

## EVALUATION POLICY IMPACTS OF HOUSEHOLD WASTE MANAGEMENT IN PALEMBANG CITY

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*The question of household waste is a complex problem because it adversely affects society with its effects. In addition, lack of public understanding of the consequences that can be inflicted by household waste makes waste management increasingly difficult to be solved. This research aims to observe the policy evaluation impact of household waste management in Palembang City. The research method used by researchers is qualitative research. Data collection techniques through in-depth interviews, observations, and documentation, while supplemented with audio-visual material that allows it to be taken in that field. The finding shows that the domestic of waste management policy in Palembang City has not run effectively. While, in the policy implementation of household waste management, it is necessary for community participation in handling the garbage that is found in its own home. The evaluation of the impact consisting of individual impact and society will be the high volume of household waste in Palembang City that can be solved by reducing the use of disposable goods and plastics. In addition, managed household garbage by doing garbage sorting that corresponds to the type and the formation of Garbage bank as a place to manage the garbage in recycling and economical value.*

**Keywords:** Evaluation; Effect; Management; Household Garbage; Palembang City**JEL Classification:** L23; Z18; R50; Q50; P51**I. INTRODUCTION**

Generally, household waste has a bad impact on the quality of life, environment and society with the effect. The impact of household waste is a complex problem due to the lack of public understanding of the consequences that can be inflicted by garbage. According to (Notoatmodjo, 2011) stated that Garbage was a material or solid object that is no longer used by humans, or solid objects that are no longer used in human activities and disposed of. Under (Undang Undang, 2008) on waste management, garbage is defined as the remainder of human's daily activities as well as solid-form natural processes.

According to (Aziz & Febriardy, 2016) stated that waste management is a series of activities ranging from garbage collection to the container in the source (producer), collected towards the temporary shelter, then transported to a place of processing and recycling, such as posting, incineration, *Landfilling* or other means. Waste management covers technical and non-technical aspects, such as how to organize, how to finance and how to engage waste-generating communities to participate actively or passively in these handling activities.

Another factor that causes waste problems becomes increasingly complicated is the increase in the living standards of people who are not accompanied by the harmony of knowledge relates to waste. In addition, the level of community participation is lacking in the maintenance of hygiene and dispose of garbage in place. Garbage Warehouse is also in leave by the behavior of people in throwing garbage. The unmanaged garbage and the pattern of society that removes garbage in rivers or coastal areas is a factor in supporting waste on the sea. Surface water, both flowing and in unitary such as lakes, reservoirs and marshes as well as under-surface water (rivers) are joined to each other. In addition, form the main river that carries the entire surface water around the river basin to Sea, where the coastal region of Indonesia covers 50% of land area, with a population rate of 70% of the region's residence (<https://kompas.com>).

One of the areas that have problems in waste management is Palembang City. Garbage household waste that keeps increasing annually in Palembang City raises new issues. The Office of Environment and Hygiene (DLHK) is a waste management institution in Palembang City. Palembang city government policy on waste management by issuing Regional Regulation (PERDA) No. 03 in 2015 on Household Waste Management And

Garbage Type Household Waste. The purpose of the issued of Regional Regulation (PERDA) classify into as follows: (1) reducing the amount and impact caused by garbage (2) improving the quality of public health (3) improving the quality of the environment (4) creating waste as a resource (5) changing the Community behavior in waste management.

The policy evaluation of impacts gave more attention to the output and impact of the policy compared to the implementation process (Anggraeni, Zauhar, & Siswidiyanto, 2011). The impact can be an expected impact as well as unexpected impacts. The expected impact contains understanding when a policy created by the Government has determined or mapped out what impact it will take, but among the expected impacts, there are unexpected impacts.

Based on the source, garbage comes from four (4) sources, namely only settlements, commercial and office areas, modern markets as well as traditional markets. The sources of waste according to (Lessel, Altmeyer, & Krüger, 2015) was as follows:

Garbage originating comes from the settlement (*domestic wastes*). This garbage is based on solid materials because of the household activities that have been used and disposed of.

Garbage comes from public places. This garbage is paper, plastic, bottle and so on.

