

# Willingness To Accept Toward Negative Impact of TPA Jabon Existence

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## ABSTRACT

Municipal solid waste (MSW) management has become common problem in regional development especially in developing countries. In Indonesia, waste management still relies on landfilling system which generate both positive and negative externalities. Odour pollution is one of the negative externalities. This study aimed to find out the willingness to accept (WTA) of compensation funds by the community around TPA Jabon, Sidoarjo Regency. Primary data were conducted through questionnaire from 180 respondents scattered in four villages directly affected to the existence of TPA Jabon. Mean WTA of all society toward compensation of TPA Jabon existence was IDR 55,424/household per month. The highest mean WTA, IDR 65,033/household per month, occurs in Semambung Village. The second-highest mean WTA, IDR 56,765/ household per month, occurs in Tambak Kalisogo Village. Balongtani Village generate the lowest mean WTA among others, IDR 47,633/ household per month. This mean WTA is higher than both compensation set by the local government (IDR 45,000/household per month) and compensation that actually received by the household (IDR 22,486/household per month). The objection emerge in society because of wide gap between WTA and what they actually received. Village government need to improve the equal policy distribution of compensation with proportionated distribution.

*Keywords: Economic Valuation, Willingness to Accept, Landfills*

## 1. INTRODUCTION

The economic development has affected the rapid population growth and urbanization of a region. There will be an increase in income followed by an increase in living standards. Eventually problems will arise regarding the production of waste which is the final product of all human activities.

Municipal solid waste (MSW) management has become common problem in regional development especially in developing countries. Community understanding of how to manage solid waste plays an important role in dealing with urban waste. People still think that waste is something that has no use value and must be removed from the surroundings. Waste management using end pipe approach is still commonly use in the society. Garbage is collected, transported and disposed of to landfill. The paradigm must be shifted by prioritizing 3R (reduce, reuse, recycle) implementation starting from the source of waste generation.

This condition was made worse by the lacking of awareness level for the environment of the society. It is indicated by

the value of the Environmental Indifference Behaviour Index (IPKLH) which reached 0.51 in 2017. This index describe the proportion of people who don't care about the environment. In other words, there are less than 50% people in Indonesia giving attention to environmental sustainability.

Landfilling is undeniably the easiest and cheapest method of waste management [1]. In Indonesia, waste management still relies on landfilling system. The data of Ministry of Environment (2017) showed that 43% landfills in Indonesia used open dumping system where garbage is only piled in open fields. Some facts show that waste treatment at landfills in Indonesia is still in poor quality. Mountains of garbage cause many disasters. Landslides and fires in landfill have caused many losses.

Landfilling activities cause externalities, both positive and negative. Negative externalities include water, solid, and air pollution [2]. The deterioration in water quality is caused by seepage of leachate water produced by landfills. Meanwhile, air pollution is the effect of greenhouse gases (GHG) produced by landfills. The waste processing sector in Kendari City dominated by landfilling activities contributes to greenhouse gas (GHG) emissions consisting of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O [3]. Household solid waste that is not treated properly will reduce the quality of the

environment (water, soil, and air) [4]. The waste sector is or 8.5% of the potential national GHG emissions in 2020 [5]. Various mitigation actions have been taken including landfill management because the biological processes of waste management in landfills contribute 14-18% of global methane gas emissions.

However, landfilling activities also generate positive externalities. Waste management can be used to generate income with an estimated value of compost generated by Rs 3 Lakh and almost 153 new jobs created [2]. The existence of informal waste collection activities has a variety of benefits for the local government [6]. Some of the benefits that arise include the creation of new jobs, the reduced amount of waste stored, the longer life of landfills, the preservation of key resources and energy, and the reduction of pollution caused by waste.

Sidoarjo, one of the metropolitan city in East Java Province, applies landfilling system for municipal solid waste management. There is only one active landfill in Sidoarjo, TPA Jabon which has been operated since 2003. It is expected to face overcapacity in 2018, but it is still used until nowadays.

Environmental and Hygiene Agency of Sidoarjo Regency has been specified policy to pay compensation to the community around landfill. This policy was taken as the answer of objection from the society about odour pollution from waste treatment activities.

This study aimed to find out the amount willingness to accept of compensation funds by the community, whether in accordance with the value paid by government. The second part of this article reviews the background of the study, and the third part contains methodology and data used in the research. The fourth part will analyse the household characteristics and WTA generated by the data. Conclusions are presented in the fifth sections.

## 2. LITERATURE REVIEW

The economic system has a dependency on the environment in three ways. The environment is a provider of natural resources and energy; the economic system will extract non-renewable natural resources and harvest natural resources that can be renewed; and the environment provides environmental facilities (amenities) that can be utilized to meet human needs such as clean air, recreation, and biodiversity. Furthermore, the environment becomes a place of waste disposal for production and consumption activities [7].

