across multiple tiers (i.e. national, regional or local) (Hooghe and Marks, 2001).
Policy networks	A policy network is a cluster or complex of organisations connected to each other by resource dependencies and distinguished from other clusters or complexes by breaks in the structure of resource dependencies (Rhodes and Marsh 1992).
Disruptive innovation	Disruptive innovation is a model of social change taken from management. It is an interesting concept especially for more radical change and has been applied to a variety of policy areas (see Christensen, Aaron and Clark, 2003; Christensen et al. 2006). Disruptive innovation is a two-stage process: first, an innovator makes a product more affordable and simpler to use than an existing one, while in the second stage, additional technological change in the industry makes it simple and inexpensive to build and upgrade the products (Christensen, Horn and Johnson 2008).

Theory	Description
Politics of change and reform	Politics affects origins, formulation and implementation of public policy especially when significant changes are involved (Reich 1995). Reform is political for the following reasons: It represents a selection of values that express a particular view of society; it has distinct distributional consequences in the allocation of benefits and costs; it promotes competition among groups that seek to influence consequences; Enactment or non-enactment of reform is often associated with regular political events or political crises; and it can have significant consequences for a regime's political stability. There are three models of policy reform that represent three clusters of political conditions under which reform can occur. a) Political will model: decisions by political leaders are necessary and sufficient for a major policy change. This model is more likely under political circumstances such as a strong mandate, strong state, narrow coalition and strong leadership (Reich 1995). b) Political factions model: politicians seek to serve the desires of different groups (interest groups, political parties). Reform occurs when it corresponds to a preferred distribution of benefits to specific constituent groups of government leaders. c) Political survival model: government officials seek to protect individual interests (as powerholders) in order to maintain or expand their existing control over resources. Reform occurs when it serves the personal political survival or the personal interests of political leaders (Reich 1995).

Source: Cerna (2013)

Moreover, policy reform can be conceived by exploring concepts developed by Brinkerhoff and Crosby (2002). In the development of discussions about policy analysis, policy reform is seen as a proces in which policies are perceived to be dynamic combinations of purposes, rules, actions, resources, incentives, and behaviors leading to outcomes that can only imperfectly be predicted or controlled. In addition, Brinkerhoff and Crosby also proposed a tool kit as guidelines for poliy reformers in managing policy reform, as follows:

a. Stakeholder analysis

Stakeholder analysis is designed to assist policy managers in identifying those interests that should be taken into account when making a decision. To that end, stakeholder analysis is directed at assesing the nature of a policy's constituents, their interests, their expectations, the strength or intensity of their interests in the issue, and the resources that they can bring to bear on the outcomes of a policy change.

b. Policy characteristic analysis

Policy characteristics analysis is a useful tool to help policy reformers to better understand the dimensions and dynamics of the policy, where it came from, and where support and opposition are likely to be strongest. Also, it is designed to assist reform teams systematically think through these issues: what the policy is designed to do, the context n which the policy will be implemented, how the reactions of the public are likely to be manifest, and how consequential the changes for the bureaucracy are likely to be.

c. Political and institutional mapping

To be successful public officials need the capacity to asses the political environment for decision making and the ability to develop strategies that will improve their chances for success. In this case, policy mapping techniques help in assesing the level of competition policy managers face, the channels of access to critical decisions, and the possibilities for increasing support through alliances and coalitions to achieve objectives.

d. Workshops for managing policy reform

Workshop have proven to be highly effective in establishing and supporting strategic management processes and also in providing opportunities for

participation in policy change by affected parties. Effective workshops contribute to economic efficiency gains by, such as, improving coordination across implementing agencies and sectors. Workshops also yield political benefits, for example, in the form of increasing support for policy issues and solutions.

e. Advocacy for policy reform

If significant policy change is to occur, policy reformers need to work together to influence key stakeholders. One important tool for influencing outcomes in democratic polities is advocacy, also called lobbying. Policy advocacy can be defined as the effort of individuals or groups to influence policymakers and to have an impact on public policy decisions and the action of government.

f. Conflict resolution

There are many opportunities for disagreements and disputes to arise among stakeholders when policies are being changed. While the potential for conflict as part of the policy process is ever present, policy implementation calls for shared and coordinated action by numerous stakeholders. Understanding and activating the agreement motive in policy implementation situations can be powerful tool for policy reformers to tackle barriers to cooperation and move implementation forward. In this case, conflict resolution stimulates stakeholder participation, encourage policy ownership, and build institutional capacity.

g. Policy monitoring

Monitoring policy reform implementation is critical to keeping activities and progress on track, reporting on results, identifying when changes are needed, and assesing the effectiveness of reform strategies. Information from well designed monitoring system can be instrumental in dealing with the politics of policy implementation.

2.3. Waste Concept

According to Amasuomo and Baird (2016), there are several definitions of waste developed by scholars. Those definitions are as follows:

Table 2.4. **Waste Concept**

Scholar	Definition
White et al (1995)	Waste can be defined as the useless by-product of human activities which physically consist of the same materials that are contained in the useful product
Dijkema et al (2000)	Waste is considered materials in which people want to dispose of though they have to pay some money for that disposal
Cheremisinoff (2003)	Like two sides of the coin, waste is a crucial material produced from human activities and it is also the product of inefficient production processes that continually result in the loss of important resources
Basu (2009)	Waste is conceived as any product or material which is useless to the producer

Source: Amasuomo and Baird (2016)

In addition, based on the Law of the Republic of Indonesia No. 18 of 2008 on Waste Management, waste is defined as the residual of human daily activities and/or of natural processes in solid form. Next, DEFRA (2009) suggested that it is also crucial to know what constitutes waste (Amasuomo and Baird, 2016) since the classification of a product to be waste will establish the basis for the regulations needed to secure the people and the environment where the wastes are being disposed of. According to Tchobanoglous and Kreith (2002), there are several sources of solid wastes in communities.

Table 2.5. **Waste Sources**

Source	Activities, or Locations	Types of Waste
Residential	Single-family and multifamily dwellings; low, medium-, and high-density apartments; etc.	Food wastes, paper, cardboard, plastics, textiles, leather, yard wastes, wood, glass, tin cans, aluminum, other metal, ashes, street leaves, special wastes (ie. consumer electronics, white goods, batteries, oil, tires), and hazardous household waste.

Source	Activities, or Locations	Types of Waste
Commercial	Stores, restaurants, markets, office, hotels, print shops, service stations, auto repair shops, etc.	Paper, cardboard, plastics, wood food wastes, glass, metal wastes, ashes, special wastes (see preceding), hazardous wastes, etc.
Institutional	Schools, hospitals, prisons, governmental centers, etc.	Same as for commercial
Industrial (non-process wastes)	Construction, fabrication, light and heavy manufacturing, refineries, chemical plants, power plants, demolition, etc.	Paper, cardboard, plastics, wood, food wastes, glass, metal wastes, ashes, special wastes (see preceding), hazardous wastes, etc.
Municipal solid waste (MSW)	All of the preceding	All of the preceding
Construction and demolition	New construction sites, road repair, renovation sites, razing of buildings, broken pavement, etc.	Wood, steel, concrete, dirt, etc.
Municipal services (non-treatment facilities)	Street cleaning, landscaping, catch-basin cleaning, parks and beaches, other recreational areas, etc.	Special wastes, rubbish, street sweepings, landscape, and tree trimmings, catch- basin debris; general wastes from parks, beaches, and recreational areas
Treatment facilities	Water, wastewater, industrial treatment processes, etc.	Treatment plant wastes, principally composed of residual sludges and other residual materials
Industrial	Construction, fabrication, light and heavy manufacturing, refineries, chemical plants, power plants, demolition, etc.	Industrial process wastes, scrap materials, etc.; nonindustrial waste including food wastes, rubbish, ashes, demolition and construction wastes, special wastes, and hazardous waste
Agricultural	Field and row crops, orchards, vineyards, dairies, feedlots, farms,etc.	Spoiled food wastes, agricultural wastes, rubbish, and hazardous wastes

Source: Tchobanoglous and Kreith (2002)

Moreover, OECD suggested that municipal waste includes (i) bulky waste (e.g., white goods, old furniture, etc) and (ii) garden waste, grass clippings, street sweepings, the content of litter containers, and market waste, if these are managed as waste (World Bank, 2018). This definition excludes waste from sewage network and treatment systems as well as municipal C&D waste, even though municipalities may reckon the small amount of C&D waste generated from house renovation projects. Regarding the definition that will be used in this study, the author refers to the term municipal solid waste that is generally taken for granted to include all wastes generated in a community, similar to the definition developed by OECD.

2.4. Integrated Waste Management (IWM)

By the 1970s, several scholars first associated the term 'integrated' with solid waste management. Then the term of "Integrated Waste Management" had become common use by the mid-2000s after its use extensively by the scholars and imaged in various names of waste-related academic research centres such as 3R: Residual Resources Research, DTU, Denmark; the Integrated Waste Management Centre of Cranfield University, UK; the CSIR Centre for Integrated Waste Management, South Africa; and the Center for Integrated Waste Management of the University at Buffalo in the USA (Wilson, et al., 2013).

Arjmandi et al. (2013) defined IWM as a means for proper management of solid waste specifying the quantity and composition of generated waste, details of services related to storing, collecting, transporting and disposing stages, separation manner of recyclable and non-recyclable materials at the source, waste minimization and pollution control settings, harmful waste management instructions as well as all possible plans for minimizing waste generation.

Deus et al. (2016) claimed that without integrated management, the increased waste resulted from GDP growth and economic development increases the negative environmental impacts related to GHG emissions and energy consumption. This is one of many reasons showing how important the concept of IWM for the sustainability of life. Furthermore, Arjmandi et al. (2013) suggested that over the past decades, the waste management in European countries has been shifted to a more elaborate system that consists of various waste treatment and disposal processes as a distinctive feature of innovation and high-tech programs. Similarly, IWM has also become a major concern in Asian countries as the economic aspects growing rapidly.

There are several definitions of IWM developed by scholars in which the utilization of the term depends on the thematic use.

Table 2.6. **Different Uses of The Terms "Integrated Waste Management"**

Thematic use	Description
Waste and wastewater processing integration	Integrating solid waste management with wastewater treatment, and sometimes also with energy generation and food production
Solid waste processing integration	Integrating various technical elements into a single waste treatment process (e.g. as in modern mechanical biological treatment plants)
Facility integration	Integrating different types of solid waste treatment and disposal facilities in close proximity, often with various treatment processes and a landfill site co-located
Integrated solid waste management in industrial parks	Exploring industrial symbiosis and economies of scale in managing solid wastes of industries located in the same park, as a part of the industrial ecology approach to resource management
Integrated planning for a region/ metropolitan area	Integrating a number of neighboring political units into a region for the purposes of analysis/planning/sitting and permitting common facilities to serve the whole region. Often the term implies the use of a systems approach or mathematical modeling
Integration (consolidation) of disparate legislation and policies	Consolidating disparate, disconnected or partly overlapping/contradicting legislation and policies into strategies or overarching initiatives, for example as emerging from EU regulations and directives

Thematic use	Description
Integration of decision makers	Consolidating contradictory suggestions from multiple institutional statutory bodies involved in solid waste management decision making
Integrated (solid) waste management (using the waste hierarchy)	Integrating SWM according to principles of the waste hierarchy, combining waste prevention or reduction, reuse, recycling/composting, energy recovery and disposal, or discussing the role of particular technological solutions
Integrated analysis of SWM options with other (environmental, economic) aspects	For example, integrating analysis of SWM options with air pollution in a city, energy consumption, cost-benefit analysis, etc.
LCA	'Integrated waste management' and 'integrated solid waste management' are terms that have been used to describe life-cycle assessment (LCA) approaches to waste management
Integrated resource management	Integration of waste with resources management, often in the context of a 'closed-loop' recycling, eco-design/ recyclability of new products or general 'circular economy'
Integrated sustainable waste management	Integrating across three dimensions – all the elements of the waste hierarchy, all the stakeholders involved and all the 'aspects' of the 'enabling environment' (political, institutional, social, financial, economic and technical). Used particularly in developing countries

Source: Wilson et al. (2013)

Furthermore, by summarizing several concepts of IWM developed by scholars, Menikpura et. al (2013) added that since society becomes more advanced, simple solutions are no longer sufficient to solve the ever-growing municipal solid waste disposal issues. In addition, there is no single management system which can be generally applied to all waste issues. Hence, it is necessary to combine appropriate treatment methods such as recycling, anaerobic digestion, incineration, and landfilling in order to form proper management. Then, this model is called integrated solid waste management (ISWM) including the recovery of useful materials and energy from waste. In subsequent developments of ISWM, the concept will stimulate not only the integration of technologies but also the policies and or programs related to waste problem management. Memon

(2010) claimed that the ISWM concept can optimize the gains of 3R on one hand, and improve the waste management system on the other hand. Moreover, USEPA (2002), has claimed that the hierarchy of integrated solid waste management follows the priority order: reduction, recycling, waste combustion or waste transformation and landfilling. Hirschhorn et al. (1993) mentioned that the waste hierarchy triggered a big shift from end-of-pipe to preventative thinking (Marshall and Farahbakhsh, 2013).

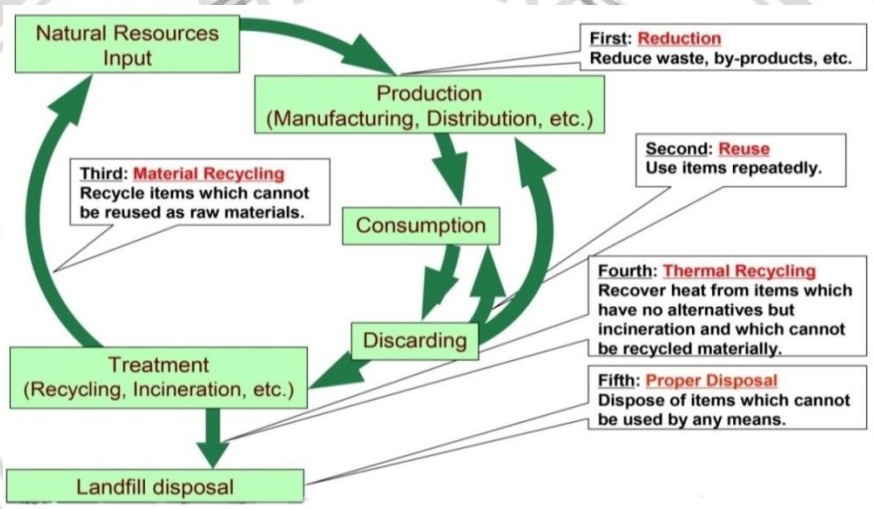

Figure 2.7. **The Scheme of 3R**
Source: Mohanty, 2011 (Adapted from MoE-Japan)

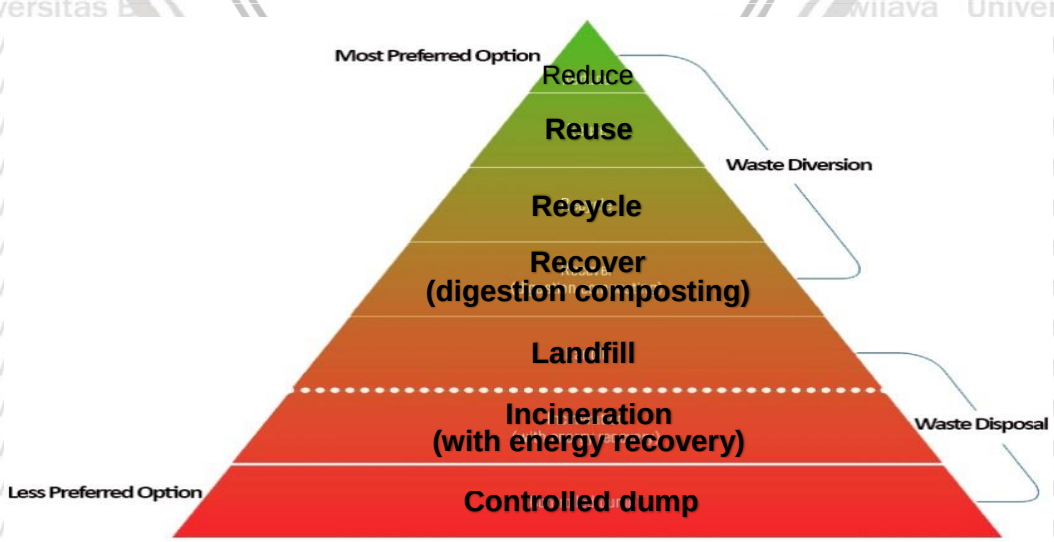

Figure 2.8. **Waste Hierarchy**
Source: A Global Review of Solid Waste Management, 2012 (UNEP, 2017)

In addition, as claimed by Amit (2008) and seeing Figure 2.1 and 2.2, it can be said that the 3R approach essentially revolves around the concept of the waste hierarchy, which is basically a precautionary principle that prioritizes the prevention and reduction of waste, reuse, and recycling of waste, and optimization of final disposal. Memon (2010) added that 3R, along with integrated solid waste management, has become regular terms for decision-makers and practitioners in the course of waste management. Efforts to reduce waste by raising public awareness and issuing policy can bring about significant reductions in term of waste generation. Besides, it was also conceived that waste contains valuable resources that can be recovered in forms of materials for recycling and in forms of energy to be utilized as an alternate for fossil-based fuels. This understanding completes the concept of 3R to minimize the final volume of waste as well as to turn most of the waste into reuse and resource innovation.

Hotta (2015) remarked that many countries employ a variety of quantitative 3R indicators, such as total municipal solid waste generation, recycling rate, and resource productivity according to material flow accounting. Moreover, qualitative indicators can be employed for observing particular features and effectiveness of recycling status based on the goals arranged within the policies. More circumstantial social aspects are alsotaken as the sample of indicators for overseeing the advancement of 3R activities. Those aspects comprise public satisfaction of waste management models, a ratio of population involving in source separation, how well public grasp on local preferences in waste management or fulfillment of waste management services in the course of the capacity of administrative practices.

2.5. Research Framework

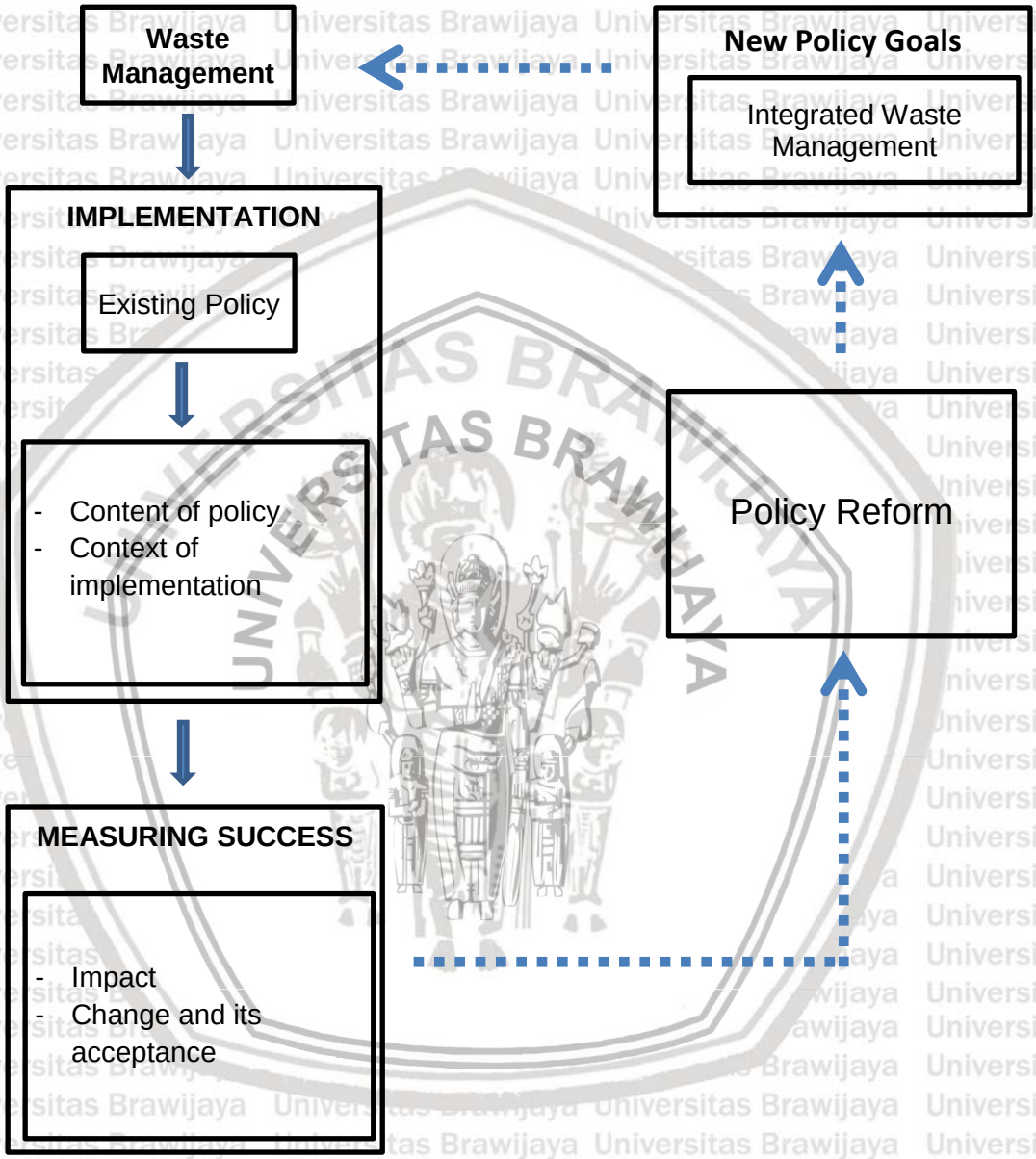

Figure 2.9. **Research Framework** (adopted from Grindle, 2017)

Based on the background and the literature review presented earlier, the researcher then develops a research framework. As suggested by Yin (2009), The researcher is directed to develop a descriptive framework for organizing the case study. Also, developing a case description is one of the general analytic strategies preferable in case studies.

