Journal of Science Innovare
https://journal.unpak.ac.id/index.php/jsi

Volume 05, Number 01, February 2022, Page 16-22
e-ISSN: 2615-3750 ; p-ISSN: 2615-3769

ANALYSIS OF SOLID WASTE MANAGEMENT STRATEGY IN PELAYANGAN DISTRICT, JAMBI CITY, INDONESIA

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***Article history**: received 15 December 2021; revised 02 January 2022; accepted 10 January 2022* *DOI: https://doi.org/10.33751/jsi.v5i1.6219*

Abstrak. Garbage is one of the problems that needs attention because waste generally always increases from year to year along with the rate of population growth. This causes several problems if it is not accompanied by the improvement and improvement of waste management facilities and infrastructure. The volume of waste that exceeds the carrying capacity, ineffective waste management, and the lack of government policies can cause waste to accumulate. Garbage has always been a problem in big cities, including Jambi City. The current solid waste management system in the Pelayangan District still relies on the old pattern, namely waste is collected from its source, transported to a Temporary Shelter/Trash Bin, and either disposed of to a final processing site or burned. Improper waste management results in pollution, both air pollution, water inside and above the surface, soil, and the emergence of various diseases that threaten public health. The research was conducted using a qualitative method approach with an exploratory design. in the Pelayangan District of Jambi City. The subject of this research is focused on determining strategic priorities so that household solid waste management becomes more optimal by identifying factors that influence household solid waste management such as education, income, behavior, knowledge of local regulations, and willingness to pay user fees. Based on the results of the study, it can be concluded that the factors that influence waste management include issues of education, income, behavior, knowledge of regional regulations, and willingness to pay retribution. Meanwhile, regarding community involvement in household waste management, it is influenced by local government decision-making factors, the implementation of household waste management and the supervision carried out. The strategy that can be applied in the Service District of Jambi City so that the management of household solid waste is more optimal is a defensive strategy, namely reducing waste from the source by reducing the use of goods that produce waste and providing information data about waste management that is easily accessible to the public such as through social media. , websites, television advertisements, bulletin boards

Keywords: solid waste management; garbage;

I. INTRODUCTION

Indonesia is known as a rich natural resources country, but at the same time has a problem of water shortage, soil degradation, pollution, agriculture and forest production, biodiversity conservation, and mineral and energy sustainability **[1]**. Garbage is one of the problems that need attention because waste generally always increases from year to year along with the rate of population growth **[2]**. This causes several problems if it is not accompanied by the improvement and improvement of waste management facilities and infrastructure. The volume of waste that exceeds the carrying capacity, ineffective waste management, and the lack of government policies can cause waste to accumulate **[3]**. Garbage has always been a problem in big cities, including Jambi City. Although it is not as crowded as the city of Jakarta, the city of Jambi is also facing waste management problems. In Jambi City, waste management activities are carried out by the Jambi City Environmental Service. The amount of waste produced in Jambi City in 2017 was 362,880 m3 (Department of Public Works Arrangements Jambi City Space, 2017), most of the waste is generated from households. Increased waste production is a risk of development development and population growth.

Service District is one of the sub-districts located in Jambi City. The existing condition of the Pelayangan District is a dense settlement. The problem of solid waste in the District ofServants is that waste management is still very lacking and waste reduction includes activities to limit waste generation, recycle waste, and reuse waste **[4]**. Waste management **[5]** includes waste sorting, collecting waste to Temporary Shelter (*Tempat Penampungan Sementara – TPS*) or Integrated Waste Processing Sites (*Tempat Pengolahan Sampah Terpadu - TPST*), transportation to (*Tempat Pembuangan Akhir* – TPA), waste processing, and final waste processing (Law No. 18 of 2008: Waste Management, 2008: 10-15). Waste management activities must be carried out because over time there is an increase in population and an increase in people's consumption patterns, if only relying on the TPA, the capacity of the TPA is limited.