Starting with thoughts about the process of encouraging growth that does not add to the burden on environmental quality, comes the thought of green economic growth. To integrate the environment into conventional economic policies, a valuation of assets and environmental impacts is carried out.

estimated to contribute around 0.25 Gigatons of CO<sub>2</sub> (eq Economic valuation can be conducted through five approaches: The Market Pricing Approach,

The Replacement Cost Approach, Hedonic Price Approaches, The Household Production Function Approach, and Contingent Valuation Method [7]. Contingent Valuation Method (CVM) is a specific valuation method using a direct approach that basically asks the public what is the maximum willingness to pay (WTP) additional benefits obtained from use and / or how much is the willingness to receive (WTA) compensation from a decrease in the quality of environmental goods [8]. Some studies of land [9], watershed [10], and waste management [11] had been conducted using this method.

TPA Jabon applies controlled landfill system in waste processing. Solid waste dumped in the landfill was levelled up by heavy equipment everyday. This activities produce odour pollution that can be perceived in range 3 km from the landfill. Wind direction will also affect the odour dispersion. The odour pollution will get worse in rainy season.

Regional government of Sidoarjo Regency through Environmental and Hygiene Agency has set the compensation fund of odour pollution of TPA Jabon activities, that was IDR 135,000/household paid out quarterly, or IDR 45,000/household per month. Each village gets the same portion of compensation fund amounting of 155 household.

The village government gets freedom in the process of distribution of the compensation fund to the household. Most of village government set an equal distribution to all household in the village. So that, people get compensation fund only once a year with different values depending on the number of households in each village.

Government of Balongtani Village was the only one that does not apply equal distribution to all household in the village. The compensation fund was distributed only to household in Dusun Ngingas directly affected to the odour pollution of TPA Jabon. So that, every household gets relatively higher compensation than household in other villages. The obtainment levels of household in Tambak Kalisogo Village and Semambung Village toward the compensation was IDR 12,500/household per month, while the real obtainment levels of household in Kupang Village was IDR 16,667/household per month.

## 3. RESEARCH METHODOLOGY

This research was conducted in four villages directly affected by the existence of TPA Jabon and received compensation funds from Environmental and Hygiene Agency of Sidoarjo Regency. They are Dusun Kupang Lor of Kupang Villages, Dusun Penumpaan of Semambung Villages, Dusun Ngingas of Balongtani Villages, and Tambak Kalisogo Villages.

Primary data were obtained by conducting door to door interview toward 180 respondents through questionnaire. The selection of the household sample was using simple random sampling. Data collected include education level, monthly income level, number of household members, length of stay, distance of house to landfill, and their willingness to accept (WTA) of compensation fund from the government.

Secondary data were also collected from the village government and Environmental and Hygiene Agency of Sidoarjo Regency about the policy of municipal solid waste management in TPA Jabon.

There are several stages in the application of CVM analysis. First, creating a hypothetical market. Second, obtaining an offer of the value of WTA. Third, estimating the middle value of WTA [8].

The hypothetical market on this study is based on the negative externalities of the existence of TPA Jabon to the surrounding community. The technique of measuring WTA used in this study is open-ended question. This is an open question method where each individual is asked the minimum value of the respondent's WTA without the initial value suggested to the respondent.

Mean WTA (EWTA) was calculated by the distribution of respondents' WTA.

$$EWTA = \sum_{i=1}^n W_i P f_i$$

- Where  $EWTA$  : Mean WTA
- $W_i$  : WTA level  $i$
- $P f_i$  : relative frequency of WTA level  $i$
- $n$  : number of level

**4. RESULT AND DISCUSSION**

General characteristics of respondent in the four villages were obtained based on a survey of 180 community members. The general characteristics of this respondent were assessed from several variables including gender, age, formal education taken, type of work, income level each month, number of dependents, length of stay around TPA Jabon, and distance of the house to TPA.

83.3% head of household was male, while 16.7% was female. This characteristic does not differ among villages. Male head of household dominated the household characteristics in all villages.