CHAPTER III

SOCIAL SETTING

3.1. The General Condition of Pontianak City

3.1.1. Geography

Pontianak city is the capital of West Kalimantan province with total area reaching 107.82 km2. The administrative city of Pontianak is divided into 6 districts (*Kecamatan*), namely, West Pontianak (16.47 Km2), Central Pontianak (15.98 Km2), South Pontianak (14.54 Km2), Southeast Pontianak (14.83 Km2), East Pontianak (8.78 Km2) and North Pontianak (37.22 Km2); as well as 29 *Kelurahan* (village). One of the most notable characteristics is that Pontianak City is located on track of the equator line at coordinate 0^0 02'24 "LU - 0^0 05 '37" LS and 109^0 16' 25 "BT - 109^0 23 '01" BT.

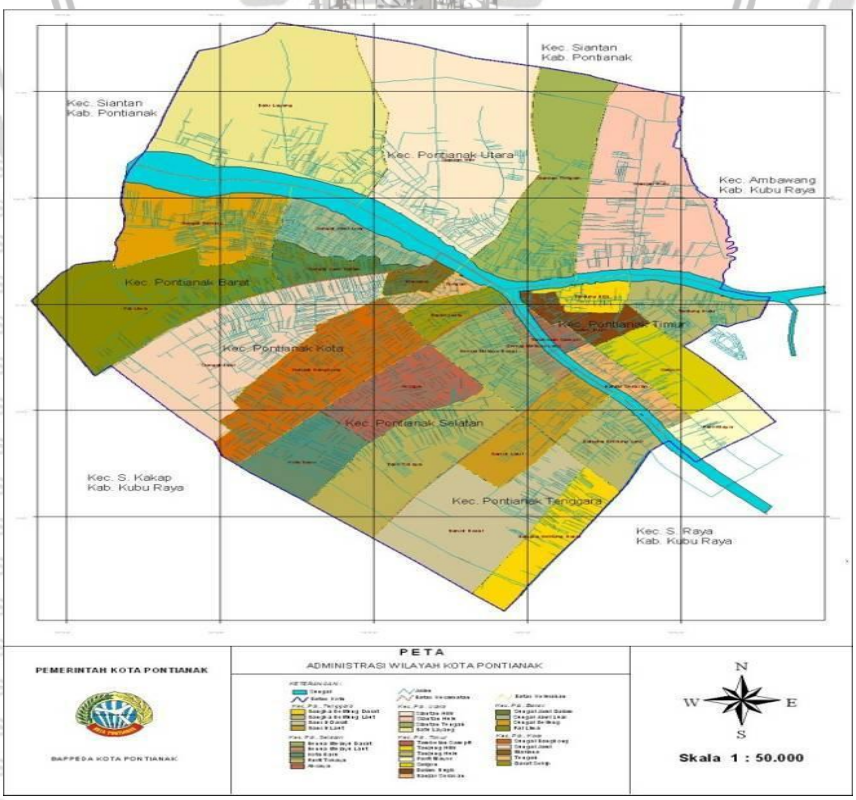

Figure 3.1 **Map of Regional Administration of Pontianak City**

Table 3.1. **Pontianak City Administration Boundaries**

No	Boundary	Area
1	Utara	Kecamatan Siantan, Mempawah Regency
2	Selatan	Kecamatan Sungai Kakap and Kecamatan Sungai Raya, Kubu Raya Regency
3	Timur	Kecamatan Sungai Ambawang dan Kecamatan Sungai Raya, Kubu Raya Regency
4	Barat	Kecamatan Sungai Kakap, Kubu Raya Regency

Source: BPS-Statistics of Pontianak Municipality (2016)

Viewed from the existing climate, the result of the recording of the Pontianak Maritime Meteorological Station shows that in 2015 the average air temperature in Pontianak City ranges from 21.30 ^{0}C to 36.8 ^{0}C and the average air pressure by 1.009,85 millibar. Next, the average wind speed in Pontianak City ranges from 2.5 knots to 3.8 knots with the largest wind speed occurred in January at 28 knots. In 2015, the most rainy days most occurred in January (25 days), while the most rainfall occurred in May by of 436.5 mm.

3.1.2. Demography

In 2015, the total population of Pontianak Municipality was about 607.438 people in which there are 5.634 people for each square kilometer of the territory. East Pontianak District has the greatest population density among the other districts, that is resided by 10.276 people/km^2, while North Pontianak is the district with the rarest population in Pontianak Municipality with population density level 3.312 people/km^2. In addition to that, from 1990 to 2000 the growth rate of population in Pontianak Municipality was 0,7 percent per year, whereas in the next decade (2000-2010) the figure increased to 1,8 percent per year. Based on the development for 5 year period 2010-2014, there is also an increase from year

to year. In 2010 the population of Pontianak City was 554,764 people with male composition 277,971 people (50.11%) and female 276,793 (49.89%), then in 2014 the total population became 598,097 people with male population 298,689 people (49.94%) and female population of 299,408 (50.06%). Furtermore, in the last three years, the ratio of males to females population showed the proportional rates, it means that there were 100 males for every 100 females.

Table 3.2. **Total Population of Pontianak City in 2011-2015**

No	Year	Total	Male	%	Female	%
1	2011	554.764	283.529	51,11%	282.327	50,89%
2	2012	577.314	288.368	49,95%	288.946	50,05%
3	2013	587.169	293.017	49,90%	294.152	50,10%
4	2014	598.097	298.689	49,94%	299.408	50,06%
5	2015	607.438	302.711	49,83%	304.727	50,17%

Source: BPS-Statistics of Pontianak Municipality (2016)

Table 3.3. **Sex Ratio in 2017**

District	Male		Female	
	n	%	n	%
Pontianak Selatan	46,438	14.05	46,766	14.26
Pontianak Timur	50,809	15.37	50,108	15.28
Pontianak Barat	74,453	22.52	73,487	22.41
Pontianak Utara	72,896	22.05	70,902	21.62
Pontianak Kota	61,752	18.68	62,452	19.05
Pontianak Tenggara	24,199	7.32	24,195	7.38
	330,547	100.00	327,910	100.00
Total	***658,457***			

Source: Population and Civil Registration Agency, Pontianak Municipality

It can be seen that the percentage is almost the same between male and female. This shows that the population in Pontianak is relatively equal between male and female. Pontianak Utara is the district that has the smallest ratio.

Furthermore, the prediction of the population density of Pontianak Municipality in 2016 is 5.736 people per km^2. Population density per district in Pontianak Municipality is relatively uneven. For instance, although East Pontianak has a relatively small number of population, it is the most densely populated district in Pontianak. On average, for each square kilometer East Pontianak is resided by 10.459 people/km^2. Unlike the North Pontianak, although the population is much more numerous, even the second most populous district behind West Pontianak, the district has the smallest population density, 3.349 people. This is because North Pontianak has the largest area among other districts in Pontianak Municipality.

Table 3.4. **Population Density in 2016**

No	District	Area (km^2)	Population	Density
1	Pontianak Selatan	15,14	92.952	6.139
2	Pontianak Tenggara	14,22	50.038	3.519
3	Pontianak Timur	8,78	91.830	10.459
4	Pontianak Barat	16,47	136.805	8.306
5	Pontianak Kota	15,98	122.118	7.642
6	Pontianak Utara	37,22	124.645	3.349
	Kota Pontianak	**107,82**	**607.438**	5.736

Source: BPS-Statistics of Pontianak Municipality (2017)

In the next table (Table 4.5), it can be clearly seen that the productive age group (aged 15-64 years) dominates the population of Pontianak City. This is because Pontianak is the main migration destination of West Kalimantan. The population aged 35-39 years is the age group with the largest number of 59.630 people, then the population aged 5-9 years ranks second largest age group with 59.058 people, followed by the third age group that is the population aged 30-34 year with the total of 57.834 people. While the age group with the smallest number is the population aged 70-74, amounting to 7,299 people.

Table 3.5. **Population by Age Group 2017**

Age	Male		Female		Population	
	n	%	n	%	n	%
0-4	24,425	7.39	22,706	6.92	47,131	7.16
5-9	30,312	9.17	28,746	8.77	59,058	8.97
10-14	29,276	8.86	27,730	8.46	57,006	8.66
15-19	29,599	8.95	28,196	8.60	57,795	8.78
20-24	27,331	8.27	27,074	8.26	54,405	8.26
25-29	26,939	8.15	27,413	8.36	54,352	8.25
30-34	28,366	8.58	29,468	8.99	57,834	8.78
35-39	29,708	8.99	29,922	9.13	59,630	9.06
40-44	25,346	7.67	25,049	7.64	50,395	7.65
45-49	22,073	6.68	21,531	6.57	43,604	6.62
50-54	16,788	5.08	16,628	5.07	33,416	5.07
55-59	14,213	4.30	14,443	4.40	28,656	4.35
60-64	10,176	3.08	10,330	3.15	20,506	3.11
65-69	6,931	2.10	7,425	2.26	14,356	2.18
70-74	4,465	1.35	4,990	1.52	9,455	1.44
>= 75	4,599	1.39	6,259	1.91	10,858	1.65
Total	**330,547**	**100.00**	**327,910**	**100.00**	**658,457**	**100.00**

Source: Population and Civil Registration Agency, Pontianak Municipality

As the capital of West Kalimantan Province which is the center of activities in West Kalimantan, such as education, administrative, and economic, Pontianak municipality attract the productive age from other areas in West Kalimantan Province, as well as from outside the Province to come to Pontianak for continuing their education or looking for jobs. According to table 4.5, it can be seen that most of the population of Pontianak City are school-age and working-age residents.

3.2. Pontianak Environment Agency

3.2.1. Brief History of Pontianak Environment Agency

In 1998, the Pontianak Environment Agency *(Dinas Lingkungan Hidup/DLH)* was part of the Government Secretariat of Pontianak Municipality, known as the Environment Section *(Bagian Lingkungan Hidup)*. Along with the dynamics of the organization, in 2003 the Environment Section turned into the Environment Office *(Kantor Lingkungan Hidup)* in the hope that its functions and benefits were better than ever.

Next, the status of the Environment Office was upgraded to the Environment Body *(Badan Lingkungan Hidup)*, based on Pontianak Muncipality Regulation No. 11 of 2008 concerning the Establishment of Organizations of Pontianak Muncipality. The Environment Body is headed by a Chief who is under and directly responsible to the Mayor with reference to the Mayor of Pontianak Regulation No. 46 of 2008 concerning Organization Structure, Function and Work Procedure of Pontianak Environment Body. The main task and function is to control the environmental impact. Further description of the implementation instructions and job description on Pontianak Environmental Body is stated in the Decree of Mayor of Pontianak Number 46 of 2008.

Then, the Environment Body again experienced organizational change. This amendment is based on Government Regulation No. 18 of 2016 concerning Regional Device and Regional Regulation No. 7 of 2016 concerning Establishment and Composition of Regional Devices. The Environment Body that was changed to the Environment Agency *(Dinas Lingkungan Hidup)* is the result of the merger of two work units under the Pontianak Municipal Government, namely the Sanitation and Gardening Agency *(Dinas Kebersihan dan*

Pertamanan) and the Environment Body itself. Based on the Regional Regulation No. 5 of 2009 concerning Medium Term Development Plan (RPJM) Pontianak of 2015-2019, the organizational change is followed up with the preparation of the Medium Term Plan for the same period from 2017 to 2019 as the Strategic Plan *(Renstra)* in the implementation of the main tasks and functions within that period.

3.2.2. Main Duty And Functions

The Environment agency has the main duty of assisting the Mayor in carrying out government affairs which is the regional authority and the duty of assistance in the field of environment and forestry. To carry out the main tasks, the Environment Agency performs the following functions:

a. Formulation of environmental policy;
b. Implementation of environmental policy;
c. Implementation of evaluation and reporting in the field of environment;
d. Implementation of the administration of the Environment Agency; and
e. Implementation of other functions directed by the Mayor of Pontianak relating to the duties and functions of the Office of the environment.

Main Duty and Functions mentioned above are based on Regulation of the Mayor of Pontianak No. 61 of 2016 concerning Position, Organizational Structure, Main Tasks, Functions, Job Descriptions and Working Arrangement, in which it incorporate main tasks of Sanitation and Gardening Agency *(Dinas Kebersihan dan Pertamanan)* and the Environment Body. This is a follow up to the merger of the two organizations in accordance with Government Regulation No. 18 of 2016 concerning Regional Device and Regional Regulation No. 7 of 2016 concerning Establishment and Composition of Regional Devices.

3.2.3. Organizational Structure

Based on Regulation of the Mayor of Pontianak No. 61 of 2016 concerning Position, Organizational Structure, Main Tasks, Functions, Job Descriptions and Working Arrangement, Pontianak Environment Agency consists of Structural and General Functional Officers as follows :

(1) Head of Agency

(2) Secretary; consisting of Head of General Subdivision and Apparatus; Head of Planning Sub-Division; and Head of Financial Sub-Division.

(3) Head of Division for Pollution and Environmental Degradation Control

   (a) Head of section for Environmental Monitoring and Control

   (b) Head of section for Control of Environmental Damage

   (c) Head of section for Environmental Development

(4) Head of Division for Waste Management

   (a) Head of section for Transport, Facilities and Infrastructure of the Environment

   (b) Head of section for Partnership and Retribution

   (c) Head of section for Waste Management and Street Sweeping

(5) Head of Division for Licensing and Environmental Law Enforcement

   (a) Head of section for Environmental Licensing Services

   (b) Head of section for Environmental Law Enforcement

   (c) Head of section for Environmental Case Handling

(6) Head of Division for Environmental Revitalization and Capacity Building

   (a) Head of section for Environmental Cooperation

   (b) Head of section for Capacity Development

   (c) Head of section for Community Based Waste Management

(7) Head of Technical Implementation Unit

(8) Certain Functional Positions

STRUKTUR ORGANISASI
DINAS LINGKUNGAN HIDUP
KOTA PONTIANAK

LAMPIRAN
PERATURAN WALIKOTA PONTIANAK
NOMOR 61 TAHUN 2016
TENTANG KEDUDUKAN, STRUKTUR ORGANISASI, TUGAS POKOK, FUNGSI, URAIAN TUGAS DAN TATA KERJA DINAS LINGKUNGAN HIDUP KOTA PONTIANAK

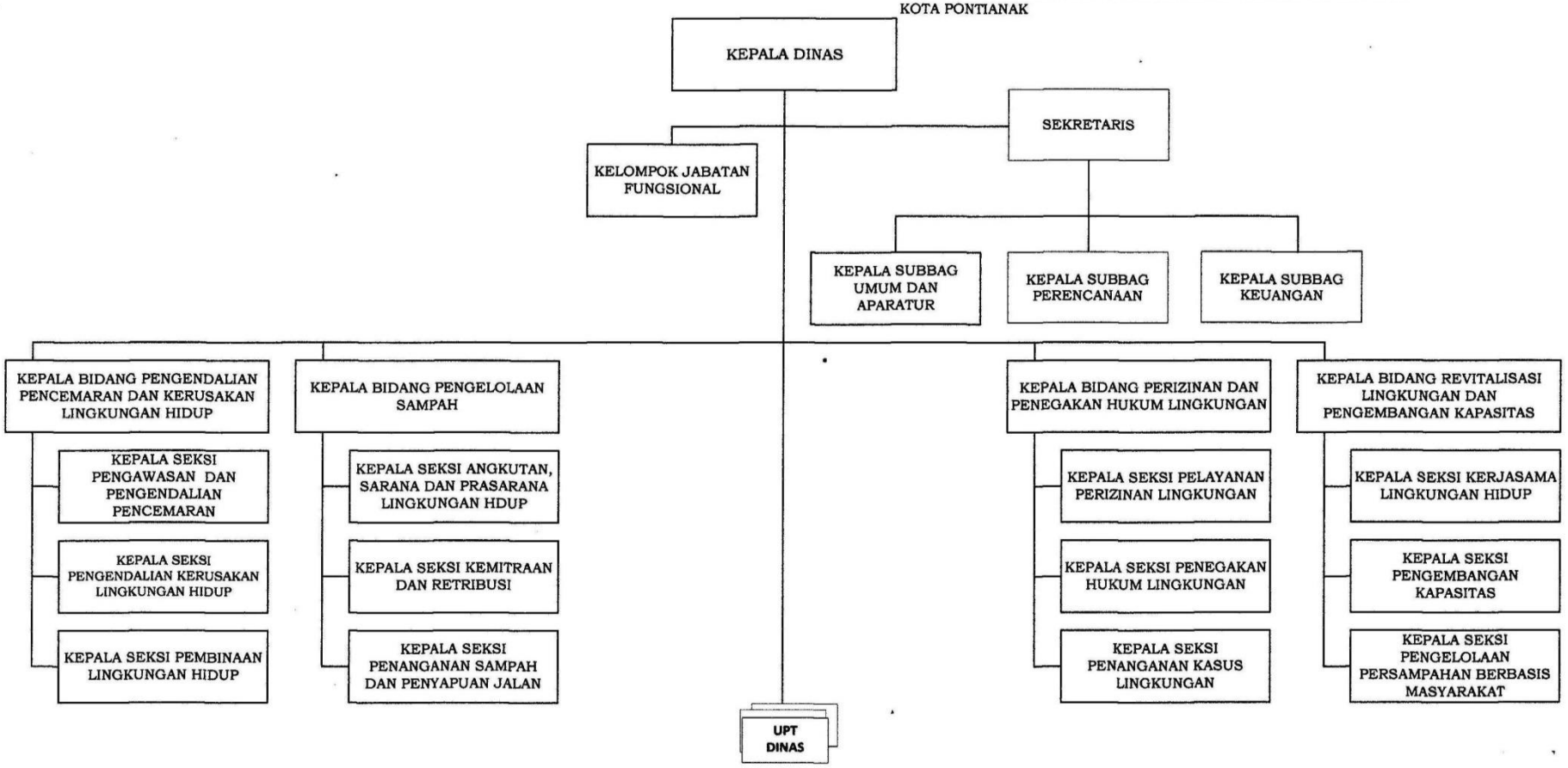

Figure 3.2. **Organizational Structure of Pontianak Environment Agency**

CHAPTER IV

RESEARCH METHOD

In this chapter, the researcher will explain the method employed to carry out this research. In doing so, this chapter is divided into several parts, namely, research type, research focus, research locus, data collection techniques, sources of data, analysis method, and data validity. These parts aim to make the process of the research implementation easy to understand by the readers.

4.1. Research Type

The researcher used a descriptive research method within the qualitative approach to undertaking several steps consisting of finding, describing and analyzing objects and conditions regarding the current state of the implementation of IWM in Pontianak municipality selected as a case study so that the research objectives can be achieved.

