Challenge of Waste Management in Medan City

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Abstract: Waste management is a challenge for many cities in Indonesia, especially Medan. Especially because of the increase in waste, the burden on the city budget as a result of the high costs associated with its management, the lack of understanding of diversity, the factors that influence the various stages of waste management and solutions enable the entire waste handling system in Medan to be immediately implemented in the form of Policy. This research is a qualitative research with a critical paradigm. The purpose of this study is to determine the behavior of stakeholders who have a role in the waste management process and analyze the factors that influence the challenges of waste management in Medan. Data is collected from structured interviews with relevant professionals, field observations, books and scientific journals. The findings of this study that challenge the management of waste management in Medan City are collaboration between stakeholders in handling through institutional collaboration in the concept of Mebidangro institutional.

1 BACKGROUND

The main challenge in the waste management process so far must be recognized is the role of local governments. Where the janitor management pattern takes garbage from the population and brings waste to the TPS to be transported to the landfill by the sanitation department it is still a pattern of waste management activities in many regions in Indonesia. Understanding the authority of local governments in waste management is very important to understand the opportunities for changes that can be done by local governments to improve the legal loopholes in plastic and plastic waste management in regulations at the national level (Qodriyatun, 2015).

Local governments can make regulations and/or policies to manage plastic waste in the area without having to wait for regulations and / or policies at the national level. The scope of the strategy above shows that local governments have the authority to regulate the matter of producer obligations in reducing waste. Thus, the efforts of the regional government to achieve the target of reducing waste are not limited to the activity of reusing and recycling waste at the source of waste generation (Sumarni & Amiruddin, 2014). Waste problem is a problem in various regions in Indonesia including Medan City. This problem arises by increasing population, technological advances and transportation in urban areas which is directly proportional to the increasing amount of waste produced (Ferronato et al., 2017). This is a consequence of the city of Medan as the most efficient and effective location for productive activities related to industry, transportation and other activities. The problem has a bad effect because of the negative impacts caused, such as; environmental damage, pollution of clean water sources, flooding to various diseases that are born.

According to data from Medan City Sanitation Office in 2018, the amount of waste in Medan in the last 3 (three) years has continued to increase, namely in 2016 the amount of waste is 1,595 tons per day, in 2017 is 1,675 tons per day and in 2018 is 2,000 tons per day (Putra, 2018). Furthermore, the increasing amount of waste is not accompanied by the amount of garbage transportation in the city of Medan which amounts to 216 transport trucks (BPS, 2018) Various policies in overcoming the complexity of the waste problem have been implemented in various regions in various parts of the world and regions in Indonesia. One of them is collaboration between regions in waste management, such as; waste management cooperation conducted by the state of *Maryland* and the state of *Pennsylvania* in 2014 in order to achieve the *"Zero Waste Maryland 2040"*. This collaboration is based on the potential of solid waste in the state of *Maryland to* reach 12-13 million tons of waste per

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year which causes flooding in the country (Ryu, 2014).

Then, South Korea in 2016 made a module in the collaboration policy on waste management through *"Zero Waste in Korea 2018"* through the collaboration of ideas to maximize reuse through the recycling process by maximizing technology with sustainable ideas. Collaboration in South Korea compares sustainable waste management in European countries, Japan and the United States through technology transfer (Lee, 2018). Then, waste management in DKI Jakarta through collaboration with Bekasi City related to Integrated Waste Management Sites (TPSP) in Bataran Gebang (Aprillia, 2016).

Related to rubbish in Medan City is a comprehensive problem that can be solved through the collaboration of Medan City Government and the Deli Serdang Regency Government in the Mebidangro scheme which until now has not been effective and efficient when implemented. Previously, there were 2 (two) locations that were used as landfills (TPA) in the city of Medan, namely the TPA Falls located in North Medan and the TPA Namo Bintang located in South Medan. However, until now the existing landfill site is still not functioning optimally. This is due to the limited area of landfills which also affect the technical operational management and waste disposal services.

The impact of uncontrolled waste management in Medan has begun to be felt by the community, such as; the narrowing of the River Basin (DAS), pollution of water sources and flooding in the city of Medan. This means that the collaboration of waste management between Medan City Government and Deli Serdang Regency Government in the Mebidangro secretariat is something that is urgent to be implemented. Because territorially, Medan City borders and divides Deli Serdang Regency directly. Moreover, large rivers in the city of Medan are experiencing damage and a source of problems for the community due to the accumulation of waste, such as; Denai River, Babura River and Deli River when viewed upstream and downstream watershed are in Deli Serdang Regency.