When compared with the regulation, this is not in line with the existing condition of solid waste management, especially households in the Pelayangan District, because based on field studies, household solid waste management in the Pelayangan District still relies on the end-of-pipe

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approach, namely waste is collected, transported, and transported. and disposed of to the TPS and TPA by the community in the District ofServant and the waste cleaners. In addition, it was found that people in the District ofServant who have a place to live in the form of a building using a wooden pile foundation have a culture of throwing garbage under their house, this can have an impact on public health and the environment if it is done continuously and there are still people who throw garbage into the trash. rivers that can lead to the accumulation of garbage and environmental pollution in rivers, this unmanaged waste can have an impact on the environment in the form of water, soil, air, and health pollution if carried out continuously. Based on unstructured interviews with the head of the village in the District of Pelayangan, there are several other problems in managing household solid waste in the District of Pelayangan, namely the interest of the community in managing household solid waste is still lacking due to the lack of segregated facilities and infrastructure. there are residents' settlements and it is difficult to build TPS because the area during the rainy season often floods, the rite of transporting waste, which is 2 times per day is considered insufficient so that at night the garbage can interfere with the aesthetics of the environment, and so on.

The existing condition of household waste management in the District of Pelayangan in the activity of collecting waste is carried out with an indirect individual/communal pattern with 1 m3 motorized carts as much as 1 unit with 2 times collection rites in the morning at 06.00-12.00 and in the afternoon at 13.00-14.00 with staff Garbage that is in charge of collecting garbage from each house / garbage drum, the number of units / rotations of this motorized cart tool is still lacking because it is used to serve household waste in one sub-district. Waste processing activities in the form of TPS 3R/Waste Bank are not yet available, then the waste will be transported to the TPA. The activity of transporting waste from the house to the TPA uses a dump truck of 6 m3 1 unit with 2 transport cycles at 06.00-12.00 and 17.00-20.00. The number of units/rotations of this dump truck is still lacking when viewed from the amount of waste generation as shown in Table 1.

Table 1. Waste generation by sub-district in Jambi City

District	Number of Population (soul)	Total Trash (kg/hari)	Total Trash (m3/hari)
Kota Baru	78.818	55.172,68	183,91
Alam Barajo	98.921	69.244,65	230,82
Jambi Selatan	63.797	44.657,56	148,86
Paal Merah	92.685	64.879,17	216,26
Jelutung	65.660	45.961,84	153,21
Pasar Jambi	13.107	9.175,03	30,58
Telanaipura	52.158	36.510,33	121,70
Danau Sipin	49.827	34.878,74	116,26
Pelayangan	12.563	8.793,99	29,31
Pelayangan	14.059	9.841,14	32,80
Jambi Timur	69.300	48.510,25	161,70
amount	**610.893**	**427.625,39**	**1.425,42**

In the Sub-District, the production of managed waste has only reached 72.05% and unmanaged waste (treated without access) has reached 27.95%. When compared to other sub-districts in Jambi City, the percentage of managed waste is one of the lowest and unmanaged waste (treated without access) is the highest. The problem of absolute waste must be handled jointly between the government and the community itself. Therefore, awareness and mutual commitment are needed towards changing attitudes, behavior and ethics that are environmentally cultured. As an effort to raise awareness in handling environmental problems, especially solid waste and to create a clean and environmentally friendly residential environment, a paradigm shift in waste management must be carried out by reducing the volume of waste from the source by selecting or processing with simple technology such as composting with a house scale. ladder or environmental scale as well as community participation in waste management are coordinated by non-governmental groups (KSM). (Artiningsih **[6]**).

The current solid waste management system in the Pelayangan District still relies on the old pattern, namely waste is collected from the source, transported to TPS and disposed of to TPA or burned. Improper waste management results in pollution, both air pollution, water inside and above the surface, soil, and the emergence of various diseases that threaten public health. Based on the phenomena that exist in the District of Servant, so far the condition of household solid waste management has not been optimal, identification of factors affecting household solid waste management, analyzing community involvement in household solid waste management, as well as determining the priority of solid waste management strategies households that can be applied in the District of Service to be more optimal.

II. RESEARCH METHODS

The research was conducted using a qualitative method approach with an exploratory design **[7]**. in the Service District of Jambi City from January to June 2022, the subject of this research is focused on determining strategic priorities so that household solid waste management becomes more optimal by identifying factors that influence household solid waste management such as education, income, behavior, knowledge about local regulations, and willingness to pay user fees. Determination of respondents is done by purposive sampling, namely the selection of samples on the basis of certain objectives. The selected respondent is someone who meets the criteria and qualifications of an expert in accordance with the objectives of the study. The criteria in question are someone who has experience, authority, professionalism and integrity in dealing with waste management problems in the area. Secondary data was collected by studying various literatures from related agencies that could support this research.