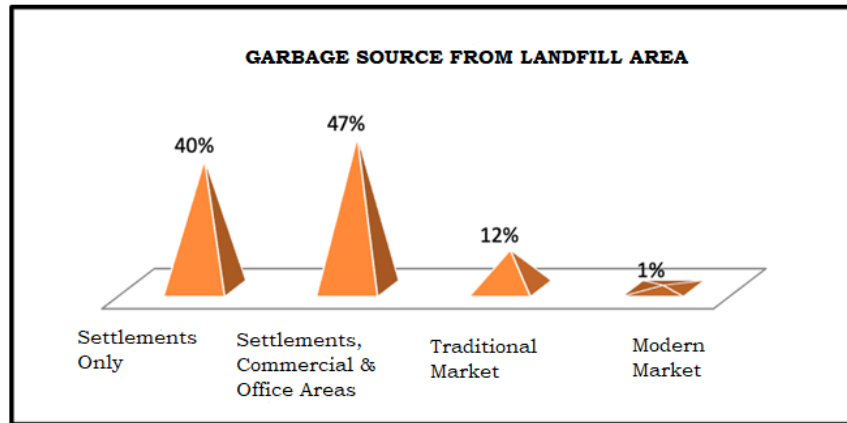
Garbage comes from office. This garbage's are paper, plastic, carbon and so on.

Garbage originating comes from the highway. Garbage consists of paper, cardboard, dust, rocks, leaves, plastic and so on.

Garbage comes from the industry (*industrial wastes*). Garbage such as metal, garbage packing goods, plastic, wood, cans, bottles, and so on.

The overview of the garbage source to the Landfill Area in Palembang City can be seen from the chart below.

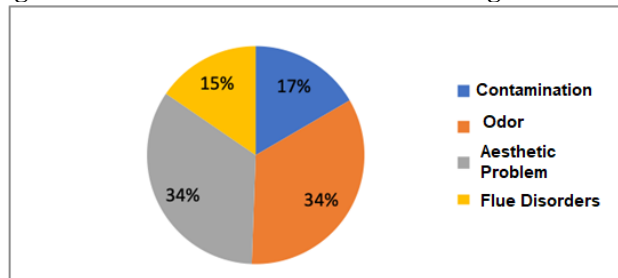
**Figure 1: Garbage Source from Landfill Area in Palembang City**



Source: Environmental Agency and Cleanliness (*Data Managed*)

Bases on the data above, it shows that in Palembang City only has 40,4% Landfill Area that is serving Settlement Areas (Domestic), 11,6% that is serving Traditional Market, 46,6% that is serving residential area, as well as commercial and office areas amount 1,4% also serving modern market. In addition, the data shows that landfill service in Palembang District amount from 60% to 70% and left from 30% to 40% garbage that has not been managed and solved. There is point place of resettlement garbage area that does not have facility of garbage landfill areas (DLHK of Palembang City). Unmanaged landfills cause environmental disturbances such as odor, contamination, flue disorders and aesthetic problems. The Diagram below shows data on landfill point disruption in Palembang City.

**Figure 2: The Effects Data around Unmanaged Landfill**



Source: Environmental Agency and Cleanliness of Palembang City (*Data Managed*)

In the figure above it is seen that the odor and aesthetic problems become the most impactful environmental disorder in society. The odor and aesthetic problems are directly visible and can be observed by the public in general. This research aims to observe the impact evaluation of household waste management in Palembang City.

## II. RESEARCH METHOD

The type of research used is qualitative research. According to (Creswell, 2009) presented 4 (four) basic types of data collection procedures in qualitative research such as: (1) Observation is the retrieval of research data through the field of conduct or individual activities. In the field record, the researcher noted in an unstructured way or semi structured activity in the study. (2) The interview is the researcher conducting a face-to-face interview with the participants by phone or focus group.

Interviews involve unstructured questions and open-ended questions. (3) Documentation during the research process may also collect documents, such as public documents consist of newspaper, meetings, reports or private documents such as individual journals, diary, letters, or email. (4) Audio-visual materials, this data retrieval can be in the form of photography, art objects, video recordings, or other forms of sound. The technique of data collection in this research is what (Creswell, 2009) stated, that was through in-depth interviews, observations, and documentation, while also equipped with audio-visual material that allows it to be taken in the field.

## III. LITERATURE REVIEW

The evaluation of the policy impacts gave more attention to the output and impact of the policy compared to the implementation process (Dorey, 2014). The impact can be an expected impact as well as unexpected impacts. The expected impact contains understanding when a policy made by the Government has determined or mapped out what impact it will take, but among the expected impacts, there are unexpected impacts. The social units impacted by a policy include: individuals, households, groups or organizations, communities, institutions and social systems (Dorey, 2014).

According to (Australian Public Service Commission, 2007) stated that the impact of individuals touched on biological, psychic, environmental, economic, social and personal aspects. Organizational impact is how far the policy helps or interferes with the organizational objectives, which is indirectly indirect. The impact on society is the extent to which the policy affects community capacity in serving its members. The impact on social institutions and systems, the changes that occur in institutions are also social systems through the disputes of functionalism and conflict theory.

