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Study Of Urban Waste Management Based On Community Participation To Zero Waste In The District Ngawi

Hengky Pudji Suryanto
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STUDY OF URBAN WASTE MANAGEMENT BASED ON COMMUNITY PARTICIPATION TO ZERO WASTE IN THE DISTRICT NGAWI 142 - 159

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Study of Urban Waste Management Based On Community Participation To Zero Waste In Ngawi Regency

Hengky Pudji Suryanto¹⁾
Suryanto²⁾

Abstract

The increasing number of waste in types and amount at metropolis have far exceeded service capacities and medium management of existing waste, so the amount of waste which comes to TPA (Final Place of Exile) progressively abundance.

According to the result of analysis of *pairwise comparison*, policy of government have the highest score, it means that management efficacy of town waste with concept of zero waste in TPA Selopuro need commitment of development responsibility from government in the form of policy, so that management of town waste in TPA can be done effectively, efficient, integrated, and synchronized with institutional system and target wished to be reached by each side in concerned.

Through policy of waste management with approach of zero waste by pemulung in TPA Selopuro, by entangling all stakeholder which is relevant to be, expected by concept of zero waste can lessen impact contamination of environment effect of existence of heaping of waste, lessening government responsibility in overcoming operating expenses management of waste, powered of society around TPA so that it can lessen social difference and conflict about existence of TPA followed with improvement of growth of economies in the society area.

Keywords : *waste management, zero waste, the people participant*

JEL : Q53, M11

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I. BACKGROUND

According to Poerwanto (2000), the rapid population growth led to the increasing variety of social and economic activities of society, the construction of municipal facilities such as business center, commercial, and industrial, especially in big cities, has negative impacts, namely: (1) The occurrence of ecological imbalance as a result the increasing number of waste volume; (2) The narrowness of green area due to pressure from the construction of housing and commercial facilities. The increasing number and types of waste in big cities has far exceeded the capacity of services and waste management facilities that are ready, hence, the amount of waste that goes to landfill (Tempat pembuangan Akhir/TPA) is more abundant, as a result, it emerged environmentally and health problems such as contamination of odors, water pollution due *leachate*, decreasing the level of aesthetics, where the development of insects and mosquitoes and the faster, the landfill is full and short-lived, raising fears no more land for the landfill. If that happens then maybe people will be buried in a pile of garbage they produced.

Based on the results of a study to estimate the amount of trash by the Kantor Lingkungan Hidup Kabupaten Ngawi, through a population approach and the standard volume of waste the city of Ngawi in fact, increase the amount of waste in Ngawi experienced a significant increase, wherein 2007 the number of wastes at 5199.6 tons per year (28682.8 m³ / year) and in 2010 increased to 10782.9 tons per year (45637.75 m³ / year). The increased amount of garbage and increase the number of residents in the town of Ngawi can be presented in Table 1.1 and Table 1.2.

Table 1.1 Volume of Trash

No	Month	Year 2007 (ton)	Year 2008 (ton)	Year 2009 (ton)	Year 2010 (ton)
1	January	413,8	742,0	819,0	794,8
2	February	377,4	730,2	736,6	756,4
3	March	437,6	767,1	820,0	830,2
4	April	451,1	705,3	789,3	808,5
5	May	453,7	680,1	816,9	835,5
6	Juny	426,6	708,1	790,2	808,8
7	July	439,8	817,9	816,2	971,5
8	August	442,5	823,1	823,1	1.016,8
9	September	430,7	801,5	798,9	981,2
10	October	441,2	820,6	819,6	997,6
11	November	431,0	801,7	800,1	981,2
12	December	454,2	844,8	832,7	1.000,4
Amount		5.199,6	9.242,8	9.662,4	10.782,9
% addition		-	43,744	4,342	10,391

Source: Environment Office, Ngawi Regency 2010

Table 1.2. The Increasing number of Residents in Ngawi

year	Number of population (inhabitant)	%	square (km ²)	Popolation density (inhabitant/km ²)	%
2007	78.581	-	70,56	681	-
2008	78.997	0,527	70,56	686	0,729
2009	84.076	6,041	70,56	1.196	42,642
2010	93.959	8,390	70,56	1.332	10,210

Source: BPS Ngawi Regency 2010

Based on Table 1.1 and 1.2, Ngawi Regency with an area of 1298.58 km², spacious urban 70.56 Km² and a population of Ngawi in 2010 amounted to 912.568 inhabitants, with a growth rate of 2.3 people per year and the number of population in Ngawi (urban) 93.959 inhabitants. When compared to the year 2009, the urban population in Ngawi has increased quite significantly; it is increased by 9.597 people or 10.2% over the year. The population density shows the ratio between the numbers of residents in a territory. The population density of Ngawi (urban) in 2010 amounted to 1,332 people / km², up about 136 inhabitants per kilometer from 2009. Based on these conditions.

It is inevitable that an increasing number of people are always directly proportional to the increase in the amount of waste volume. Assuming every one person in one day on average produces waste 2 kg /day (KNLH, 2008) it is predicted that the next 10 years TPA Ngawi City with an area of 1.6 hectares which has been operating since 1996 and a lifespan of 15 years would not be enough to accommodate total volume of waste generated from the activities of the population, if the waste is not managed properly.

Government of Ngawi needs to implement a policy program 3R (Reduce, Reuse,

Recycle) and a model of integrated waste management called zero waste concept (BPPT, 1999), which is a concept that aims to reduce waste as much as possible in order to reduce the burden of pollution and management of urban waste, it is highly related to the technological options based on the concept that a clear and straightforward, and can be justified technically, economically, and environmentally. This concept allows the improvement of the standard of living of the scavengers and the communities around the landfill became more noble and humane to treat them as partners in tackling the problem of waste in Ngawi due to the utilization of garbage by scavengers can be seen as potentially containing an economic value.