The Ministry of Environment and Forestry of the Republic of Indonesia released the list of dirtiest cities in Indonesia in early 2019 and Medan City occupied a position as one of the dirtiest metropolitan cities, besides Bandar Lampung and Manado, from 369 regencies/cities throughout Indonesia (Sur, 2019). This assessment is based on physical indicators and the condition of the final processing site (TPA) where Medan received poor grades. Therefore the research entitled; *Management challenges for waste management in Medan are* important to do.

2 METHODS

This research method is qualitative with a positivist paradigm with direct interviews to informants, observations, interviews, journals and books. The determination of informants as sources of data in this study was determined on research subjects who had the knowledge and experience needed by researchers in accordance with the research problem, were able to express their knowledge and experience and had time to be interviewed for research purposes. Data was collected starting from the initial observation, pre-research to direct interviews to informants in Medan City Sanitation Office, NGOs to academics.

3 DISCUSSION

3.1 Garbage Issues in Medan City

The Ministry of Environment and Forestry of the Republic of Indonesia released the list of dirtiest cities in Indonesia in early 2019. In that list Medan City occupies a position as one of the dirtiest metropolitan cities, besides Bandar Lampung and Manado, from 369 regencies/cities throughout Indonesia. The assessment is based on physical indicators and the condition of the final processing site (TPA) where Medan received poor grades. According to data from Medan City Sanitation and Landscaping Office (2019), the volume of waste in 2016 averaged 1595 tons per day, continued in 2017 to increase to 1,675 tons per day, and in 2018 it reached 2000 tons per day. At the same time, waste management in Medan still uses an open dumping system as a sign of low commitment and public participation in handling waste. Jaya Arjuna, an environmental observer, assesses the bad title that Medan bears as a worrisome condition.

The study of waste management so far has not only tended to focus on community behavior and participation, but also concerns the issue of waste management by related institutions and the community (through the Waste Bank), as seen from Hilburn's (2015) study of household waste management in rural areas in Coxcatlan , Puebla, Mexico. Likewise, studies from Lydie Yiougo (2013) in Ramos, Vicentini, & Ortega (2012)on waste management in Caracas, Venezuela. These studies

have looked at various forms of problems encountered in waste management, but do not pay attention to the solutive aspects in solving the garbage problem. In addition to various problems and weaknesses, there are also possibilities and opportunities owned by related institutions in improving waste management. This study specifically wants to look at the issue of collaboration between neighbors in dealing with waste management issues by taking cases in Medan City and Deli Serdang Regency.

This research is based on the assumption that in urban waste management, especially in Indonesia, collaboration between regions is needed if there is a condition where one area with an excessive volume of waste *(overloaded)* does not have sufficient land to manage its waste. Barriers in the form of differences in perceptions and attitudes of the two regional governments must be removed by creating a synergistic and conducive collaboration format in handling the waste problem (Lee, 2017).

Exploration of how the collaboration opportunities owned by the two related institutions become very important in the context of efforts to improve waste management in the community, especially in Indonesia as a developing country that must prepare itself to welcome the Industrial 4.0 era. Furthermore, this paper is intended to explain how the collaboration between Medan City Government and Deli Serdang District Government takes place in handling waste as mandated by Presidential Regulation (Perpres) No. 62 of 2011 concerning Spatial Planning (RTR) of the Mebidangro Urban Area. Some important questions explored in this study include (a) how the collaboration between the Medan City government and Deli Serdang District took place in waste management; (b) how the different perspectives and values of the two actors become obstacles and advocates for collaboration; and (c) how the problem is solved and how a synergistic and conducive collaboration format for waste management can be formulated. These three questions direct this study to enable the discovery of an ideal collaboration format in handling waste between Medan City Government and Deli Serdang District Government. Furthermore, this paper, therefore, addresses these three issues as the subject of discussion which becomes the very important parts.

3.2 Waste Management in Medan City So Far

Based on data from Medan City Office 2018, the composition of waste in Medan City is a mixture of physical components of waste such as food scraps, paper, plastic, metal, glass, fabric, rubber and others. From the data it was noted that the most dominant component of waste was food waste which was 38.63% and the lowest was fabric / textile by 0.83%.

Furthermore, other data explained that the largest volume of waste was paper and plastic, each of which amounted to 38.90% and 38.09%, then the lowest was 0.69% fabric. Furthermore, based on weight indicators such as plastic and paper composition is only 26.31% and 17.81% this is due to differences in the density of each component of waste where plastic waste has the lowest density.

Food/organic waste, paper and plastic waste appear to be more dominant, this is due to the fact that paper waste does not yet have economic value, so that paper waste in the form of newspapers, boxes is discarded directly by the source of waste and is not picked up again by scavengers which are usually useful for them economically. Then the majority of people in the city of Medan in meeting the basic needs of shopping every day and most do not carry shopping places this increases the potential for plastic waste generation.

