

# **Analysis of commercial approach to non-organic domestic waste management at settlement besides Kampar River case study : Pulau Birandang Village and Alai Village in Kampar District, Riau Province, Indonesia**

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**Abstract.** The area of coverage of waste management services in some areas sometimes only focus on specific areas such as the capital province, district or city. Some areas of the region (district) still do not get special attention for waste management facilities services from local City Sanitation Department. In this study we raised two villages located on the banks of the Kampar River and examined the management of non-organic domestic waste in this area. We choose Pulau Birandang Village and Alai Village because of the habit this people to throw garbage like non-organic waste (such as paper, plastics, etc) to the Kampar river. This act is very dangerous for the sustainability of water security and can cause silting rivers. The aims of this research to analyze the influence of commercial approach as a solution to solve waste problem in both villages. Commercial approach is the method applied by giving incentives to people who are sort the non-organic waste according to its kind. Data for this study were collected from observation using 80 questionnaires to 80 respondents from both villages, the Pulau Birandang village and Alai village. Results of the analysis is also reinforced by opinion from the leaders of them (people) who are likely to reflect the wishes of the people too. The results from this study is the commercial approach (take and give system) which applied in this villages could increase people's enthusiasm in managing domestic waste by sorting waste before it is collected.

**Key words:** Non-Organic Waste, Commercial Approach, Waste Sorting, Incentives.

## **Introduction**

Issue of waste management is one of the biggest problems faced by Indonesia. Most areas in Indonesia does not have a good waste management system. Limited of work facilities of waste management, quality of education and expertise to manage rubbish are problem for waste management. Most of areas do not have good waste management facility, especially in villages and inland district. The poor waste management system give more impacts for society. The spread of germs, bad odor and an unfavorable view are the impact caused by poor waste management system. The poor quality of education and public awareness of waste management also led a lot of people to throw trash out of place. In addition, a habit to do incineration for garbage-related adverse health effects such as toxic metal emissions and combustion produces more than 200 organic chemicals, including carcinogens, mutagens, and hormone disrupters (Thompson, 2008).

Although waste is a matter that is considered useless, many people can manage the waste into a source of income. Like a company exist in Indonesia, Majestic Buana successfully manage plastic waste into plastic ore and exported it to countries such as China (KaltimPost.co.id). Better waste management develop us to increase incomes and reduce unemployment in an area. Commercial approach is expected to improve the ability of communities to manage the waste. Waste management system with a commercial approach in a village must also be balanced with some strategy to change people's paradigm and their behavior in managing waste generated.

### **Study Area and Methodology**

The research was implemented in Pulau Birandang village and Alai village, two villages located in the East Kampar district, Riau. Both villages are located not far from the highway that connects Pekanbaru Riau and West Sumatra province. Pulau Birandang village has an area about 4000 hectares with a population of 4548 people, made up of 1113 families (KK). The village is divided into 10 RW (Rukun Warga) and 23 RT (Neighborhood Association). While the Alai village has other name is Tanjung Bungo (the administratif name). The village has 1280 people with 320 families. The village is divided into four district, and the district divided into 16 RT (Neighborhood Association).