Undang-Undang Nomor 18 Tahun 2008 on Waste Management has emphasized that local governments are to ensure that waste management and environmental -based. Applicability of the legislation would not want the local government should make waste management as one of the priorities in the policy development in the area.

Given the volume of waste will continue to grow along with the increase in population and economic growth. Volume uncontrolled waste occurs as a logical consequence of human activity and industrialization, which then affects the problems of the urban environment such as the beauty of the city, public health, and further natural disasters (explosions of methane gas, landslides, air pollution due to open burning and etc).

Settlement of the problem of waste must be done in a systematic and integrated by involving all stakeholders and stakeholders as well as the active participation of the community. Since the era of regional autonomy in 2000, waste management is in under the authority of local government, but on the other hand, Local Government still considers the waste has not been a priority, it can be seen from the budget allocated for waste management is still <1% of the total budget Ngawi, as well as the low-income areas of the waste sector.

The system of waste management in Ngawi can be said still classified using the traditional concept that embraces the concept of gathering, transport, and waste, as well as

Selopuro landfill where waste management systems today still use open dumping. The system is still being used because people do not know how to manage garbage well, starting from how to reduce landfill waste domestic (reduce), reusing domestic waste which is still fit for use (reuse) and recycling of domestic waste (recycle) so that garbage can be valuable in the economy.

All parties involved in waste management must constantly improve his work both in quantity and quality. The speed of population growth and the level of waste volume to make the manager must continue to compete with the amount of waste that must be managed. Limited funds and technology are often forced to make failure to manage waste. Therefore, it is necessary to do research on alternative waste management in order to improve waste management imperfections Ngawi Regency.

1.1. Formulation of the problem

Issues examined in this study is how sustainable forms of waste management based on community participation Ngawi Regency. This research is done through the identification of the current forms of waste management, as well as the role of today's society, the participation of stakeholders, and development possible. Study/research on waste management has been a lot done with a focus on the different studies among others on waste management, the performance analysis of the economic, institutional waste management, pollution caused by garbage, etc.

Ngawi regency with an area of 1.298.58 km², spacious city (Urban) 70.56 Km² and a population of 912.568 inhabitants districts, with a density of 1.49 inhabitants per km² as well as the growth rate of 2.3 people per year total population of 93.959 inhabitants Ngawi City. Nowadays, they who get waste management services is limited in urban areas consisting of four villages (Beran, Jururejo, Grudo, Karangasri) and 4 villages (Margomulyo, Karangtengah, Ketanggi, Pelem) in District Ngawi, but growing management in the area of Urban (urban), the service area plans are developed mainly in the district of Ngawi Village (Ngawi, Karangtengah prandon, Watualang), District Geneng Village (klitik, Tambakromo), District of Paron Village (Paron, bun), District Pitu Village (Selopuro for TPA), with potential waste generation amounted to 126.77 m³ per day and 96.62 m³ per day (80%) were transported to landfills / TPA (Source: Data from the Department of Public Works Highways, Human Settlements and Hygiene Ngawi/ Dinas PU Bina Marga, Cipta Karya dan Kebersihan Ngawi Regency). Means of waste disposal that there is 1 (one) location transfer depot in the village Karangtengah and 18 polling locations spread over four (4) Village and 4 (four) villages, and villages and other urban outside the District of Ngawi, 1 (one) landfill sites Selopuro village Pitu subdistrict, in each sub-district (15) were also there the waste facility.

The increasing the number of volumes of waste and the increasing the number of population in Ngawi from year to year were resulting in the reduced land that can be used for landfill. Garbage that does not cause adverse impacts, can be used as a valuable economic commodity for humans which may ultimately reduce the subsidy to be provided by the government and thus the need for a waste management system that is adequate from a variety of aspects such as economic, social, institutional aspects, and the aesthetic aspects of the environment.

Community participation and scavengers have a positive result in terms of causes: (1) The reduction in the volume of waste to be dumped; (2) the reuse waste that still can be used again (recycling); and (3) Providing job opportunities for scavengers and residents around the landfill. While the negative side of the scavenging garbage is that it can cause workplace accidents and health, as well as aesthetic effects and social conflict. This illustrates the importance of capacity pickers in municipal waste management.

Coordination and cooperation between Local Government, Public Works Department of Highways, Human Settlements and Hygiene and Environment Office of Ngawi, society, both as a provider / waste producer or society as a manager as well as beneficiaries of garbage, the private sector / entrepreneurs in the waste management system of the place temporary disposal (household level) up on an industrial scale composting is one solution to tackle the problem of waste that occurred in the town of Ngawi. The success of a municipal waste management system is inseparable from the role of the various input manager that is in it, namely households, RT / RW, local authorities, employers scavengers and recycling used goods from waste.

From the description above, the question of research obtained in this study is: How is Sustainable Waste Management Forms- Based Public Participation towards Zero Waste in Ngawi City?

Based on the description and study questions above then obtained the following questions:

1. How is the waste management system in the application of the TPA Selopuro towards zero waste??
2. How is alternative governance of waste in the landfill Selopuro?

1.2. Objectives

This study aims to formulate a sustainable alternative waste management at the landfill Selopuro. The specific objectives of this study are:

1. Describing the waste management system in the landfill Selopuro.
2. The Identification of the alternative sustainable governance of garbage in the landfill Selopuro and the role of the parties (stakeholders).

1.3. Benefits

The benefits of the research are:

1. The identification of sustainable forms of waste management based on community participation Ngawi City, which can be used as input to the Government of Ngawi in order to improve waste management services performed.
2. As reference material for the study of the improvement of waste management in a sustainable manner based on community participation.
3. As a reference for the public (or private individuals) who wish to participate in waste management Ngawi City.

II. LITERATURE REVIEW

2.1. Definition of Waste

According to Azwar (1990: 53), waste is something that is not used anymore, which cannot be used again, unwelcome and should be discarded, the trash, of course, must be managed as well as possible, such that things that are negative for the life do not happen. Kodoatie (2003: 312) defines the garbage is waste or effluent that is solid, semi-solid which is a byproduct of urban activities or the life cycle of humans, animals, and plants.

