

# Waste Management Model in Merauke

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**Abstract.** The purpose of this study is to provide an overview of the role of local government, industry, and society in Merauke waste management. The approach of this research is Qualitative. Data obtained by conducting in-depth interviews to the key informants and the supporting informants (snow ball sampling technique), observation and so that the data obtained meet the saturation point. The analysis of data are include (coding, data grouping, data validation, data presentation, conclusion). The results of research shows the following: the first is, the role of local government in waste management in Merauke is not optimal yet. The second is the lack of involvement and participation of other officials, industries, communities that should be responsible for waste management. The third is the handling of waste that has been done is by transported and accommodated the garbage in a temporary garbage disposal to be sorted and then transported to the landfills. The concept of 3R (Reduce, Reuse and Recycle) which supported by the participation of government, industry, society is the right concept in solving the garbage problem in Merauke.

**Keywords:** Waste Management Model; Local Government; Industry, Society; and 3R Concept.

## 1 Introduction

All human activities on the earth cause carbon emissions that have an impact on climate change. Waste management that is unprocessed well is also one of the causes of carbon emissions. World and the Indonesian government have a great commitment in mitigating and preventing climate change, namely by carrying out low carbon development. In other words, the development carried out in Indonesia will refer to development that takes into account environmental sustainability and is also nice to the environment.

The garbage problem day by day is still become an important topic and interesting to talk about, because it is one of the examples of the carbon emissions that have an impact on climate change. This becomes more important when Indonesia in 2020 will declare as a waste-free country. This is not too excessive considering that Indonesia is the second largest contributor of plastic waste in the world, so the handling of waste problems becomes very important to find a solution. In fact, the problem of waste is not only a national agenda but also has become an international agenda.

The Paris conference at the end of 2015 discusses about the handling of the world's waste problem, where

Indonesia is also committed to reducing carbon emissions through the 3R (reduce, reuse, and recycle)

concept even the concept evolves into the 4R concept (reduce, reuse, recycle, and replace). The understanding of 3R concept is reducing waste dump (reduce), reuse of waste (reuse), recycling waste (recycle). When using the 4R Concept, the fourth R is a replace containing the understanding that as much as possible replacing disposable products with products that can be used repeatedly that are environmentally friendly by avoiding the use of plastics and styrofoam products [1].

One of the Indonesian government's policy steps in handling climate change is to commit to reducing greenhouse gas emissions by 2020 by involving several sectors, including: Forestry and Peat lands, Agriculture, Energy and Transportation, Industry and Waste Management. For waste management, the government plans the construction of wastewater facilities and infrastructure, construction of final processing sites (TPA) and integrated 3R waste management (Reduce, Reuse, Recycle).

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Merauke as a town that is growing rapidly cannot be separated from the significant increase of population and urbanization in Indonesia. The development and growth of Merauke town must be followed with the growth and development of society, the number of industrial developments that will surely contribute to the increase in volume, type, and characteristic of waste as a result of the savings. Together with the development and growth of Merauke town as a district in the eastern border of Indonesia, Merauke also cannot be excluded from the problem of garbage produced by industry and household. Therefore, it is not too excessive if the Local Government of Merauke, including the society who participated in launching Year 2020 becomes a waste-free year.

The problem of garbage in Merauke becomes interesting and important to be studied, several reasons are below: the first is there has been a lot of research related to waste management, but there is a few researches related to the waste management in Merauke. The second is that population growth and urban development will have an impact to the volume and type of waste result of savings. Therefore, if the problem of garbage is not immediately noticed and found the solution will lead to the negative impact in Merauke that is not handled properly. The third is that there is no good and comprehensive understanding of the society, industry and local governments on the economic value of waste.

Waste is what we do not want or fail to use [2]. The definition of household waste according to Government Regulation No. 81 Year 2012 is the garbage that comes from daily activities in households that do not include feces and specific waste [3]. Furthermore, waste can be interpreted as something unused, unwanted, and discarded or something that is not used, not used, disliked, or something that comes from human activities and does not happen by itself [4].