The objective of the impact evaluation, the evaluation impact is generally done to obtain information related to the effectiveness of a policy/program on the problem of intervention. According to (J E Anderson, 2003) stated that the Impact evaluation aim to as follows:

Evaluating whether the program has been given an effect desired for individual, marriage life and institutions.

Evaluating whether this effect relates to program intervention

Exploring whether the effect undesired both of positive and negative causes

Evaluating how the program give an effect for target group, and whether able to improve the condition of target group caused by this existence program or there is other factors.

The impact dimensions according to (Langbein, 2014) estimated the impact need to take into account the following dimensions are as follows:

Time, this time dimension is important to be taken into account because the policy can give a long impact, both now and in the future.

The difference between actual impact and expected. In addition to paying attention to the effectiveness of achieving objectives, it should also be noticed: the various unwanted impacts, the impact that only in part is expected and the conflicting impact of the expected.

The level of impact aggregation, the impact is also aggregative means that the perceived impact individually will be able to seep on changes in the community as a whole

Impact type, program impact type include as follows:

Impact on economic life: income, valuation

Impact on policy-making programs: what will be done in the next policy

Impact on public attitudes: Government support, programs and so on

Impact on the quality of life of individuals, groups and communities that are non-economical

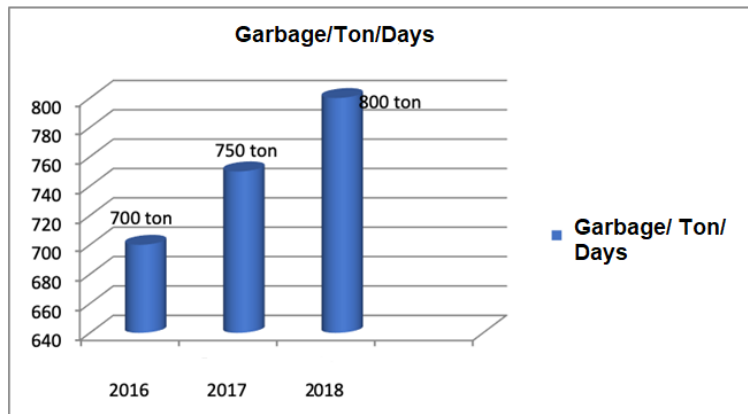
According to (Notoatmodjo, 2011) Garbage was a material or solid object that was no longer used by people, or solid objects that are no longer used in human activities and disposed. Based on the nature of garbage can be classified into 2 (two), namely (1) organic waste, namely can be *degradable*. Organic waste is garbage

that is a waste of food such as leftovers, vegetables, dried leaves, and so on. This garbage can be processed further into compost (2) inorganic garbage, does not un-raveled (*un-degradable*). Inorganic garbage is a garbage that is not easy to rot, such as plastic container food wrapping, paper, plastic toys, bottles and glasses drinks, cans, wood, and so on (Notoatmodjo, 2011).

**IV. RESULT AND DISCUSSION**

The garbage problem in Palembang City requires proper handling because the waste production continues to increase. According to (Bernardo, 2008) Garbage was a material or solid object that is no longer used by humans, or solid objects that are no longer used in human activities and disposed. Along with increasing its population to make the waste products increase, while the land to accommodate the remnants of consumption began to be limited (DLHK of Palembang City, 2018). Garbage production of Palembang City in a day of about 600 tons up to 700 tons of garbage, but on weekends reaches 900 tons per day. The graph of garbage increase in Palembang City is contained in the next chart.

**Figure 3: Increased Volume of Garbage in Palembang City**



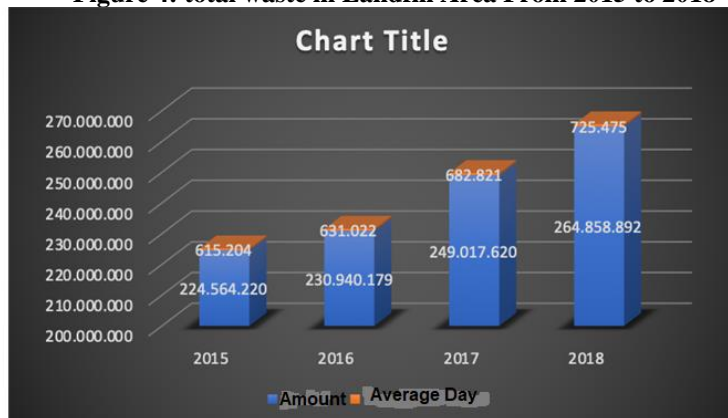
Source: Environmental Agency and Cleanliness of Palembang City (*Data Managed*), 2018

In the figure above can be seen that Palembang City in a day can produce 600 tons up to 700 tons of garbage, and the number continues to increase annually.