Garbage in environmental health sciences (refuse) is only a subset of objects or things that are seen are not used, not used, not liked or to be disposed of, so as not to interfere with survival. According to the Department of Public Works (1990), the garbage is waste that is solid consisting of organic and inorganic substances that are considered no longer useful and should be managed so as not to harm the environment and protect the investment of building.

Urban waste is waste that arises in the city and did not include trash hazardous and toxic materials (B3). Hadiwiyoto (1983: 12), defines the garbage as the remains of materials that undergo the treatments either because it has taken the main part or because of processing or because it had no benefit in terms of the economy and in terms of the environment can cause disruption health or nuisance sustainability. Based on some notion of junk like the above, it can be defined trash is residual materials, waste or effluent is solid, semi-solid which is a byproduct of the activities or the life cycle of humans, animals, and plants.

2.2. Waste classification

According to Hadiwiyoto (1983: 25), waste classification by nature is divided into two kinds, namely:

1. Organic waste, waste consisting of leaves, wood, paper, cardboard, bones, remnants of fodder, vegetables, and fruit. Organic waste is waste that contains organic compounds composed of the elements carbon, hydrogen, and oxygen. These materials are easily degraded by microbes in.
2. Inorganic waste, waste consisting of tin, plastic, iron and other metals, glass, mica or materials that are not composed of organic compounds. Trash cannot be degraded by microbes.

According to Hadiwiyoto (1983: 24), based on its location, the waste can be classified into two, namely:

1. Municipal solid waste (urban) that the waste collected in big cities.
2. Regional Waste, waste collected in areas outside urban areas, for example in the village, in a residential area, and at the beach.

2.3. Waste Management System

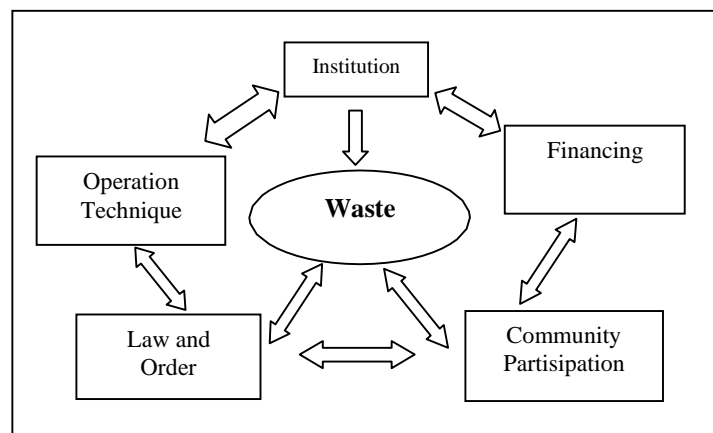
Waste management is the effort organizing or managing the waste from the collection, separation, removal until treatment and disposal (Human Settlements, 1993). Waste management is composed of two types of local management (people) and the centralized management of the environment or urban.

According to Kodoatie (2003: 217), the urban waste management system is basically seen from the components that mutually support one another mutually interact to achieve the goal of a healthy city clean and orderly. These components are:

1. Operational Technique aspect (teknik)
2. Intuitional aspect (institusi).
3. Financial aspect (finansial);
4. Law and management aspect (hukum).
5. Society contribution Aspect.

Because the municipal solid waste management system should be intact and does not cut the chain of the ecosystem will require coordinated action, synchronization, and simplification. For improved handling of solid waste, a lot of things that should be reviewed operations include collection, transportation, and final disposal as well as the equipment used. Besides, the very role is in the organization and management aspects of management.

According to the DPU (1990), essentially urban waste management systems are seen as components of subsystems that support each other, interact and relate to each other, as in Figure 2 below:



Source: Public Work Department, 1990

Figure 1. Scheme of Urban Waste Management System

2.4. Sustainable Waste Management (Sustainable)

Sustainable means satisfying our present needs without compromising the interests of the ability of future generations in fulfilling needs. Sustainability is an ethic, principles and oriented view of the future, which is able to compete successfully in the global economy and maintain the vitality of the social, cultural, political, defense and security, and the environment in the broad sense (Budiharjo, 2005: 25).

To address the issue of waste in a sustainable manner, it should be done by looking for alternatives management. Alternative waste management should be able to handle all the problems of waste, including potential impacts on natural resources.

As defined by Budiharjo (2005), it takes five basic principles to establish a sustainable city, i.e. Ecology, Economy, Equity, Engagement, and Energy. Furthermore, it specifically for implementation in Indonesia added more ethical and aesthetic development of the city.

Thus, it means that the waste management sustainable means management is carried out based on the ability of its resources (engagement), able to maintain the physical condition of the environment (ecology), oriented to be able to compete (economy), and can be passed down to future generations (equity and energy). Sustainable waste management and environment which are:

2.5. The Management of Zero Waste

The concept of zero waste is the waste management concept that integrates the principles of the 3Rs: reduce, reuse, and recycle by processing as close as possible to the source. Reduce is to reduce waste generation at source. Reuse is an effort to reuse waste or goods that are no longer useful, while recycling is recycling of garbage (useless stuff) into other products that are more economical. The concept of zero waste has three benefits (Bebasari, 2004): (1) reducing dependence on landfill (Landfill) of waste that is increasingly difficult to obtain; (2) Improving the efficiency of urban waste processing; and (3) The creation of opportunities for people. The application of the concept of zero waste to be successful when done integrated and holistic, involving all actors (stakeholders) involved, such as governments, businesses, NGOs, and communities.

The concept of zero waste is part of an integrated waste management system. Inside, it had been done a screening of the techniques that are suitable, appropriate technologies and management program that can be applied, so that specific waste that exists in each region or source can be minimized by good; for example through recycling (recycling), and composting (composting).

