

Waste Management Financing Model Through Utilization of Village Funds

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ABSTRACT

This research is to create a model for the use of village funds for waste management, using the cost sharing method, namely the distribution of financing between the Padang Pariaman Regency APBD and the Village Fund as a transfer from the APBN. The survey method and literature for data collection in this study used village fund documents, district APBN funds, where respondents were asked to provide their responses to the management of village funds in waste management. Compilation of the concept of calculating waste management activities using activity based costing (ABC), dividing waste management financing through village fund financing is used to create a waste management financing model for Lubuk Alung sub-district to analyze the hypothetical relationship in the research model,

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INTRODUCTION

The increase in population has an impact on increasing consumption and population activities which result in the amount of waste generated is also increasing. Waste generated from activities and public consumption is known as garbage. One type of waste is domestic waste. The main problem in waste management in Padang Pariaman Regency is the lack of budget allocation for waste management, very minimal operational funds, and the absence of a Regional Regulation to collect retribution from the community so that services for waste management at the sub-district level are also less than optimal. In the Lubuk Alung sub-district, it generates 24.34 tons/day of waste with a population density of 257 km²/person based on the survey results. The accumulation is only managed through accumulation in each place such as in public housing, educational facilities, office facilities, health facilities and other public facilities, there is no waste transportation service to the temporary waste disposal site and the final waste disposal site.

Again, the cause is the very minimal financial condition (Final Report on the Preparation of Technical Planning for Waste Management in Padang Pariaman Regency, 2016:I-2). In response to the waste problem, various options were made, in the form of a waste management concept, the emphasis of which was on changing the paradigm of society in general in viewing waste, for example in the form of community participation in waste management. Besides introducing various models of waste management and handling, starting from the household to the final waste disposal site and finally being strengthened through legal instruments. One of them is the issuance of Law Number 18 of 2008 which in Article 24 emphasizes that the Government and Regional Governments are obliged to



finance the implementation of waste management originating from the APBN and APBD. In addition, there is also Law Number 6 of 2014 concerning Villages which provides a village development budget and is described by the laws and regulations below it as technical guidelines and its utilization. Then the issuance of Minister of Village Regulation and PDRT Number 16 of 2018 which provides opportunities for every local government to utilize village funds in the context of accelerating development. Based on Article 5 paragraph 2 letter d it is explained that this village fund is prioritized to finance the implementation of programs and activities in the field of social services through procurement, development, development, and maintenance of environmental infrastructure to meet the needs of environmental conservation.

Based on the description above, it can be seen that in general, previous studies only discussed the impact of waste management on the environment from the perspective of consumers. Whereas the decision to manage waste is the main spear and the responsibility of the government, society and other stakeholders. Therefore, the main objective of this research is to develop a financing model for waste management through the use of village funds in Lubuk Alung District, Padang Pariaman Regency. Whereas the decision to manage waste is the main spear and the responsibility of the government, society and other stakeholders. Therefore, the main objective of this research is to develop a financing model for waste management through the use of village funds in Lubuk Alung District, Padang Pariaman Regency. Whereas the decision to manage waste is the main spear and the responsibility of the government, society and other stakeholders. Therefore, the main objective of this research is to develop a financing model for waste management through the use of village funds in Lubuk Alung District, Padang Pariaman Regency.

LITERATURE REVIEW

Rubbish

Solid waste according to SNI 19-2454-1991 on the Technical Management of Urban Waste is solid waste consisting of organic and inorganic substances which are considered useless and must be managed so as not to harm the environment and protect development investment. Law No. 18 of 2008 concerning waste management states that waste is the residue of human daily activities or natural processes in the form of solid or semi-solid in the form of organic or inorganic substances that are biodegradable or non-biodegradable which are considered no longer useful and are disposed of into the environment. According to the World Health Organization (WHO), waste is something that is not used, not used, not liked or something that is thrown away from human activities and does not happen by itself.