Household waste management is very important by not wasting garbage. According to (Rahman, 2000) stated that the impact of individuals touches on biological, psychic, environmental, economic, social and personal aspects. Organizational impact is how far the policy helps or interferes with the organizational objectives, which is indirectly indirect. The impact on society is the extent to which the policy affects community capacity in serving its members.

The effect on its institution and social system, the changing system occurs on institution also its social system through functional perspectives and theoretical conflict. This community behavior on garbage by taking it inside the landfill areas, neglected cause to rot, threw a way to the river, also threw inside the black hold area without closed by solid fully. The amount of garbage in Palembang City annually from 2015 to 2018 continuity increase and seen on the figure below:

**Figure 4: total waste in Landfill Area From 2015 to 2018**



Source: Environmental Agency and Cleanliness of Palembang City (*Data Managed*), 2018

The above Data shows the amount of garbage volume that keeps increasing annually. Meanwhile, the number of Landfill Area in Palembang City does not balance it as many as 263 units, spread throughout the sub-district in Palembang City.

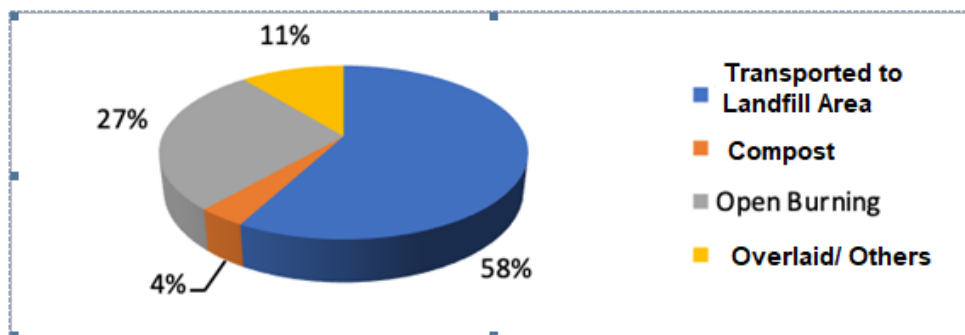
**Table 1: The Amount of Landfill Area in Every Sub-District of Palembang City**

No.	Sub-District	Amount	Notes
1.	Seberang Ulu II	8	
2.	Seberang Ulu I	48	
3.	Iilir Timur I	28	
4.	Iilir Timur II	14	
5.	Iilir Barat I	11	
6.	Iilir Barat II	24	
7.	Kemuning	15	
8.	Alang-alangLebar	10	
9.	Bukit Kecil	34	
10.	Gandus	11	
11.	Sukarame	11	
12.	Sako	8	
13.	SematangBorang	7	
14.	Kalidoni	17	
15.	Plaju	12	
16.	Kertapati	5	
Amount		263	

Source: Environmental Agency and Cleanliness of Palembang City (*Data Managed*), 2018

On the table, 1 above shows that between the amount of garbage volume with the number of Landfill Area is not balanced. So many piles of garbage locate in Palembang City. At this time, the waste of garbage generated per day 1,171 tons assuming each individual produces a waste of 0.7 kg from the population of 1,673,000, but that is transported to of Landfill Area average of 800 tons per day,. It means that there are approximately 371 tons of garbage has not been carried into the wild point of the moon, thrown into the swamp or river. The Diagram adopts the distribution of household waste treatment in detail.

**Graph 1: Distribution of Household Waste Treatment in Palembang City**



Source: Environmental Agency and Cleanliness of Palembang City (*Data Managed*)

In the diagram above shows that 57.9% of household waste is transported to Landfill Area, 3.6% of garbage is composted, 27.6% of garbage is burned open and 10.9% of garbage is overlaid and rest. Meanwhile, the garbage management distribution of Palembang City is also contained in the following table.