2.6. Integrated Waste Disposal Sites (TPST)

Processing waste by using old paradigm requires landfill up to hundreds of hectares to hoard junk. By dividing the land into several parts, and before discharge treated properly, then the required land does not need to be extensive, and with the use of technology in managing waste can reduce landfill waste by 90 percent. (BPPT, 2007: 3).

The application of waste processing more modern technology, efficient, and environmental friendly is the Integrated Waste Disposal Sites. Integrated means waste processing is done at a specific location (manufacturing), and the results leave no new garbage processing. System processing is performed:

1. Organic Waste / International Bio Recovery (IBR) is a system of processing organic waste into solid and liquid fertilizers within a maximum of three times 24 hours, using a microbe that is responsive to heat to process the rest of the trash without.
2. Incinerator. It is done by burning incinerator that will generate ash as raw material for the manufacture of building materials such as the manufacture of paving blocks and particle board, and as a powerhouse of energy produced.
3. Recycling, which is reprocessing into useful items, so we get the economic benefits directly and generate a stream of material that can supply industry

2.7. Waste Management by Waste Collector (*Pemulung*)

Scavenger's role in the handling of municipal waste is very important. It is because the scavenging activity can overcome the accumulation of garbage at source and landfills. Waste management technology using the machine cannot be done at this time, especially in Ngawi. It is more due to the limitations of both financial capital and labor because energy and operational tools require special skills. This means that not everyone mastered the technology. So the role of waste pickers in recycling activities in order to reduce environmental pollution load is needed.

III. RESEARCH METHODS

3.1. Research Location

This research was conducted at the final disposal (landfill) Selopuro, District Pitu, Ngawi which is the location of the landfill Ngawi City with an area of 1.6 ha.

3.2. Respondents Defining Technique

In this study, respondents were divided into two categories. The first is the respondents consisting of scavengers and from the stalls/collectors. From the observation and survey, respondents (scavengers) who would be interviewed as many as 40 people out of a population of 40 people, while for stall/collectors in the landfill, making the overall respondents i.e. 10 people from a population of 10 shanties/collectors. Second, respondents are from experts to study the role of the parties (stakeholders) in determining the alternative governance sustainable trash.

3.3. Types and Source of Data

The required data is primary data and secondary data. The primary data is collected through questionnaires and in-depth interviews (depth interview). Secondary data by reviewing a variety of sources such as reports, results of previous studies, as well as other important documents that support the goals of research, including data on waste management abroad and in other areas that are considered successful as a best practice model.

3.4. Technique of Collecting the Data

Methods of collecting data used survey methods with interviews with respondents and informants related, later described descriptively on sample data. Informants in this study are the community, Kantor Lingkungan Hidup Kab. Ngawi, Dinas PU Bina Marga, Cipta Karya dan Kebersihan Kab. Ngawi, scavengers, shanties and the parties involved in the management of municipal waste.

Data collected for alternative governance and the role of stakeholders of waste whether it is effective and efficient in the handling of garbage is done descriptively by means of interviews with relevant stakeholders such as Dinas PU Bina Marga, Cipta Karya, Kantor Lingkungan Hidup Ngawi Regency, the private sector, scavengers, and society composed of four experts. Basic considerations in the determination or selection of experts/respondents used the following criteria:

- a. The existence and the willingness of experts/respondents to be interviewed.
- b. Having a reputation, position and has demonstrated its credibility as an expert or specialist in substance under study.
- c. Having experience in the field, in this case, the environmental policy and standardization.

3.5. Data Analysis

The research data on the landfill Waste Management Pattern Selopuro were analyzed in the descriptive qualitative method so it can give the reader a systematic, factual, and accurate information on waste management activities are ongoing at this time. For the analysis of aspects and sub-aspects of the role of the parties (stakeholders) and alternative governance effective and efficient garbage at the landfill Selopuro, the descriptive was done with the quantitative approach with pairwise comparison method (pairwise-comparison).

Making the structure determination of priorities is very important, especially to know the criteria or sub-criteria used, so it will be easier in the next stage. After the criteria and sub-criteria were determined, then it was determined how important a criterion for eligibility or other sub-criteria. To know this, then it was done Delphi method which used survey method with a questionnaire and then sends it to an expert or a competent person in the field of solid waste in the area around the landfill Selopuro research.

IV. DATA ANALYSIS AND DISCUSSION

4.1. The Analysis of Waste management Pattern in TPA Selopuro

The amount of waste in Ngawi continues to increase along with population growth. Ngawi City waste generation in 2010 reached 45637.75 m³ / year or about 126.77 m³ / day with an average litter is transported only reached 96.62 m³ / day. Such conditions directly contributed to the increase in the volume of waste and pollutants at the final disposal (TPA) located at the landfill Selopuro. The increasing the amount of waste in the landfill Selopuro require Ngawi City Government to seek opportunities using environmentally friendly technologies that involve personnel in the landfill itself, the surrounding community and non-governmental organizations.

Waste management system at the landfill Selopuro today is still using a system of open dumping that waste disposal in the open, where the waste is disposed only on the bare ground and left to rot without any process of backfilling, compacting and closing with the ground so that it can have a negative impact on the surrounding environment, such as odor pollution, where the development of insects and mosquitoes. To reduce the negative impact caused by the accumulation of garbage in the landfill Selopuro, Ngawi regency, the government sets up the infrastructure of compost that has not operated optimally. Composting aims to reduce the burden on the landfill of waste continues to increase, reducing the cost of waste management, the use of simple technology, providing value-added and labor intensive.

Partnership system has not been conducted by the Department PUBMCK and Sanitation of District. Ngawi so it has not been able to reduce the amount of garbage as a whole because, during this existence of this infrastructure, it is only operated by personnel who work at the landfill, the trash is composted only waste from market waste, while waste from household garbage, shops, industries, public facilities, and social, sweep streets and others have not done. This illustrates that there is still much waste discharged into the environment and not utilized. Hence, most likely the litter will accumulate and pollute the surrounding environment as it will affect the volume of *leachate* discharged into the soil as a result of groundwater quality would decline. Based on interviews and direct observation, market waste is organic waste that is easily decomposed and 75% of the waste can be composted garbage consisting of vegetables, fruits, and leaves. Trash market is still the main raw material in the landfill composting Selopuro.