Sources of data used by researchers are primary data taken directly from respondents in the form of questionnaires (questionnaires), observations, and interviews. While secondary secondary data is data sourced from document

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studies such as journals, books, reports, regulations, and others related to research. Sources of data in this study are divided into two types, namely respondents and informants. Respondents used to identify the factors that influence the management of household solid waste are residents in the District ofServants, analyzing community involvement in household solid waste management is the population. Informants used to assist in the preparation of a SWOT analysis design to obtain strengths, weaknesses, opportunities, and threats from household solid waste management in the District ofServant are some of the respondents involved in the study, then respondents to assess the strength, weakness, opportunities, threats analysis design (SWOT) to obtain the strengths, weaknesses, opportunities, and threats of household solid waste management in the District ofServant using some of the respondents involved.

III. RESULTS AND DISCUSSION

Existing Condition of Waste Management System

Based on the source of the waste, the results of the sampling of waste generation for the TPS in the District of Pelayangan have a tendency to be dominated by organic waste of 37.81%. This organic waste comes from food waste, such as leftover rice and vegetable residue. In addition, there is also wood waste, twigs and dry leaves.

According to Damanhuri **[8]** the composition of waste is a description of each component contained in the waste and its distribution. Components of the composition of waste are physical components of waste such as food scraps, paper-cardboard, wood, cloth-textiles, rubber-leather, plastics, ferrous-non-ferrous metals, glass and so on. The most frequent grouping of waste is based on the composition of the waste, for example expressed as % by weight or % by volume of paper, wood, rubber, plastic, metal, glass, cloth, food and other waste**[9]**. The waste management system in the District ofServant can be viewed from various aspects. In the legal and regulatory aspects, the products of local regulations in waste management have been available but not all aspects have been implemented. As regulated in Jambi City Regional Regulation Number 8 of 2013 Jambi City concerning waste management. However, the orientation of these regulations focuses on services that must be carried out by the government to the community. Meanwhile, the role of the community in regulations is not so prominent, especially the involvement of the community in managing waste. In addition, there is a regional regulation that regulates user fees, namely Jambi City Regional Regulation No. 11 of 2003 concerning Retribution for Waste or Cleaning Services, which is collected by the Jambi city government. In 2014 the Jambi City Government issued a regulation prohibiting every citizen from burning waste as outlined in the Jambi Mayor's Instruction Number 1122/BLH/2014 concerning the Prohibition of Burning Garbage in the Jambi City Region.

Institutionally, in order to deal with hygiene management problems, a formal institution that handles waste management problems was formed **[10]**, namely the Jambi City Environmental Service. Led by a head of service who is under and responsible to the mayor through the regional secretary. The waste retribution fee is very important for its sustainability in order to replace the budget that has been issued by the Jambi City Environmental Service. The amount of the waste service levy in Jambi City has been regulated in Jambi City Regional Regulation No. 11 of 2003 concerning Waste or Cleaning Service Retribution. The levy for the management of residential waste has been set, but most residents in the residential area do not pay the levy for transporting the waste because the levy is integrated with the payment for drinking water at the PDAM, so that people who do not subscribe to the PDAM have not paid the levy.

The role of the private sector and the community in waste management is also very influential on the performance of waste management in Jambi City. However, the community and the private sector have a role that cannot be ruled out in the waste management section. The contribution given by the community is the development of the community environment to process and utilize waste into something that has meaning and value, both economic value and artistic value. The community movement in waste management in Jambi City moves either through initiation from the government or initiation from individuals (informal actors).

However, when viewed from an operational technical point of view, in the phase of waste sorting/containing activities, the community in the District ofServant has not done waste sorting based on the type of waste grouping **[11][12]**. The housing system used is individual and communal. Individual containers in the form of containers in the form of plastic bags or trash cans made of plastic are placed on the roadside or in front of their respective houses **[13]**. Meanwhile, the communal housing system uses drums made of zinc/metal which are placed on the side of the road. The collection of residential waste in the Pelayangan District which is currently running with an indirect individual and communal pattern **[14]**. There is a collection system from households that uses a cart or three-wheeled motor to go to the transfer depot with a capacity of 1 m3 with 2 repetitions, namely in the morning at 06.00-12.00 WIB and at night 13.00-14.00 WIB. Transportation, namely at the last collection point, the waste is transported to the Final Management Site (TPA). In the Sub-district ofServant, using a transportation pattern with the type of pattern of collecting waste through an indirect transfer system at the depot transfer with the type of transportation means in the form of a dump truck with a capacity of 6 m3 with 2 cycles, namely in the morning at 06.00 - 12.00 WIB and evening 17.00-20.00 WIB.