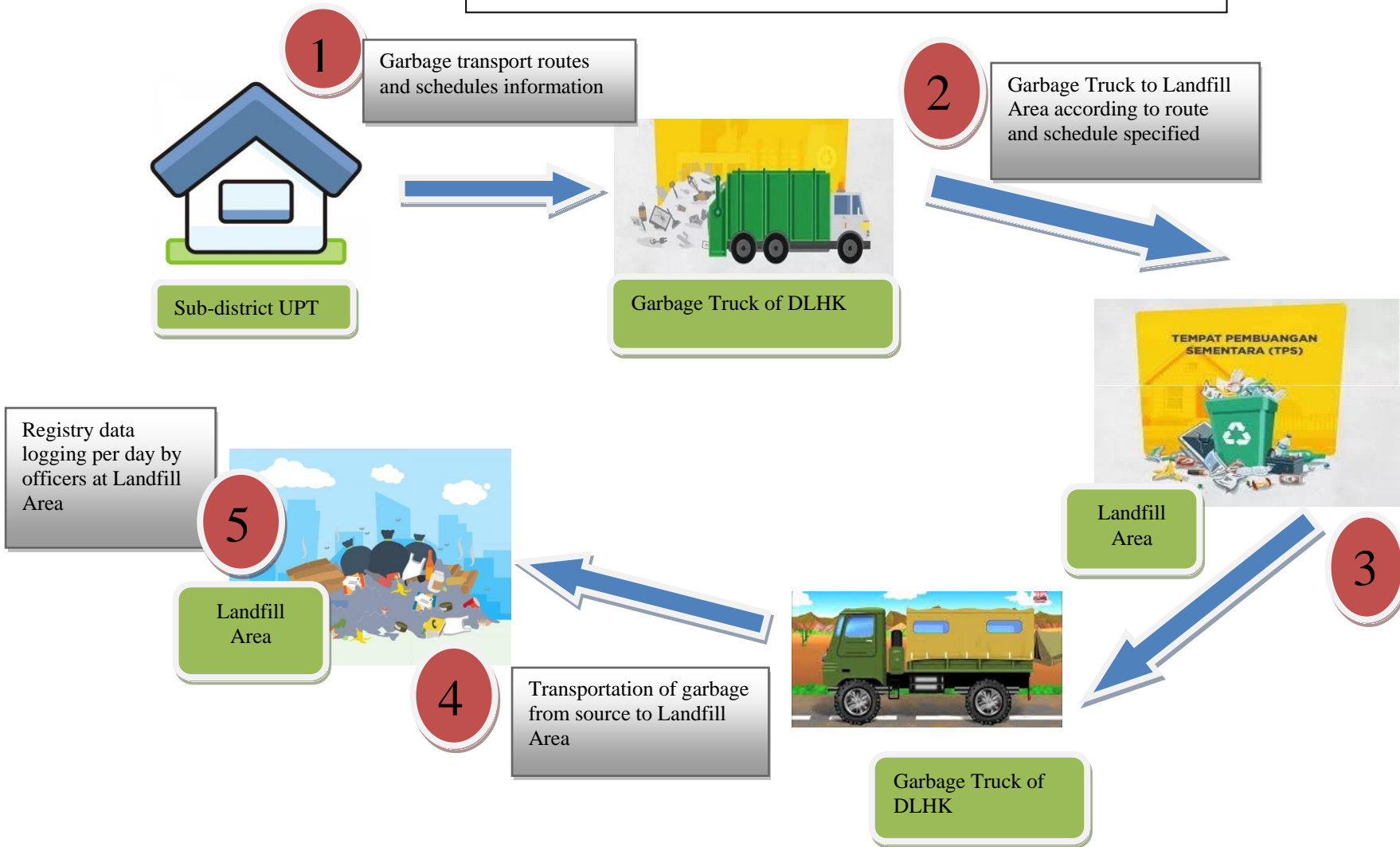
**Table 2: The Distribution of Garbage Management in Palembang City**

No	Garbage Treatment	Percentage
<b>1</b>	<b>Taken to Landfill Area</b>	<b>57,90%</b>
1a	Collected at home, transported by local government officers	29,60%
1b	Collected in a joint place, transported government officers	14,80%
1c	Discarded outside the home page: to Landfill Area	13,50%
<b>2</b>	<b>Compost</b>	<b>3,60%</b>
2a	Discarded on the home page: to the hole then buried	3,60%
<b>3</b>	<b>Open Burning</b>	<b>27,60%</b>
3a	Discarded on the home page: to the hole then burned	14,20%
3b	Discarded on the home page: no holes then burned	7,50%
3c	Burned directly	5,90%
<b>4</b>	<b>Overlaid/Others</b>	<b>10,90%</b>
4a	Dumped on the home page: to the Hole and left	0,30%
4b	Dumped on the home page: no Holes & Allowed	0,70%
4c	Dumped on the home page: under house	0,10%
4d	Dumped on the home page: to the hole/trash	2,00%
4e	Thrown outside the house: Times/Creek	5,10%
4f	Thrown outside the house: Ditch/trench	0,20%
4g	Thrown outside the house: Pit/fish pond/ponds	0,00%
4h	Discarded outdoors: open-Ended	1,80%
4i	Thrown out of the house: Don't know where	0,00%
4j	Others	0,50%
4k	Unknown	0,20%