If this condition persists Selopuro landfill will fill up quickly and requires a very expensive cost for new land acquisition. Not only financial conflicts faced but social conflicts will arise because not all people accept the existence of landfill. Because in general, people already know the impact that would be caused by a landfill that is the negative impact on the quality of the environment such as pollution of water, soil, and air. Based on interviews and direct observation in the field businessman compost only involves workers coming from the compost plant alone. While scavengers are not empowered and engaged in the activities of composting, scavengers only act as a collector recycling of inorganic waste materials then sold it to stall. The existence of scavengers are not bound or spontaneity without setting clear meaning whenever they can come and go without any binding rules that do not guarantee their presence in the long term, in addition to the risk of accidents and safety is still vulnerable. Scavengers only had a working relationship (bond) with a stall as a reservoir to buy items they collected. Indirectly this condition gives a negative stigma against scavengers. Scavengers were seen as unimportant and as if they are helpless because of the inability and ignorance about the magnitude of the role of scavenger if it is involved in the management of waste in the landfill Selopuro. Even though, indirectly scavengers have a big hand in reducing the burden of environmental pollution. This condition is due to the public perception that it is the responsibility of handling hygiene janitor. Knowledge and sense of public ownership of the landfill are very low. In addition to non-technical constraints, technical constraints are also influential in management activities at the landfill. Among other limitations of operational officers in the field, the condition of the machine that is damaged makes the number of heavy equipment operated very limited. This shows that the scavengers based waste management and community participation towards zero waste in landfill Selopuro are not yet fully implemented. This condition causes the management of waste in the landfill is not optimal Selopuro.

The waste problem may not be resolved if it just managed by PUBMCK and Ngawi Hygiene Department of the District. It is given the amount of garbage that is increasing every day while the capacity of the compost processors infrastructure is very small in processing waste. Garbage is processed only organic waste while the inorganic waste is predominantly used by scavengers. Conceivably, if the presence of scavengers does not get attention and place as business partners, the TPA Selopuro has always been a sea of garbage. While land for waste disposal is very limited and land acquisition costs very expensive. It ironically exists in the waste management system in Ngawi. Conflicts of interest are always behind the existence of the landfill. Sometimes the conflict is very confusing because of most of the scavengers, shanties, and traders who make a living in the landfill Selopuro mostly residents around the landfill. The existence of the landfill is helping the economy of local communities that make a living in the landfill. Conflicts occur as a result of the gap between those who are directly involved and who have no part or benefit from the presence of the landfill. If it is not immediately anticipated, these conditions will be a big problem, especially for the Government of Ngawi and also scavengers, shanties, waste recycling industry and merchants who depend on the existence of the landfill. Therefore, the Government of Ngawi should seek the best solutions by involving all stakeholders associated with the presence of TPA Selopuro including scavengers, shanties, waste processing industries, and the surrounding communities in order to avoid a new conflict. It is the time for Government of Ngawi to provide opportunities and it is the opportunities for scavengers and the surrounding community and managed in the monopoly of the certain group so that equalization can be felt by the entire community around. Hence, it results in the sense of ownership and responsibility towards the existence of the landfill.

To enhance the role and capacity of scavengers at the landfill Selopuro when the study was also conducted socialization on the importance of waste reduction independently and self-sustaining through composting and making charcoal from wood and twigs as well as household waste materials, offices, factories and others. This activity received a positive response from scavengers. Basically, Selopuro scavengers at the landfill would be directly involved, as long as these activities can provide benefits and economic benefits, it is not time-consuming and does not interfere with their work in garbage scavenging. Scavengers will be motivated to do the recycling bins if they are supported financially and there is the input of technology that is easily accepted and accessible both individually and collectively. Thus, the most important thing is that every product they produce is guaranteed and marketed clearly. It means that the activity will be sustained in the long term for their market and economic benefits received.

Ngawi regency's government should be able to empower and increase the capacity and the role of scavenger and the participation of local communities to reduce the environmental burden from the dangers of pollution and gain economically benefit by their jobs. Hence, the burden of funding for waste management can be minimized.

4.2. The Alternative Analysis of Waste Management in TPA Selopuro *Stakeholder's Role*

Based on the discussion with experts in the field of solid waste, and research, there are five aspects related to and significantly affect the success of alternative governance with the concept of zero waste garbage in landfill Selopuro, namely: (1) aspect of focus; (2) aspects of factors; (3) aspects of the actor; (4) aspects of the objectives and (5) an alternative aspect. Those are then elaborated into sub-aspect based on discussions with experts as shown in Figure 4.14.

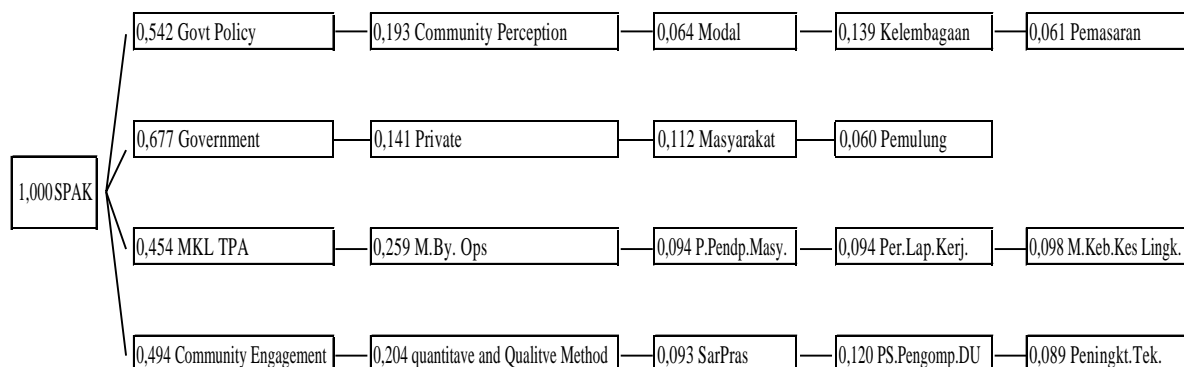


Figure 2. Alternative Structure and Management System in Municipal Solid Waste Management in landfill Selopuro

1. Focus Aspect

The role of each stakeholder and the alternatives of the garbage management are focused on management systems and alternative in managing municipal waste in the Ngawi city (SPAK) because of the magnitude (size) and the complexity of the institutional structure is the most influential tool for efficient achievement of the objectives of policies of an organization.