Waste management

Law No. 18 of 2008 concerning waste management states that waste management is a systematic, comprehensive, and sustainable activity that includes waste reduction and handling. Waste that is managed includes household waste; waste such as household waste; and specific garbage. Waste management is the collection, transportation, processing, recycling, or disposal of waste materials. This sentence usually refers to waste materials that are generated from human activities, and are usually managed to reduce their impact on health, the environment or beauty. Waste management is

also carried out to restore natural resources. Waste management can involve solid, liquid, gaseous, or radioactive substances with special methods and expertise for each type of substance.

The practice of waste management differs between developed and developing countries, also differs between urban areas and rural areas, also differs between residential areas and industrial areas. Management of non-hazardous waste from settlements and institutions in metropolitan areas is usually the responsibility of local governments, while waste from commercial and industrial areas is usually handled by waste processing companies. Waste management methods vary depending on many things including the type of waste substance, the land used for processing and the availability of the area.

Waste Management Model

The waste management models consist of first, the Life Cycle Assessment (LCA) waste management model is a method used to assess and evaluate the total impact on the environment caused by a product, process or service, including the implementation of a municipal office waste management system. In this model, what is measured is quantitative data on waste produced and energy used and discharged into the environment in each life cycle of institutional waste management systems that use mixed waste management systems and institutions that use separate waste management systems, namely sorting and processing waste at the source for recycled, to the final disposal system. Second, Community-based waste management model is waste management that involves all levels of society. The community is involved in waste management with the aim of making the community aware that the waste problem is the responsibility of all levels of society (Cecep Dani Sucipto, 2012). Third, the Green Community participation-based waste management model supports green cities. This model pays more attention to environmental aspects and local potential (local wisdom) of the community. In this case, community support is needed, both goodwill and political will. Fourth, the waste management model through increasing community participation and strengthening synergies in urban waste management.

This waste management model begins with the need for an action plan which includes, (1) To identify the characteristics of waste and its disposal methods; (2) Planning and implementing integrated waste management (collection, transportation, and final disposal); (3) Separating the regulatory and supervisory roles from existing institutions with the function of service providers, to be more assertive in implementing reward & punishment in services, (4) Promoting the Reduce, Reuse and Recycle (3R) program in order to achieve a zero waste program in the future, (5) Reforming the tariff structure by applying the principle of full cost recovery through the possibility of applying progressive tariffs, and reviewing the possibility of applying a different tariff structure for each type of customer; (6) Develop waste management technology that is more friendly to the environment and provides added economic value for waste materials (Bambang Munas Dwiyanto, 2011). Fifth, the waste management model based on "Zero Waste" on a household scale independently. Zero waste management is management by sorting, composting and collecting goods worth selling. Sixth, the model of waste management through financing using the Activity Based Costing (ABC) System.

The ABC system is used to increase the accuracy of cost assignments but also provides information about the costs of various activities, thus enabling management to focus on activities that provide opportunities for cost savings. According to Mulyadi (2007: 803), there are two basic beliefs that underlie the Activity Based Costing System, including, among others, Cost in cause. Costs have a cause, and the cause of costs is activity. Thus, a deep understanding of the activities that cause costs to arise will put company personnel in a position to influence costs and the cause of cost can be managed. The cause of the cost is that the activity can be managed. By managing the activities that cause costs, company personnel can influence costs.



Waste management financing

In the solid waste management system which includes 5 component aspects, namely; operational technical aspects, regulatory aspects, institutional aspects, financing aspects, and community participation aspects. These five aspects are interrelated and mutually support each other. This waste management system can be done individually or communally. (SNI 19-2454-2002). However, this research only focuses on the financing aspect. Because this aspect of financing is the most sensitive and decisive thing in an activity. This aspect of financing has a very large influence, considering that in waste management, costs are needed for both labor, vehicle maintenance, facility maintenance, procurement of cleaning equipment, procurement of official clothing and procurement of retribution tickets. The financing aspect is a driving resource so that the wheels of the waste management system in an area can move smoothly.

It is hoped that the solid waste management system in Indonesia will lead to 'self-financing', including here with the formation of local companies. This financing sector involves several aspects, such as the proportion of APBN/APBD for waste management, between user fees and waste management costs, the proportion of these cost components for salaries, transportation, maintenance, education and development as well as administration and the proportion between user fees and community income, structure and collection of levies. applicable. In this study, it does not focus on financing through the results of retribution receipts from the community, because it can burden the community's economy in the midst of economic conditions that are felt by some people are very heavy. However, the source of financing offered in this study is more to utilize government policies through Law Number 6 of 2014 concerning Villages, especially village revenues through village funds.