A good definition is given by Denzin and Lincoln (1994) that a qualitative research focuses on the interpretation of phenomena in their natural settings to make sense in terms of the meanings people bring to these settings. In addition, the researcher also decides on a type of study within qualitative research known as research design. Creswell (2014) claimed that there are various types and complete procedures that can be applied to specific qualitative inquiry approaches as claimed by. Those are five major alternatives as follows:

(1) Narrative research

The information obtained from data collection is then retold or restored by the researcher into a narrative chronology. The narrative combines views from the participants with those of the researcher in a collaborative narrative.

(2) Phenomenology research

This type is a design of inquiry coming from philosophy and psychology in which the researcher describes the lived experiences of individuals about a phenomenon as described by participants.

(3) Grounded theory

The researcher derives a general, abstract theory of a process, action, or interaction grounded in the views of participants. In other words, there is a likely to build up a theory based on this research.

(4) Ethnography

The researcher studies the shared patterns of behaviors, language, and actions of an intact cultural group in a natural setting over a prolonged period of time. Data collection often involves observations and interviews.

(5) Case study

In this type, a design of inquiry is found in many fields, especially evaluation, in which the researcher develops an in-depth analysis of a case, often a program, event, activity, process, or one or more individuals.

In this research, a case study is selected as a means to analyze and explore the implementation of IWM in Pontianak Municipality. Case study research is an increasingly popular approach among qualitative researchers. Besides, it also has a level of flexibility that is not readily offered by other qualitative approaches such as grounded theory or phenomenology (Hyet et. al, 2014). Also, a case is addressed to understand an issue or to provide input for an existing theory or a new theoretical concept. Moreover, Yin (2009) added that case study research is commonly employed as a research method in the social science fields, including public administration.

4.2. Research Focus

Bryman (2012) remarked that a totally open-ended research focus is risky and can lead to the collection of too much data, and, when it comes to writing up, it can result in a lack of focus. Therefore, it is necessary to outline and identify the research questions. According to the Bryman's thought and the research questions mentioned in chapter one, this research focus on:

(1) The current state of waste management of waste management in Pontianak Municipality, West Kalimantan, Indonesia, using Grindle's implementation theory.

(2) Factors influencing the policy implementation of waste management in Pontianak Municipality, West Kalimantan, Indonesia. The factors to be found out consist of supporting factors and constraining factors.

(3) Recommendations regarding policy aspects that need to be reformed in order to develop IWM in Pontianak Municipality, West Kalimantan.

4.3. Research Locus

This research will be conducted in the Pontianak Municipality, West Kalimantan Province. Pontianak is selected as a research location by considering the local government's efforts to start preparing Pontianak to be a smart city as arranged in Medium Term Development Program of Pontianak Municipality 2015-2019. Besides Pontianak becomes one of several cities appointed by National Development Plan Agency (Bappenas) to be A New City by 2015. Regarding the development of the smart city, as claimed by Rodriguez-Bolivar (2015), environment along with other important aspects namely management and organization; technology; governance; policy; society; economy; infrastructure, is a focus becoming success key factors in developing a smart city. Colldahl, et al.

(2013), based on theories developed by scholars, added that there are six characteristics of the Smart City Model in which waste management as part of Smart Environment relate to city energy management.

4.4. Data Collection Technique

Generally, data collection techniques used in qualitative are similar to each other. In this research, the researcher will employ data collection technique as suggested by Kumar (2014). Three techniques to be employed are as follows:

(1) Interviews

It is data collection technique in which researcher dealing directly with the informants to conduct in-depth discussion and interview. A semi-structured interview will be used in doing discussion. In doing so, the researcher contacted local officials from bureaucrats and political representatives as well as private if needed; the implementers; and other stakeholders concerned with environmental issues. Those interviewed in this research are as follows:

(a) Head of Division Waste Management

(b) Head of Division for Environmental Revitalization and Capacity Building

(c) Head of the section for Partnership and Retribution

(d) Head of the section for Community Based Waste Management

(e) A staff member of the section for Transport, Facilities, and Infrastructure of the Environment

(f) Head of the section for Infrastructure, Regional Development, and Connectivity

(g) A staff member of the section for Infrastructure, Regional Development, and Connectivity

(h) A member of Regional People's Representatives Assembly

(i) Academics, Nahdlatul Ulama University

(j) Environmental Activist and Volunteer

(k) PT. Angkuts, waste transportation company

(2) Documentation

It is a data collection technique to get supporting data from various documents such as reports or other written documents pertaining to the case studied. According to that definition, the researcher seek to find several important documents that can provide the findings with valuable information. Those documents are as follows: Strategic Plan of Pontianak Environment Agency; Performance Report of Pontianak Environment Agency; Waste Bank Planning-Reporting Document; *TPST-3R* Planning-Reporting Document; and other written files related to the research focus.

(3) Observation

It is carried out by observing directly and making some field notes about the implementation of waste management exercised by government. The researcher try to get as much information as possible through this technique. This is expected to enrich the findings along with interview and documentation.

4.5. Source of Data

Data can be defined as plural of datum which literally means to give or something given. Data is thought to be the lowest unit of information from which other measurements and analysis can be done (Kumar, 2014). In this research data sources are classified into two types, namely:

(1) Primary data consist of interview results (*informants*) and field-notes that are generated from observation activities in the field (*phenomena*).

(2) Secondary data are obtained from archival records and government documentation as well as article references searched further as additional relevant data (*documents*).

4.6. Data Analysis Method

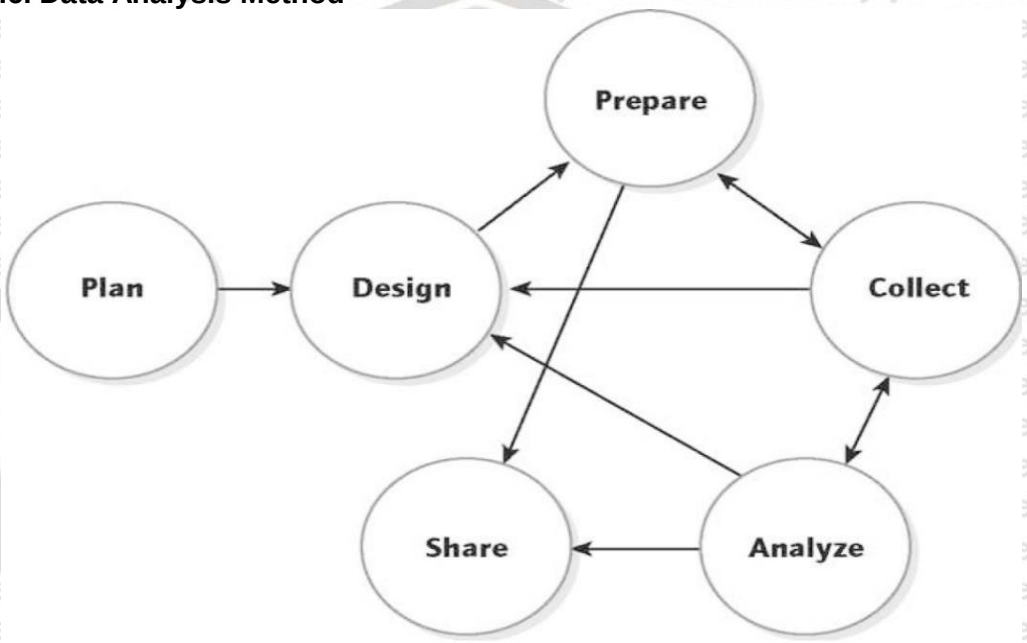

Figure 4.1. **Doing Case Study Research: A Linear but Iterative Process**
Source: Yin (2009)

Yin (2009) suggested that generally, a case study is a preferred method when: “how” or “why” questions are being proposed; the researcher has little control over events; and the focus is on a contemporary phenomenon within a real-life context. These are what makes case study different from other of types research. The characteristics of the case study are in line with what the researcher conducted in the current study, then the researcher is interested in employing a case study as research type.

In this research, the qualitative method employed to get the pertaining data and information is based on several works of literature concerning on how to carry out case study analysis.

(1) According to Yin (2009), the researcher relied on the most preferable strategy in case studies, that is theoretical propositions. Such propositions then reflect a set of research questions, reviews of the literature, and framework. Moreover, these propositions can be an example of a theoretical orientation that guides the analysis to focus concern on particular data.

(2) Yin (2009), in his textbook, credited the contribution of Miles and Huberman (1994) to one set of comprehensive analytic manipulations. Some important analytic manipulations used in this research are putting information into different arrays; making a matrix of categories and placing the evidence within such categories; and creating data displays for analyzing the data.

4.7. Data Validity

Miles et al (2014) suggested that in drawing and verifying conclusions, the researcher have to know whether the finally emerging findings are good or not. That term has many possible definitions: possibly or probably true, reliable, valid, dependable, reasonable, confirmable etc. It's not enough to say that well carried out tactics will make good conclusions.

This research used several tests to establish the quality of empirical research according to Rowley (2002), excluding internal validity that only suitable for causal studies only. Thus, the tests conducted in this research are as follows :

(1) Construct validity: establishing correct operational measures for the concepts being studied. This is concerned with exposing and reducing subjectivity, by linking data collection questions and measures to research questions and propositions. Yin (2009) suggested that one of tactics that is applicable to strengthen the construct validity is multiple sources of evidence. The studies that only depend on individual sources is not recommended for operating

case studies. In doing so, triangulation is a rationale for using multiple sources of evidence. Miles et al. (2014) added that the purpose is to draw triangulation evidence that has different focal point and strengths so that they can complete each other.

(2) External validity: establishing the domain to which a study's findings can be generalized. In this case, the researcher is seeking to generalize a particular set of results to some broader theory, according to Yin (2009). In addition, it is occasionally necessary to work from the top down, from a theory to the collection of data to test the validity. Importantly, the researcher must remain open to the idea that the concept is valid or should be discarded when seeing the data. The concept without the appropriate facts is void (Miles et al. (2014).

(3) Reliability: showing that the process of a study, such as the data collection produced can be repeated with the same results. This is obtained through documentation of procedures and appropriate records.

CHAPTER V

RESULTS AND DISCUSSION

5.1. Results

5.1.1. Waste Management Implementation in Pontianak Municipality

5.1.1.1. Content of Policy

1) Interests Affected

This indicator relates to various interests that affect a policy implementation. It also shows that a policy in its implementation must involve many interests, and to what extent these interests have an impact on its implementation. Based on information obtained from Head of Division Waste Management, Environment Agency, it can be seen that Pontianak Municipal Government has not issued a regional regulation that specifically governing waste management. In this case, the government is still referring to a regional regulation regarding public order, Regional Regulation No. 3 of 2004.

According to that regulation, there are several interests affected in terms of waste management in Pontianak Municipality are as follows: the regional head (the mayor of Pontianak Municipality; agency of community order development; officials (employees who are given certain tasks in accordance with the provisions of regional regulations); the owner (any person or body –based on law– having wealth); the user (any individual or body that controls and / or makes use of something that is movable and / or immovable, which is not on behalf of a person or entity); and the occupant (any individual or body that uses immovable objects either on personal behalf or on behalf of the body. To sum up, it can be concluded that interesets affected or stakeholders can be grouped into three groups; the government, businessmen or the private sector and the general public.

Based on programs that must be carried out by the environmental agency as a series of waste management implementation, several activities show the interests that are affected. One of them is the community, as said by Head of section for Community Based Waste Management, as follows:

> One of the programs arranged by the environment agency is community-based waste management which is one form of waste management starting from the sources promoted by DLH. In addition, this activity is also an effort from the government to reduce the volume of waste sent to landfill. Through this program, it is expected that every household can process waste starting from their homes by sorting garbage, organic and inorganic. Organic waste can be made for compost, while inorganic waste can be sold to waste banks. (Interview, July 2018)

It can be seen that, the community becomes one of the parties who have influence in the implementation of waste management. For this reason, public interest can be considered as part of the discussion of the content of policy. Moreover, there is also another information showing that the waste management carried out by the government involve other interests, as mentioned by Head of section for Partnership and Retribution, as follows:

> One of the activities carried out by the environmental agency in the framework of handling waste is Operational Partnership with Third Parties then known as KSO. We provide waste transport services to third parties and then withdraw retribution for that services. This collaboration is built not only with parties from the government but also from the private sector or business actors such as hotels, restaurants, and banks. In its implementation, KSO is not profit oriented, but service orientated. (Interview, July 2018)

According to what Head of section for Partnership and Retribution said, it can be seen that waste management run by the government cannot be separated from the interests of other parties outside the government, the private sector and the community. This is in line with the observations of researchers that waste management is a fairly complicated problem where many interests are involved in handling it. In this case, to achieve policy objectives, the government must strive to minimize the possibility of conflicts of interest.

2) Types of Benefits

Based on the type of benefit definition proposed by Grindle, it can be understood that each policy can be divided into two, policies that are beneficial to many people and policies that only meet the demands of some groups. regarding this research, as it is known that waste problem can be regarded as common problems faced by all people. Thus, waste management policies must be benficial for many people. Type of Benefits in waste management is in line with what has been presented in the previous part regarding interests affected. It can be conceived that those who will feel the impact of implementing waste management can be classified into three groups; the government, businessmen or the private sector and the general public.

Furthermore, to depict how the govenrment carry out waste management policy and meet the demands of both general public and private parties, this research will present data regarding waste services in Pontianak Municipality. First of all, the waste management is a part of basic services covering 6 areas of districts which are then divided into 29 Kelurahan (typical village in urban areas). The total population is more than 650 thousand people (Population and Civil Registry Office, 2017). The growth of population will affect the amount of waste produced by the society. In Pontianak, the Environmental Agency manages daily huge landfill as much as 1.800 m^3.

In waste management, field workers carry out transporting and sweeping activities on the road. For processing activities, it is still limited to a small scale, as said by a staff member for Waste Management and Street Sweeping, as follows:

> In waste management, we only carry out transportation and sweeping. So, garbage is only stacked in landfill with a controlled landfill system. The waste is not processed. The step taken by the government to anticipate the increasing volume of waste is the expansion of landfill land, which is carried out at the end of 2017. (Interview, July 2018)

The waste comes from various sources, e.g. housing, commercial areas, industries, offices, open public spaces, agricultural areas, and so on. Commercial area, industry, and housing contribute the most portion of waste in Pontianak City. Housing area in Pontianak includes single housing, housing complex, and small villages in the river bank. Generally, each area has different systems in managing their waste. There are families that carried out directly by themselves or by waste collector (someone who is paid to collecting waste from house to house) using a waste cart.

The followings are data of waste producers in Pontianak City according to the area of district, Kelurahan, the number of population.

Table 5.1. **Waste Producers In Pontianak 2017**

No.	*Kecamatan* and *Kelurahan*	Population	SNI Liter/ Day	Total Waste (Liter)	Total Landfill (Unit)	Area
Kecamatan Pontianak Barat						
1	Sungai Beliung	57.052,00	2,75	156.893,00	9	Residential
2	Sungai Jawi Luar	40.827,00	2,75	112.274,25	7	Residential
3	Sungai Jawi Dalam	33.153,00	2,75	91.170,75	13	Residential
4	Pal 5	16.225,00	2,75	44.618,75	0	Residential
		147.257,00		404.956,75	29	
Kecamatan Pontianak Selatan						
1	Parit Tokaya	17.659,00	2,75	48.562,25	1	Residential
2	Benua Melayu Darat	30.088,00	2,75	82.742,00	8	Residential
3	Benua Melayu Laut	10.140,00	2,75	27.885,00	0	Residential
4	Kota Baru	17.657,00	2,75	48.556,75	0	Residential
5	Akcaya	17.672,00	2,75	48.598,00	0	Residential
		93.216,00		256.344,00	9	
Kecamatan Pontianak Kota						
1	Sungai Bangkong	51.709,00	2,75	142.199,75	18	Residential
2	Sungai Jawi	44.526,00	2,75	122.446,50	9	Residential
3	Darat Sekip	10.441,00	2,75	28.712,75	2	Residential
4	Tengah	8.052,00	2,75	22.143,00	0	Residential
5	Mariana	9.161,00	2,75	25.192,75	0	Residential
		123.889,00		340.694,75	29	

No.	*Kecamatan* and *Kelurahan*	Population	SNI Liter/ Day	Total Waste (Liter)	Total Landfill (Unit)	Area
Kecamatan Pontianak Tenggara						
1	Bansir Darat	8.970,00	2,75	24.667,50	1	Residential
2	Bansir Laut	10.779,00	2,75	29.642,25	0	Residential
3	Bangka Belitung Laut	14.937,00	2,75	41.076,75	0	Residential
4	Bangka Belitung Darat	13.688,00	2,75	37.642,00	5	Residential
		48.374,00	2,75	133.028,50	6	
Kecamatan Pontianak Utara						
1	Siantan Hulu	44.791,00		123.175,25	5	Residential
2	Siantan Tengah	38.737,00		106.526,75	1	Residential
3	Siantan Hilir	34.721,00		95.482,75	1	Residential
4	Batu Layang	24.927,00		68.549,25	3	Residential
		143.176,00		393.734,00	10	
Kecamatan Pontianak Timur						
1	Tambelan Sampit	7.761,00		21.142,75	3	Residential
2	Baniar Sarasan	11.929,00		32.804,75	4	Residential
3	Dalam Bugis	19.150,00		52.662,50	0	Residential
4	Saigon	21.575,00		59.331,25	0	Residential
5	Tanjung Hulu	20.146,00		55.401,50	2	Residential
6	Tanjung Hilir	11.492,00		31.603,00	0	Residential
7	Parit Mayor	7.467,00		20.534,25	0	Residential
	Operational Partnership with Third Parties (KSO)				**20**	
	Total	**655.432,00**		**1.802.438,00**	**112**	
Total volume of transported waste				***1.547.000***		
Total Volume of Waste which is not Transported to Landfill (TPS)				***255.438***		

Source: Performance Report, Environment Agency, 2017

Population in Pontianak City in 2017 (when the data was managed by the Environmental Agency) totally reaches 655.432 spreading in 6 (six) districts. The population density is 5.736 people in every square kilometre and it grows 1.8% per year (BPS, 2017). Based on the demographic data, and the estimation of waste producer by 2.75 liter per person each day (according to SK SNI S-0-1993,

DPU 1993), the total amount of waste produced by all cities is around 1.802 m^3/day or more han 40 tan/day (if the bulk density is 225kg/m^3). Based on the table above, it is indicated that the service coverage of waste in housing complex, especially transportation service, reaches 85.8%. In terms of the handled amount of waste since 2015, there is a small decline from 88.47% in 2015 to 86.14% in 2016. Although it is categorised good, the Pontianak Government still cannot find a real solution to reduce the amount of waste. It surely can cause a negative effect in the future in relation to the availability of wide landfill and its effect towards environment in general. There is a need for new efforts and innovations to reduce the waste.

In connection with the volume of waste that was successfully transported by the environment agency, the researcher found a difference in data, as stated by an academic in an interview, as follows:

> If direct measurements are made, the percentage of waste transport is around 77%. This is because the data obtained from the environment agency did not take into account the compaction factor so that it is higher. In addition, the data used in the calculation is in the form of a volume measure, not using a weight measure that takes into account the density of waste in the truck. (Interview, July 2018)

Furthermore, most of the waste comes from housing or domestic waste. The second and third biggest sources of waste producers are office or commercial and market respectively. These three activities are among the contributors of waste with a striking volume compared with other activities, like office, street waste, industry, and others. Most of the waste (77.4%) comes from households (domestic), 14.5% of them is from market, and 7.9% comes from public facilities, and 0.15% waste is from road and garden sweeping (Bappeda, 2013). The composition of waste collected in the landfill according to data in 2015 consists of organic waste by 80.3%, inorganic waste by 17%, and B3 waste by 2.6%

(A study of TPST Edelweis Pontianak, 2017). There is a need, therefore, to develop technology and innovation towards the management of the waste especially organic waste which can be converted to compost and biogas.