2. Factorial Aspects

The results of analysis using pairwise comparisons against five sub-aspects of factors obtained subkey aspect of aspect factor are government policy (1) with a score of 0.542 and the knowledge society (2) with a score of 0.193 subsequent institutional, capital and marketing that each score is 0,139; 0,064; 0.061. This can be seen in Figure 3.

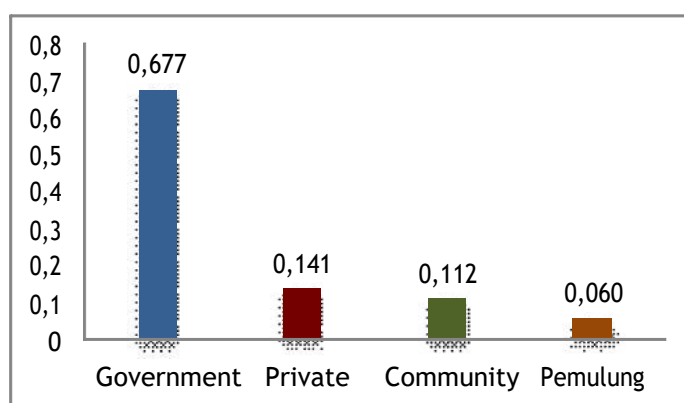


Figure 3. The level of importance of each factor to management system and alternative management of municipal waste in landfill Selopuro

The high contribution of government policy based on the analysis method of paired comparisons gives the sense that for the success of the municipal waste management based on participation scavengers and society to the concept of zero waste in landfill Selopuro, ultimately, it is necessary needed development commitment and moral responsibility of relevant parties, especially the government in the form of policy, that the waste management cities in the landfill can be done in an effective, efficient, integrated, and synchronized with the institutional system and the objectives to be achieved by each of the parties involved. However, the successful management of waste in the landfill with zero waste concept, is not only determined by government policy, but it needs to be supported by other factors such as the knowledge society, institutional waste management that ensures successful handling of municipal waste, for example, need to set up a special commission handling municipal solid waste involving community leaders, religious leaders, NGOs, experts, and law enforcement officials.

3. Actors aspect

In the aspect of behavioral analysis, its results show that the perpetrator has the highest score is the government followed by private, public and scavengers shown Figure 4.16.

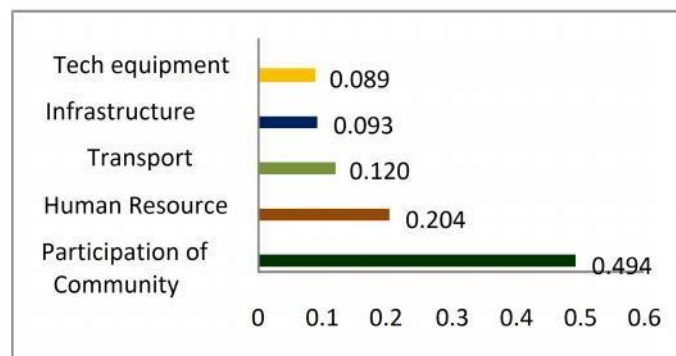


Figure 4. The level of importance of each actor to waste management and alternative municipal waste management systems in landfill Selopuro

The high contribution of the government based on expert opinion is not only seen from its policy in establishing a waste management system by issuing a decree or legislation, but also facilitating each waste management activities of the transport system to the destruction of waste in the landfill in the form of funding through subsidy funds, waste management programs that can be implemented in the short term and long term, for example, training and empowerment of local communities so that communities get benefit both education and the economy.

4. Objectives Aspect

In the aspect of objectives, based on the analysis, the objectives that want to be achieved in waste management with zero waste approach, the one which provides the highest score is reducing dependence on landfill (MKLTPA), then, reducing operating costs (M.By.Ops.), Improving the cleanliness and environmental health (M.Keb.Kes.Lingk.), the increasing in people's income (P.Pend.Masy.) and the expansion of employment (Per.Lap.Kerj.), with a score of each destination is 0.454; 0.259; 0.094; 0.094; and 0.098.

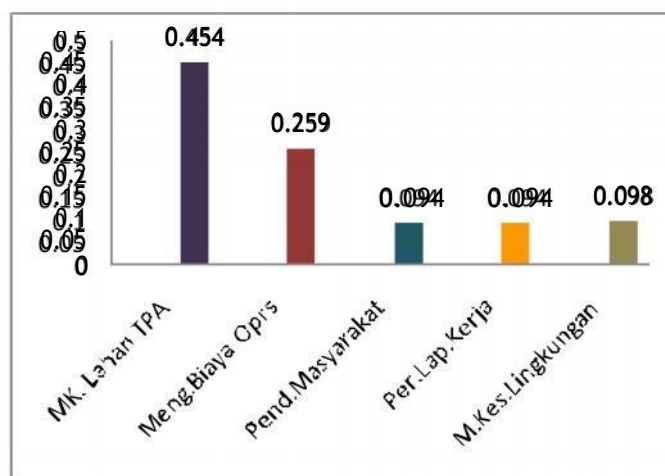


Figure 5. The level of importance of each goal against management systems and alternative municipal waste management in TPA Selopuro

The high value of objectives score of reducing dependency on landfill in the management of municipal waste in landfill Selopuro compared to other destinations showed that the dependency on landfill for the more limited availability of land and it is not balanced with the increasing in the volume of waste. This situation will be more difficult if the volume of generated waste is increasing every year without a good management system, it would be disastrous in terms of environmental, social, economic, and public health. Due to the procurement of new land as landfill that there is always a conflict between the government, community and non-governmental organizations. This can be due to: lack of socialization, lack of public knowledge, lack of supporting infrastructure, there is no guarantee for the health, safety, environmental sustainability and economic communities, as well as the management and utilization of waste in the landfill not optimal yet.

