

Integrated Waste Management in Supporting Awareness of Healthy Clean Communities in the Garut City Area

Yunita Anggraeni¹, Retno Hanggarani Ninin², Karolina Lamtiur Dalimunthe⁴, Noer Fauzi Rachman³

^{1,2,3,4} Faculty of Psychology, Universitas Padjadjaran, Jatinangor, Sumedang, Indonesia 45363

Abstract

This study aims to find out how waste management, especially in the Garut region. Waste management is an activity that requires integration between elements from up to downstream in order to create a clean and healthy environment. Proper and integrated waste management will keep up the balance of nature and cut the risk factors for disasters. This study uses ethnographic methods where researchers are directly in the field and follow people and groups who carry out waste disposal behavior in the community. The results of this study are the management of organic and inorganic waste at a personal level. In addition, local people's wisdom in maintaining the ecology of their living space cannot be transferred in the form of awareness of waste management. On the other hand, the government does not yet have an integrated plan that will integrate personal, community and government levels in local waste management. The conclusion of this study is the limited understanding of the community only on the classification of types of waste with risk management forms such as the accumulation or burning of waste. Thus, awareness raising and integrated, simultaneous and continuous handling is needed so that the management of organic and non-organic waste becomes more right.

BACKGROUND

Tracing the foot of the Guntur mountain, one village was found bordering the forest area. Areas with the dominance of vegetable plantations that surround the village. The scene that can be seen among vegetable plantations is a pile of damaged vegetables that cannot be resold. Become organic waste that is not processed and allowed to rot. Another scene when continuing the journey to the village area is household plastic waste that is scattered to cover the road. Water drains on the left and right of the road. filled with plastic garbage that has piled up. As if not stopping to give a bleak, arid and dusty landscape that stands out in the long dry season in PS village.

As migrants, the trash and flying flies becomes the dominant sight. How can people live in an area dominated by waste? While the other side of this region is the vegetable plantations and forest highlands. Is there no waste management done by the surrounding community so that garbage can be scattered throughout the area?

The condition of the garbage scattered around PS village has happened for a long time. In 2005, based on satellite imagery, the right and left of the road was littered with garbage. When compared with the current condition of the roadside, the rubbish that is lying increasingly accumulates within 14 years. The increasing condition of garbage accumulation is certainly triggered by the behavior patterns of the people living in the area. Do the technological advancements of the last 14 years not offer solutions to waste management? Or, the consumption of society mainly for instant products wrapped in plastic which is increasing from year to year?



Figure 1. Comparing community area during years 2005 and nowadays at 2019. Source : Google Earth and personal documentation

By comparing these two conditions, it can be stated that waste is not something that is troubling over a short span of time but in the long run, it can continue to accumulate and accumulate so that it becomes dangerous for people, households and the wider community. Based on the disaster trends that occur in Garut in Figure 2, it seems that several forms of disaster have struck Garut. Based on data from disaster events that occurred from 2010-2019 it can be seen that the level of flood and landslide events is a disaster that often occurs in the Garut region. Furthermore, two specific types of disasters related to waste are floods and forest fires.

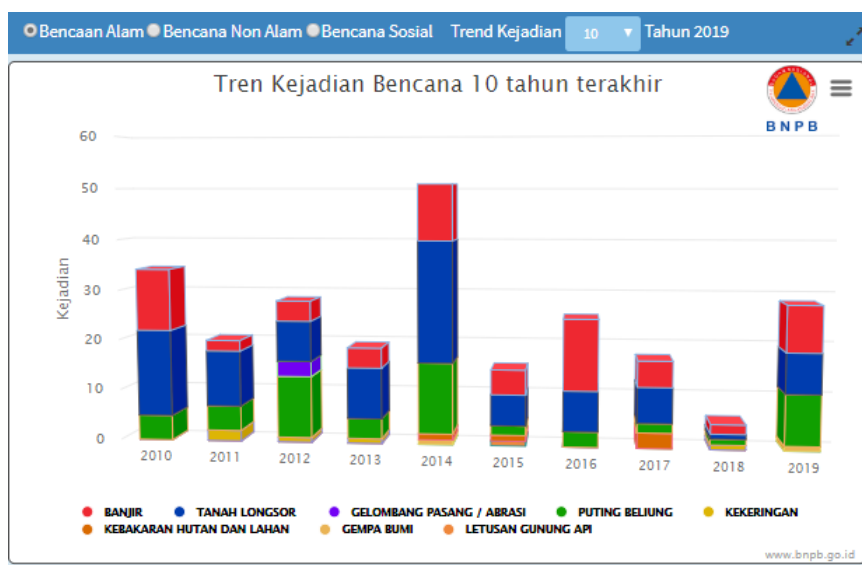


Figure 2. Data on the Garut disaster in 2010-2019 source: https://bnpb.cloud/dibi/l_reports5