Waste is divided into: 1. Organic waste / Wet trash, this type of garbage can be degraded (decay / destroy) naturally, is the garbage that comes from living things that is human, plant and animal for example: kitchen waste, food and vegetables, leaves, livestock and other manure. 2. Inorganic waste / Dry waste, this type of waste cannot be degraded naturally. For example: metal, iron, cans, plastic, rubber, bottles and many other. 3. Dangerous waste, this type of garbage is a waste that is harmful to human being and the environment. For example: batteries, medical equipment waste, chemical toxic waste, nuclear waste and others. By this type of waste requires special handling.

The classification of waste source by classification of source category is divided into: 1. Source of garbage which come from residential area; the biggest waste is garbage from settlement area, that is 75% and 25% from non-settlement area. 2. Source of garbage which come from commercial area; trade centers, hotels, malls 3. Source of waste which come from public facilities; markets, hospitals, offices 4. Sources of garbage which come from social facilities; houses of worship, orphanages, nursing homes. 5. Source of waste which come from other sources; such as construction waste

disposal, agricultural areas, and animal slaughter and even waste disposal [5].

Constitution Number 18 Year 2008 states that there is a need for fundamental changes in waste management that has been carried out. This is clarified in Article 19 where waste management is divided into two main activities, namely waste reduction and waste management. Article 20 also describes three main activities in the implementation of waste reduction activities, namely limitation of waste collection, recycling of garbage, and waste utilization. These three activities are the embodiment of the principle of environmentally waste management called 3R (reduce, reuse, recycle). Article 22 describes five main activities in the implementation of waste handling activities which include sorting, collection, transportation, processing, and final processing of waste [6].

The European Council Directive on Waste defines waste management as collection, transport, recovery and disposal of waste, including the supervision of such operations and after-care of disposal sites. Government regulations number 81 year 2012 state that waste management is overall sistematically activities and sustainable that include reduction and handling garbage [7].

The practical values of Waste Management Theory namely: 1. Providing a guide for choosing waste management options. 2. Providing a foundation for how and when to select and integrate waste management options. 3. Predicting the outcomes of the use of waste management actions. 4. Aiding legislation in how to prescribe activity for/upon waste [8].

All these waste management activities work well when it's accompanied by the participation of the various stake holders. There are three important elements in participation are:

- a. That participation is in fact a mental and emotional involvement, more than merely or solely a genuine engagement
- b. Willingness to contribute to the effort to achieve group goals. This means that there is a sense of fun, volunteerism to help the group
- c. The element of responsibility. The element is a prominent feature of the sense of belonging. Being recognized as a member means to have a feeling of "sense of belongingness".

According to these things, so the participation is not only involved phisically in working and jobs but also self-involvement, then the responsibility will come along, and will result in a large and full responsibility for the group [9].

## 2 Methodology

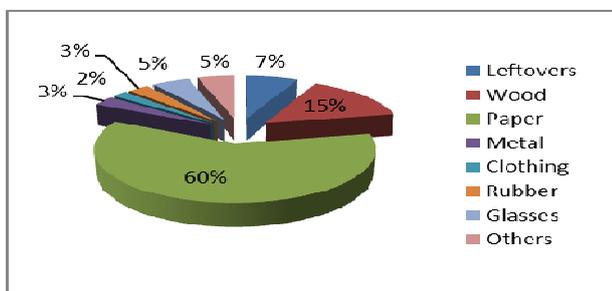
This research uses qualitative approach. The data were obtained by conducting in-depth interviews from key informants and developed with supporting informants (snow ball sampling technique) until data obtained through saturation point [10]. Data analysis (coding, data

grouping, data validation, data presentation conclusion) [11].

### 3 Results and Discussion

Merauke is one of the small cities located in Papua Province with an area is 46,791.63 Km<sup>2</sup> with a population is 216,585 people (Merauke District in Figures, 2017)[12]. By looking at the number of people so much, of course the amount of garbage in Merauke also increased. The data obtained from the Environmental Office of Merauke Regency that the amount of garbage dumped in Final Disposal Site (TPA) is 0.89 ton / day. Meanwhile, the amount of waste that is not managed as much as 3.13 tons/day[13]. The irony is that the garbage produced and unmanaged has not been followed up with a good waste management program by the Merauke Regency Government.