Source: Environmental Agency and Cleanliness of Palembang City (*Data Managed*)

In the table above, it is seen that the distribution of waste management in Palembang City, which was raised to Landfill Area, only reached 57% and the rest is not transported. The rest made or combed by itself, dumped in the yard, thrown into the pit, burned, thrown into the river, trenches, and times and dumped in the trash.

The Flow of Garbage Can Be From the Sub District Integrated Service Unit to LANDFILL Area (Final disposal)



According to (Fullerton & Kinnaman, 1995) stated that the impact of individuals touches on biological, psychic, environmental, economic, social and personal aspects. Economic aspects that can be felt especially by some individuals who make garbage as a livelihood so that garbage can be economically valuable, which is initiated by the scavenger either at the Temporary Disposal or in place The Landfill Area, which has a daily income ranging from IDR. 50,000- up to IDR. 100.000,-.

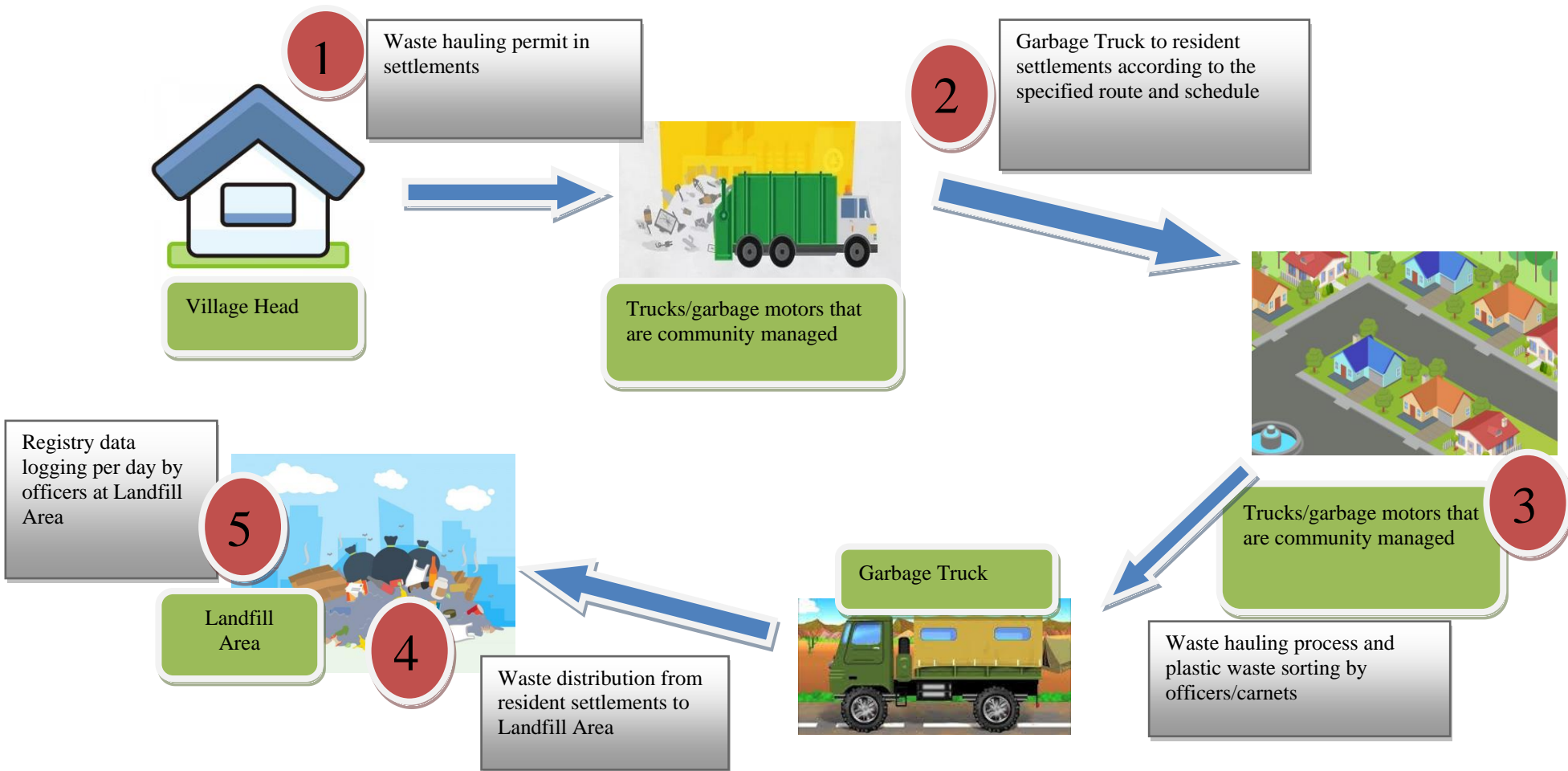
In addition the scavengers, there are groups of people who provide garbage transportation services from community settlements or households using garbage motors or garbage trucks. This service got a good response from the community, because it is very helpful to remove garbage from their household especially in areas that do not have a temporary disposal. However, the number of motorcycles/trucks is still not adequate, so not all areas can be served the transport of garbage from households. With the unavailability of this transport service in areas that do not have a temporary disposal, it creates an uncharted garbage heap or wild garbage.