If we separate these two disaster events in Figure 3, it seems that the two largest flood events occurred within an interval of 14 years and fires occurred almost periodically in the last year. Waste that is not managed and causes the accumulation of garbage can hamper the flow of the river even worse, eventually carried away by the river and cause flooding of garbage in the downstream area in the City of Garut. Large-scale flash floods occurred in 2016. An unexpected flood event as a potential disaster occurred after heavy rains in the upper reaches of the river and brought large amounts of water along with garbage that clogged the river area.

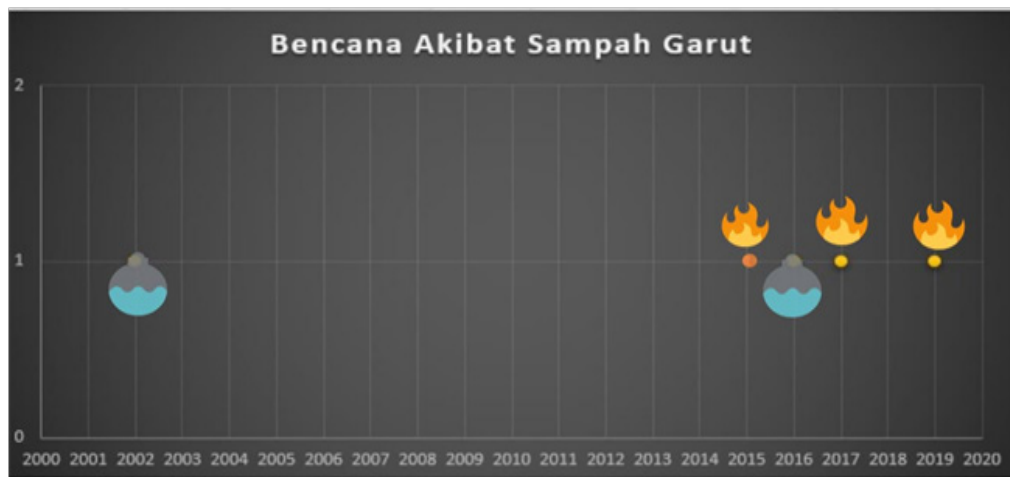


Figure 3. The range of disasters that occur as a result of waste management.2000-2020.

Furthermore, waste management by incineration of waste carelessly and in risky areas turns out not to solve the problem, on the contrary, is able to bring up new impacts or problems in the form of forest fires. Waste management by burning without the support of good facilities can have an impact on nature and its ecosystem. Garut in 2015 had experienced forest land fires due to burning of rubbish in the last shelter. The community at the time was blocking the last shelter. The relocation of the last shelter site around the area of Leuweung Tiis which also caused a fire.

After a fire the forest service then only asked for help from Sunda Hejo as a coffee plantation community and nature guard. Sunda Hejo was asked to manage an area bordering forestry and to plant coffee as a boundary area. Coffee plantation management does not simply limit the risk of forest fires. Forest monitoring and safeguards are needed to make sure that when there is a hotspot, it does not spread forest territory. The risk of the impact of burning the waste is not calculated by the manager and causes harm to the community.

Based on the explanation above, the potential for disasters that threaten the region with inefficient waste management results in a slow onset disaster that can harm the community and cause loss of life and material. According to Adamo (2011) Slow onset disaster is a disaster event that occurs in the long-term. At the moment the potential of a slow disaster disaster is of less concern when compared to sudden onset disasters. With the potential for disasters that threaten the community slowly, the researchers were intrigued to explore further about the forms of waste management that have been carried out to the people's awareness and views on the ecological conditions of their living space

METHODS

The method implemented in extracting information from people in the community through ethnographic methods in which researchers become a tool in retrieving data. Researchers involved with the community, observe the behavior patterns of the people in the community. Qualitative research in which the data is not a quantity data. Qualitative research can define needs, reasons and how people behave in these conditions (Darlington, 2002). The subjects in this study consisted of people at the micro level as agents in the community. The pattern of farming communities in PS villages to local government policies related to waste management in Garut City. The instrument used in this study consisted of observations and interviews with people from the PS community as well as a study of government policy literature related to waste management. The application of policies related to the pattern of waste management was also observed in PS village as part of Garut City

RESULTS AND DISCUSSION

The results of this study will be divided into three major parts, namely waste management at the personal and household level, community waste management and also community management at the Garut sub-district / district level. This pattern was further chosen to show how far efforts have been made at each level including the integration of the three levels in responding to issues related to waste.