Village Fund

Regulation of the Minister of Villages and PDPT Number 16 of 2018 which provides opportunities for every local government to utilize village funds in the context of accelerating development. Thus, this village fund can be used as one of the funds in financing waste management in Lubuk Alung District as contained in the Permendes and PDPT regarding the priority use of the village fund budget. By referring to the ABC system described above, a cost classification is obtained into various activities that are included in the financing aspect of this waste management. Broadly speaking, the waste management costs can be grouped into investment costs, operational costs, management costs and basic costs, but in this study only focused on operational costs and waste management costs.

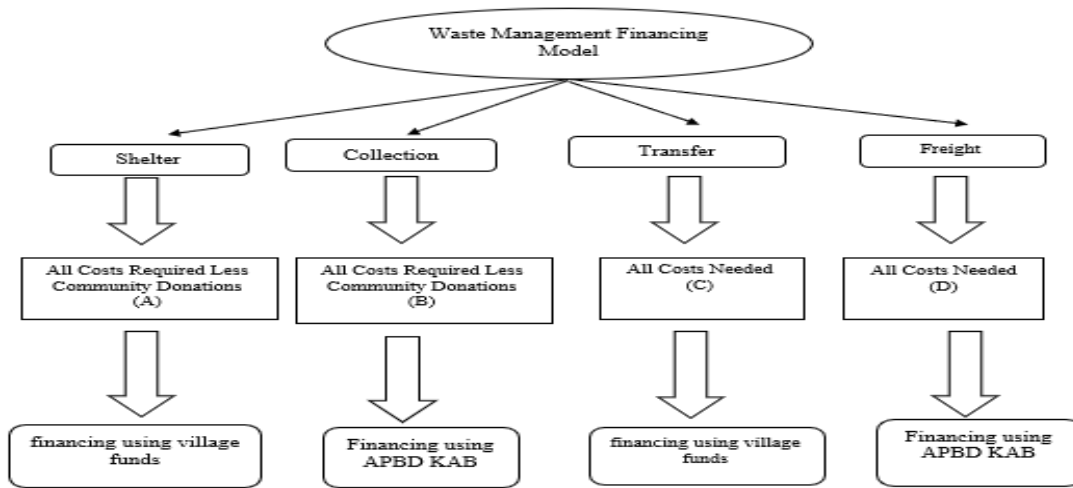


Figure 1. Waste Management Financing Model

Based on the model above, it can be seen that the distribution of waste management financing in this study can be explained that the financing is carried out using village funds, namely all costs of accommodating all costs of moving from waste sources to temporary disposal sites by waste officers in the nagari. The financing is carried out using the Padang Pariaman Regency APBD, namely the cost of collecting activities, both individual collection and public facilities between villages by garbage collectors, and then transportation financing. Because the cost sharing model is also commonly used between organizations or companies as outlined in the cooperation agreement document.

conceptual framework

Based on the theoretical study and the developed model, the conceptual framework of the research can be formulated as shown in Figure 2. that the waste management financing model uses village funds. The details can be seen in the conceptual framework of the research below.

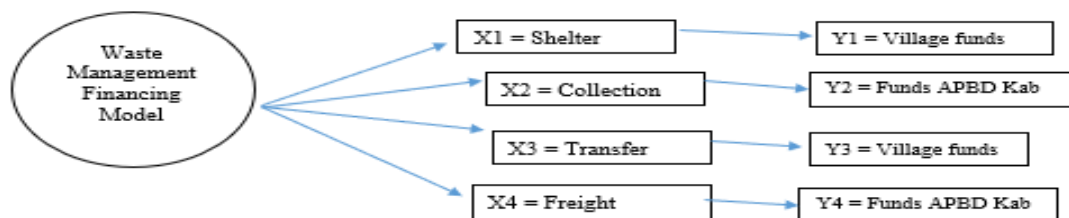


Figure 2. Research Conceptual Framework

Methodology

The population in this study were all villages in Lubuk Alung District. The sample size of 9 villages was selected using a purposive sampling technique in the form of administrative data which covering land use, topography, geology, hydrogeology, population, area, public facilities and infrastructure as