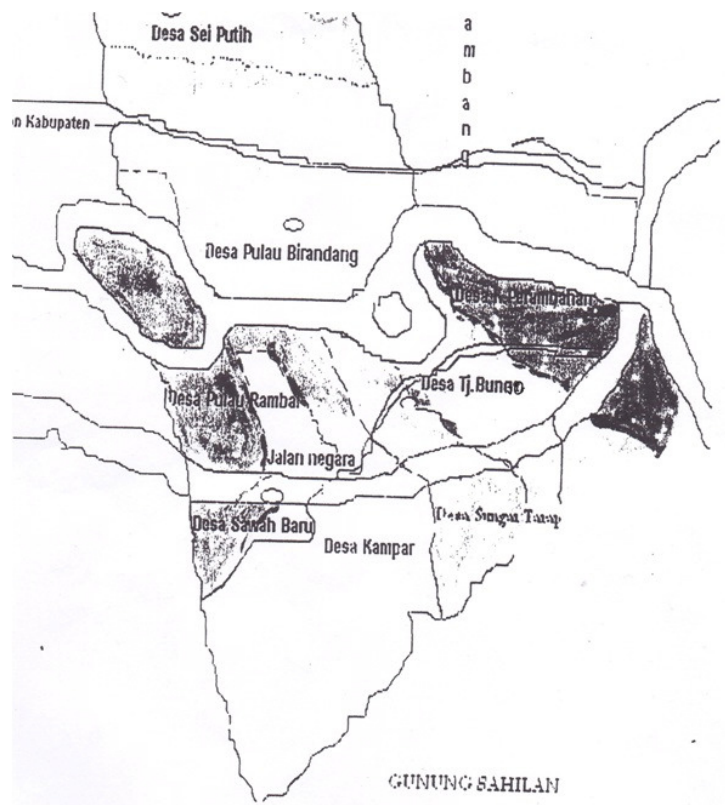


Figure 1. Area Maps of Pulau Birandang Village and Tanjung Bungo Village (Alai)  
Source: Department of Social Welfare and Labor Kampar regency

Pulau Birandang village and Alai village are located on the banks of the Kampar river, which is one of the largest rivers in the Riau province. The selection of both villages because of observing the number some factors, such as level of education, livelihoods and access to rural transport. According to observations, these villages do not have transportation access to implement routine garbage collection as implemented in the big cities. Many roads in the both villages have not been given the pavement and the access road to a house is so narrow. It cause difficulty to collect garbages.

### **Sample and Population**

Data were obtained by distributing questionnaires to the residents in the two villages (Pulau Birandang Village and Alai Village). In this study there were 80 questionnaires were divided into two villages. There are 40 questionnaires were distributed in the Pulau Birandang village and 40 questionnaires distributed in the Alai village. Sample in this study was limited to the head of each family homes located in the administrative area of both villages. In addition, the sample taken to a resident who has the house with the distance between the house and the river about 0-300 meters. The sample selection was based on the tendency of people to throw garbage in the Kampar river which is caused a silting river.

### **Methodology**

Analysis of data from the questionnaire sampling performed using SPSS software to determine the correlation between the variables. This study used several variables related to viewing habits and the condition of the sample in terms of waste management. Here are the variables that are used in analyzing the habits and condition of the sample.

- 1) Salaries (X1)
- 2) Whether or not the bin at home (X2)
- 3) The last bin (X3)
- 4) Techniques to manage waste (X4)
- 5) Knowledge of incineration (X5)
- 6) Knowledge of throwing garbage in the river (X6)
- 7) Willingness to sell garbage (X8)
- 8) Contributions to collect and sort the waste (X9)
- 9) The level of incidence of selling waste (X15)
- 10) Participation to municipal waste (X16)
- 11) Willingness to pay the retribution cost (X20)

### **Results and Discussion**

Pulau Birandang village and Alai village are two villages with similar geographical conditions. It have the similar population and only limited by the Kampar river. Both these villages are connected by *powou* (boat) as a water transportation facilities. Pulau Birandang village and Alai village do not have waste management facilities like the one in the capital province or city. Majority of the population of these villages as rubber farmers and 55.2% have incomes below the provincial average salaries (UMP Riau about Rp 1.400.000, -; source riaupos.co). Most villagers have trashbin (72.4%) and a small portion does not have a trashbin at home (27.6%). Trashbin of the population is a naturally bins (a hole in the ground behind the house that used to accumulate waste generated). Waste disposal in both villages is quite diverse such as private area (51.7%), municipal waste (3.4%) and the Kampar river (44.8%). Although 3.4% of people admit to throw garbage into municipal waste, but in fact both of villages there is no landfill is managed directly by the government. Municipal waste which meant the banks of rivers around the residential area that has not been used as intercropping plantation.