Moreover, the government also carry out collection services in the operational partnership. In this kind of service, the government try to build a positive partnership between public sector and private parties. The form of cooperation is stated in the employment contract, called Operational Partnership (KSO). The environmental agency on behalf of the Pontianak Government transports certain volume of waste, and then the third party makes a payment according to certain value stated in the agreed contract. The money then will be transferred to Pontianak Government bank account through a designated bank (Bank Kalbar). This is a good program in order to increase own-source revenue (PAD). The number of waste producers will be surveyed periodically to determine the assumption of the transport volume. Next, the duration of the contract is 1 (one) year and can be extended if the private institution apply for a renewal to the Pontianak government.

In addition, KSO which is run by the environmental agency is not profit oriented, but service oriented. For more details, here are a statement delivered by Head of section for Partnership and Retribution, in an interview session:

> This collaboration is not profit oriented, meaning that the government does not take advantage. Third parties only pay for operational costs incurred by the environmental agency, such as vehicle rental, including container maintenance costs, driver's wages (if using crews, the payment component will be added), and fuel costs. Usually the bill of retribution is submitted to third parties in the following month, for example, KSO in July, then at the beginning of August, the amount of ritation carried out, calculated with details of the costs agreed upon in an agreement. As for the legal basis that is a reference in the determination of levies is the regional regulation on business service retribution. KSO is part of the environment agency's efforts to meet the retribution target which is charged to the section for Partnership and Retribution, around 15 billion. (Interview, July 2018)

Table 5.2. **Operational Partnership in 2018**

No.	Company Name	Trip per month	Price per trip (Rp)	Type of Vehicle
1	Kantor Perwakilan Bank Indonesia Provinsi Kalimantan Barat	2	1.056.000,00	Truck Fuso
2	Hotel Golden Tulip Pontianak	15	422.700,00	Dump Truck
3	Hotel Ibis Pontianak City Center	31	397.700,00	Dump Truck
4	Hotel Gajah Mada Pontianak	15	327.700,00	Arm Roll Truck
5	Hotel Mercure Pontianak	31	397.700,00	Dump Truck
6	Hotel Santika Pontianak	15	327.700,00	Arm Roll Truck
7	Hotel Kapuas Palace Kota Pontianak	31	327.700,00	Arm Roll Truck
8	KFC - Ahmad Yani	15	327.700,00	Arm Roll Truck
9	KFC - Gajah Mada	15	327.700,00	Arm Roll Truck
10	PT. Ligo Mitra Jaya Kota Pontianak	15	327.700,00	Arm Roll Truck
11	PT. Pelabuhan Indonesia II (persero)	108	327.700,00	Arm Roll Truck
12	Matahari mall Pontianak	31	327.700,00	Arm Roll Truck
13	A.Yani Mega Mall Pontianak	124	327.700,00	Arm Roll Truck
14	PT. Mutiara Mas Putih	31	327.700,00	Arm Roll Truck
15	Yayasan Pendidikan Santo Hioronymus	15	327.700,00	Arm Roll Truck
16	PT. Indowell Lintas Khatulistiwa	15	327.700,00	Arm Roll Truck
17	Rumah Sakit Umum Santo Antonius	31	327.700,00	Arm Roll Truck
18	Rumah Sakit Ibu dan Anak Anugrah Bunda Khatulistiwa	15	327.700,00	Dump Truck
19	Rumah Sakit Mitra Medika	15	327.700,00	Arm Roll Truck
20	PT. Ramayana Lestari Sentosa, Tbk.	15	327.700,00	Arm Roll Truck
21	Rumah Sakit Universitas Tanjungpura	15	327.700,00	Arm Roll Truck
22	Hotel Garuda Pontianak	15	327.700,00	Arm Roll Truck
23	Rumah Sakit Kharitas Bhakti	31	150.000,00	Pick-Up
24	Hotel Borneo Pontianak	31	150.000,00	Pick-Up
25	Hotel Grand Kartika Pontianak	31	120.000,00	Tossa
26	Aneka Pavilion Kota Pontianak	31	120.000,00	Tossa
27	Hotel Neo	31	120.000,00	Tossa
28	Rumah Sakit Umum Daerah Sultan Syarif Muhammad Alkadrie	31	327.700,00	Arm Roll Truck
29	Pasar Teratai Jeruju	15	327.700,00	Arm Roll Truck
30	Kepolisian Daerah Provinsi Kalimantan Barat	15	327.700,00	Arm Roll Truck

Source: Environment Agency

Furthermore, based on the results of the interview with the head of section for partnership and retribution, it can be seen that currently a local regulation specifically concerning waste management is needed. In connection with cooperation with third parties, the value of retribution that is used as a provision is considered to be incompatible with the current economic situation. In addition, the operational costs of transportation, especially vehicle maintenance, also require a large cost. For this reason, the head head of section for partnership and retribution expect that a regional regulation on waste management can be immediately decided, especially with regard to cost standards in collaboration with third parties.

3) The Degree of Change Desired

Every policy has a target to be and wants to achieve. the content of policy that is intended to be explained at this point is that how much change to be achieved through a policy implementation must have a clear scale. In the case of Pontianak Municipality, regarding the degree of change desired, we will be directed to the goals of the environmental agency in implementing the programs and activities as part of main tasks and responsibilities. Several programs arranged by the envrionment agency are aimed to reduce the waste generation sent to landfill, to increase public awareness and to develop a better technology, as stated by Head of section for Community Based Waste Management, as follows:

> The environment agency has a community-based waste management program that aims to reduce waste generation from its source. In addition, The environment agency has been also striving to realize an increase in public awareness and better use of technology, in order to convert waste into useful goods or energy, such as biogas. Thus, we can reduce waste generation transported to the landfill, and minimize accidents that may be experienced by drivers due to fatigue. (Interview, July 2018)

Moreover, in general, we can see what the government want to achieve from the planning document that consists of vision, mission, and goals. For more details, based on the strategic plan 2017-2019 vision of the environment agency are: *Realization of Pontianak Clean City and Quality Improvement of Environmental Functions through Sustainable Management of Natural Resources*. The explanation of the vision is as follows:

1. *Clean Pontianak* is a picture of Pontianak Municipality whose conditions are always clean and healthy and optimally managed.
2. *Improving the Quality of Environmental Functions*, aims to improve the carrying capacity of the environment by means of environmental management. Environmental functions in a balanced ecosystem condition are needed for human welfare. In the case of waste management, environmental management includes the activities of structuring, utilizing, developing, maintaining, restoring, and controlling the environment by giving understanding to all levels of society about the importance of preserving the environment through the application of the 3R principle.
3. *Sustainable Management of Natural Resources* is the wise management of natural resources in order to ensure the fulfillment of current human needs without reducing their potential to meet human needs in the future.

To realize the vision stated above, then specific missions are required to lead the agency to more measurable objectives. Mission is a statement that describes the objectives of all officials and staff of the environmental agency. The missions of the environment agency are as follows:

1. Improving the quality of city environmental management and services;

2. Increasing the participation of the community, the private sector and other parties to environmental regulations and environmental cleanliness management;
3. Increasing public awareness in developing information systems for managing natural resources and environmental cleanliness;
4. Increasing the participation of the community and government in community-based participatory pollution control efforts.
5. Improving administration service, performance and financial accountability as well as professionalism of apparatus resources.

Furthermore, as a description of the mission, the goal as a description of the mission and the final result to be achieved is produced within a certain period. The goal must be consistent and relevant to the main tasks and functions of the organization so that they can describe the strategic direction and improvements that will be realized in the future. The goal is the direction that is set to be achieved by referring to the vision and mission of the environment agency and paying attention to the vision and mission of Pontianak City. The goals to be achieved are: Increasing Capacity and Accountability of Regional Device Performance and Finance; Improving Waste Services; Improving Compliance of Community and Business Owners Against Environmental Regulations; and Increasing Quality of Comfortable, Safe, Livable and Sustainable Environment. In addition, in terms of waste management, the target to be achieved is the Increased Waste Management both at the source and the landfill. To assess the success of achieving this target, the indicators to be measured are: the level of performance of cleaning facilities and infrastructure and the level of cleanliness of Pontianak Municipality.

4) Site of Decision Making

Based on Law Number 23 of 2014 concerning Regional Government, it can be seen that there has been a division of government functions into three parts, namely the central government, provincial government and regency/city government. Waste sub-sector is part of the affairs of public works, Spatial planning and environmental affairs. The roles of regency/city governments include the following:

a) Development of waste system and management in district / city regions.
b) Issuance of waste recycling/ processing permits, waste transportation and final processing of waste held by the private parties.
c) Guidance and supervision of waste management organized by private parties.

Waste management in Pontianak is the responsibility of the environment agency. The program is based on the strategic plan prepared every five year. The environment agency also needs to coordinate with the regional planning and development agency in order to adjust the program to the regional medium-term development plan *(RPJMD)* which is derived from the mayor's vision and mission. The plan is a policy related to the development plan which is the result of joint discussions and decisions with the regional people's representative assembly.

As it is known that Pontianak Municipality has no regional regulation concerning waste management. The government is still guided by the old regulations, as said by the Head of Division for Waste Management, as follows:

> Pontianak has not issued a regional regulation that specifically regulates waste management. The Government is still referring to Regional Regulation No. 3 of 2004 concerning Public Order and Major Regulation No. 6 of 2006 concerning Waste Disposal Schedule. (Interview, July 2018)

Moreover, based on information obtained from the results of an interview with the head of regional planning and development agency through head of section for infrastructure, regional, development and connectivity, it can be seen that:

> in implementing waste management, the government also arrange a master plan as a guidance. This document is reviewed every five years. The last master plan that was compiled by the Pontianak Municipal Government is masterplan 2013. In the near future a review of the masterplan will be conducted. The masterplan arranged is expected to be a comprehensive guideline for all stakeholders, directly or indirectly, in solid waste management in Pontianak, including for the general public who are expected to actively participate in the implementation of this plan in their daily lives. (Interview, July 2018)

Furthermore, the government in drafting the activity plan is not only through a top-down approach but also through a bottom-up approach, for example *musrenbang*. It is a development planning deliberation carried out from the citizens association/*RW*, *Kelurahan*, Disctrict/*Kecamatan* to City level. The results of the *musrenbang* become the basis for the preparation of the activity program in the following year, still referring to the strategic plan of the environment agency. In addition, in order to support the on going program, the mayor can also issue a policy in a simple form such as a circular letter.

5) Pogram Implementers

In carrying out a policy or program must be supported by the existence of competent and capable policy implementers for the success of a policy. The government, in this case, the environment agency is the main agency who play an important role in the implementation of waste management. Based on Regulation of the Mayor of Pontianak No. 61 of 2016 waste service is one of the main tasks of the environment agency. Pontianak Municipality does not yet have a specific waste management unit that stands alone. Division for Waste

Management led by a head is divided into three following sections; Transport, Facilities and Infrastructure of the Environment; Partnership and Retribution; and Waste Management and Street Sweeping. In some activities, some program regarding waste management is also part of the main tasks of Division for Environmental Revitalization and Capacity Building consisting of: section for Environmental Cooperation; section for Capacity Development; and section for Community Based Waste Management.

Based on performance report of the environment agency of 2017, the activities related to waste management are as follows:

Table 5.3. **Program and Activities**

No	Main Performance Indicator	Program / Activity
1	**The Level of Cleanliness of Pontianak Municipality**	**Program for Improvement of Hygiene Facilities And Infrastructure**
		Increase In Landfill Infrastructure
		Landill Arrangement Stage Ii
		Construction of Container Base
		Procurement Of Waste Transport Vehicles
		Waste Infrastructure And Infrastructure Workshops
		Procurement Of New Containers
		Program for Cleaning Maintenance
		Sweeping City Roads
		Transporting Waste From TPS to Landfill
		Container and Container Base Maintenance
		Operational Maintenance of Cleaning The Big Days
		Operational Maintenance of IPLT
		Operation of Leachate Sludge Treatment Plants And Installations
		Landfill Management
		Maintenance of Transport Vehicles
		Program for Waste Management Performance Development in The Community
		Community-Based Waste Management (3R)
		Operational Management of TPST 3R

No	Main Performance Indicator	Program / Activity
2	**Presentation of Strengthening Community or Community Engagement**	**Program for Rehabilitation and Restoration of Natural Resource Reserves**
		Commemoration of Environmental Day
		Clean and Green City
		Commemoration of Waste Day Care
		Program for Waste Management Performance Development in The Community
		Cleanliness Monitoring And Enforcement
		Program for Socialization of Waste Management Policies
		Extension Activities And Socialization of Waste Regulations
		Management of Partnerships and Cleanliness Fees
		Reclarification of Data on Potential Cleanliness Retribution

Source: Performance Report, 2017

In waste management, collaboration between related agencies in waste management is also really needed, for example partnership the environment agency and the industry and commerce agency in marketing the recycled waste from the waste bank. In addition, the government can also establish a regional-owned enterprise *(BUMD)* that specifically handles waste issues. This view is based on interviews with the Chairman of Commission B, Regional People's Representatives Assembly, as follows:

> Hence, the environment agency and the industry and commerce agency with other interested parties need to find a solution on how to distribute the results from the waste bank so that the marketing runs. I also propose that in fact Pontianak needs to have a regional-owned enterprise that specifically deals with waste problem. Because we are talking assets, if waste is able to be processed properly then it can be regardes as an asset. Establishing a regional-owned enterprise for waste is an extraordinary step.(Interview, 2018)

Furthermore, based on the table on the previous page, it can be seen that in dealing with waste issues, the environment agency also involves the community in several activities. One program that requires community participation is the development of community-based waste management with 3R principles. As a manifestation of Law No. 18 of 2008 concerning Waste Management and Regulation of the Minister of Environment Number 13 of 2012 concerning Guidelines of Reduce, Reuse, And Recycle Implementation Through Waste Bank, Society-based waste management is an attempt to reduce waste volume transported to TPA. In this case, the Pontianak government has facilitated the establishment of waste bank established by several groups of people who care about environment. This activity aims at educating people on waste management either in the terms of prevention or reduction in the household level. Waste Bank constitutes as a place used to collect sorted waste to be sold to waste collectors or made as craft materials. Waste Bank uses a bank-like management system where they have a record system (bookkeeping) as a media once their customer save or deposit waste. Those who save waste in the bank is called client.

Furthermore, waste bank as an effort to increase community participation into a program that continues to be promoted by the environment agency, as stated by Head of section for Community Based Waste Management, as follows:

> The establishment of waste bank still refers to the Regulation of the Minister of Environment Number 13 of 2012 concerning Guidelines of Reduce, Reuse, And Recycle Implementation Through Waste Bank. Waste bank begins with the initiation of the community that forms the group, *Kelurahan* then issue a decree. The environment agency plays a role in coaching and providing assistance. Promotion carried out by the environment agency usually through women's communities such as *arisan*. Because the biggest waste producer is from households. Waste bank has management like a bank that has an account and has a customer. People save waste, he returns with money. Depending on the waste bank, there are those who can process both organic and inorganic, or those who only can process one type of waste. (Interview, July 2018)

Table 5.4. **Waste Bank**

No.	Waste Bank	Processed Waste (Kg)	Type of Waste Treatment	Information
1	Rosella	1850	Inorganic (sold dan crafted)	
2	Selamat Sejahtera	1580	- Inorganic (sold dan crafted) - Organik (compost)	
3	Rosella	29325	Inorganic (sold dan crafted)	
4	Borneo	1476	Inorganic (sold dan crafted)	
5	Bina Sejahtera	24000	Inorganic (sold dan crafted)	
6	Wahana Sejahtera	350	Inorganic (sold dan crafted)	
7	Melati	10	Inorganic (crafted)	Newly Established
8	Baitul Wustha	-	Education and Promotion Stage	Newly Established
9	Ananda	-	- Inorganic (sold dan crafted) - Organic (compost)	Newly Established
	Jumlah	**58591**		

Source: Environment Agency, 2017

A community-based waste management system is useful and can increase people's insight about waste management and household waste management. Nonetheless, the establishment of a community (like waste bank) remains limited. For that reason, the increase of frequency to approach the community in order to deepen their understanding, especially to public figures, is urged to do by the government. The purpose is to help the government persuade people work hand-in-hand in managing waste in their neighbourhood. Further, waste bank activities which result creative values from the waste is facing challenges to market their products. Therefore, there is a need of supports in marketing from the government either in direct promotion or in training about how to introduce products to public. Eventually, the success of waste bank depends on people's awareness to screen their waste. Screening is the key in managing waste so the waste can be converted into a variety of products. The government, therefore, should have a commitment to keep promoting a movement or campaign of waste screening in all levels of community.

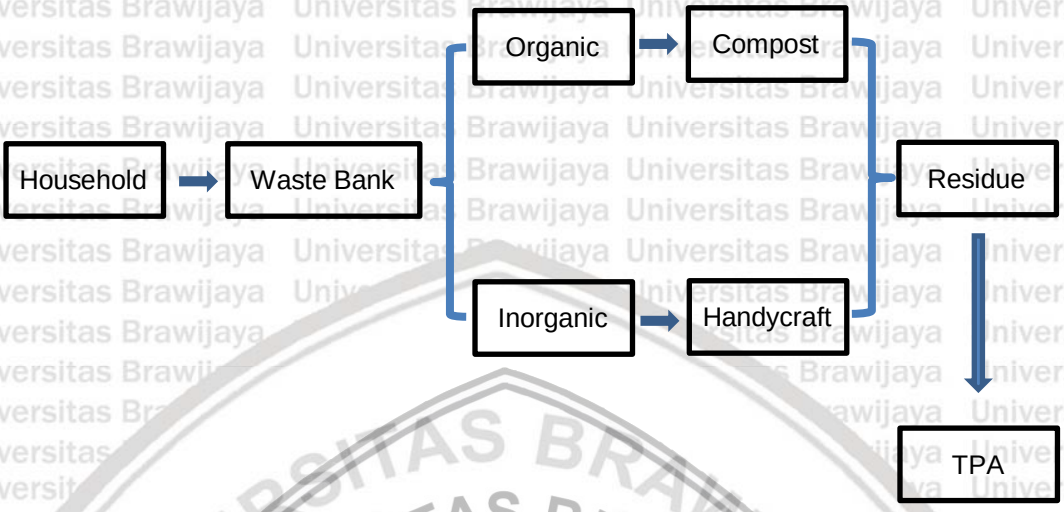

Figure 5.1. **Waste Management Concept at Waste Bank**
Source: Environment Agency, 2017

Furthermore, regarding the application of 3R principles, there are several problems that make the program run ineffectively. First of all, an activist interviewed said that at present, most of the waste produced in Pontianak is mixed, without being sorted at the source. This ultimately leads to lower efficiency of waste reuse and recycling and increased costs for those who want to reuse and recycle the waste generated. The interviewed activist added that if the waste produced could be separated at the source and then transported from the source according to type, the proportion of waste reuse and recycling would increase to some extent.

Furthermore, as it is known that among the '3R' strategies for IWM, waste reduction is an optimal step because of the lowest negative impact it has on the environment. Therefore, it is considered a top priority when developing the IWM plan. However, the level of waste reduction in Pontianak as a whole is low. This is mainly because of two reasons: most people do not realize the importance of reducing waste and a large amount of waste can be produced due to lack of knowledge about waste management plans or the use of old waste management approaches, presented by households or companies.

Moreover, the existing waste recycling facilities in Pontianak are mostly distributed in irregular ways throughout the region. This causes inconvenience for the community to transport waste to the specified recycling facility. Indirectly, this also results in an increase in the cost of transporting and recycling waste. Accordingly, systematic planning of waste recycling facilities must really consider populations throughout the region and optimize the distribution of overall waste recycling facilities. Long transportation distances will increase costs and ultimately make people reluctant to carry the waste to recycling facilities.

6) Resources Committed

The implementation of a policy must also be supported by supporting resources so that its implementation works well and can achieve the expected goals. In terms of the resource, the researcher focuses on three things, namely human resources, facilities and infrastructure and financial resources. To begin, based on Mayor Regulation No. 61 of 2016 concerning the Position, Organizational Structure, Main Tasks, Functions, Job Descriptions and Working Procedures of the Pontianak Environment Agency, waste management is the responsibility of the Environmental Agency, then in this section the researcher explain the condition of resources managed by the Environment Agency.

The condition of human resources in the Environmental Service, is seen by some people as still not adequate in terms of quality, as stated by Chairman of Commission B, Regional People's Representatives Assembly, as follows:

> Previously there had been technological development, but it was not supported by the quality of good human resources…..Waste problem is a serious problem. I see that the present quality of our human resources, especially in the environment agency where there is a waste management division in it, has not improved. More and more jobs make handling garbage not getting better, even worse, coupled with limitations in terms of fleet availability they have. (Interview, July 2018)

According to data obtained from a strategic planning document 2017-2019, the condition of human resources of the Environment Agency is generally good enough. However, increasing the capacity and technical expertise will certainly remain a concern in order to improve the quality of services in accordance with the field of work of each work unit.