well as the existing waste management system. The stages of research on the financing model for waste management through the use of village funds using the ABC method include 1) managing waste from the source of waste, storage, collection, transfer and transportation/transportation of waste to the final waste disposal site, 2) classifying waste management costs into investment costs, operational costs, management costs and basic costs, but in this study only focused on operational costs and waste management costs. 3) financing carried out using the Padang Pariaman Regency APBD, namely the cost of collecting activities for both individual collection and public facilities between villages by waste transport officers, and further financing for transportation from the temporary disposal land provided by each village to the final disposal site. 4) use the cost sharing model which is also commonly used between organizations or companies as outlined in the cooperation agreement document. However, in the administration of government cooperation agreements in one district are not recommended but are more directed at the formation of laws and regulations. because based on Permendagri 13 of 2006 it is explained that the Regional Head is the holder of power in regional finance.

Results

Lubuk Alung is a sub-district in Padang Pariaman Regency, West Sumatra province. Despite its sub-district status, Lubuk Alung is one of the important centers of economic growth in Padang Pariaman Regency, and is a connecting hub for the PALAPA (Padang-Lubuk Alung-Pariaman) metropolitan area. Previously, this sub-district was one of the most extensive sub-districts in Padang Pariaman Regency. After expansion Sintuk Toboh Gadang become a separate district. Lubuk Alung sub-district only has one nagari, namely Lubuk Alung. In 2011, Nagari Lubuk Alung was divided into five villages, namely: Lubuk Alung, Pasie Laweh, Pungguang Kasiak, Sikabu, and Aie Tajun. In 2016, 4 villages were added, namely Balah Hilia, Abang River, Singguling, and Salibutan.

Waste management system

Based on a literature study conducted on the Final Report of the Preparation of the Padang Pariaman Regency Waste Management Technical Planning in 2016 which was carried out in collaboration with the Padang Pariaman Regency Government with PT Anirindo Mitra Kosultan, the waste management system was obtained as follows:

Upstream System

The upstream system carried out is as follows:

a) shelter

The types of containers used to accommodate waste at its source in each nagari in Lubuk Alung District are:

- 1) Plastic bin closed volume 40 liters (50%)
- 2) Used tires 30 - 40 liters (30%)
- 3) Basket volume 30 – 40 liters (10%)
- 4) Permanent trash can (10%)

It is proposed that the container used in the form of a plastic bin with a volume of 40 liters for housing in settlements is placed in the yard of the house inside the fence and also in public facilities such as schools, offices, as well as trash bins with a volume of 6,000 liters of iron plate containers for road storage placed on the edges. Street. With the estimated needs as follows:

- For housing at home, 1 (one) plastic bin is for 1 (one) head of the family.
- To accommodate these public facilities, 4 (four) plastic bins are for 1 (one) public facility.
- To accommodate the road, 1 (one) plastic bin is for 100 families

From the above proposal, the required costs can be estimated as follows:

- For housing in the yard, the cost obtained is the same as the price of one plastic bin with a volume of 40 liters x the number of heads of families in each nagari.
- For the accommodation of these public facilities, the cost is not calculated here because it is the budgeting responsibility of each school, office, and so on.
- For road housing, the cost obtained is the same as the price of one trash can with a volume of 6000 liters x (the total number of heads of families in each nagari divided by 100 families).

So that the total cost of accommodation for each required nagari can be estimated using the following formula:

Total Cost = housing costs + housing costs on roads (1)

b) Garbage Collection

1) Settlement

The collection pattern used for settlements is an indirect individual pattern. Where waste from housing is collected by garbage collectors using a three-wheeled motorbike garbage bin with a carrying capacity of 800 liters to be transported every 1 x 2 days and then taken to the road container with a volume of 6000 liters.

Thus, the requirements are as follows:

- For the purchase of a three-wheeled motorcycle garbage bin with a carrying capacity of 800 liters.
- For the honorarium of the garbage collector for every waste transportation.