Waste management individually and households

Based on the explanation in the background, the types of waste in the PS village area are divided into two types of waste, namely organic waste originating from vegetable waste produced from plantations around the village and plastic waste, which mostly comes from household consumption. Furthermore, plastic waste ranges from food products such as snacks, cigarette packets and coffee wrappers, used laundry detergent used by households, as well as other users whose identities are not identified. This is different from the classification of municipal waste which is divided into (organic) food waste, waste that can be burned to become energy, plastic waste, metal waste, paper waste, branch waste, electronic waste (Sahwan, 2015). Observations from the authors show that the garbage in the PS village area is more focused on two types, namely organic waste and plastic waste.

Furthermore, people with a background in vegetable farming realize that there is waste generated from the rest of the plantation. By its nature, this waste is classified as organic waste. This means that waste can rot easily and can be managed into compost (Wied, 2004). The rest of the plantation waste which is organic waste can basically be managed to re-used by farmers as organic fertilizer. Even vegetables with organic fertilizer have a higher market price compared to inorganic agriculture. So that organic waste management has economic value in society. The management of organic waste into compost has actually been done by PS village farmers. With the provision and guidance provided by government officials (?), Vegetable farmers are trained to manage their organic waste into compost. However, this activity was then stopped and no longer carried out continuously by the farmers. One of the reasons proposed was that they felt they still needed guidance in carrying out activities while at that time the government had stopped their guidance program.

Next is the management of inorganic waste in this case plastic. On the basis, people and households have a quick understanding of the classification of waste as stated by Mrs. Aidah, one of the villagers of PS:

“Waste from plantation vegetables is organic waste, which can actually be used as fertilizer. But no one processes it. Inorganic rubbish is rubbish from people snacks wrap such as plastic rubbish.”

This statement shows the public’s knowledge about the classification of waste and the origin of waste that should be managed. Knowledge from the classification has not become the basis for managing waste to create a clean and healthy environment. However, this knowledge is not balanced with the awareness and willingness of citizens to sort out and manage waste more organized. Referring to the Ministry of PUPR (2010) in the waste processing module which is used as a reference for waste management in the relevant ministries. Waste management is divided into 3Rs (Reuse, Reduce and Recycle). The management of each waste depends on the type of waste available. For items that can be reused, reduce their use (cut) and reuse (reuse). In recycled plastic waste that cannot be reused, recycle can be done.

Basically, the level of people and households can do sorting, reduction and recycling on a small scale. However, this sorting practice has not been carried out consistently, even at the level of waste collection, it has not yet occurred massively. The following are the efforts being made at the household level in waste management including:

- a. Stack organic waste and agricultural residues in the plantation area and left to rot by itself,
- b. Collecting non-organic waste in the form of plastic, wood waste that can be burned in water disposal as a container to burn waste.
- c. Piling garbage in locations outside the home.

The results of each effort by the community have reduced 10% of unmanaged waste accumulation. While the other 90% is still piled up and left around the village so that in the buildup site will be found flying green flies. The water channel that is not flowing because it is blocked by the accumulation of garbage that does not decompose. When we asked the residents, the residents dodged the reasons for the scattered rubbish because it was difficult to sweep through the dry dust. Dust makes people cough so hard to breathe. Some people flush the ground in their yard first to deal with the dust that is flying when sweeping.

Garbage lying on the side of the road and not collected provides its own difficulties in processing waste. Putting a trash can in a warung scene is also an effort to clean the area. Some residents who have built awareness of the importance of maintaining cleanliness in supporting family health make efforts to manage waste, it’s just that, when this effort is done alone, the frustration becomes more prominent as stated by one of the Cadres in the PS village:

“It’s useless to put a trash can. Children continue to litter. Anyway, I have a trash can, others keep littering.”

Thus, it can be said that waste management must involve all parties and be carried out simultaneously and massively so that this movement will be more inspiring and not frustrated as felt by the cadre of the PS above.