Table 5.5. **Human Resources**

Position	Structural Officials	Staff Members
Head of Agency	**1**	**-**
Secretary	**1**	**-**
General and Apparatus Subdivision	1	7
Planning Sub-Division	1	2
Financial Sub-Division	1	11
Division for Pollution and Environmental Degradation Control	**1**	**-**
section for Environmental Monitoring and Control	1	3
section for Control of Environmental Damage	1	3
section for Environmental Development	1	2
Division for Waste Management	**1**	**-**
section for Transport, Facilities and Infrastructure of the Environment	1	9
section for Waste Management and Street Sweeping	1	5
section for Partnership and Retribution	1	5
Division for Licensing and Environmental Law Enforcement	**1**	**-**
section for Environmental Licensing Services	1	3
section for Environmental Law Enforcement	1	1
section for Environmental Case Handling	1	1
Division for Environmental Revitalization and Capacity Building	**1**	**-**
section for Environmental Cooperation	1	2
section for Capacity Development	1	1
section for Community Based Waste Management	1	2
Technical Implementation Unit	1	1
Total	**23**	**58**

Source: Strategic Plan of Environment Agency 2017-2019

Table 5.6. **Level of Employee Education**

No.	Education Level	Male	Female
1	Master (S2)	2	2
2	Bachelor (S1/D4)	15	17
4	D-3	3	1
5	D-2	1	-
6	Senior High School	27	9
7	Junior High School	1	1
8	Elementary School	1	1
Total		50	31

Source: Strategic Plan of Environment Agency 2017-2019

There are also freelancers (317 people) working for environment agency, especially for market environment and street sweeping activity. The purpose is to make 102 streets and 4 park clean, creating a comfortable atmosphere for street users or people who shop in the market. The street sweeping is performed every day starting from 05.00 to 08.00. The waste collection resulted from the sweeping is done twice, from 07.00-11.00 and 13.00-17.00. During this time, the janitors sweep 102 streets and 4 parks. The street length reaches 105.865 m and the width is 662.980 m2. The following is table 5.5 which shows details of the sweeping.

In connection with the work motivation of freelancers, the government has been trying to give reawards and punishments based on the performance, as stated by a staff member of section for Transport, Facilities and Infrastructure of the Environment, as follows:

> There are about 600 freelancers. Some are diligent, some lazy. It can be handled. We are also firm, if there are freelancers who work below standard, then a warning letter will be given. In addition, recently, the government also provided health benefits, employment insurance, and holiday allowances. In fact, when civil servants receive a 13th salary, we also try to provide similar benefits as a form of reward, because as it is known that a few years ago Pontianak City had become the first champion of cleanliness in Indonesia. (Interview, July 2018)

Table 5.7. **Street Sweeping**

No.	Description	Total	Remarks
1.	Sweeper	317 people	4 drivers for Pick-up trucks 8 drivers for three-wheel vehicles 9 crews for Pick-up trucks 8 crews for Tossa 22 Supervisors 266 sweepers
2.	Number of Swept Street	102 streets	-
3.	Street Length	105.865 m	-
4.	Street Width	662.980 m^2	-

Source: Environment Agency

Furthermore, In carrying out its authority, its main tasks and functions, the Environmental Service is equipped with facilities and infrastructure to support the implementation of waste management. The facilities and infrastructure of the Environmental Service consist of office buildings, transport vehicles and garbage collection or processing facilities. To begin, as is known that the Environmental Service is a combination of two agencies before the enactment of Law 23 of 2014 concerning Regional Government. Therefore, the Environmental Service has two office building units, located at Jl. Alianyang (former office of Environmental Body) and at Jl. Kebangkitan Nasional (former office of Sanitation and Parks Agency).

Furthermore, in terms of storage facilities, at the present, the Pontianak government is no longer using a permanent container made by cement or stone. To collect people's waste, the government only provides portable containers.

Figure 5.2. **Container**
Source : Regional Planning And Development Agency

Table 5.8. **Number of TPS/Container and Waste Volume of 2017**

No.	Districts	Kelurahan	Total TPS of Pontianak City					
			Portable Container	Cement Cont.	Base	Depo	TPST	Compost House
1.	Pontianak Kota Population 123.889	Sungai Bangkong	18	0	0	0	0	0
		Sungai Jawi	9	0	0	0	0	0
		Darat Sekip	0	0	2	0	0	0
		Tengah	0	0	0	0	0	0
		Mariana	0	0	0	0	0	0
		Jumlah TPS	27	0	2	0	0	0
2.	Pontianak Barat Population 147.257	Sungai Jawi Dalam	13	0	0	0	0	0
		Sungai Jawi Luar	7	0	0	0	0	0
		Sungai Beliung	9	0	0	0	0	0
		Pal Lima	0	0	0	0	0	0
		Jumlah TPS	29	0	0	0	0	0
3.	Pontianak Selatan Population 93.216	Benua Melayu Darat	7	0	1	0	0	0
		Benua Melayu Laut	0	0	0	0	0	0
		Parit Tokaya	0	0	0	0	1	0
		Kota Baru	0	0	0	0	0	0
		Akcaya	0	0	0	0	0	0
		Jumlah TPS	7	0	1	0	1	0

No.	Districts	Kelurahan	Total TPS of Pontianak City					
			Portable Container	Cement Cont.	Base	Depo	TPST	Compost House
4.	Pontianak Tenggara Population 48.374	Bansir Laut	0	0	0	0	0	0
		Bansir Darat	1	0	0	0	0	0
		Bangka Belitung Laut	0	0	0	0	0	0
		Bangka Belitung Darat	5	0	0	0	0	0
		Jumlah TPS	6	0	0	0	0	0
5.	Pontianak Utara Population 143.176	Siantan Hulu	4	0	1	0	0	0
		Siantan Tengah	0	0	0	1	0	0
		Siantan Hilir	0	0	1	0	0	0
		Batu Layang	3	0	0	0	0	0
		Jumlah TPS	7	0	2	1	0	0
6.	Pontianak Tlmur Population 99.520	Tambelan Sampit	3	0	0	0	0	0
		Tanjung Hulu	1	0	0	0	0	1
		Tanjung Hilir	0	0	0	0	0	0
		Saigon	0	0	0	0	0	0
		Parit Mayor	0	0	0	0	0	0
		Banjar Serasan	4	0	0	0	0	0
		Dalam Bugis	0	0	0	0	0	0
		Jumlah TPS	8	0	0	0	0	1
	KSO		20					
	Total		**104**	**0**	**5**	**1**	**1**	**1**

Source: Environmental Agency

The biggest number of TPS is located in West Pontianak District by 29 TPSs and Central Pontianak by 27 TPSs. Other four districts have less than 10 units. The volume of TPS container is 6.5 m^3. The table above also indicates that Pontianak City is no longer using permanent TPSs which are made by cement. In addition, recently the Pontianak Government also reduces the number of TPS to beautify the city view. The government starts to develop an integrated waste management place, known as TPST 3R. It will then be established in all districts.

The overall capacity of all TPS is 1.129 m^3. It shows that new TPSs only cover 56% of the total waste produced by Pontianak people (estimated 1.802 m^3). As stated in the table, it is predicted that there is around 250 thousand m^3 of waste which is not handled yet by the environmental agency. Some of the waste was burned, stockpiled, and thrown to river, ditch, and illegal TPS. With regard to the emergence of illegal TPS in various scales in the neighbourhood, based on the information of the head of the environmental agency of Pontianak City of 2017, Pontianak has 60 illegal TPS around Pontianak. The issues of illegal TPS have been discussed for quite a while. People are used to using TPS near their houses. Thus, when the numbers of TPS are cut down, the people will be littering, hoping the waste will be transported by the environmental agency. Several causes of the emergence of illegal TPSs are the followings:

1. People think that they have paid retribution so transporting the waste should become the responsibility of the government.
2. People do not wish to litter in place far from their houses.
3. Lack of people's awareness and concern on the effect of waste towards environmental pollution.
4. Lack of people understanding about the waste management in the households.

Figure 5.3. **Illegal TPS**
Source : Regional Planning And Development Agency

Moreover, the government also has developed 3R-based waste processing site known as TPS 3R. According to waste management data of 2017, the reduction of waste from the source only contributes 5-7% of the total waste production in Pontianak City. This means that ways and concepts of waste management are needed to press waste volume transported to TPS or TPA. In this case, the Pontianak government has established four TPS 3R and a community-based communal composer in the following locations:

(1) Kelurahan Sungai Beliung, West Pontianak District, located at UPTD RSUD Sultan Syarif Mohama Alkadrie, managed by Medical Support (Cleaning Service)

(2) Kelurahan Siantan Hilir, North Pontianak District, located on Sungai Selamat Dalam Street, next to Environmental Agency office, managed by a community known as Kreasi Sungai Putat (KSP)

(3) Kelurahan Kota Baru, South Pontianak District, located on Kurnia Street, behind kelurahan office of Kota Baru, managed by Angkuts Indonesia.

(4) Kelurahan Parit Mayor, East Pontianak District, located on Tanjung Raya II Street Komp. Star Borneo III, managed by Amanda baby and mother health centre (*posyandu*).

In addition, the Pontianak government also built an integrated waste treatment plant 3R called TPST 3R Edelweis managed by the government itself. For the meantime, the waste comes from a traditional market located on Dr. Wahidin Street. TPST 3R is located on Purnama II Street, Parit Tokaya Kelurahan, South Pontianak District. It was established in 2015 as an attempt to manage waste into economic products and increase the waste volume. The concept applied in the TPST 3R in Purnama is to convert organic waste into compost and biogas.

Table 5.9. **TPST 3R Resources**

No.	Job Description	Total
1.	Keeper	1 person
2.	Worker	6 people
3.	Composting Chamber	1 unit
4.	Waste chopper	1 unit
5.	Waste Filter	1 unit
6.	Biogas Reactor	1 unit
7.	Waste Cart	1 unit

Source: Environment Agency

The main objective of the development of TPST 3R is to reduce the amount of waste delivered to the landfill. In addition, waste is expected to be recycled into new energy, such as compost and biogas. as stated by Head of section for Community Based Waste Management, as follows:

> TPST has the same role as a waste bank, which is to reduce the volume of waste. The government-run TPST is still processing only one type of waste, organic waste. The processed waste comes from a traditional market, around 1 ton. 80-90 percent of waste is processed to produce solid fertilizer, liquid fertilizer and biogas.... The constraint faced in the development of TPST 3R is the absence of advanced technology. The process is still done manually and is still not optimal because there is only one type of waste. Initially, TPST 3R was expected to be able to accommodate at least 3 markets in Pontianak City, apparently only able to serve 1 market. Workers were overwhelmed to process trash every day, because the mechanism was still manual. It is expected that later on there will be development, the environment agency has made a study for future development, so that the processed waste can increase. (Interview, July 2018)

The interview with an academic showed that the existence of TPST was important in the effort to reduce waste generation. Following are excerpts of the interview:

> The government should indeed develop TPST 3R, along with waste banks. It is expected that the generation of waste produced by the community is not directly transported to the landfill. There will be a reduction in waste generation. Also, it will have an impact on maintain landfill area capacity, which is increasingly limited. (Interview, July 2018)

Table 5.10. **Data on Processed Organic Waste at TPST Edelweis of 2017**

No.	Month	Volume of Processed Waste (Kg)	Waste Treatment		
			Compost		Biogas (m^3)
			Initial Weigth	Final Weight	
1	January	5.063	4.285	631	563
2	February	8.046	7.696	509	350
3	March	4.442	4.353	576	109
4	April	6.854	6.754	717	100
5	May	10.998	10.803	1.069	75
6	June	9.358	9.358	854	
7	July	7.779	7.779	668	
8	August	9.562	9.562	849	
9	September	9.149	9.072	788	77
10	October	8.380	8.380	970	
11	November	8.295	8.295	896	
12	Desember	9.390	9.390	995	
	Total	97.306	95.727	9.522	1.274

Source: Environment Agency

Waste resulted from the market is dominated by organic waste such as vegetable and fruit as much as 80%, while the rest is inorganic waste by 20%. The concept is to convert organic waste into compost (about 21 days) and biogas. Meanwhile, the inorganic waste will be handled by TPA Batulayang. The waste is transported to TPST in every 2 days.

Based on the figure 5.4 (next page), the first step of waste management is to bring the market waste to TPST. Next, the waste is screened by its type: organic or inorganic. After that, the waste goes through a chopping process making it into smaller pieces. 80% of the chopping result will be converted into compos while the rest is used to produce biogas. The process of inorganic waste is handled by TPA Batulayang.

TPST Edelweis is able to manage waste 275.25 kg/day. Urban waste generation in Pontianak City is 326,426 kg / day, it means that waste management in TPST Edelweis can reduce waste by 0.087% from urban waste transported to landfill. In 2016, the volume of waste handled by TPST is 10515 kg. It produced 1359 kg of compost every year. For biogas, the capacity of TPST is 17 m^3 and can store 500 kg of waste per day producing 5-6 m^3 biogases every day. The following is data of organic waste management in 2017.

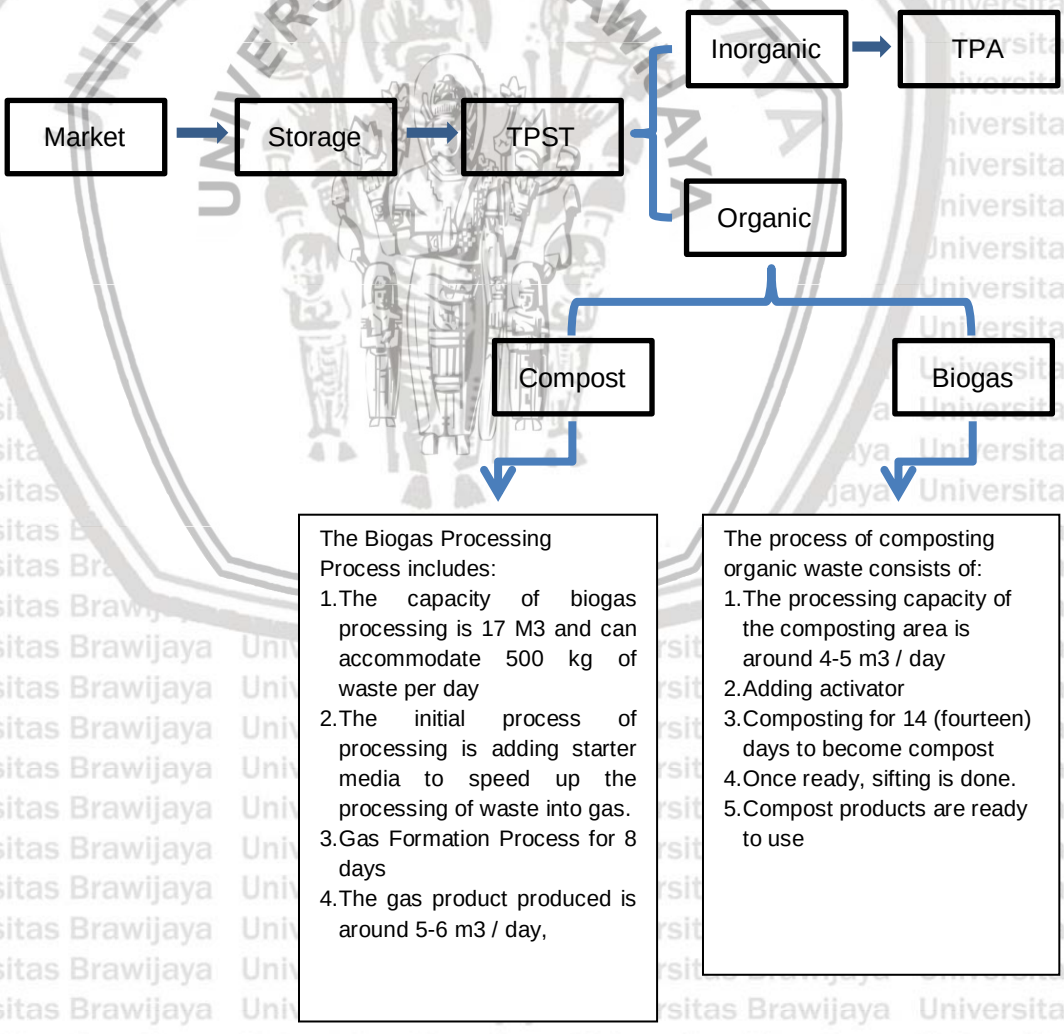

Figure 5.4. **Waste Management Concept at TPST**
Source: Environment Agency

Based on the table 5.8 above, result of the compost is around 10-15% of the initial weight of the waste. It shows us that the waste has high water content. The liquid compost will be used again as basic material of biogas and a small portion is used as fertilizer for plants around TPST. Solid compost is used by the Environmental Agency and Public Housing Agency as fertiliser for city park plants and to support greening program implemented by institutions or individuals in Pontianak City. Additionally, it can be distributed to farmer groups.

Biogas produced in a day is about 3-5 m^3 and then distributed through pipe installations which are directly connected to people's stoves and 1 m^3 gas bags. For the meantime, the biogas replaced LPG gas and used for various purposes such as cooking and lighting (lantern).

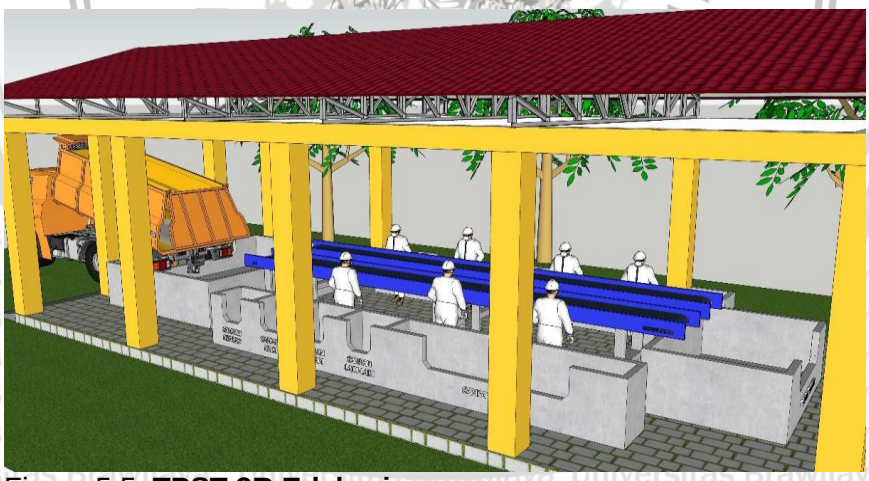

Figure 5.5. **TPST 3R Edelweis**
Source: Environment Agency

The figure depict a plan designed to improve TPST Edelweis. Based on the results of a study by consultants in collaboration with the Environmental Agency, the Government needs funds of Rp. 2,400,518,000 for the development of Edelweis TPST which includes preparation work, earthworks, installation work, construction work and procurement of goods.

Figure 5.6. **Documentation of TPST's Activities**
Source: Environment Agency

In addition, in managing the cleanliness of Pontianak Municipality, the availability of adequate numbers and conditions of the fleet or operational vehicle is a factor that greatly influences the workload and performance achievements of environmental agency. Some of the interviews conducted show that the current fleet conditions were inadequate, most of them were old and not suitable for use. As submitted by Head of section for Partnership and Retribution, as follows:

> Another obstacle faced by the government, most of the vehicles used by the environmental service are in an old condition... In addition, in terms of quanity, our fleet is also limited. Sometimes, this impedes *KSO* activities. For example, as we know that the fleet must carry out routine activities every day, and at the same time there is an obligation to transport waste from third parties. This takes longer time. (Interview, July 2018)

The same thing was also stated by a staff member of section for Transport, Facilities and Infrastructure of the Environment, as follows:

> We have problems in terms of the transport fleet, from almost 50 existing vehicles, most of them are old and not suitable for use. Because it is not feasible to use, it breaks quickly. as is known that, each vehicle already has its own schedule, so if there is a damaged vehicle, then another vehicle will be used for several transportation times. It takes time. in 2019, there is planned to be a procurement of garbage cars through a special allocation budget of 4 dumps, 3 containers, 1 heavy equipment. This heavy equipment is very necessary, because the manual system and crew cannot handle the waste because of the high volume. So hopefully in the next year the obstacles will decrease. (Interview, July 2018)

Based on my the interviews, it can be seen that the government needs to map the current situation with regard to the transport vehicles used, because based on the data obtained from the documents, the condition of most vehicles is good. Considering that Pontianak does not have advanced waste processing technology and still tends to use old approach, the availability of an adequate fleet is highly required.