Furthermore, there is also a temporary disposal independently, which provides a collection services by means of every individual who throw garbage in this Landfill Area pays IDR. 1,000 (one thousand) rupiah per garbage bag, while the motor/dump truck pays IDR. 350.000 per month.

The waste transport flows managed by the public can be seen in the following flow below:



Community-Managed Garbage Transport Flows from Settlements to LANDFILL Area





Being able to complete household waste management required household waste sorting practices. Garbage sorting is a simple step that can be done every household as the initial key of activity 3R (reduce/reduce, recycle/recycle, reuse/re-use). In general, sorting can be done based on the type of waste, namely organic waste and inorganic waste. Organic waste classify in the interwoven of foodstuffs, major vegetables and other easily decomposing garbage. While inorganic waste in general consist of plastic, glass bottles, cans and other. To be able to start the garbage sorting activities at the household level, plastic waste sorting can be an option.

One of the advantages of plastic waste sorting is not a problem with the smell and relative low potential spread of disease when storage is done in the house. According to the nature of garbage can be classified into 2 (two), namely (1) garbage (*degradable*). Organic waste is easy to decay garbage such as food scraps, vegetables, dried leaves, and so on. This garbage can being further processed into compost. (2) Inorganic garbage does not ravel. Inorganic garbage was a garbage that is not easy to rot, such as plastic container food wrapping, paper, plastic toys, bottles and glasses drinks, cans, wood, and so on (Notoatmodjo, 2011).

The objective of the impact evaluation, the evaluation of the impact is generally done to obtain information related to the effectiveness of a policy/program on the problem of intervention. According to (James E. Anderson, 2003), the Impact evaluation aim to as follows:

Assessing whether the program has brought the desired impact on individuals, households and institutions

Assessing whether the impact is related to the program intervention

Exploring whether there is a consequence that is not predicted both positive and negative

Reviewing how the program affects the target group, and whether the correction of the target group condition is actually caused by the program or because of other factors.

Trash Bank Program is one way to help waste management in Palembang City. At this time, the garbage bank in Palembang City is generally formed at the village. By involvement of the participation is both of non-governmental, private parties and of BUMD/BUMN (State/ Regional Own Enterprises).

The principle or system of working waste bank classify into 3 parties involved as follows:

Depositing is a community or a customer who is a source of waste that will be managed by a garbage bank, usually individual.

Garbage Bank is a group in charge of receiving and then processing garbage from the deposit and selling it to the parties that bias utilizing garbage

The buyer is those who buy garbage that is managed by a garbage bank. Can be individual and can be a company.

Meanwhile the way the garbage bank works includes the following as follows: (1) a deposit will bring the household garbage that has been sorted and selected to fit the criterion set by the Trash Bank (2) garbage Bank set the price of garbage are accepted by type or size. When a deposit carries garbage, the trash bank officer will weigh and the member of the price or nominal value based on the benchmark price set (3) the garbage Bank will give the savings book exactly like the passbook given by Commercial banks. This book is to record how much garbage deposits it has done.

At this time in Palembang City, several garbage banks do self-management waste. The number of waste banks in Palembang City is currently contained in the table below.