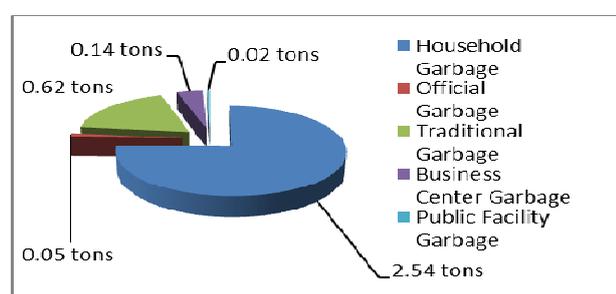
Referring to the results of this study, waste management in Merauke refers to the Law Constitution of Republic Indonesia Number 18 Year 2008 and Government Regulation of Republic Indonesia Number 81 Year 2012 on Waste Management. Garbage in Merauke generally comes from household waste (coming from the household itself) and household garbage (garbage coming from office, traditional, commercial center, public facility, and other garbage). Percentage of daily garbage pile based on the source of waste as mentioned above, can be seen in the Figure 1:



**Fig. 1.** Daily Waste Dumps Merauke

Diagram on the figure 1 above is based from the result of interview and some data from the government. From the diagram it can be seen that the amount of waste piles daily based on waste sources in Merauke that the largest waste comes from household waste.

The composition of waste as a result in saving in Merauke based on the material can be seen in the Figure 2:



**Fig. 2.** The Composition Of Garbage In Merauke According To The Material, 2017

Based on the diagram above it can be seen that the contributor of waste composition based on the material is paper waste with percentage is 60 percent.

The results show that the concept of waste management in Merauke has not led yet to the 3R model or 4R model. Where garbage is come from households and similar type of household waste is directly transported and disposed to the Temporary Disposal Site (TPS) is then discharged to the Final Disposal Site (TPA).

This is supported by data showing that the amount of waste treated as compost is only 0.03 tons per day. The management of waste generated in Merauke in the form of recycling to raw materials, recycling in the form of creative and innovative products, waste management into fuel, waste management into biogas or other waste processed form into productive goods have not been identified in Merauke. It is also reinforced by the statement of the Head of Waste Processing Division at the Environmental Office of Merauke Regency that waste production in Merauke has not been processed in other forms, either by the Environmental Office of Merauke Regency, the community, and other parties.

In addition, the Government of Merauke Regency in this case the Waste Processing Division at the Environmental Office of Merauke Regency has conducted a community-based waste management program that is in the form of Waste Bank conducted in Kelurahan Bambu Pemali and Kelurahan Karang Indah, but the Waste Bank program has not run optimally due to the lack of human resources at the Environmental Office of Merauke Regency and also the absence of involvement of other parties, such as: entrepreneur, industry, community and related institution that should play an active role in the running of Waste Bank Program. This is due to the lack of industry and community knowledge about the economic value of waste.

### 4 Conclusion

Based on the results of research and discussion as mentioned above, it can be drawn some conclusions:

1. Waste management in Merauke is not optimal yet, so we need a new waste management model.
2. Community-based 3R waste management model can be one of the new models for waste management in Merauke.
3. The Government of Merauke Regency needs to evaluate and improve the concept of Waste Bank ever done.
4. Require participation of local government, industry, and society in implementing the 3R Waste Management Model.
5. The concept of managing 3R waste (Reuse, reduce, recycle) by involving the community and stakeholders offered by researchers for the government of Merauke regency is one of the things that can be done in order to succeed in low carbon development in Indonesia. This concept will not only

improve the quality of the environment and the quality of life of the community, but will also change people's behavior related to waste reduction, involvement in waste management and policies that will be taken by agencies related to waste management in the city of Merauke. If the concept offered by researchers adopted by the government of Merauke regency means that it will support the development of low carbon communities in Indonesia

## 5 Suggestion

1. The Government of Merauke Regency has to start implementing the 3R Waste Management Model.
2. Socialization of the 3R's Waste Management Model is immediately implemented on all parties concerned to increase awareness and knowledge.
3. The focus of waste management handlers should be emphasized on human resources, so that government, industry and community participation is essential in the application of the 3R Waste Management Model.

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