Table 5.11. **Vehicle**

No	Type	Good	Minor Damage	Severe Damage	No Operation	Total
1	Fuso	2	0	0	0	2
2	Dump Truk	7	5	0	0	12
3	Amroll Truk	21	2	0	0	23
4	Pick Up	2	3	0	0	5
5	Tossa	3	2	1	2	6
	Total	**35**	**12**	**1**	**2**	**48**

Source: Environment Agency

Figure 5.7. **Vehicles**
Source: Environment Agency

The last but not least, one of important facilities in the waste management that will also explained is landfill, in Indonesia called TPA. Landfill area is crucial especially for cities that do not have sophisticated facilities to reduce waste generation. Pontianak has only one area to be used as a final disposal (landfill). The TPA is located in Batulayang Kelurahan, North Pontianak District, so-called as TPA Batulayang. To get there, the access is through Kebangkitan Nasional Street and 28 Oktober Street. A regional technical implementation unit is under the environmental agency and they are responsible of handling the TPA.

According to Regional Regulation No. 02 of 2013-2033 on Urban Planning of Pontianak City, waste management system is developed in the following ways:

1. The development of sustainable waste management program by making an integrated waste management place (TPST) in every sib-districts.
2. The development of environmental waste transportation.
3. The development and the implementation of 3R waste management model (reduce, reuse, and recycle).
4. The development of waste management system in the final disposal or landfill (TPA) of Batulayang in North Pontianak District.
5. The development of regional TPAs that serve Pontianak City, Kubu Raya Regency, and Pontianak Regency. The TPA is located in Kubu Raya.

According to the RTRW, the location of TPA Batulayang has followed the urban space planning of Pontianak City of 2013-2033, located in North Pontianak District. The TPA is planned to have 6 landfill zones, but in practice, A, C, and D zones are united as one big zone and B, D, and F becomes another big landfill zone. The total area is 30.6 ha. At the present, the area of TPA that has been occupied for waste disposal is 14 ha.

Based on the results of interviews, the government moved the landfill site in 1996 from TPA Jeruju (now become RSUD) to TPA Batulayang. The Government began purchasing an area in Batulayang Subdistrict in 1994 and started to utilize the area as a landfill from 1996 until now. TPA Batulayang serves 6 districts located in Pontianak City. High activities and lifestyles of people in Pontianak influence significantly the increase of volume and type of waste. Based on data obtained from the environment agency in 2017, the average of waste volume successfully handled by the government is 1.547 m^3/day of the total which reaches 1.800 m^3. The remaining waste 500 m^3/ day or about 110 tan/ day is burnt, piled, thrown to river, and put in other places by the Pontianak people. This means that 85% of them are the load of TPA Batulayang. In 2013, TPA Batulayang has accommodated 300,000 ton of waste, mounting up to 5 meters, compounded by the newly extra waste every day, 250-300 ton/day in average.

The government has expanded the landfill several times, most recently at the end of 2017, reaching 30.6 hectares. In connection with the method of handling waste in the landfill, at first, the method of handling waste is open dumping, until the central government issued Law No. 18 of 2008 on Waste Management which requires regional governments to stop the operation of landfills that still use an open dumping system. Now Pontianak begins using a controlled landfill method in processing waste. According to Government Regulation No. 81 of 2012, controlled landfill is a method of storing waste, by compacting and covering waste with soil at least every seven days. This method is regarded as an intermediate method before being able to apply a more advanced method, sanitary landfill (a means for collecting waste into areas that are prepared and operated systematically, by compacting and closing waste with soil every day.

Furthermore, in order to deal with a waste problem, in 2007, the Pontianak City Government cooperated with PT. Gikoko Kogyo Indonesia, a Japanese company. This collaboration was also supported by the World Bank and NCDMF. The main goal is to reduce the methane emissions from solid waste disposed of to TPA Batu Layang, through carbon finance transaction between the World Bank-managed NCDMF and the project sponsor (PT Gikoko). However, according to World Bank (2012), owing to technical barriers along with other environmental problems such as leachate, operation of existing landfill gas flaring at the landfill failed to achieve the desired target (deliver emission reduction). This project was then considered unsatisfactory and the operation was stopped.

In addition, during 2005-2009, Pontianak has ever utilized 1 unit incinerator machine with the capacity of around 3-3.5 m3/hour. It only covered one district area, South Pontianak. Burning garbage in an incinerator could minimize the presence of illegal dumping around the protocol road in the South Pontianak and also reduce the generation of waste sent to the landfill. However, there were some problems faced while using the incinerator, such as the high cost for its operational – maintenance, high dependence on the incinerator, and the incinerator caused environmental pollution. Therefore, the government decided to stop the operation of the incinerator.

In addition, based on the results of interviews with an academic, it can be seen that the dredging of waste at several spots on the landfill has an impact on environmental pollution. For this reason, the Batu Layang TPA must be rehabilitated immediately. The need for land area will also continue to increase if there is no concrete effort to reduce waste from sources. The government needs to choose an alternative landfill development by considering the investment and operating costs of the TPA Batu Layang as well as the development of TPS 3R.

5.1.1.2. Context of Implementation

1) Power, Interests, and Strategies of Actors Involved

In a policy implementation, one indicator that needs to be taken into account is related to the strength or power, interests, and strategies used by the actors involved. As it is known, besides the government which acts as the main actor, other actors may also try to influence the decisions made. If this is not considered, it is very likely that the program to be implemented will face serious obstacles.

As explained earlier in the previous part, it can be seen that there are several interests affected in terms of waste management in Pontianak Municipality. Those are as follows: the regional head (the mayor of Pontianak Municipality; agency of community order development; officials (employees who are given certain tasks in accordance with the provisions of regional regulations); the owner (any person or body –based on law– having wealth); the user (any individual or body that controls and / or makes use of something that is movable and / or immovable, which is not on behalf of a person or entity); and the occupant (any individual or body that uses immovable objects either on personal behalf or on behalf of the body. To sum up, it can be concluded that interesets affected or stakeholders can be grouped into three groups; the government, businessmen or the private sector and the general public.

Each has interests and goals. In implementing waste management in Pontianak Municipality, the government, in this case the mayor and his bureacratic implementers, have full control over the responsibility for waste management. This can be seen from the division of government affairs based on Law number 23 of 214, that the regional government has an obligation to develop

systems and management of waste in its territory. In other words, the government is the main actor in implementing waste management policies.

In connection with the role of the private sector, based on the existing regulations, it can be seen that the regional government can build cooperative relationships with business entities in waste management. The scope of the partnership includes: withdrawal of solid waste service fees; provision/construction of TPS/TPST, landfill, as well as supporting facilities and infrastructure; transporting waste from TPS / TPST to TPA; landfill management; and / or management of other processed products. In this case, the Pontianak Municipal Government is still focused on withdrawing solid waste services, through the KSO program. However, based on the statement from the head of section for partnership and retribution, that the value of retribution is now considered to be inappropriate for economic conditions, because it is still too cheap. This will have an impact on the realization of the target of the regional revenue that has been determined. Another form of cooperation is the government's cooperation with several convenience store entrepreneurs not to provide plastic bags for free to people who shop.

Furthermore, the general public as recipients of services can also play a major role in decision making in terms of waste management. In Pontianak, there have been many community groups or communities engaged in dealing with waste issues. In addition to providing physical support, such as mutual assistance *(gotong royong/kerja bakti)*, they also suggested to the government about good waste management, especially about sorting garbage. One activist who interviewed said that the government is now better to focus on socializing waste sorting and providing facilities for it. He added that business opportunities in waste recycling are very high.

2) Institution and Regime Characteristics

The regime that is leading the Pontianak city government continues to strive to run public service programs very well including waste management. In terms of compliance with the law on public service, the Ombudsman gave Pontianak Municipal Government an award as the best in 2015 and 2016. This has become one of the proofs showing that the current regime wants to advance Pontianak Municipality. Furthemore, the government's commitment in waste management can be seen from the aspects of supporting policies issued. The policies often outlined in the circular letters are in order to encourage the application of the 3R principle in waste management, with the aim of reducing the generation of waste transported to the landfill. In addition, the current government also applies the principle of openness in public services. Through the development of the *Gencil* application, the government has opened transparent public communication facilities, especially those related to the public's complaint on public services, including waste management.

Based on an interview with the Chairperson of Commission B, Regional People's Representative Assembly (in charge of environmental issues), it can be conceived that there is a positive improvement. Following is an excerpt of the interview:

> The regime in power, in this case the mayor, can be said to be successful in bureaucratic reform where this is one of the tough challenges for a leader, but in terms of waste management, the government has not been successful. Because the government has not found a concrete solution to overcome the problems associated with increasing waste generation. (Interview, July 2018)

In addtion that, an environmental activist and volunteer also added that in general the government's commitment to managing waste was good. This can be seen from the government's sincerity to embrace the community in various

activity program activities. But in some cases related to waste reduction, another activist see that the government still has not shown satisfactory performance because it still tends to use the old approach and has not concretely supported the waste sorting program which is the first step in the implementation of 3R. Following an excerpt of the interview:

> Leadership commitment is good enough. but as it is known that the leader cannot control everything because of there are many affairs that must be handled in the government. So, what should be most active is the environment agency. This is about how to form a team to do the things that I said earlier, how to encourage all stakeholders to reduce the volume of waste. Not only implementing the old pattern –collect-transport-dispose– related agencies also need to apply a new approach. Because the spearhead of service is related agencies, in this case, the forefront is the environment agency. (Interview, July 2018)

Based on the data above, it can be concluded that the regime in power now shows the characteristics of good governance in terms of bureaucratic and administrative fields. However, in terms of waste management, the government has not made a step that has a significant impact on reducing waste transported to the landfill.

3) Compliance-Responsiveness

To determine the level of fulfillment of obligations and responsibilities in the implementation of waste management, the researcher uses two data sources, namely performance report and result of public satisfaction survey on public service. To begin, the performance report is a form of accountability of government agencies in carrying out government performance for one year. The arrangement of the performance report is based on the performance planning prepared in the previous year and outlined in the performance agreement. The purpose of the performance report is to provide performance information that is measured to the mayor for the performance that has been and should be

achieved. In other words, prformance measurement is done by comparing the expected performance with the performance that has been implemented.

Table 5.12. **Realization and Target of Main Performance Indicators in 2017**

No	Main Performance Indicators	Target (%)	Realizasion (%)
1	The Level of Cleanliness of Pontianak Municipality	80	85,81
2	Percentage of Achievement of Environmental Quality Index	65,5	66,21
3	Percentage of Strengthening Community or Community Involvement	80	80

Source: Performance Report

Based on the table above, it can be clearly seen that the target of expected level of cleanliness of Pontianak Municipality is succesfully achieved even the figure exceeds the predetermined number. This means that the government succeeded in implementing waste management programs. In addition, some interviews with environmental activists show that the performance of the government is satisfying, as the following interview quote:

> So, the mayor's commitment is good enough. It can be said that if there are 4 rating scales, which consist of very satisfied, satisfied, dissatisfied and very dissatisfied, in general I am satisfied with the performance of the government, although more fitting is quite satisfied. For other systems, service performance is good, such as community empowerment efforts and transportation performance. What needs to be paid attention and needs to be improved is the way of processing waste from the TPS before being sent to the landfill. (Interview, July 2018)

Furthermore, based on the Regulation of The Minister of State Apparatus Empowerment and Bureaucratic Reform Number 16 of 2014 concerning Guidelines for the Community Satisfaction Survey on the Implementation of Public Services, government agencies are required to compile a public satisfaction survey report on public services that have been provided. Nine

elements of service that are indicators of measuring community satisfaction are as follows: service requirements; service procedures; speed of service; fees / rates; service type specifications; competency of officers; implementing behavior; service announcement; and handling complaints, suggestions and input. The answer form of each service element generally reflects the level of service quality. Value 1 for the Bad category, 2 for the Poor, 3 for the Good, and Very Good given the perception value 4.

In this case, the environment agency through its annual work program carries out a community satisfaction survey twice a year. For the environment agency, the measurement of community satisfaction on public services can be used as an evaluation material in order to improve public services in the future. For the community, the survey is employed as an illustration of the service performance of the Pontianak Environment Agency. Based on the results of measurements of satisfaction, especially in tems of waste management services in 2017, the environment agency got a score of 88.61 in the first semester and 86.24 in the second semester. Despite experiencing a decline, the environment agency is still in the category of Very Good in terms of waste management.

5.1.2. Influencing Factors

5.1.2.1. Supporting Factors

1) Legal Basis From The Central Government

Clear regulations from the central government is a main basis for local authorities to arrange programs in the environmental agency. In this case, the government of Indonesia has showed the commitmen to develop waste management system integratedly by issuing several important regulations. Those regulations are as follows: Law No. 18 of 2008 concerning Waste

Management, Government Regulation No. 81 of 2012 concerning Waste Management of Household Waste and Waste Similar to Household Waste and Regulation of the Minister of Environment No. 13 of 2012 concerning Guidelines of Reduce, Reuse, And Recycle Implementation Through Waste Bank. In addition there is also a presidential regulation that encourages immediately local governments to make strategic policies, as explained by Head of section for Community Based Waste Management, as follows:

> Recently, the government issued presidential regulation number 97 of 2017 concerning national policies and strategies for managing household waste and similar waste with household waste. Based on the regulation, the regional government is obliged to formulate waste management policies and strategies with clear targets, until the end of 2025. And we must fulfill that. (Interview, July 2018)

2) Strong Awareness of Local Government

Strong leadership from the mayor become a driving factor for all bureaucratic reform systems in the framework of good governance. Strong leadership then encouraged a bureaucratic mindset change to be more disciplined, public service oriented, responsive and prioritizing better outcomes. A strong commitment from the mayor is one important key to create a clean and environmentally-friendly city. The government has been trying to find a solutive way to address waste problem. The first endeavor is launching a pilot program for recycling waste. For example, the organic waste generated on one traditional/public market was recycled to produce compost.

As explained earlier, there are some supports from external parties showing that the government has a strong commitment. Based on an interview with the Chairperson of Commission B, Regional People's Representative Assembly (in charge of environmental issues),

> The regime in power, in this case the mayor, can be said to be successful in bureaucratic reform. As it is known that it is one of the tough challenges for a leader, but in terms of waste management, the government has not been successful. Because the government has not found a concrete solution to overcome the problems associated with increasing waste generation. (Interview, July 2018)

The same thing said by an environmental activists, that in general the government's commitment to managing waste was good. This can be seen from the government's sincerity to embrace the community in various activity program activities. But in some cases related to waste reduction, another activist see that the government still has not shown satisfactory performance because it still tends to use the old approach and has not concretely supported the waste sorting program which is the first step in the implementation of 3R. Following an excerpt of the interview:

> Leadership commitment is good enough. but as it is known that the leader cannot control everything because of there are many affairs that must be handled in the government. So, what should be most active is the environment agency. This is about how to form a team to do the things that I said earlier, how to encourage all stakeholders to reduce the volume of waste. Not only implementing the old pattern –collect-transport-dispose– related agencies also need to apply a new approach. Because the spearhead of service is related agencies, in this case, the forefront is the environment agency. (Interview, July 2018)

Furthermore, the government also facilitated a program encouraging community to participate in sorting, reusing and recycling waste. The government also strictly implements the provision of sanctions for those who dispose of waste are not on the right schedule, from 6 pm to 6 am. Also, there is a levy imposed to community in order to support support funding of waste management activities performed by the government. The levy scheme used is through a partnership with PDAM Tirta Khatulistiwa of Pontianak City. Those are therefore evident that the Pontianak municipal government is aware of the importance of managing waste properly.

Next, the government also implement immediately what is mandated by Law number 23 of 2014 concerning regional government, two of them is reorganization and restructuring. Based on Government Regulation No. 18 of 2016 concerning Regional Device and Regional Regulation No. 7 of 2016 concerning Establishment and Composition of Regional Devices, Environment Agency *(Dinas Lingkungan Hidup)* is the result of the merger of two work units under the Pontianak Municipal Government, namely the Sanitation and Gardening Agency *(Dinas Kebersihan dan Pertamanan)* and the Environment Body (*Badan Lingkungan Hidup*). Then, in Mayor Regulation No. 61 of 2016, it can be said that Environment Agency has and play important roles in terms of waste management. This regulation stated clearly position, organizational structure, main tasks, functions, job descriptions and working procedures. Moreover, environment agency has also arranged SOP (Standard Operational Procedure) as a guideline in running jobs.

3) The Competency of Officials

Human resources at Echelon 3 and 4 have a linier field of knowledge with their respective main task and function. The policy to place officials according to their capabilities is very important. In the public service context related to technical matters, the principle of "the right man on the right place" is absolutely necessary. In this case the government that is committed to continuously provide excellent service to the community try to maintain and improve the capacity of its officials through education and training activities. This step is carried out in order to anticipate the advancement of information technology where people are getting smarter and demanding maximum service. Also, based on my observations, it can be seen that the government has tried to

place officials according to their expertise. This can improve organizational performance because the officials has mastered their main tasks and functions, considering that waste problems are technical problems in which not all employees can understand.

Based on information obtained from the 2017-2019 strategic plan that the environment agency continue to improve the competence of its employees through a variety of trainings such as Training / Course in the Environment that has been followed: UKL and UPL Document Preparation Courses, AMDAL Basics Courses, Training for Regional Environmental Supervisors (PPLHD), Waste Management Improvement Training, PROPER Program Training, and Certification of Procurement of Government Goods and Services.

4) Participation from Stakeholders

Support and awareness from the private sectors and community regarding the importance of environmental management are also important for government in carrying out waste management program and developing innovative ways. Stakeholders can support and strengthen the program arranged by the government to be implemented more successfully through many activities, such as promotion of cost-sharing activities and adopting appropriate mutually agreed strategies for integrated waste management,

Recently, the motivation of the community to be involved in government programs, especially in terms of environmental concerns, is very high. This can be seen from their enthusiasm in collaborative activities. This cannot be separated from the government's efforts through socialization, as said by an activist, as follows:

> So far, the socialization carried out by the environment agency is quite good where there have been many forums or activists in each kelurahan formed. This can increase community participation, especially among the youth and encourage the general public to care about the dangers and benefits of waste. The environment agency also began to campaign on environmental issues in creative ways, for example, commemorating environmental big days by conducting environmental awareness promotion events; or through creative campaigns through social media. (Interview, July 2018)

In addition, government also receives support from private parties, one of which is PT. Angkuts that provides information technology-based waste transportation services. Also, there are some companies that provides aid to the community through CSR programs (PLN and Pertamina) or giving assistance to freelancers at the moment of environmental big days. This can be regarded as a form of private concern for the environment.

5.1.2.2. Constraining Factors

1) No Regional Regulation

Pontianak Municipality has been playing a role in promulgating regulations related to waste management. However, when compared with national regulations especially regarding 3R principles, it is clear that the current regulatory arrangement of waste management should be improved to address the waste problem. The existing regulatory system is considered outdated.

From several officials interviewed, it can be seen that Pontianak does not yet have regional regulations specifically for waste management. The following is an interview interview with the Head of Division for Waste Management:

> Now the government is drafting a regional regulation on waste management. The regulations that are used as a reference are regulations on public order and regulations on waste disposal schedules. (Interview, July 2018)

To strengthen this information regarding regulations that become a reference in the waste management in Pontianak Municipality, the researcher also interviewed the Head of section for Community Based Waste Managemen, and she added that:

> The government in carrying out the waste management program refers to regulations at the central level: Law No. 18 of 2008 concerning Waste Management; Government Regulation No. 81 of 2012 concerning Waste Management of Household Waste and Waste Similar to Household Waste; Regulation of the Minister of Environment Number 13 of 2012 concerning Guidelines of Reduce, Reuse, And Recycle Implementation Through Waste Bank; and most recently Presidential Regulation No. 97 of 2017 concerning National Policies and Strategies for Managing Household Waste and Similar Waste with Household Waste. So far, there is no regulation at the regional level. Local regulations on waste management are still in draft form. In practice, to support government programs in terms of reducing waste, the local government has issued a lot of circular letters, such as promotion of waste sorting and 3R, although these steps have not been optimal.

