

## PLASTIC CHIPS AS AN ALTERNATIVE PLASTIC WASTE COMMUNITY TREATMENT-BASED IN GALUGA LANDFILLS, BOGOR DISTRICT

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**Abstract.** Trash can cause negative environmental impact of a dirty environment, the emergence of various diseases, and soil and water pollution. This condition occurs in end disposal place (TPA) Galuga Bogor Regency. Solutions to reduce the impact of waste one of them with plastic chips as an alternative method of processing plastic waste. Plastic chips in the process, more emphasis on the classification of plastic waste on the basis of chemical elements contained. The strategic steps in implementing the method of plastic chips, such as by providing socialization to the community especially those who work as scavengers for sorting waste by type. This will have an effect on economic income communities because of the waste that has been sorted, especially plastic chips will be worth much higher than the usual recycled junk. Further guidance, the establishment of the organization and the fulfillment of the completeness of the necessary things that must be pursued by all relevant parties. Including the construction of plastic chips production houses need to be realizable. Method of plastic chips require support from all relevant parties as the empowerment. Such centralized production units landfill plastic chips. Institute for the Environment will act as quality control consultant performance, and Garden City Sanitation Department and the District of Bogor served as technical executor daily at the landfill, which will control the activities of collecting, transporting and processing waste, party observers and academics as research in the production and local governments as well as regulators and providers of production equipment and working with waste processing industry in marketing.

**Keywords:** plastic garbage, plastic chips, community based.

### 1. Introduction

Demographic theory states that the population should be of the equilibrium point where the environment can support and the boundary between the balance point is the carrying capacity of the environment (Mangkara *et al.*, 2010). A good city should be able to balance between the total population living in the city with the existing environment. Based on 2010 Population Census the number of residents in the city of Bogor to reach 949,066 souls census results showed that the population of the City of Bogor, spread across six districts experienced a growth rate of 2.39 percent per year over the last ten years. 2010 population census shows the spread or distribution of the population is the largest city of Bogor in Bogor, West District, which numbered 210,450 people or 22.17 percent of the total population in the city of Bogor (Iwan, 2010). Final Disposal (TPA) Galuga at RT 08.05, Lalamping, Galuga Village, District Cibungbulang Bogor Regency. Bordering the district. West Bogor. TPA is used as a landfill from the County and City of Bogor, Garbage in the landfill Galuga condition is very alarming and threaten the safety of residents around the landfill Galuga because managers have not been able to process plastic waste entering effectively and efficiently, giving rise to environmental hazards, such as soil and water pollution. Damage was also caused by waste leachate (liquid waste from the garbage) that is not channelled into pools of

processing and when the rainwater that fell onto the pile of garbage built up to the lower slope and sediment over time water will be full and if it rains can lead to occurrence of landslides, as happened on Tuesday, March 16, 2010 that killed four people and seven other people were injured (Antara, 2010). Based on the facts above, TPA Galuga really need to get the handling right away. For that the author gives an idea of ideas in the trash problems that occur with the method of plastic chips. Plastic chips are an alternative solution in the processing of waste and to anticipate the dangers posed by plastic waste because the method of plastic chips implement waste management system with classifications based on chemical elements of plastic waste is contained so that it has a high selling value and can put a halt to the volume of waste. In addition, local community based continued to be the solution method of plastic chips because the method is quite simple and easily applied by the community. The benefits of application of the empowerment of community-based plastic chips are expected to provide new insights for local governments in addressing problems Bogor Galuga landfill. In addition, through this solution expected by society about conscious and able to play an active role in supporting alternative waste treatment through plastic chips. Will also indirectly boost the economy surrounding community.

## 2. Method

Study of writing scientific papers is based on literature study, direct observation and interviews with various sources, scholarly journals on the internet search and literature to scientific journals, textbooks, and books taken manually in the library Bogor Agricultural University.

## 3. Description

### 3.1 The condition of plastic waste management in Galuga

Waste disposed in end disposal place (TPA) Galuga is garbage from the city of Bogor and Bogor Regency. The volume of waste transporters to provide 64 fleet Bogor Regency garbage. Waste transported by the sanitary service through a fleet of transport trucks. Waste transported Galuga taken straight to landfill and garbage dumped directly into the reservoir while the residents around a lot of work as scavengers have been ready for a plastic garbage scavenged economic value. Is made of organic waste by sorting for hygiene service to be processed into compost fertilizer. After it is done then the residual waste from landfill scavengers and workers thrown away without any further processing, causing the volume of waste in landfill Galuga very much. While in the processing of waste, the landfill does not build a swimming-pool water treatment of leachate (liquid waste from the garbage) and not close the stacking area. Rubbish dumped into a large shelter, trash compacted by forming a solid dispersion pattern from the edge of the area toward the middle of garbage collection area (engineering stack). So for the garbage heap of trash has been outstanding for more than 5 years required smoke pipes (flare) that serves to channel the gases methane (CH<sub>4</sub>) produced from the fermentation process by the waste that has been aged more than 5 years. But it is not effective since the landfill is located in Bogor Galuga high rainfall, so the potential to cause landslides.