5. Alternative Aspect

Based on the analysis, it appears that alternative community involvement (Keter.Masy.) Had a score of 0.494, which is followed by the quality and quantity of human resources (Kual.Kuan.SDM) had a score of 0.204, waste management through composting and recycling (PS. Pengomp.DU) inorganic waste with a value of 0.120, infrastructure (SarPras) and the improvement of waste management technologies (Pening.Tek.), with a score or respectively 0.093 and 0.089 which is described by Figure 4.18.

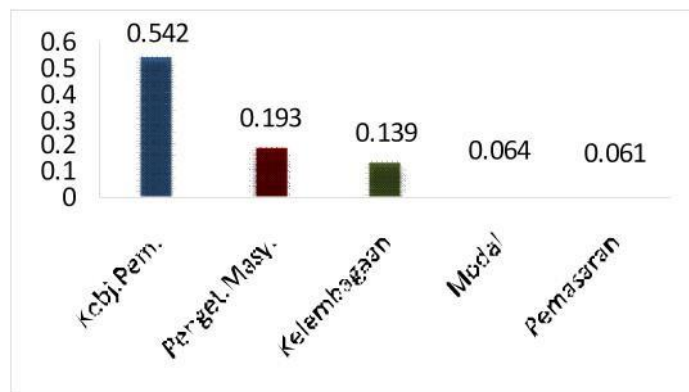


Figure 6. The importance of each alternative to management systems and alternative management of municipal waste in landfill Selopuro

To increase community engagement experts argue that it is needed to increase public awareness about the importance of maintaining hygiene and environmental health through awareness and education in order to improve the knowledge and ability (capacity development) in the environmental field. The increasing knowledge of the community will be able to change the mental attitude and behavior. This change may be an element driving force in community involvement to manage waste voluntary (self-help) e.g. sorting in the initial process of waste management, reduction of waste volume (reduce), reuse (reuse) and recycling bins (recycle), for example through composting, authoring and recycling of inorganic waste. To achieve the goal of waste management to zero waste in landfill Selopuro, experts also expect their efforts to improve waste management technologies supported by existing institutions, which is still dependent on a composting plant which is managed by the government and composting plant without involving scavengers and surrounding communities. The technology used is an environmentally friendly technology and accountable both scientifically and academically. In addition, the technology to be used is a technology that is inexpensive, readily available and affordable for every citizen who is able to produce a quality product. This means that these technologies can provide benefits both financially and environmentally. Hence, it will provide business opportunities in order to increase income and employment opportunities that will encourage and motivate people to get involved in waste management.

In order to achieve the objectives of waste management through the concept of zero waste in landfill Selopuro with alternative decision-making is community involvement, then the other things that contribute in determining are the factors affecting the management of waste in the landfill Selopuro, the stakeholder's involvement, and goals to be achieved.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusion

Management of waste pattern in the landfill Selopuro still uses open dumping system, which is garbage dumped and left to rot without any further processing.

1. Composting and material utilization of recycled product by scavengers are economically profitable to increase revenues, create jobs for the local population and to reduce landfill Selopuro the environment pollutant from a load of organic and inorganic trash.
2. Waste management system at the landfill Selopuro in overall is not optimal because there is no cooperation between the government and the surrounding scavenger community but only managed by the Department PUBMCK Ngawi.

3. According to an analysis by the method of paired comparisons (pairwise comparison), best policy options for dealing with municipal waste in Selopuro landfill to zero waste concept is enhancing community involvement in waste management. The increasing involvement of community can be in form of included in the sorting of waste at source using the concept of 3R (reuse, reduce, recycle), improving the quality of communities around the landfill Selopuro with the operation of the facilities and infrastructure of waste management, involving local communities and scavengers in the processing of organic waste (composting) and inorganic (recycling), socialization and outreach to the community about the waste management system.

5.2. Suggestions

To achieve the goals and objectives of waste management with zero waste approach on Ngawi Region in the future where municipal solid waste is not only disposed and destroyed but also fully utilized, the author suggests:

1. In order to increase the capacity of scavengers and municipal waste management with the approach of zero waste through recycling business might run and grow as it is expected, it needs to set up a system of cooperation (partnership) organized and it can benefit financially and socially stimulate the involvement of the scavengers and the surrounding communities in the management waste in the landfill Selopuro.
2. Community involvement in the management of municipal waste is still relatively low, the local governments should make efforts to increase public awareness through "capacity building" through socialization, counseling, guidance, and services for the sake of management of waste business continuity in the landfill Selopuro by involving universities and institutes (NGOs)

Market availability of recycled products ultimately compost is still an obstacle for scavengers and employers in recycling bins, so government needs to ensure the marketing of these products by creating specific policies, for example by buying compost product through agencies or departments that have a need for a product compost for example through the Department of Agriculture, the Agriculture Agency or the Department of Industry and Trade as well as enterprises.