Comprehensive regulations can form a clear basis for implementing integrated waste management. Nevertheless, according to the present regulations in Pontianak Municipality, many issues are still waiting to be dealt with. Actually, community and private parties have attention about how the local government maintains integrated waste management continuously in the future. The responsibility allocation between different government agencies involved is still obscure, which is a notable constraint to better waste management. Besides, whether the regulations support the development of waste reduction and recycling in Pontianak Municipality is not clear. Furthermore, the regulations only regulate waste issues from a general perspective, instead of developing the principal focus on addressing specific issues that need to be solved in practice. For instance, there are almost no regulations about how to regulate 3R-based behavior and the roles of stakeholders. As a consequence, this results in a lot of difficulties to reduce the waste generation as a main goal of waste management in Pontianak Municipality.

2) Limited Human Resources

Based on the situation in the field, there is still a lack of human resources, both in terms of quantity and quality. This is one of the problems that must be resolved immediately. For information, when this research was conducted, the position of the secretary of agency is not occupied by a definitive official. This inevitably affects the performance of the secretariat's performance in supporting administrative matters. Also, the number of staffs in the supervision department remains limited in which they also have inadequate abilities. This is due to the lack of professional development program such as training, seminar, workshop, and technical tutorial.

3) Lack of Public Awareness

As the capital of West Kalimantan, Pontianak serves as the centre of activities for all sectors in the province. This, along with the increasing volume of waste as the growth of population, are the causes of increasing waste generation. To solve this problem, the government can not work alone, for that reason, the government needs support of public. In this case, community participation is one of the keys to the success of waste management in Pontianak City. Community participation, as the biggest waste contributor, in supporting the waste processing program, especially 3R, can have a significant effect on reducing waste generation. However, public awareness to participate in the problem is still lacking. Some people are still unfamiliar with waste sorting which is the first step in implementing the 3R principle.

Head of section for Community Based Waste Management also added that public awareness is still low, as quoted by the following interview:

> One of the obstacles we face is people who are not fully aware of the environment. Educating the public about waste bank and sorting waste is not as easy as turning the palm of the hand. Sometimes the community has sorted out, but the community is confused because the TPS provided is not a shelter for sorted waste. This makes people unmotivated to do it sustainably. The management of the waste bank also has difficulties in getting people to save. The community feels that if they carry waste to waste bank they will immediately get money. In this case the waste bank must have capital. This is what sometimes makes them difficult. (Interview, July 2018)

The lack of awareness from the community in terms of sorting and reducing waste generation also become a concern of an academic, as quoted from the following interview:

> Regarding waste management, public awareness of sorting is also still low, very few people are sorting out garbage, because the community also understands that if there is no separate, the tps are not separate. (Interview, July 2018)

The information obtained from interviews show that the government needs innovative steps to encourage public awareness, one of which is socialization for programs related to promotion of the role of community participation in environmental sustainability organized by the environmental agency to the community. In addition, the government also needs to prepare supporting facilities for the application of the sorting and 3R principles.

4) The lack of Facilities and Innovative Technology

As it is known that the development of waste management technology requires no small amount of money. Generally, developing countries face this problem. In this case, Pontianak Municipality as a emerging city is also experiencing the same problem. At the same time, from regional revenue and expenditure budget, the government also has to prioritize other basic services such as education and health. This makes the government choose to adopt old approaches.

Pontianak Municipality is stiil using old approaches, open dumping and controlled landfll, that make the landfill capacity decrease from day to day. Open dumping is the simplest disposal system in which waste is simply dumped in a landfill without further treatment. The open dumping disposal system should no longer be implemented because many cause problems ranging from groundwater contamination by leachate, odor, spillage to smoke. However, there are still many developing countries using open dumping disposal systems because of their ease and low cost. Controlled landfill is a more developed disposal system than open dumping. In this method, the waste that comes every day is compacted with heavy equipments into a cell. Then, the solidified waste is covered with soil every five times or at least once a week. This is done to reduce odors, the proliferation of flies, and the release of methane gas. In addition, drainage channels are also built to control the flow of rainwater, leachate collection channels and processing plants, operational control posts, and methane gas control facilities. In the case of Pontianak Municipality, waste generation which continues to increase makes the capacity of the landfill decrease. This requires the government to immediately find appropriate innovations.

Furthermore, regarding the development of the integrated saste management system, actually the government has developed integrated waste treatment plant and facilitated the establishment of community-driven waste banks. Both steps are part of efforts to reduce waste generation through the application of 3R principles in waste management. The waste is processed into useful and economic value items, for example, biogas, compost fertilizer, and handicrafts. However, these programs have not had a significant impact in reducing Pontianak City waste. This is due to the absence of an integrated

system related to the hierarchy of waste, ranging from the storage by the community, shelter and transportation by field workers.

Based on the results of interviews conducted by the researcher, it can be concluded that waste bank and TPST 3R can be the main programs in an integrated waste management effort. The following is an excerpt of an interview with an academics:

> The government should indeed develop TPST 3R, along with waste banks. It is expected that the generation of waste produced by the community is not directly transported to the landfill. There will be a reduction in waste generation. Also, it will have an impact on maintain landfill area capacity, which is increasingly limited. (Interview, July 2018)

The same thing was said by an activist about the importance of developing waste banks in handling waste problems in an integrated manner. The following is an excerpt of an interview:

> Waste banks must be echoed, because this is the most humanistic, most representative and empowering approach because we empower communities to be pioneers at the community level themselves to help the government. With the existence of a waste bank, it is expected that waste will be reduced at the community level. The community can process it and even better if the community can get economic benefits. (Interview, July 2018)

Based on the the results of interviews and the observations the researcher did, it can be concluded that in order to organize waste management in an integrated and comprehensive manner, the fulfillment of the rights and obligations of the community, as well as the duties and authorities of the overnment to carry out public services, a legal umbrella is highly required.

5.1.3. Model of Waste Management Implementation

Waste management in Pontianak City is carried out through policy instruments, such as Regional and Mayor Regulations. However, the existing regulations have not explicitly explained the certain procedures for waste

management as regulated by the Central Government, both the Law and the derivative regulations in which waste management is defined as a systematic, comprehensive, and sustainable activity which includes waste reduction and handling.

In practice, Pontianak Municipal Government through the Environmental Agency carry out waste management as a daily task in which the agency is still using an old approach, namely collecting, transporting and disposing. In terms of transporting waste to the landfill, it can be said that the government has a very good performance. This is supported by the responsibilities of field workers who carry out their duties in accordance with the provisions. However, on the other side, the government has not been able to develop waste reduction management.

The increasing population plus the status of Pontianak Municipality as the capital of West Kalimantan, as well as the center of trade, certainly affects the increase in the amount of waste generation. Without proper handling, the government will experience severe problems in the future, especially with regard to the capacity of the landfill. The government has indeed begun to build an integrated waste processing site known as TPST and facilitates the establishment of waste bank managed by the community. In addition, the government also cooperates with a private IT-based company engaged in the transportation of waste, namely PT. Angkuts. However, these steps have not provided maximum results. This is due to the lack of a clear legal basis relating to waste management techniques, the low awareness and understanding of the community about waste segregation as the initial step in the implementation of 3R, and the lack of appropriate technology for waste management.

Diagramatically, the implementation model of waste handling policy in Pontianak City as presented in the description above can be depicted as follows.

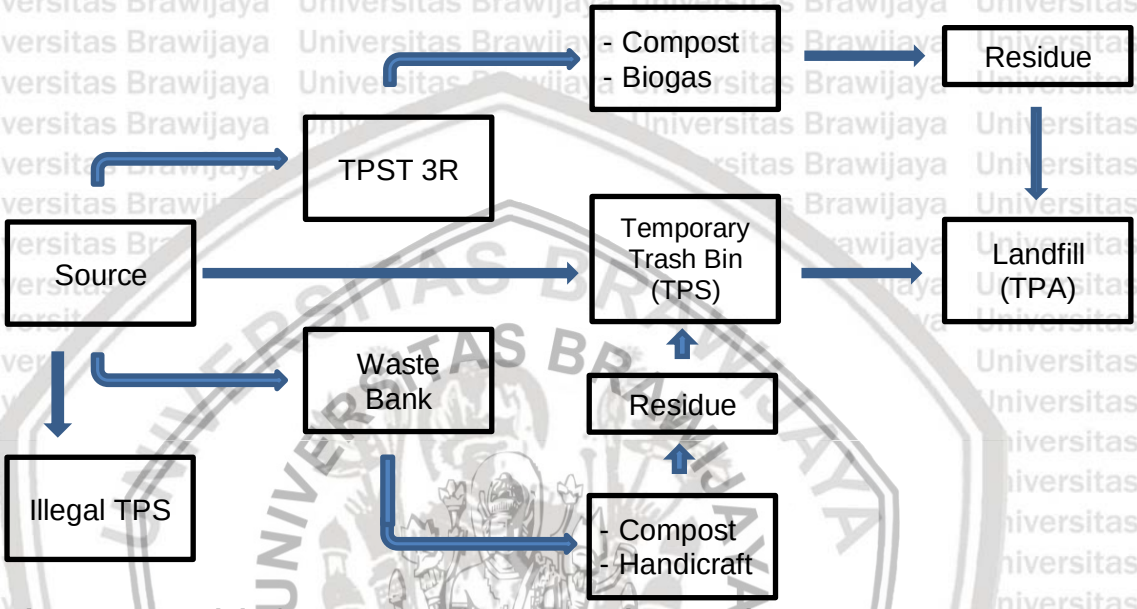

Figure 5.8. Model of Waste Management Implementation
Source: Modified by author

Based on the picture above, it can be seen that the Government has tried to encourage the implementation of 3R in waste management. TPST 3r and garbage banks are 2 programs that are the pioneers of the 3r implementation. However, these steps have not been carried out in an integrated manner. In addition, the operation of TPST 3R is also not too maximal because it is still constrained by the limitations of the technology used, TPST 3R can only process organic waste and cannot process inorganic waste, especially plastic. Increasing community participation through the establishment of a waste bank also has not shown a significant impact in reducing waste sent to landfill. For this reason, the government needs to accelerate technological development in TPST 3R and continue to socialize and encourage the community to form a waste bank.

5.2. Discussion

5.2.1. Implementation of Waste Management in Pontianak Municipality

Based on the data that has been presented, it can be seen that the implementation of policy of waste management can be analyzed by employing Grindle's policy implementation model, consisting of two following variables:

(1) Content of policy: interests affected, types of benefits, the degree of change desired, site of decision making, program implementers, and resources committed.

(2) Context of implementation: power, interests, and strategies of actors involved; institution and regime characteristics; and compliance-responsiveness.

5.2.1.1. Content of Policy

1) Interest Affected

Different from an example mentioned by Grindle– Landowners who oppose agrarian reform measures, often violently– as it is known that waste problem is an issue faced by all levels and types of society. In other words, waste management is carried out to achieve collective positive impacts. In addition, in executing waste management programs, the government is committed to providing the public with the best service. Although there are still complaints, those cannot be regarded as considerable oppositions from those whose interests are threatened. This is because nowadays people are increasingly concerned about the environment.

According to Elsaid and Aghezzaf (2015), Interests affected are one of the crucial factors that can affect the performance of waste management being

carried out by the government. According to previous research, it can be seen that several stakeholders involved in implementing waste management programs consist are as follows: national and local government, governmental agencies, private sectors, non-governmental organizations, households, private sectors, including recycling companies. Moreover, as said by Shamshiry et al. (2011), the planning program of waste management optimization will have an important impact when the government plays the role of the facilitator and catalyser to implement partnerships between stakeholders. In addition to that, there are three interrelated requirements for delivering ISWM under the framework of 'good waste governance'. One of them is inclusivity that provide transparent spaces for stakeholders to contribute as users, providers and enablers (Wilson et al, 2012).

2) Type of Benefits

Grindle said that a distinction can also be made between programs providing collective benefits, which encourage categorical demand making, and those providing benefits that are divisible, which may mobilize more particularistic kinds of demands at the implementation stage. According to Grindle, in this research, waste management is regarded as a program arises from government will to provide collective benefits. As it is known that people around the world face the same problem relating to waste management. This also applies to Pontianak Municipality in which waste management is considered crucial for many people.

3) Extent of Change Envisioned

The introduction of new manners for waste management can be seen as programs that need substantial behavioral adjustmen and high participation on the part of recipients. Besides, those program are also designed to gain long term

purposes in terms of maintaining environment. As Grindle said, programs that are arranged to achieve long-range objectives may be more difficult to implement than those whose advantages are immediately apparent to the beneficiaries.

Zaman (2010) said that Waste is no more treated as the valueless garbage; waste is rather considered as a resource in the present time. Resource recovery is one of the prime objectives in sustainable waste management system. Moreover, according to Elsaid and Aghezzaf (2015), current models reflect policy change where waste management is directed from landfilling to more environmentally useful alternatives based on principle of Integrated Solid Waste Management (ISWM). They added tha waste management system including the generation of waste, storage, collection, transportation, treatment, and final disposal is used to avoid or reduce waste generation in the first place.

4) Site of Decision Making

Acccording to Grindle, the content of various policies also dictates the site of implementation. There are several examples of how policy are executed. Some usually depend upon a limited number of key decision units, for instance monetary policy, while others are implemented by a large number of individual decision maker sscatterd throughout an wide geographical area but usually belong to a single bureaucratic organization such as education policy. There are also more complicated policies that depend upon an extensive network of decision units whose responsibilities are also organizationally dispersed. Local and national level agents, the community, and private sectors may all be implicated as implementors of a policy. Therefore, the task of executing certain programs becomes more difficult, given the increase in decision units involved.

As we know that Indonesia has imposed the broadest regional autonomy to the regions. However, regulations made at the regional level must remain in line with the regulations issued by the central government. With regard to waste management, the central government has issued a regulation which then becomes a reference for any regional government that will make derivative regulations by adjusting regional conditions. In this case, the Pontianak Municipal Government does not have such regional regulations.

According to Wilson et al. (2012), one of the requirements for carrying out waste management based on the framework of good waste governance is inclusivity. In this case, laws require consultation and participation with stakeholders outside the bureaucratic structures and neet to encourage public–private partnership, private sector participation or community based organisation participation/empowerment.

5) Program Implementers

In the case of Pontianak municipality, Environment Agency is charged with running waste management programs in Pontianak urban area. As mentioned in the previous part regarding human resources, not only public servants, Environment agency also employs contract based personnels, especially for technical works. Moreover, in order to manage programs succesfuly, the government also open the discussion about handling waste issues with other stakeholders– private sectos and community.

Owalobi et al. (2016) said that any effective institution has to have separated administrative procedures and planning, clarity of roles and coordination, jurisdictional boundaries and good governance structures in order to improve the accountability of the implementing agencies for quantifiable targets and

operational plans. Amir and Anto (2018) added that without any coordination, the waste management policy can not be effective. In other words, the lack of coordination and expertise on waste management issues among the environment agency and other relevant governmental agencies will promotes inefficiency performance.

6) Resources commited

Feeling dedication along with loyalty to a activity or job, in this case waste management and public service, are important values that program implementers must have. In the bureacracy, it is common to have some more dedicated, some more loyal, some responsible, or vice versa. In this case, the Pontianak Municipal Government keeps continuing to strive to provide better services in waste service. Employee commitment is evidenced by the many awards received by Pontianak Municipality from the central government.

However, the government must face other obstacles in terms of resources. As is known that waste management is a program that requires a lot of funds. In fact, at the same time, the government must also consider funding for other basic services. In this case, it can be said that the government has limitations in funding for the development of environmentally friendly and appropriate technology. As said by Ferreira (2016), need to have continuous financial support for institutions dealing with solid waste management process is a big hindrance and a reason for the failure of most of the waste management initiatives in developing countries (Gopal et al, 2018). Also, as stated by Elsaid and Aghezzaf (2015), that improving infrastructure including roads, increasing the equipment and human resources positively impacts the performance of the waste management system. This in line with the findings of Guerrero et al. (2013)

showing that those factors are important and represent part of the financial expenditures of a waste management system, yet the cost of waste collection and transportation is estimated to constitute 80 to 95 per cent of the budget of a solid waste management system (Elsaid and Aghezzaf, 2015).

5.2.1.2. Context of Implementation

1) Power, Interest and Strategies of Actions Involved

According to Grindle, implementation stage can be conceived as a continuing process of decision making that entangles various actors. In the activation of any program, those actors are called upon to arrange choices regarding precise allocations of public resources and many other that may try to affect decisions made. At the local level, those who may be involved include local politicians, both executive and legislative; private groups; beneficieries; and bureaucratic implementers.

According to Elsaid and Aghezzaf (2015), a waste management system may be described as the management of all responsibilities, practices, procedures, processes and resources for establishing a system that manages waste and complies with environmental regulations. Regarding implementation of waste management program that Pontianak Municipality is carrying out, stakeholders involved are local politician, especially the mayor; bureaucratic implementer, environment agency; private sectors; and community. The mayor through his vision and mission attempt to convince and get attention from the public. As it is known that the mayor need support of public in terms of maintaining his position,in other words he must stand for reelection. Rather similar, if politicians depends on public votes, bureaucratic implementers in executing the program also have interest.

As Weimer and Vining (2011) said, some agency heads seek the prestige and career advancement that might result from being perceived as innovators. So, in carrying out the innovative programs, the implementers not only think about public oriented activity, but also career oriented. If we believe that most people are economically rational, then the greater the expected net benefits one expects to reap from some political activity, the more likely that one will undertake the activity (Weimer and Vining, 2011). Private sectors also play an important role in waste management. The government require their support to cope with the limitation of funds through CSR program. This make private sectors have privileged to, sometimes, influence the government in decision making related to business. Last but not least, community, as recipients of the program have a right to get public best service. But, in the waste management, their participation is also significant for the government to pursue the program goals, such as 3R promotion.

2) Institutions and Regime Characteristics

First of all, according to World Bank (2000), a well-planned institutional framework with planned management is essential for running waste management in an acceptable level and to reduce the risk (Gopal et. al, 2017. Next, talking about instuitutions and regime will direct us to discussion about hierarchical relationships known as principal (mayor) – agent (burecuracy implementer). In this case, Pontianak Municipality, locus in this research, is one of emerging cities that has been succesfully implementing bureucracy reform. Strong leadership from the mayor become a driving factor for all bureaucratic reform systems in the framework of good governance. Strong leadership then encouraged a bureaucratic mindset change to be more disciplined, public service oriented, responsive and prioritizing better outcomes.

There are two approaches used by the mayor in running the government (Rustan et al, 2014). First, the power-coercive approach, the approach taken after looking at the work ethic of a low apparatus, poor discipline, low openness / transparency, consequently the quality of public services cannot satisfy the public. After the power-coercive approach model has been successfully implemented and the system has been well developed, the mayor uses a normative-reeducative approach, where this model focuses on the process of repeated education related to the values and beliefs of the apparatus to always prioritize the public interest.

Despite having achieved some awards in terms of public service, Pontianak Municipality is still struggling to find the best way to manage waste problem. Limited funds to develop appropriate technology for waste management is one of the main problems faced by the Pontianak city government. For this reason, the Pontianak City Government continues to improve public services in order to attract investors. It is expected that there are investors who are interested in developing waste processing technology into valuable products.

3) Compliance and Responsiveness

Referring to Grindle's textbook (1980), in order to achieve the goals, there are at least two subordinate problems faced by officials. Those are compliance and responsiveness. Regarding compliance, officials require the support of political elites and the compliance of implementing agencies or bureaucrats charged with executing the program and of intended recipients. In the case of Pontianak Municipality, the mayor has already acquired the support of stakeholders, such as the political elite, private sectors, community as intended beneficiaries. It can be said that the mayor with his commitment to develop Pontianak city has managed to address the problem of how to achieve the objectives stated in the policy.