Processing, namely processing activities is an activity to change the characteristics, composition, and/or amount of waste, which can be in the form of Waste Banks and 3R TPS. It can be said that in the District ofServant, it can be said that waste processing activities have not been carried out either by institutions (community groups), individuals or by institutions spread over several locations. Processing activities carried out starting from waste processing with the 3R principle, waste collection through the Waste Bank, as well as processing waste into individual scale compost have not been carried out. Final processing, the final waste processing operation in

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Jambi City, is currently carried out only Gulo is located in Jambi City with an area of 21 hectares. The distance from the TPA to the city service center is ± 16 Km. TPA Talang Gulo uses a sanitary landfill system with Emission Reduction In Cities (ERIC) technology **[15]**.

Factors Affecting the Management of Household Solid Waste in the District of Servant

The factors that influence the management of household solid waste in this study are education, income, behavior, knowledge and willingness to pay user fees.

Education

The education referred to in this research is the last formal education level that the respondent has taken. Based on the results of the respondent's education research, it can be seen in Table 2.

Table 2. Distribution of respondents' education level

Education	Frequency (F)	(%)
Low (primary school / junior high school)	7	12
Medium (senior high school)	39	71
Height (Diploma/ bachelor)	8	17
Total	**54**	**100**

Based on Table 3, it indicates that the education level of the respondents is quite high and can still absorb information well. Respondent's education was dominated by respondents in the medium category (graduated from high school). In research conducted by Lando **[16]**, that the environment has a very supportive role for the sustainability of the level of education taken by the generations in it. If many individuals are aware of the importance of education in the environment, then automatically other individuals will follow this phenomenon because they see individuals who continue their education can survive with changing circumstances.

Income

The income in question is the average income received by the respondent every month. Based on the results of the study, it is known that the income of respondents can be seen in Table 3.

Table 3. Distribution of respondents' income

Income	Frequency (F)	(%)
Low (<Rp.2.649.000)	29	54
Medium (Rp.2.649.000-3.815.000)	22	41
Height (>Rp.3.815.000)	3	5
Total	**54**	**100**

Based on Table 3, it indicates that the income level of the respondents is still low. The income of respondents in the low category is dominated by respondents with occupations, namely self-employed. In a study conducted by Darmasetiawan **[17]** that the wages of a job in various regions and even within a region are not always the same. One of the factors that give rise to these differences is the imperfection in labor mobility. The imperfection of worker mobility is caused by geographical and institutional factors.

Behavior

The behavior referred to in this study is the respondent's action on waste management household dense. The frequency distribution of respondents' behavior in the study can be seen in Table 5.

Table 4. Behavior Frequency Distribution

Behavior	Frequency (F)	(%)
Don't understand	29	54
Already understand	11	20
Haven't taken action yet	14	26
Total	**54**	**100**

Analysis of the data used in relation to people's thinking processes regarding these behavioral factors is using the Miles and Huberman model. On the behavior of the service community regarding waste knowledge, this was conveyed in interviews conducted with respondents regarding solid waste management, it was found that 29 respondents stated that the habits of the people in the District Service did not know much about waste management and 3R waste sorting and also the attitude of throwing garbage indiscriminately and burning. garbage in certain yards. Meanwhile, 11 respondents stated that they understood household solid waste management and took action on household solid waste management such as sorting 3R waste. While 14 respondents have understood but have not taken action on household solid waste management.

Research conducted by Widiyono **[1]** reports that the environment (including culture) has a major influence in shaping a person's personality. Personality, he said, is nothing but a consistent pattern of behavior that describes the history of reinforcement that we experience. Everyone has a certain pattern of attitudes and behavior due to the reinforcement (reinforcement, reward) from the community for these attitudes and behaviors, not for other attitudes and behaviors.

Knowledge

Knowledge of local regulations referred to in this study is the respondent's understanding of household solid waste management regulations that apply in their area. Based on the results of interviews, it was found that respondents with high knowledge of local regulations were 54 respondents who already knew about local regulations. This indicates that respondents' knowledge of local regulations is quite good. In research that socialization plays a role in knowledge of regulations, if the regulations are really enforced then of course this will have a deterrent effect on the community. who violated it. Enforcement of this law will have a positive impact on better household waste management.