Waste management in both of villages is quite alarming because 77.6% of the waste-garbage just discarded and the remainder (22.4%) were burned. This activity give the impact like of seedling diseases and mosquito breeding which can cause Malaria and Dengue Fever around the areas. The level of public understanding about the process waste is also poor with the following facts:

- 1) 77.6% of people do not know that incineration (burning trash) is not good for the environment health
- 2) Although 84.5% of people know that throwing garbage in the river are not good, there are still 44.8% of the population likes to throw garbage in the river.

From both of villages, 70.7% of the village population produced more non-organic waste in their daily life. In SNI (National Standar Indonesia) for a small town (rural areas)

estimated the rate of waste generated is 0.5-0.6 kg/person/day. From waste generation, it is assumed that  $\frac{3}{4}$  of the waste is non-organic. Accumulate waste from Pulau Birandang village there will be 2046.6 kg/day non-organic waste. Assuming that the price of non-organic waste Rp 300.00/kg, then this village earn income Rp 613,980.00 / day.

Almost the entire population of villages are willing to sell non-organic waste generated during the facility are adequate. 96.6% of both villages are willing to sell their non-organic waste. Participation from this community is also quite high with 56.9% of people are willing to just collect garbage and 43.1% are willing to collect garbage sorting according to its kind. In these villages only 10.3% of population ever sell non-organic waste, while 62.1% of the population never sell garbage. The lack of infrastructure for recycling of waste and the cost to recycling makes the non-organic waste in this area always burned. More than half of the population in both rural (58.6%) wanted a pick-up facilities in their region. 56.9% of them wanted the officer come to pickup their trash once every 3 days and 41.4% want the officer to come once a week. Even so, only 58.6% of people who are willing to pay the retribution cost. Nearly half of the population is not willing to pay the retribution cost for waste management facilities. The magnitude of the tendency to throw garbage in the river seems to be the best alternative for the community in managing waste. There is no cost and waste disappeared from view, it is like a promise of Kampar river for the garbage problem in the two villages.

In this study, Pearson correlation test used to determine the correlation between variables X6, X1, X16, X20 and X2 as a reference variable to indicate the commercial approach to waste management systems. Based on statistical tests were conducted, found that:

- a) Knowledge of incineration (X5) and throw garbage in the river (X6) has a correlation with **income (X1)**.  
Level of public education has a close connection with the income of an area. Low income people are generally inhibit the process of empowering because if ever implemented outreach programs, not entirely enthusiastic citizens to understand and apply their knowledge due to more pressing financial needs. A good thing necessarily have the time and more cost to manage it. Burning activities and throw trash in the river is a branch of the impact of the lack of enthusiastic residents which is caused of priority focus distracted by financial problems.
- b) Public participation in the program throw the waste to municipal waste (X16) has a correlation with the amount of **income (X1)**.  
Not all people want to dispose of their garbage in municipal waste which is provided by the government. It cause of the paradigm that the cost of waste management facilities are large and burdensome financial condition of the people.
- c) The willingness of people to pay the **retribution cost** of waste management (X20) has a positive correlation with the provision of trashbin in the house (X2).  
The throwing garbage in the river is considered more advantageous when compared with independent waste management participation at home.

Based on the results of analysis commercial approach in the management of solid waste in two villages could be a new alternative in managing domestic waste. Managing of non-organic waste based on commercial approach can implemented by applying the Trash Bank programs already exist in several cities in Indonesia. In the implementation of the Trash Bank program in both of villages, we can applied a socialization and counseling program about waste management.

## **Conclusions**

From the research, it could be concluded that better waste management activities is influenced by several factors, namely:

- 1) The level of education or knowledge, and
- 2) Amount of salaries

Both of these are a major determining factor in implementing good waste management system in the region. The existence of inadequate income levels cause people tend to care about the issues surrounding the environment as a priority in their lives. They are too focus with financial problems faced. Levels of education and limited knowledge causes people not be able to manage the waste properly and optimally, so that government should held a routine socialization and counseling to solve the garbage problem in the region.

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