Figure 01. Location of TPA Galuga



Figure 02. Scavengers activity at TPA Galuga



Figure03. Writers interview with thescavengers



Figure04. Writers interview with the collector 1

### 3.2 Plastic chips method

The method is to classify the plastic chips of plastic waste by type levels of the chemical when it will be recycled so that the economic value of waste can increase. Classification of plastic waste by using plastic chips by looking at the contents and the codes that are printed on the waste, which generally there are seven types of plastic waste that is Polyethylene Terephthalate (PETE or PET), High Density Polyethylene (HDPE), Polyvinyl Chloride (V or PVC), Low Density Polyethylene (LDPE), Polypropylene (PP), Polystyrene (PS), Polycarbonate (Other). The method of community-based plastic chips have higher profits, particularly in the role and the surrounding community who participate in the sorting of plastic waste in the landfill Galuga that will impact the high selling price and the effect will improve living standards for people around and prevent soil and water pollution by garbage.

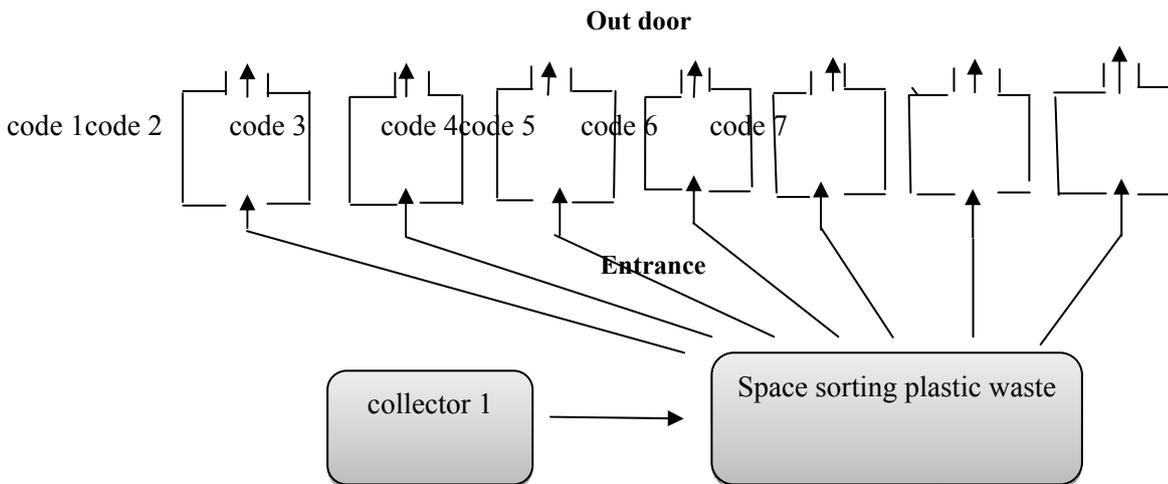


Figure 05. Plan post-production sorting plastic chips

## 4. Discussion

Method of plastic chips community-based is an alternative solution to reducing plastic waste in the landfill Galuga Bogor, Application of the method of plastic chips, is to give understanding to the community around the landfill to participate actively in the separation of plastic waste entering the landfill area, especially people who work as scavengers.

It is important for the TPA to socialize, teach and help to all parties to be able to perform the separation of waste based on the content and the chemical species mainly scavengers who work as garbage collectors which will be sold by them to the reservoirs to get the reward of collecting the trash and then The waste will be recycled by the container so that if the garbage in the can be more valuable it will increase the revenue collectors. Outcome expected from the method of plastic chips, which is recycled has a valuable selling points higher than the usual recycled.