And the costs required can be estimated as follows:

- For the purchase of each three-wheeled motorcycle garbage bin with a carrying capacity of 800 liters
Cost = purchase price of a three-wheeled motorcycle garbage bin with a carrying capacity of 800 liters
- For the honorarium for the garbage collector for every waste transport

Cost = the amount of honor paid for each waste transport

So that the cost of collecting residential waste in each required village can be estimated using the following formula:



Cost = the cost of purchasing a 3-wheeled motorcycle trash bin + transportation officer fees (2)

2) Public facilities

Public facility waste is waste originating from shops, health facilities, restaurants, entertainment venues, schools and offices. The collection is carried out with an indirect individual system where waste from public facilities is transported using a three-wheeled motorcycle garbage bin with a carrying capacity of 800 liters to be transported every day to a 6000 liter container.

Thus, the needs are the same as for household waste collection:

- For the purchase of a three-wheeled motorcycle garbage bin with a carrying capacity of 800 liters.
- For the honorarium for the garbage collector for every waste transport

And the costs required can be estimated as follows:

- For the purchase of each three-wheeled motorcycle garbage bin with a carrying capacity of 800 liters

Cost = purchase price of a three-wheeled motorcycle garbage bin with a carrying capacity of 800 liters

- For the honorarium for the garbage collector for every waste transport

Cost = the amount of honor paid for each waste transport

So that the required waste collection costs for public facilities in each nagari can be estimated using the following formula:

Cost = the cost of purchasing a 3-wheeled motorcycle trash bin + the transport officer's fee .. (3)

And the total cost of waste collection in each required nagari can be estimated by the following formula:

Total cost = residential waste collection fee + public facility waste collection fee..... (4)

1. Downstream System

The downstream system carried out is as follows:

e) Garbage transport

The transportation of waste from the 6000 liter container to the Ladang Laweh TPA is carried out when the containers and trash bins are fully filled and in accordance with the transportation schedule that has been confirmed by the city waste manager (DPU Kabupaten Padang Pariaman). The transportation is carried out using an amroll truck with a capacity of 6m³ 3rit/day and a dump truck with a capacity of 8m³ 2rit/day.

Thus, the requirements are:

- To purchase an amroll truck with a capacity of 6m³ 3rit/day and a dump truck with a capacity of 8m³ 2rit.

- For the honorarium of the garbage collector for every waste transportation.

So that the required waste collection costs for public facilities in each nagari can be estimated that:

- Cost = the cost of purchasing an amroll truck type truck that has a capacity of 6m³ 3rit/day and a dump truck that has a capacity of 8m³ 2rit + honorarium for garbage collectors.

Financing aspect

By referring to the ABC system, it is obtained the classification of costs into various activities that are included in the financing aspect of this waste management. Broadly speaking, the waste management costs can be grouped into investment costs, operational costs, management costs and basic costs, but in this study only focused on operational costs and waste management costs. The financing aspects include bWaste Management costs are known from the sum of the operational costs of maintaining waste management for residential, market, highway and other institutions and bThe operational cost of maintaining waste management is known from the cost of activities at the time of storage, collection to transportation. For more details, it can be seen in table 1. below (The data used only uses code for simulation)

Table 1. Operational Cost of Waste Management Maintenance

No	Name of Nagari	Activity Fee	Year 2021 (Rp/m ³ /day)
1	Lubuk Alung	shelter	A
		Collection	B
		Transfer	C
		Freight	D
2	Punggung Kasik	shelter	A1
		Collection	B1
		Transfer	C1
		Freight	D1
3	Pasir Lawas	Shelter	A2
		Collection	B2
		Transfer	C2
		Freight	D2
4	Aie Tajun	Shelter	A3
		Collection	B3
		Transfer	C3
		Freight	D3
5	Sikabu	Shelter	A4
		Collection	B4
		Transfer	C4
		Freight	D4
6	Sungai Abang	shelter	A5
		Collection	B5
		Transfer	C5
		Freight	D5
7	Singguling	shelter	A6
		Collection	B6
		Transfer	C6
		Freight	D6