Willingness to pay retribution

Willingness to pay retribution referred to in this study is the willingness of respondents to pay service fees related to household solid waste management. Based on the results of

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interviews with respondents with a high willingness to pay levies, there were no respondents who did not participate in their willingness to pay levies. This is because the cleaning fee is integrated with the payment for drinking water at the PDAM and most people have subscribed to the PDAM. This indicates that the willingness of respondents to pay levies is quite high. In a study that people who are aware of the importance of environmental cleanliness are willing to pay a retribution as long as they get good waste management services by the government. Based on research on the factors that influence the management of household solid waste, there is a factor with the highest category, namely the willingness to pay user fees.

Community and Government Involvement in Household Solid Waste Management

Community and government involvement in household solid waste management consists of decision making, implementation, supervision, policy makers and service providers.

Decision-making

Decision making is the initial stage of the respondent's involvement in household solid waste management. Based on the results of the study which showed that the decision making of respondents was low, this was because on average the respondents were self-employed workers and civil servants who had enough busyness so that they rarely participated in attending meetings regarding waste in the district of services. However, respondents agreed and supported the ideas and opinions in meetings related to waste management in the service district. In accordance with research that providing ideas and opinions can be an indication of the level of public awareness to be actively involved in waste management.

Organizing

Implementation is participation respondents in the implementation or implementation of household solid waste management. Based on the results of the research, the respondents' interviews were quite high due to the involvement of respondents in organizing the collection, separation and processing of waste which was dominated by respondents with self-employed jobs. Regarding the implementation process, coordination between communities is needed and can provide advice to the government in creating a clean and comfortable environment.

Supervision

Supervision is the participation of respondents in evaluating the lack of management of household solid waste. Based on the results of the study, it is known that the involvement of the respondents' supervision of concern in paying attention to waste management in the environment is quite good due to the high sense of the respondent's desire to create a good environment which is then based on the high old cultural values of the local community regarding coordination and supervision. According to research that in monitoring or supervision which is defined as gathering information about facts and making decisions during the implementation process to assess a particular object or activity being observed

Household Solid Waste Management Strategy in the District ofServant

Based on the results of the SWOT analysis matrix assessment above, strategic priorities can be formulated so that the management of household solid waste in the District ofServant is more optimal, including:

Implementing a policy to be obliged to utilize the availability of garbage bins on the roadside for temporary waste disposal sites (S3O1). In accordance with Regional Regulation 8 of 2013 that there is a prohibition for any person/body to throw, pile up, store on roads, green lanes, parks, rivers, public facilities and other similar places and dispose of waste outside the designated disposal site or location. By following the requirements for communal housing as stipulated in SNI 19-2454-2002, namely waste in the form of boxes, cylinders, containers, bins with lids that are lightweight, easy to move, and emptied and made of metal, plastic, fiberglass, wood, bamboo, rattan with sizes for roadsides and gardens of 3040 liters. It is expected to be able to make people take advantage of the availability of garbage bins properly.

Manage household solid waste with the 3R principle for waste generation to the TPA (S2T2) and reduce waste starting from the source by reducing the use of goods that produce waste (W3T1). In Law Number 18 of 2008 that everyone is obliged to carry out three main activities in the implementation of waste reduction activities, namely limiting waste generation, recycling waste, and recycling waste. These three activities are the embodiment of the principle of environmentally sound waste management called 3R (reduce, reuse, recycle). The benefit of managing household solid waste with the 3R principle is that the waste generated from the source can be directly managed without adding to the waste generated at the TPA, so that the waste in the TPA only remains. This can reduce the need and cost of household solid waste management facilities and infrastructure.

Fully support community participation in the 3Rs. By conducting socialization and training on household solid waste management from the sub-district level to the RT (S2O2). One of the determinants in household solid waste management is the participation of the community, involving the community to participate in managing waste starting from sorting organic and inorganic waste and processing organic waste using a household composter, and involving managers from the local community to recycle. recycling of inorganic waste and composting on an environmental scale. Based on Permenpu 3 of 2013 that the implementation of 3R activities is based on the principle of community needs. 3R activities are focused on waste management at the source and socialization/activities campaigns are still being carried out in an effort to do so. The government can carry out socialization from the sub-district level to the RT which is expected to be able to make all layers of society absorb information on the importance of implementing household solid waste management and implementing 3Rs.