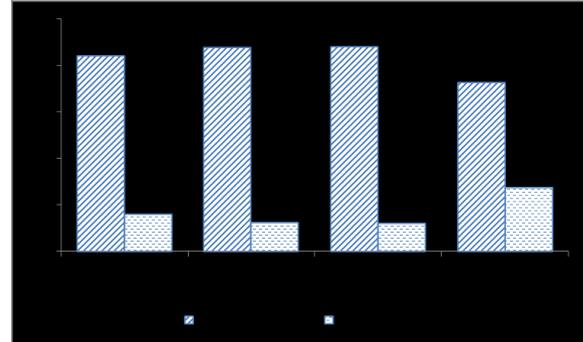


Figure 1. Household Characteristics by Head of Household Gender

The main occupation of head household varies between villages. In Balontani Village and Semambung Village, most of the head household main occupation are entrepreneur, respectively 58% and 40%. Different from those villages, most of head household of Kupang Village and Tambak Kalisogo Village labour at agriculture sector, respectively 32.5% and 52.5%. Head of household working at waste collecting sector is about 9.44% consisting of scavengers and waste collectors. The presence of waste collecting activities around TPA Jabon showed that TPA Jabon gives positive impact to the society.

Most of household income level per month in four villages were in IDR 2,000,000 – 2,999,999 amounting of 46%. The second largest income level group was more than IDR 3,000,000 per month amounting of 36.7%, while the smallest income level group was less than IDR 1,000,000 amounting of 3.9%.

Number of household members portrays household level of cost living. Higher number of household members means higher household expenditure. In average, number of household members in village around TPA Jabon was 4. The highest proportion was 34.44% household having 4 members; 23.33% having 3 members; and 20,56% having 5 members.

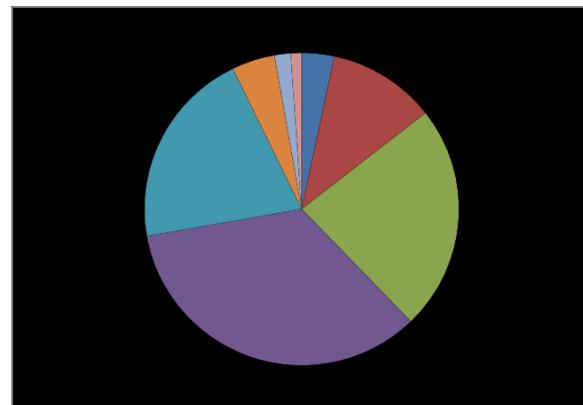


Figure 2. Household Characteristics by Number of Household Members

Length of stay affect the perception of TPA Jabon existence. 83.33% respondent has become resident for more than 20 years. They tend to regard that the existence of TPA Jabon was very annoying. 2.78% respondent has stayed less than 5 years and they tend to accept the existence of TPA Jabon. It is because they wise up the choice to live near TPA Jabon.

Distance of the house to TPA is not essentially affected the perception of respondents of TPA Jabon existence. It is because odour pollution is affected by the wind direction, so that the odour can reach by people in range more than 3 km from the landfill. Kupang Village and Tambak Kalisogo Village are on the nearest distance to the TPA Jabon. The distance is less than 1 km.

Data processing results showed that mean WTA (EWTA) varies between regions. The lowest level of WTA was IDR 30,000/household per month, while the highest level of WTA was IDR 100,000/household per month. People tend to expect high compensation due to high cost of living. Odour pollution has also affected people health because it inflicted shortness of breath.

Odour pollution inflicted by landfill activities was perceived almost everyday. The smell was getting worse during rainy season. Some respondents claimed that it was better to left the house during rainy season to elude the odour pollution. Moreover, odour pollution decrease prestige of respondents. They feel embarrassed if the smell appears when there are guests visiting.

Mean WTA of all society toward compensation of TPA Jabon existence was IDR 55,424/household per month. The highest mean WTA, IDR 65,033/household per month, occurs in Semambung Village. The second-highest mean WTA, IDR 56,765/ household per month, occurs in Tambak Kalisogo Village. Balongtani Village generate the lowest mean WTA among others, IDR 47,633/ household per month.

## 5. CONCLUSION

Basically, WTA toward compensation of the existence of TPA Jabon in four village directly affected was higher than compensation set by the local government. However, there are wider gap between WTA and what the society actually received. This problem exist because of the equal distribution policy set by the village government.

The objections emerged in the society because of wide gap between the actually received compensation and the value they want to accept. This gap stands out especially in Kupang Village, Tambak Kalisogo Village, and Semambung Village where the directly affected household receive compensation fund once a year. They perceived that compensation fund received was not in fit with the cost incurred to overcome the negative effects, such as medical expenses due to shortness of breath.

Meanwhile, respondents in Balongtani Village tend to be content with the compensation received. It is because they got the compensation quarterly. The objection emerged was about the number of household received the compensation. The new settler had not been categorized as the compensation receiver.

To overcome the objections of the society, village government need to improve the technique of distributing the compensation. Equal distribution should be altered by proportionated distribution. Household directly affected to the odour pollution in each village should get higher compensation than the one who get indirect impact.

## ACKNOWLEDGMENT

This study is supported by Indonesian Ministry of National Development Planning (Bappenas) 2019.

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