**Table 3: The Amount of Garbage Bank in Palembang City**

No	Garbage Bank Names	Locations
1	Bahagia Mandiri	Alang-Alang Lebar Sub-Districts
2	Hikmah Sejahtera	Ilir Timur II Sub-Districts
3	Kemala	Ilir Timur II Sub-Districts
4	Pesona (TPA)	Sukarame Sub-Districts
5	Patraganik	Plaju Sub-Districts
6	Junjung Biru	Seberang Ulu I Sub-Districts
7	Bersih Sehat Mulia	Plaju Sub-Districts
8	Sinar Fajar	Plaju Sub-Districts
9	Dahlia	Kalidoni Sub-Districts
10	Sakura	Alang-Alang Lebar Sub-Districts
11	Pelangi	Sukarame Sub-Districts
12	Bekal	Plaju Sub-Districts
13	Gotong Royong	Sukarame Sub-Districts
14	Hijau	Gandus Sub-Districts
15	Serumpun Jaya	Sukarame Sub-Districts
16	Kebumen Gemilang	Ilir Timur II Sub-Districts
17	Serumpun	Alang-Alang Lebar Sub-Districts
18	Mekarsari	Plaju Sub-Districts

19	Melati	Sako Sub-Districts
20	Ceria	Alang-Alang Lebar Sub-Districts
21	Dimas	Sebatang Borang Sub-Districts
22	Anggran	Plaju Sub-Districts
23	Kartini	Iilir Barat I Sub-Districts
24	Sriwijaya Bersatu	Kalidoni Sub-Districts
25	Patratura	Plaju Sub-Districts
26	Mawar	Kalidoni Sub-Districts

Source: Environmental Agency and Cleanliness of Palembang City, 2018

In table above shows that the presence of garbage bank in Palembang City is still a little. Even the presence of waste bank is not found in all sub-districts in Palembang city. The number of sub-districts in Palembang is 18 (eighteen) sub-district. While the presence of new waste banks that are located in 11 sub-districts in Palembang City.

Garbage Bank activities include 3R program (*Reduce, Reuse, and Recycling*), garbage sorting, compost fertilizer, handicraft made from paper. With this garbage bank program is expected to reduce garbage accumulation especially wild garbage and garbage in the transported in Landfill Area. It also has an economic impact on people and individuals involved in waste banks. It is like the opinion according to (Langbein, 2014) estimated the impact needs to take into account the following dimensions such as:

1. Time, this time dimension is important to be taken into account because the policy can give a long impact, both now and in the future.
2. The difference between actual impact and expected. In addition to paying attention to the effectiveness of achieving objectives, it should also be noticed: the various unwanted impacts, the impact that only in part is expected and the conflicting impact of the expected.
3. The level of impact aggregation, the impact is also aggregative means that the perceived impact individually will be able to seep on changes in the community as a whole
4. Impact type, program impact type include as follows:
  - a. Impact on economic life: income, Value Added
  - b. Impact on policy-making programs: what will be done in the next policy
  - c. Impact on public attitudes: Government support, programs and so on
  - d. Impact on the quality of life of individuals, groups and communities that are non-economical

In addressing the garbage problem for individuals and communities by doing the following steps such as: (a) growing awareness and concern about the environment through counseling, and the enactment of sanctions in the form of fines that are properly enforced, means that the device to carry out the sanction has also been prepared, causing a deterrent effect. (b) Changing the viewpoint about the garbage that started early in the family, and school (c) reducing the use of plastics (d) Improving the skills, perform the process of recycling waste independently with regard to Use of the waste. There are many economical values relate in the garbage and become a high selling value.

The city government's policy through the environment and cleanliness of Palembang City on waste management classify into as follows:

1. The activities of cooperation with the community that is scheduled every week in each of the neighboring pillars monitored by Sub-District Head in each Sub-District, the village will allocate consumption funds amounting to IDR. 150.000,-per week.
2. Monitoring conducted by the field Supervisor in the district technical Implementation Unit on the carriage of garbage in the temporary waste disposal, further improved.
3. Establishing access to waste disposal is in areas where there has been no temporary disposal, to avoid the point of the landfill waste, and appreciate a group of people. This classify into who take the initiative to deliver a collection service from home to a motor or garbage truck by eliminating the tariff or charges to be paid when dumping the trash in the final disposal.
4. Counseling, it is providing counseling to the community about the proper handling of waste and its dangers to the environment. As well as providing technology guidance in waste management so, it becomes economic value through the Garbage Bank.

## V. CONCLUSION

The policy impact of household waste management in Palembang City can affect individually through economic aspects and affect society. Economically it can be a source of income for a group of people such as scavenger and waste transport service providers. While the impact on the community is the extent to which the policy affects community capacity in serving its members, can be seen through the Garbage Bank. The Garbage

Bank that has stood yet evenly distributed in every district and needs support from stakeholders to provide guidance and technology so that it becomes more developed.

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