Furthermore, the consumptive behavior of the community brings waste into the village leaving packets that cannot be managed by the community. Plastic scraps of food scraps, detergents, coffee wrappers to the rest of cigarettes which are discarded by the community without being processed. On the other hand, there are actually several alternatives in the management of plastic waste such as re-use of used plastic materials that can be used as seed containers, or crafted as bags. Other processing that has been carried out in Indonesia is to destroy plastic and process it into other materials derived from plastic (Sahwan.F, 2015).

Waste management at the community level

The community does not yet have a temporary shelter as a place to collect garbage. The importance of TPS facilities to collect minimal waste at the village level. The community does not currently collect garbage due to the absence of a temporary landfill as a destination. So that the people who collect rubbish do not have the next channel to get the garbage out of their area. Waste is finally allowed to pile up around the villages and water drains. Garbage is in the highlands when the rainy season shifts through the river flow. Causing potential disasters in other regions in the lower plains.

If you look at the PS cadre's statement about waste management which causes frustration, it can be said that the community feels that it does not yet have the responsibility to jointly protect the community's territory. An empowered community is able to make its community a part of itself. The feeling that the person is a valuable part of the community and the community is an important part of the person in keeping together the territorial (Mc. Milan, 1986). Sense of community is a feeling that can unite the community in working together including cooperation in managing environmental cleanliness.

At present the community adjusts to the absence of facilities by conducting individual efforts. Although the results obtained can be evaluated through Figure 1 about the current conditions. Some have been able to allow themselves by processing waste through combustion. Some others are still in a condition where there is no awareness of the importance of cleanliness.

Waste management is carried out in groups at this time using waste incineration in front of house locations. Seeing the type of rubbish that is burned is plastic wrap rubbish which is basically dangerous for people if burned. Burning plastic waste causes dioxin compounds which, although not visible, have an impact on human health and the environment (Verma, 2016). Garbage burning also destroys the soil structure system which causes the soil and the surrounding environment to become dry. The impact of burning will cause the soil to become hot and difficult to replant.

On the other hand, the PS community actually has good local wisdom related to the preservation of the PS kampong area. The local wisdom of the community which has so far been lived in preserving nature by the community is obeying the culture that must protect the spring. If we look at landscapes where almost 80% of the area is cultivated into chemical vegetable farming, there is a small part that remains covered with large trees and looks green. According to the community's statement that they should not damage the spring, because it would affect the entire community's ecosystem. The preservation of local wisdom has made the area of water well maintained by its well-being.

At this point, the ecological awareness of the community cannot yet be transferred into other forms, one of which is related to waste management. Public attention to the problem of entering waste from outside the PS settlement area is not learned from the ancestors so that there is no generational knowledge in waste management. Waste that enters the new generation requires new knowledge, innovation and adaptation. The development of the consumption of the people who initially hunted, gathered, for farming and became a modern society that produced waste that was different from the previous generation had not been included in the form of their local policies and knowledge.

Waste management at the village / district level

There is a plan from the PS village government to build a Temporary Disposal Site (TPS) as a form of encouragement that can be said to be reactive. This happened because it was indeed in front

of the village office. They saw a pile of rubbish carried by the river and piled up uncontrollably before the eyes. When there are circumstances that threaten the community, it will generate physiological and psychological conditions that are more reactive to threats (Reser, 2009). The current condition of society is only at the stage of personal knowledge and awareness. Whereas the government which is one of the supporting elements in the community does not have any intervention to the community. The powerlessness of the community makes people unprepared and anticipates in facing potential disasters due to waste.

Integrated waste management is needed from the person, group, community level to government level. Management at the personal level can occur up to the stage of sorting waste based on classification and processing in small quantities. However, management in large numbers requires policies and facilities from the central and regional governments.

Communities as people who can be affected in disasters require individual preparation in facing potential disasters. Psychological readiness in dealing with disasters according to Morrissey & Reser (2003) is the knowledge possessed by people about disasters that can occur, measurement of disaster preparedness and emotional responses that occur in the face of a disaster that will occur.

Society as the biggest element but cannot give a decision to a mass region requires a policy made by the government. When the policy is made and socialized it will offer knowledge and make people have anticipation of the risk factors that might occur. But is socialization enough to make the community manage waste well and be ready to protect the environment? How can the community be aware of protecting the environment which has no real benefit to the community?

Sunda Hejo as one of the communities that has an interest in forest management and the environment makes the coffee treatment program a supporting element of forest restoration. Coffee tree care can then produce economic benefits for farmers around the forest. Support and help in organic plantations to keep up soil and water elements for the surrounding environment.