Take advantage of the community's willingness to pay user fees to increase the APBD in waste management (S5O4). The determining factor for the operational quality of waste management services is user fees. in local regulations of 2013 the government is obliged to provide services in the field of

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waste by collecting a retribution for waste/cleaning services. By increasing the APBD from community levies, it can be used to increase waste handling service activities, provide waste collection facilities, restore the environment due to waste handling activities, as well as increase the competence of waste management. so that household solid waste management can be implemented properly.

Provide adequate facilities and infrastructure for managing household solid waste in the community (W3O4). Factors affecting waste management are facilities for collecting, transporting, processing and final disposal of waste. In PP RI Number 81 of 2012 that collection and transportation tools are provided, including segregated waste. The available infrastructure facilities need to be improved to support community involvement in household solid waste management. So that people who have done waste sorting can further process the results of the sorting in household solid waste management activities. With the calculation of SNI 3242-2008, the waste collection tools contained in the form of 1 m3 motorized carts as much as 1 unit with recitation 2 times per day based on the calculation of the ideal equipment needs of 12 units of motorized carts; The means of transporting waste in the form of a dump truck of 6 m3 1 unit with 2 cycles per day based on the calculation of the need for equipment, ideally 2 units or an increase in transportation traffic.

Create a waste management model with depot transfers without TPS so that household solid waste management runs more effectively and efficiently (W4O1) There is no TPS because the land for making TPS has been made for residential land. At the location, there is already a qualified deposit transfer based on SNI 19-2454-200 which is easy to enter for waste collection and transport facilities and not far from the source of the waste. Based on the type, namely type III transfer depot where its function is as a meeting place for carts and 6-10 m3 containers suitable for areas where it is difficult to get vacant land. It is better if the transfer depot is not only used as a meeting place for transportation and gathering tools but can also be used as a parking lot for carts and sorting waste.

Cooperate with waste processing and collector businesses to improve the efficiency of household solid waste management (S3O3) results. The community cooperates with third parties to sell the waste they have managed so that the waste can be of sale value and be economically beneficial. Able to increase income for the community and business people processing and collecting waste.

Provide information data about waste management that is easily accessible by the public such as through social media, websites, television advertisements, bulletin boards, etc. (W2T2) In PP RI 18 of 2012 the government provides information on household solid waste management by at least providing information on the source, generation, composition, characteristics, facilities, and other information related to household solid waste management. This information must be accessible to the entire community. This information can be disseminated through social media, websites, television advertisements, and bulletin boards placed at the sub-district and village offices as a basis for public knowledge to manage household solid waste.

Conducting socialization to the community regarding examples of household solid waste management that have been running and are successful (W6O2) People tend to find it difficult to accept change, this can be overcome by providing socialization to the community regarding examples of household solid waste management in an area that has been running and has worked well so that waste management can be managed properly in accordance with Jambi City Regulation No. 8 of 2013. The government can planning socialization activities with resource persons from the office or person in charge of household solid waste management in the area that has been running and successfully carried out on an ongoing basis. This socialization can indirectly change the mindset community in maintaining health as well as in managing waste originating from the household environment. The importance of this activity is so that people who are less aware and understand in maintaining the health and cleanliness of their environment know how important it is to keep themselves and their surroundings clean.

IV. CONCLUSION

Based on the results of the study, it can be concluded that the factors that influence waste management include issues of education, income, behavior, knowledge of regional regulations, and willingness to pay retribution. Meanwhile, regarding community involvement in household waste management, it is influenced by local government decision-making factors, the implementation of household waste management and the supervision carried out. The strategy that can be applied in the Service District of Jambi City so that household solid waste management is more optimal is a defensive strategy, namely reducing waste from the source by reducing the use of goods that produce waste and providing information data about waste management that is easily accessible to the public such as through social media. , websites, television advertisements, bulletin boards, etc. in accordance with (Perpres RI Number 97 of 2017: National Policy and Strategy for Management of Household Waste and Waste Similar to Household Waste, 2017: 5-6). It is recommended that the community get used to making efforts to separate waste, and broaden their knowledge of household waste processing through local local institutions, and actively participate in waste management through empowerment.

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