Furthermore, another problem that officials must address is about responsiveness. To get the desired results, public instutions (bureaucracies) in carrying out the program –serve intended beneficiaries– have to be responsive. As mentioned in the previous point, in the case of Pontianak Municipality,the mayor, who has a resolute, committed and visionary approach, has succeeded in improving the bureaucratic system in Pontianak towards good governance. Technically Pontianak is still experiencing problems related to the increasing amount of waste generation. However, administratively, through bureaucratic reform, the Pontianak city government has shown excellent performance, especially in public services, where waste management is one of them. One of the concerns now is how Pontianak can find concrete solutions in handling waste technically.

5.2.2. Supporting and Constraining Factors

Based on the data that has been presented, there are eight supporting factors in waste management in Pontianak City, as follows:

1) Legal Basis From The Central Government

Clear regulations from the central government is a main basis for local authorities to arrange programs in the environmental agency. In this case, the government of Indonesia has showed the commitmen to develop waste management system integratedly by issuing several important regulations. Those regulations are as follows: Law No. 18 of 2008 concerning Waste Management, Government Regulation No. 81 of 2012 concerning Waste Management of Household Waste and Waste Similar to Household Waste and Regulation of the Minister of Environment No. 13 of 2012 concerning Guidelines of Reduce, Reuse, And Recycle Implementation Through Waste Bank. Gopal et

al. (2017) concluded that proper development of legal framework, satisfactory policies and proper regulation can contribute positive developments in the integrated waste management system.

2) Strong Awareness of Local Government

Strong leadership from the mayor become a driving factor for all bureaucratic reform systems in the framework of good governance. Strong leadership then encouraged a bureaucratic mindset change to be more disciplined, public service oriented, responsive and prioritizing better outcomes. A strong commitment from the mayor is one important key to create a clean and environmentally-friendly city. The government has been trying to find a solutive way to address waste problem. The first endeavor is launching a pilot program for recycling waste. For example, the organic waste generated on one traditional/public market was recycled to produce compost. Further, the government also facilitated a program encouraging community to participate in sorting, reusing and recycling waste. The government also strictly implements the provision of sanctions for those who dispose of waste are not on the right schedule, from 6 pm to 6 am. Also, there is a levy imposed to community in order to support support funding of waste management activities performed by the government. The levy scheme used is through a partnership with PDAM Tirta Khatulistiwa of Pontianak City. Those are therefore evident that the Pontianak municipal government is aware of the importance of managing waste properly.

According to The United Nations (1992), local authorities are considered the level of governance closest to the people, playing a crucial role in educating, mobilizing and responding to the public to encourage sustainable development.

This is endorsed by competencies local governments pose in numerous sectors such as urban planning, urban management, transportation, water, waste management, air quality management and so on. It can be concluded that strong awareness of local government can make a positive contribution in terms of waste management.

Moreover, there have been a restructuration on The Regional Organisation. Based on Government Regulation No. 18 of 2016 concerning Regional Device and Regional Regulation No. 7 of 2016 concerning Establishment and Composition of Regional Devices, Environment Agency *(Dinas Lingkungan Hidup)* is the result of the merger of two work units under the Pontianak Municipal Government, namely the Sanitation and Gardening Agency *(Dinas Kebersihan dan Pertamanan)* and the Environment Body (*Badan Lingkungan Hidup*). Then, in Mayor Regulation No. 61 of 2016, it can be said that Environment Agency has and play important roles in terms of waste management. This regulation stated clearly position, organizational structure, main tasks, functions, job descriptions and working procedures. Moreover, environment agency has also arranged SOP (Standard Operational Procedure) as a guideline in running jobs.

Furthermore, Owalobi, et al (2016) said that any effective institution has to have separated administrative procedures and planning, clarity of roles and coordination, jurisdictional boundaries and good governance structures in order to improve the accountability of the implementing agencies for quantifiable targets and operational plans. Also, they added that organizational structure, along with institutional capacity and policy framework, are important aspect will experience a lot of changes if we want to move from one stage of development in terms of performance of waste management.

3) The Competency of Officials

Human resources at Echelon 3 and 4 have a linier field of knowledge with their respective main task and function. The government that a policy to place officials according to their capabilities is very important. In the public service context related to technical matters, the principle of "the right man on the right place" is absolutely necessary. In this case the government that is committed to continuously provide excellent service to the community try to maintain and improve the capacity of its officials through education and training activities. This step is carried out in order to anticipate the era of globalization and the advancement of information technology where people are getting smarter and demanding maximum service.

4) Participation from Stakeholders

Support and awareness from the private sectors and community regarding the importance of environmental management are also important for government in carrying out waste management program and developing innovative ways. Promotion of cost-sharing activities and adopting appropriate mutually agreed strategies for integrated waste management, so that community groups and other stakeholders can support and strengthen the programme more successfully.

Stakeholders are the significant factors that can affect the performance of waste management system carried out by the government. Guerrero et al., (2013) Previous research have indicated that stakeholders interested in waste management are: national and local government sectors, municipal agencies, city corporations, non-governmental organizations, households, private cleaning companies, ministries of health, environment and economy and finance as well as recycling companies (Elsaid and Aghezzaf, 2015). Furthermore, one of them

is inclusivity that provide transparent spaces for stakeholders to contribute as users, providers and enablers (Wilson et al, 2012).

Especially for the community, Owalobi et al. (2016), according to Koroneos and Nanaki, 2012; Bahor et al., 2009; Chang et al., 2012; Shekdar, 2009), conluded that well-received contributions from the residents for source-separation of waste, incorporation of an efficient collection and transportation service, selection of appropriate treatment technologies to manage the different fraction of waste and inclusion of residual material disposal services are the essential elements of any integrated system to best serve the waste management needs of the community.

In addition to the supporting factors discussed above, there are also a number of inhibiting factors for efforts to prevent corruption, as discussed in the description below.

1) No Regional Regulations

Pontianak Municipality has been playing a role in promulgating regulations related to waste management. However, when compared with national regulations especially regarding 3R principles, it is clear that the current regulatory arrangement of waste management should be improved to address the waste problem. The existing regulatory system is considered outdated. The interviewed officials said that comprehensive regulations can form a clear basis for implementing integrated waste management.

Nevertheless, according to the present regulations in Pontianak Municipality, many issues are still waiting to be dealt with. Actually, community and private parties have attention about how the local government maintains integrated waste management continuously in the future. The responsibility allocation

between different government agencies involved is still obscure, which is a notable constraint to better waste management. Besides, whether the regulations support the development of waste reduction and recycling in Pontianak Municipality is not clear. Furthermore, the regulations only regulate waste issues from a general perspective, instead of developing the principal focus on addressing specific issues that need to be solved in practice. For instance, there are almost no regulations about how to regulate 3R-based behavior and the roles of stakeholders. As a consequence, this results in a lot of difficulties to reduce the waste generation as a main goal of waste management in Pontianak Municipality.

2) Limited Human Resources

Elsaid and Aghezzaf (2015) said human resources, along with improving infrastructure including roads and increasing the equipment positively impacts the performance of the waste management system. Owalobi et al. (2016) doing a research about a comparison of legal, social and financial resources in developed, developing and lesser developed countries claimed that one of obstacles faced by developing countries is lack of technically skilled human resources and expertise.

Based on the situation in the field, there is still a lack of human resources, both in terms of quantity and quality. This is one of the problems that must be resolved immediately. For information, when this research was conducted, the position of the secretary of agency is not occupied by a definitive official. This inevitably affects the performance of the secretariat's performance in supporting administrative matters. Also, the number of staffs in the supervision department remains limited in which they also have inadequate abilities. This is due to the lack of professional development program such as training, seminar, workshop, and technical tutorial.

3) Lack of Public Awareness

As the capital of West Kalimantan, Pontianak serves as the centre of activities for all sectors in the province. This, along with the increasing volume of waste as the growth of population, are the causes of increasing waste generation. To solve this problem, the government can not work alone, for that reason, the government needs support of public. In this case, community participation is one of the keys to the success of waste management in Pontianak City. Community participation, as the biggest waste contributor, in supporting the waste processing program, especially 3R, can have a significant effect on reducing waste generation. However, public awareness to participate in the problem is still lacking. Some people are still unfamiliar with waste sorting which is the first step in implementing the 3R principle. This is due to the lack of socialization for programs related to promotion of the role of community participation in environmental sustainability organised by the environmental agency to the community.

To deal with that problem, the government need to develop innovative ways to increase the public awareness. According to SWEEPNET (2010), awareness campaigns can contribute to influencing the social behavior of citizens who play an important role in shaping the waste management system of any city. It is often mentioned that when citizens understand the benefits and impacts of recycling they tend to be more responsive to abiding by environmentally friendly waste disposal (Elsaid and Aghezzaf, 2015). Furthermore, Chung and Poon (2001) proposed that the perception of public about waste management has to be changed and only their involvement can bring success to the process (Gopal, et al, 2018).

4) The lack of Facilities and Innovative Technology

According to Owalobi et al. (2016), appropriate and application of cleaner and relatively costeffective technologies is an important component of sustainable development. The success of a waste management system depends on the efficiency of available technology, equipment and infrastructure. Thus, the combinationand integration of technologies with strong government enforcement of appropriate policies is needed for a successful system. Furthermore, Shekdar (2009) claimed that efficient selection of cost effective and innovative technologies should be made in such a way that it is precise to deal with the prevailing conditions and waste characteristics (Owalobi et al, 2016).

As it is known that the development of waste management technology requires no small amount of money. Generally, developing countries face this problem. In this case, Pontianak Municipality as a emerging city is also experiencing the same problem. At the same time, from regional revenue and expenditure budget, the government also has to prioritize other basic services such as education and health. Waste generation which continues to increase makes the capacity of the landfill decrease. This requires the government to immediately find appropriate innovations.

Pontianak Municipality is stiil using old approaches, open dumping and controlled landfll, that make the landfill capacity decrease from day to day. Open dumping is the simplest disposal system in which waste is simply dumped in a landfill without further treatment. The open dumping disposal system should no longer be implemented because many cause problems ranging from groundwater contamination by leachate, odor, spillage to smoke. However, there are still many developing countries using open dumping disposal systems because of their

ease and low cost. Controlled landfill is a more developed disposal system than open dumping. In this method, the waste that comes every day is compacted with heavy equipments into a cell. Then, the solidified waste is covered with soil every five times or at least once a week. This is done to reduce odors, the proliferation of flies, and the release of methane gas. In addition, drainage channels are also built to control the flow of rainwater, leachate collection channels and processing plants, operational control posts, and methane gas control facilities.

5.2.3. Analysis of Model and Policy Reform

The empirical model presented in the previous chapter still does not integrate the waste management system in the region as a whole into an integrated system. Until this research has been done, Pontianak Municipality does not yet have Regional Regulations or Action Plans relating to Waste Management in an integrated manner. Whereas in Law Number 18 of 2008 concerning waste management, it is stated that waste has become a serious problem so its management needs to be carried out comprehensively and integrated from upstream to downstream to provide economic benefits, be healthy for the community, and safe for the environment, and change behavior the community.

In order to carry out integrated and comprehensive waste management, fulfillment of the rights and obligations of the community, as well as the duties and authorities of the government to carry out public services, a legal umbrella is required in the form of regional regulations. Based on the thoughts described above, the formation of these regional regulations is needed for:

a. legal certainty for the people to get good and environmentally friendly waste management services;

b. orderliness in the management of waste management;

c. clarity of duties, authorities and responsibilities of the Government waste management; and

d. increasing the participation of stakeholders, the private sector and the community in supporting government programs relating to waste management.

As a result of the absence of regional regulations that explicitly explain waste management, the efforts to deal with waste problems that tend to be not synergistic and not well coordinated between one program and another, as well as between the government and stakeholders. Therefore, in preparing the recommended model, researchers include local regulations as something that must be owned by the region. In addition, commitment support in the formulation and implementation of policies does not only come from regional leadership groups, but also comes from regional legislative, community organizations and private sector. These groups must also be actively involved in monitoring the implementation of the waste management that has been prepared.

Furthermore, it can be said that handling waste requires a better policy base. Based on several definitions of policy reform proposed by Cerna (2013), there are at least three types of policy reform as the basis for the need for policy reform in this research.

(1) Policy learning

The current waste management has not been able to have a significant impact on environmental sustainability in the future, especially with regard to reducing waste generation. This is because the approach used still tends to be the old way. The application of 3R through the development of TPST 3R and

facilitation of waste banks has not been able to provide a significant impact on reducing waste generation. The current policy has not been able to change people's lifestyles to increase environmental awareness, for example in terms of sorting waste as the first step in implementing 3R. This phenomenon can be used as an evaluation material or a lesson for the government to develop better policies.

This is in line with policy learning theory which states that policy-makers learned from previous experiences and included new information obtained when considering reforms. Policy learning refers to relatively enduring alterations of thought or behavioural intentions which result from experience and which are concerned with the attainment (or revision) of policy objectives (Heclo 1974). Learning is considered a process by which networks learn from past experiences, and thus is mostly about techniques and processes in order to improve policy (Bennett and Howlett 1992).

(2) Policy diffusion

The advancement of information technology provides an opportunity for a government to learn from phenomena in various countries, or even cities around the world. In this case it is important for Indonesia as a developing country to consider foreign policy innovations to be implemented domestically. In line with this, the local government which now has broad authority through regional autonomy, also needs to see the phenomenon that develops in other regions. In terms of waste management, there is a trend that has been an interesting topic of discussion in recent years, namely integrated waste management. As stated by Memon that IWM is a way to maximize the 3R program. The application of 3R through IWM can be regaded as a policy innovation that has been tested in many

places. Considering the current policy results in Pontianak Municipality that has not been able to provide a significant impact on reducing waste generation, it is important to make a policy reform by considering policies from other places. This phenomenon is related to policy diffusion theory where one mechanism is learning from earlier adopters.

(3) Politics of change and reform

In the case of Pontianak Municipality, the mayor who is currently in office, He is known for his firm and visionary character. Since he led, the Pontianak city government has received many awards from the provincial, national and even international institutions. Waste which is still a problem certainly requires proper handling because it will have an impact on environmental sustainability in the future. For this reason, a revision of the current policy is needed. These two things, firm political leaders and policy improvements, have been discussed by the scholars. It is said that there is one of policy reform models that is very helpful because it describes a political condition in which reform can occur. The model is known as political will model. This means that decisions by political leaders are necessary and sufficient for a major policy change. This model is more likely under political circumstances such as a strong mandate, strong state, narrow coalition and strong leadership (Reich 1995). Moreover, referring to Memon (2010), the implementation of IWM is quite easy because local capacity development, which is supported by national initiatives, can lead to all actions carried out locally, as mentioned above, including waste characterization and quantification, assessment of current waste management systems, targets for IWM, identification of issues of concern to stakeholders, and development of IWM plans and implementation strategies for IWM.

Moreover, in proposing policy reform towards the implementation of solid waste management, Pontianak municipal government can employ a tool kit suggested by Brinkerhoff and Crosby (2002) in designing, managing and influencing a policy reform. It consists of consisting of seven techniques namely stakeholder analysis, policy characteristics analysis, political and institutional mappung, workshops for managing policy reform, advocacy for policy reform, conflict resolution, and policy monitoring.

Furthermore, in terms of development of IWM, several aspects that need to be improved by the government are as follows.

1. Institutional and organizational aspects

Forming a waste management unit under the Environmental Agency as an effort to improve solid waste services to the community is necessary. With the formation of the unit, there will be a separation of functions between the regulator and the operator. It is expected that there will be an increase in service and professionalism in the management of solid waste and budget efficiency, so that it can provide better service and satisfaction to the community.

2. Legal and Regulatory Aspects

Regional regulations need to be prepared regarding waste management. This is important as a clear basis for the government and related parties on how to manage waste. The regulations made at least contain the following matters: the responsibilities of stakeholders, the technology that will be used in order to support the implementation of 3R, levies relating to local revenue to support technology development.

3. Operational Technical Aspects

a. Reducing waste starting from the source with the application of 3R, starting from government agencies, private sector and households.

b. Preparing appropriate supporting facilities and infrastructure for 3R-based waste management which includes storage containers, transportation equipment, and waste processing (compost or gas producer).

c. Increasing community participation through the socialization of the application of 3Rs and waste banks.

4. Financial aspects

a. Investment costs, including the cost of procuring infrastructure facilities in accordance with the development of technical aspects.

b. Calculation of levies, including costs that will be charged to the taxpayer.

CHAPTER VI

CONCLUSION AND RECOMMENDATION

6.1. Conclusion

Based on the results and discussion of research data in the previous chapter, some conclusions can be stated as follows:

1) Implementation of waste management policies in the City of Pontianak can be implemented effectively, especially with regard to the performance of employees in terms of transporting waste to the landfill. However, the approach used tends to still not be environmentally friendly. Efforts to reduce waste through the application of 3R through TPST 3R and waste banks have not given a significant impact on reducing waste generation that is disposed of in landfill. Moreover, implementation of waste management policies can be seen from Grindle's model based on *content of policy* : interests affected, types of benefits, the degree of change desired, site of decision making, program implementers, and resources committed; and *context of implementation*: power, interests, and strategies of actors involved; institution and regime characteristics; and compliance-responsiveness. The results of the discussion show that a policy reform is immediately needed for handling waste, given that the existing policies are outdated and not in accordance with the current situation. There are some crucial aspects, according to Grindle's model, that need to cope with.

2) The supporting factors that need to be strengthened in the framework of waste management include: legal basis from the central government, strong awareness of local government (including restructuration on the regional

organisation), the competency of officials, and participation from stakeholders. At the same time, there are several inhibiting factors that need to be minimized or rectified, namely: no regional regulations, limited human resources, lack of public awareness, and limited facilities and innovative technology.

3) The ideal model for implementing the recommended waste management policy is a model which accentuates integrated waste management system. It is a waste management approach that starts from reducing waste at the source through the application of the 3R principle. In addition, there is also clarity on the role of the government and stakeholders, including the private sector and the community in handling waste problems, given the limited ability of the government. In doing so, there are at least four aspects need to be considered: Institutional and organizational aspects; Legal and Regulatory Aspects; Operational Technical Aspects; and Financial aspects.

6.2. Recommendation

To improve waste management and address waste problem in Pontianak Municipality, some suggestions that can be recommended based on the findings of this study are as follows:

1) It is necessary to immediately fix some crucial aspects in Grindle model by carrying out policy reform. This is to answer the problem as mentioned in the conclusion. The government can adopt the approaches enunciated in national regulations, such as Law Number 18 of 2008 concerning Waste Management and Government Regulation Number 81 of 2012 concerning Waste Management of Household Waste and Waste Similar to Household Waste and as a guide for the implementation of integrated waste management that prioritizes 3R principles.

2) Supporting and constraining factors need to be necessarily considered in the implementation of waste management policy. Furthermore, commitment support in the formulation and implementation of regional regulations concerning integrated waste management has to be raised from all stakeholders, namely the government, comprising the mayor, related work units, and regional legislative bodies; community and private parties. In addition, promotive efforts in the application of the 3R principles in the region must be a synergic effort between parties, not only to be an executive domain or a specific agency, and therefore, these efforts must be a continuous effort of all stakeholders.

3) The results of this study presented that the government must consider at least four following aspects: Institutional and organizational aspects; Legal and Regulatory Aspects; Operational Technical Aspects; and Financial aspects. This is in line with Memon's view (2010) which stated that The IWM system clearly improves resource-use efficiency, as all waste sources are managed under an integrated waste management system. To pursue the optimazation of 3R goals arranged within IWM, according to Memon (2010), the recommended measures are as follows:

(a) Data collection and analysis to develop baseline data on the characterization and quantification of waste from various sources and future projections.

(b) Information collection and analysis to develop baseline data on the current waste management system and gaps therein.

(c) Setting of targets by local government in consensus with local stakeholders for IWM.

(d) Identification of issues of concern of local stakeholders covering financial, technical, environmental, and social aspects of IWM.

(e) Development of an IWM plan.

(f) Development of an implementation strategy for IWM.

(g) Development of a monitoring and feedback system for IWM.

4) Based on the recommendation of the previous point, the results of this study also recommend the importance of a bottom-up and top-down approach in the process of preparing a waste management policy, with the same strong pressure on both approaches. Thus, the role of top-down monitoring must be as strong as the role of grass roots monitoring (bottom up), not only in the implementation of standard operating procedures that have been determined in the field of waste services, but also in the field of supervision of service performance. This is in order to realize the goal of 3R-based integrated waste management, which is to make waste into valuable goods, reduce the generation of waste transported to the landfill, and primarily guarantees good environmental quality for the future.

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