Integration between the community as people who produce waste with the government as managers requires a shared understanding. Knowledge that is only known by the government and not disseminated evenly results in the existing policies having no impact. Awareness at the personal level also cannot make meaningful changes if it is not facilitated by the manager.

A study on community-based solid waste management was conducted in an area in Nigeria. This study shows that integrated solid community-based solid waste management initiatives. This initiative will save costs, generate revenue and service opportunities, safeguard local values, encourage public participation and lower government investment in solid waste management services (Rigasa, 2016).

Waste management based on the community is empowered to be able to optimize the business to issue waste to temporary shelters and has been classified. Waste management provides a smaller effort and cost in its implementation. But it requires high motivation in getting people used to sort out the type of waste produced.

Whereas in waste management in PS areas there has not been an effort made by the community collectively. Good conventional processing efforts that are common in Indonesia, where the community simply takes out trash from their homes and is managed by the regional apparatuses. Then the garbage collected at the temporary shelter is transported to the last shelter. Or an effort to process waste based on the community.

CONCLUSION

Today the community's condition is still limited to the knowledge of waste classification and its modest management in the form of collecting or burning rubbish individually or in groups. Furthermore, these efforts have not been carried out simultaneously and continuously and are more trial and error so that some solutions such as burning waste carelessly can even create new risks that can interfere with health or even cause other disasters such as forest fires

Handling can occur when an understanding of all elements is created for a common goal. The community has an important role in moving the management order until the waste ends in the last processing. Effective waste management occurs when the community understands where rubbish originates and will end up where the waste is and its impact when waste is not managed properly so that the community can give an ideal role to keep up the sustainability of the earth.

Waste treatment behavior is a form of community readiness to realize the risk of their behavior towards possible disaster risks. Anticipation in facing environmental changes that produce waste is in line with the strategy of cleaning up waste from the environment. So that disaster events that have a large impact can be minimized by the community and increase the well-being of the community.

REFERENCES

- Adamo, Susana B (2011). Slow-onset hazards and population displacement in the context of climate change. Center of International Earth Science Information Network; Columbia University
- Darlington, Yvone & Scott, Dorothy (2002). *Qualitative research in practice stories from the field. 1, 6*. Australia; Allen&Unwin
- Google Earth(2019) Pencitraan gambar wilayah pasir wangi tahun 2005. doi; <https://earth.google.com/web/@7.21518195,107.78385368,1202.02539062a,0d,27.53499581y,96.23329573h,84.09702262t,0r/data=IhoKFnhOXzY2Nk1ad0RxU1V1dlQxU3FiSUEQAg>
- Kementrian Pekerjaan umum(2010). Modul Pengolahan Sampah Berbasis 3R.C03.Kab. Bandung;Pusat Penelitian dan pengembangan pemukiman.
- McMillan, D. W., & Chavis, D. M. (1986). Sense of Community: A Definition and Theory. *American Journal of Community Psychology*, 14, 6-23. doi: [https://doi.org/10.1002/1520-6629\(198601\)14:1%3C6::AID-JCOP2290140103%3E3.0.CO;2-I](https://doi.org/10.1002/1520-6629(198601)14:1%3C6::AID-JCOP2290140103%3E3.0.CO;2-I)
- Nelson, Geoffrey & Prilleltensky, Isaac. (2017). *Community Psychology: In pursuit of Liberation and Well-Being*, 2nd. NY: Palgrave Macmillan.
- Reser, J.P., & Morrissey, S.A. 2009. The crucial role of Psychological Preparedness for disasters. In Psych. The Bulletin of the Australian Psychological Society Ltd. April 2009, 14-15.
- Rigasa.Y.A, et.all.2016. Community based solid waste management strategy: a case study of Kaduna metropolis. WIT Transactions on Ecology and The Environment, Vol 210, ©WIT Press
- Sahwan. F.L,et.all (2015). Sistem Pengolahan Limbah Plastik di Indonesia. Teknik Lingkungan. P3TL-BPPT. Vol. 6. 311-318.
- Rinku Verma, et.al (2016) Toxic Pollutans form Plastic Waste-A Review. *Procedia Environment Scienced* 35 701-708. Banglore. India. doi: <https://doi.org/10.1016/j.proenv.2016.07.069>
- Wied, Hary Apriaji (2004). *Memproses Sampah*. Jakarta: Penebar Swadaya