REFERENCE

- Arianto, Wibowo & Darwin T Djajawinata. 2003. Penanganan Sampah Perkotaan Terpadu. <http://www.google.com/cetak/2008/072008/29/0105.htm>, 23 Nopember 2010, 20.45
- Alfiandra. 2009. Kajian Partisipasi Masyarakat Yang Melakukan Pengelolaan Persampahan 3R di Kelurahan Ngaliyam Dan Kalipancur Kota Semarang. *Tesis Program Studi Magister Teknik Pengembangan Wilayah Kota*, Universitas Diponegoro Semarang.
- Azwar, A. 1990. *Pengantar Ilmu Kesehatan Lingkungan*. Yayasan Mutiara, Jakarta
- Anonim, 1993, *Modul Pelatihan Manajemen Persampahan*, Ditjen Cipta Karya Departemen Pekerjaan Umum, Jakarta
- Anonim, 2006 "Monroe County Solid Waste Management District 2006". *Annual Report*. MCSWMD. USA.

- Braunegg, Bona, Schellauf, and Wallner, 2005, "Solid Waste Management and Plastic Recycling in Austria and Europe", *The Journal Polymer-Plastics Technology and Engineering* Volume 43, Issue 6, 2005, Pages 1755 – 1767. 11 April 2011, 20.10 WIB
- Budiharjo, Eko, 2005, *Kota Berkelanjutan*, PT. Alumni Bandung.
- Bebasari, S. 2004. *Sistem Pengelolaan Sampah secara Terpadu*. Makalah pada Pelatihan Teknologi Pengolahan Sampah Kota secara Terpadu Menuju Zero Waste. Jakarta 5-7 Oktober 2004.
- BBPT, 1999. <http://www.bppt.com/pengolahansampah>, 23 Nopember 2010, 20.25
- BBPT, 2007. <http://www.bppt.com/pengolahansampah>, 7 Maret 2011, 13.45
- [Chea-Yuan Young](#), [Shih-Piao Ni](#), [Kuo-Shuh Fan](#), 2010, "Working towards a zero waste environment in Taiwan", *Waste Management Ressources, Maret 2010 vol. 28 no. 3* 236-244, 11 April 2011, 18.35
- Djuwendah, Endah, 1998. *Analisis Keragaan Ekonomi dan Kelembagaan Penanganan Sampah Perkotaan*. Tesis Program Studi Magister Sains Ilmu Perencanaan Pembangunan Wilayah dan Pedesaan, Institut Pertanian Bogor. www.ipb.ac.id, 25 Nopember, 12.15
- Ditjen Cipta Karya. 1996. *Proyek Pengembangan Institusi Untuk Menjunjung Unit Implementasi Proyek di Kotamadya Bogor*. Laporan Akhir Project Loan No. IIII-INO Bogor Urban Development Project. Dit. Bina Program Cipta Karya dan Pemda Kotamadya Dati II Bogor. Bogor.
- Ditjen Cipta Karya. 2007. *Best Practices of Solid Waste Management in Indonesia*, Direktorat Pengembangan Penyehatan Lingkungan Permukiman, Direktorat Jenderal Cipta Karya, Departemen Pekerjaan Umum, Jakarta
- Flintoff, F. 1976. *Management of Solid Waste in the Developing Countries*. World Health Organization, New Delhi.
- Hadiwiyoto, Soewedo, 1983, *Penanganan dan Pemanfaatan Sampah*, Yayasan Idayu, Jakarta.
- Hartanto, Widi, 2006. *Kinerja Pengelolaan Sampah Di Kota Gombong Kabupaten Kebumen*. Tesis Program Studi Magister Teknik Pengembangan Wilayah Kota, Universitas Diponegoro Semarang. www.undip.ac.id, 25 Nopember 2010, 12.40
- Hogland, William and Marques, Marcia, 2007, Sustainable Waste Management: International Perspectives, *Proceedings of the International Conference on Sustainable Solid Waste Management*, 5 - 7 September 2007, Chennai, India. pp.1-8. 11 April 2011, 19.25 WIB

- Hull, Terence, 2006. *Masyarakat, Kependudukan dan Kebijakan di Indonesia*, PT. Equinox Publishing Indonesia, Jakarta.
- Iriani, 1994. Sistem Organisasi Pengelolaan Sampah Pemukiman di Kotamadya Medan, *Tesis* Program Pascasarjana Institut Pertanian Bogor. Bogor.
- Kodoatie, Robert J., 2003, *Manajemen dan Rekayasa Infrastruktur*, Pustaka Pelajar, Yogyakarta.
- Kementerian Negara Lingkungan Hidup, 2008. *Statistik Persampahan Indonesia*. Jakarta.
- Kementerian Negara Lingkungan Hidup. 2008. *Undang-Undang Nomor 18. Pengelolaan Sampah*. Kementerian Negara Lingkungan Hidup. Jakarta
- Kantor Lingkungan Hidup, 2010. *Laporan Volume Timbulan Sampah Kabupaten Ngawi*.
- BPS, 2010. *Ngawi Dalam Angka 2010*. Kabupaten Ngawi
- Poerwanto, Hari, 2000, *Kebudayaan dan Lingkungan*, Pustaka Pelajar, Jakarta.
- P.C. Fishburn, 1987. *The Theory of Social Choice*. Princeton University Press. New York.
- Saaty, T.L. 1988. *Decision Making for Leaders: The Analytical Hierarchy Process for Decisions in a complex World*. RWS Publication, Pittsburgh
- Scheinberg, Anne, 2010, The Need for the Private Sector in a Zero Waste, 3-R, and Circular Economy, Materials Management Strategy. *Discussion paper for the CSD 18/19 Intercessional*, 16-18 February 2010, Tokyo, Japan, 11 April 2011, 19.05 WIB
- SK SNI-T 13-1990-F, 1990, *Tata Cara Teknik Pengelolaan Sampah Perkotaan*, Yayasan LPMB Bandung, Departemen Pekerjaan Umum, Jakarta
- Yunarti, Lestanti Tri, 2004, Kajian Aspek Teknik Operasional Pengelolaan Sampah Menuju Zero Waste (Studi Kasus : TPS Rawa Kerbau Kelurahan Cempaka Putih Jakarta Pusat), *Tesis* Program Studi Teknik Lingkungan Fakultas Teknik, Universitas Diponegoro Semarang. www.undip.ac.id, 25 Nopember 2010, 12.50