The composition of waste in Medan City continues to increase from year to year in line with changes in the type of waste. This situation is related to an increase in the life of Medan City people who are increasingly consumptive. Efforts to reduce waste use two approaches that can be done, namely reducing waste production from each source of waste and reducing the production of waste that has been generated.

The fact is that all landfills (TPS) not owned by the Medan City government indicate an unstable management where they can stop operating at any time. Given the importance of the TPS function as a place to move collected waste back into container trucks, the ideal land must be owned by the city and made the TPS function more stable.

According to the Head of Medan City Sanitation and Landscaping Service M Husni who said;

> "The disproportionate number of polling stations between districts and the data that an average polling station serves about 10,000 houses while some districts do not have any polling stations at all shows that more polling stations are needed with strategic allocation taking into account the efficiency of garbage collection. However, the City

> Government is having difficulty using the funds due to protests from surrounding residents."

The efforts of Medan City Government so far in an effort to reduce waste production from its source apply the 3R principle, namely *Reduce* , which is an effort made by reducing or minimizing the goods or materials used. *Re-use* Efforts are made by reusing or choosing items or materials that can be reused and *recycle,* recycle waste produced (Ferronato, 2017).

3.3 Challenges of Waste Management in Medan City

Empirically, it mainly addresses waste management issues as collection, transportation, processing, recycling or disposal and supervision of waste materials which subsequently forms a *waste management system* consisting of four main components namely material production, collection and transportation, processing and reprocessing and final placement ie to be recycled or ended up at the final disposal site of Medan City and Deli Serdang Regency.

Until now, garbage in Medan City is still a problem because waste management is done alone. According to the Head of Medan City Sanitation and Landscaping Service M Husni who said:

> "The role of inter-regional cooperation management in waste management is very important in Medan today. As garbage has its own form of management in traditional society, to deal with waste from a denser population modern society that has a nation state system requires a slightly different approach from traditional to modern waste management which is carried out together."

Law No 18/2008 regarding waste management regulates the responsibilities of the central, provincial and city governments in Indonesia. The responsibility of the regional government at the city/regency level is to; a) establish policies and strategies for waste management based on national and provincial policies. b) carry out waste management. c) provide guidelines and supervision to other parties regarding waste management. d) Build a Temporary Waste Disposal Site (TPS), Integrated Waste Management Site (TPST) and Final Processing Site (TPA), and (e) conduct monitoring and evaluation of TPA every 6 months every 20 months.

According to the Chairman of the Forum for the Environment Dana Tarigan said:

> "The approach used to deal with waste at a higher level requires a more comprehensive conceptualization that requires the role of cooperation in managing waste with the concept of good cooperation. The role of local government in the domain of waste management appears to illustrate the role of the state, namely in terms of planning through certain considerations such as improving the quality of life of the people who used to be solid waste collection workers, making policy, to implementing waste management through work contracts with technology intensive companies. developing a comprehensive environmentally friendly environment."

Policy of inter-governmental cooperation in Medan City is one of the important keys in seeing the role of waste management in general. Whereas the actions taken by the regional government which sometimes run individually without a concept or do not implement regulations in accordance with inter-regional cooperation. Impact on the situation, there is a lack of attention to the community affected by planning. (Ismail, 2000).

Government policies cannot be maximized if implemented alone without the support of various parties, especially stakeholders. In fact, collaboration and partnerships need to be done to get the maximum waste management results that lead to the success of an area in overcoming long problems about waste. Partnership or partnership in principle is built from cooperation carried out by certain parties where the partnership has an association with participation between local governments.

4 CONCLUSIONS

From the field findings, in an effort to overcome many waste problems in the city of Medan that have management challenges. It is necessary to form the Mebidangro Inter-Regional Cooperation Agency (BKAD) whose authority is in North Sumatra Province. Law Number 26 of 2007 concerning Spatial Planning related to strategic areas is an important part of national development. The reason is that there are activities that have a great influence on spatial planning in the surrounding area, other activities in the same field and activities in other fields, and/or improving the welfare of the community.

This specifically must lead to goals that are more efficient and effective in future waste management. Of course in the case of waste management, regulations related to waste management through cooperation agreements must be carried out in the agreed development fields that contain what fields are cooperated, who are the actors of cooperation, rights and obligations of each collaborating party, sanctions mechanism for violating the agreement, the allocation of funding sources and the deadline for the agreement to take place related to waste in Medan City.

Therefore, waste management in Medan will undoubtedly take place better in the future.

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