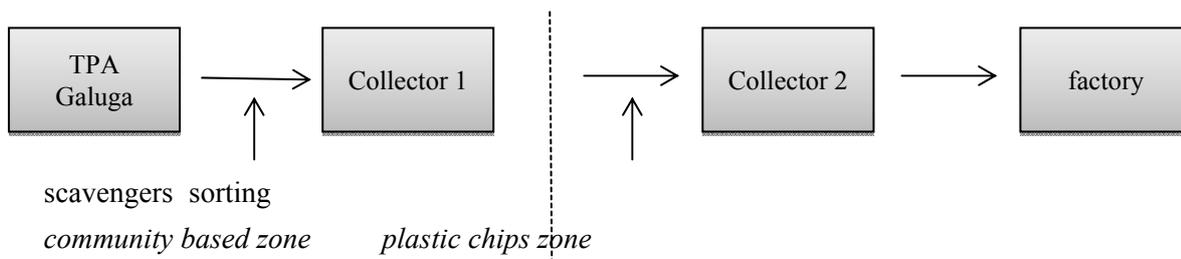


Figure 06. The step of plastic waste management in Galuga

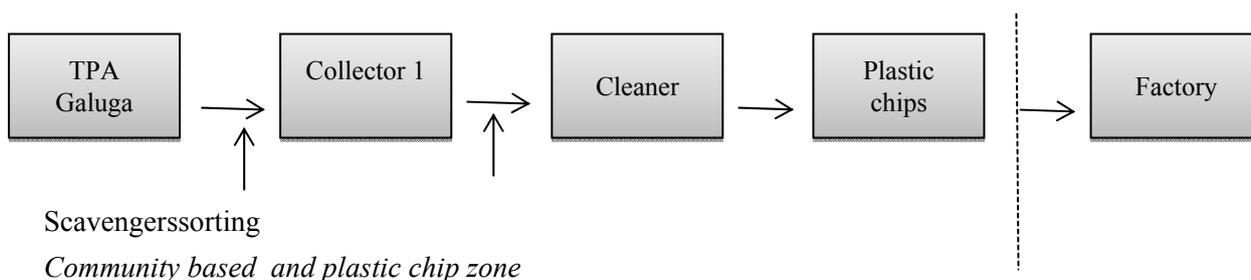


Figure 07. The concept of plastic waste management step using plastic chips

The figure above shows the comparison plot of plastic waste management in Galuga with a new concept of using plastic chips community-based empowerment. In figure 01 seen clearly public role Galuga largely as scavengers or collector 1. Prices for scavengers to collect plastic per kilo of Rp.250-700 depending on the type of plastic. The flow of figure 01 shown the quality of human resources in Galuga absorption is less effective and in addition it can be ascertained their income is much smaller than the concept of groove figure 02. In figure 02 is clearly visible specified quality human resources and people's income is much greater because the communities are able to directly produce plastic chips that will be deposited into the plant.

Government as the largest producer of waste in Galuga and Bogor district which is the owner of the landfill area Galuga role as a responsible, provider of funds, and supporting facilities of activity, make production houses at the site, and formulate policies relating to waste management and processing. Institute for the Environment will act as quality control consultant performance landfills and handle the management of hazardous and toxic waste in Bogor and Garden City Sanitation Department and the districts of Bogor and served as technical executor daily at the landfill, which will control the activities of collection, transport and process waste processing. Government also held an activity on the method of socialization on the community of plastic chips, and also as a bridge between the industrial waste processing with City Government community as the largest producer of waste in Galuga and Bogor district which is the owner of the landfill area Galuga role as a responsible, financiers, and facilities supporting activities, making home production at the site, and formulate policies relating to waste management and processing. The steps undertaken in implementing the management systems of plastic waste by using plastic chips through the empowerment function of TPA can be done by creating an area that includes legislation on the management and processing of waste in the City and County Bogor. Regulations made involving instalments Such parties as Governments, communities and industry That there are garbage processors. In addition to supporting parties, such as educational institutions, NGOs, and students. After the make local Regulations, and government as executive coordinator of the preparation by changing the physical place of the landfill. Then the government set up an association or associations waste management by involving the participation of local people Galuga.

## 5. Conclusion

The idea presented in the form of waste management systems using plastic chips on Final Disposal (TPA) as a solution Galuga Bogor Regency reduction in landfill waste Galuga, economic improvement of society around the landfill Galuga and prevention of contamination in the recycling of hazardous materials. Waste

management is a waste separation in different places based on the content and type. Before conducting an effective waste management and efficient method of plastic chips is necessary to do the socialization and understanding to the public about the importance of sorting waste plastic according to the chemical elements through the method of plastic chips.

The expected outcome of this method is the improvement of urban waste management systems, creation of a partnership between government, community and industrial waste recycling in waste management, the creation of a clean environment Bogor City by reducing the effects of landfill waste, creation of higher economic opportunities to the scavengers and job opportunities to the community in the process of managing and processing waste using plastic chips. This method is believed to be successful if applied because in addition to new and easily applied, plastic chips gave comprehensive significantly impact the surrounding environment through the plastic waste management and community based around by using the method of plastic chips.

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## 7. References

- [1] (Anonym). 2011. The types of plastic. <http://id.shvoong.com>. [3 march 2011]
- [2] (Anonym). 2011. Bogor City Overview. <http://www.indotravelers.com>. [3 march 2011]
- [3] (Anonym). 2011. Largest Plastics Supplier and Distributor in Indonesia. <http://distributorplastik.com>. [3 march 2011]
- [4] Burhani. 2010. Landfill Landslide causes Bogor Galuga 4 Scavengers Killed. <http://www.antaraneews.com>. [3 march 2011]
- [5] Hadiwiyoto S. 1983. Handling and use of waste. Jakarta: yayasanidayu.
- [6] Kementerian Lingkungan Hidup. 2008. Undang-undang no. 18 thn 2008. <http://www.menlh.go.id>. [3 march 2011]
- [7] Luthfiah WR. Dangers of plastic waste on the environment and health. <http://myhealhtylife.wordpress.com>. [7 march 2011]
- [8] Mangkara et al. 2010. City Waste Management. <http://pkm.openthinklabs.com>. [3 march 2011]
- [9] Rakhman, H. 2010. Trash Bogor. <http://ciamisleader.blogspot.com>. [3 march 2011]
- [10] Sudradjat. HR. 2009. Managing urban waste. Jakarta: Penebar Swadaya.