8	Salibutan	shelter	A7
		Collection	B7
		Transfer	C7
		Freight	D7
9	Balah Hilia	shelter	A8
		Collection	B8
		Transfer	C8
		Freight	D8

By referring to the cost sharing method, the distribution offered in this paper can be illustrated in Figure 3 below:

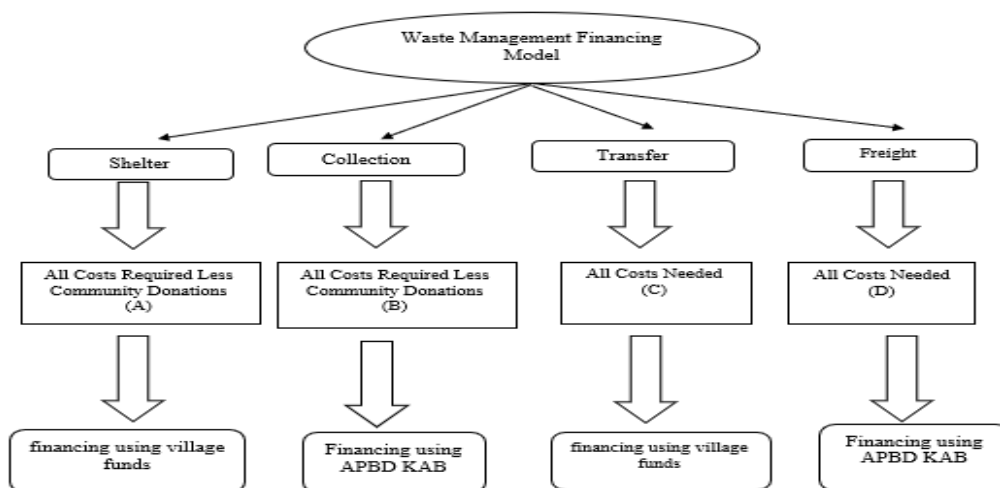


Figure 3. Waste Management Financing Model

Based on the model above, it can be seen that the distribution of waste management financing as intended in this paper can be explained as follows:

- Funding carried out using village funds includes all costs of storage activities (such as plastic bins, etc.), all costs of moving from waste sources to temporary disposal sites (provided through storage activities) by waste officers in the nagari.
- The financing carried out using the Padang Pariaman Regency APBD is the cost of collecting both individual collections and public facilities between villages by garbage collectors, and then transportation financing from the temporary disposal land provided by each village to the final disposal site.
- Because the cost sharing model is also commonly used between organizations or companies as outlined in the cooperation agreement document. However, in the administration of government cooperation agreements in one district are not recommended but are more directed at the formation of laws and regulations because based on Permendagri 13 of 2006 it is explained that the Regional Head is the holder of power in regional finance. Therefore, the form of the cooperation agreement is stated in financial policies such as Regional Regulations or the Padang Pariaman Regent's Regulation as a technical guideline in its management.

Conclusions

Results a study to develop a financing model for waste management in Lubuk Alung District, Padang Pariaman Regency through the use of village funds, it can be concluded that the waste management system in Lubuk Alung District, Padang Pariaman Regency starts from the upstream system to the downstream system. The upstream system is carried out through storage, collecting waste through indirect individual patterns and providing public facilities (offices, health facilities, restaurants, entertainment venues, schools and offices) while the downstream system is carried out through the transfer and transportation of waste to the final waste disposal site. The waste management financing model refers to the ABC system model, so the classification of costs into various activities is included in the financing aspect of this waste management. In general, waste management costs can be grouped into investment costs, operational costs, management costs and basic costs, but in this study only focused on operational costs and waste management costs. Utilization of village funds in each nagari in Lubuk Alung Sub-district for financing activities of accommodation and transfer and financing through the Padang Pariaman Regency APBD for collection and transportation activities. From the description of the conclusions above, it can be suggested that in waste management, adequate facilities are needed starting from the upstream system of waste management to the downstream system and the Padang Pariaman Regency Government to develop financial policies such as Regional Regulations or the Padang Pariaman Regent's Regulation as a technical guide in waste management.

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