



Waste Management: Descriptive Study in Nglurah Village, Karanganyar Regency

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Abstract: The purpose of this study is to describe the work system and the concept of waste management in Nglurah Village, Tawangmangu, Karanganyar, Indonesia. The study also sought to find out the reasons underlying the formation of the Wagu Budoyo waste management group established by the community. This study is a qualitative study with a descriptive approach. Data collection is done by conducting interviews and observations. The results of this study provide a description of the establishment, work system and direction of development of the Wagu Budoyo waste management group, Nglurah Village, Tawangmang, Karanganyar Regency. It was found that there was a central role in art studios with central figures who could initiate various activities including community-based waste management.

Keyword: Waste Bank, Waste Management

INTRODUCTION

Environmental damage is caused by exploitative behavior in utilizing natural resources. One of the potentially damaging behaviors to the environment is the lack of attention to the problem of waste. It is undeniable that one of the environmental problems that occurs in various regions in Indonesia is due to poor waste management

Waste is a consequence of the activities of human life. Therefore, waste will always be there as long as life activities continue. Every year, it can be ascertained that the volume of waste always increases along with the increasing pattern of community consumerism.

According to Sejati (2009) waste is a material that is wasted or discarded; is the result of human and natural activities that are not used anymore because the main elements or functions have been taken. According to Azwar (1990), waste is something that is not used anymore, which cannot be used anymore, which is not liked and must be disposed of, so the waste must of course be managed properly. Kodoatie (2003) defines waste as solid or semi-solid waste, which is a by-product of urban activities or the life cycle of humans, animals and plants.

Table 1. Population and Waste Collection in Karanganyar Regency

Regency Area (Ha)	77,544
Total Population (people)	861,240
Number of Houses (House)	21,554
Total Urban Population (people)	414,969
Total Rural Population (people)	446,271
Population density (people per square kilometer)	11

Population Growth Rate (%)	0.37
Total Waste Generation per person/day (liters/person/day)	2.00

Source: Rekapitulasi Data Persampahan Provinsi (<http://ciptakarya.pu.go.id>)

Table 1 shows the data on population and waste generation in Karanganyar. The proportion of people reside in Karanganyar is still dominated by the rural population. Its population density reaches 11 people / ha with a growth rate of 0.37% per year. Waste generation is generated as much as 2 liters of waste per person per day.

Table 2. Waste generation in Tawangmangu

Total population			Volume Timbulan Sampah					
Rural area	Urban area	Total	Wilayah perdesaan		Wilayah Perkotaan		Total	
people	people	people	(%)	(m ³ /day)	(%)	(m ³ /day)	(%)	(m ³ /day)
35,089	8,675	43,764	80.18	87.72	19.82	21.69	100	109.41

Source: Pokja AMPL (2015)

Table 2 shows that the population in Tawangmangu, Karanganyar Regency is dominated by people with rural characteristics. Waste generation is also dominated by rural areas with a percentage of 80.18% of the total waste generation in Tawangmangu. Therefore, more attention needs to be paid to how to manage waste in rural areas. Because rural areas generally have poor facilities and infrastructure in waste management while waste generation in rural areas is quite large.

Waste management is all activities carried out to handle waste from the time it is generated until the final disposal. Waste management activities include: control of waste generation, collection, transportation, processing and final disposal (Sejati, 2009). UU No 18 of 2008 and PP No 81 of 2012 regulates the need for a fundamental paradigm shift in waste management, which is from a waste-collecting paradigm, to a treatment that relies on waste reduction and waste management.

Kastaman *in* Suryani (2014) defines community-based waste management as an approach to waste management based on active community participation. The government and other institutions are only motivators and facilitators. Douglas, *et al.* (1994) state that environmental management requires the facilitation and implementation of community-based efforts as a strategy of empowering and increasing their access to important environmental resources, especially land, infrastructure, and services.

Nglurah Village is one of the villages located in Tawangmangu, Kabupaten Karanganyar which experiences waste and environmental sustainability problems. Nglurah Village is close to the famous tourist attraction in Tawangmangu, namely Grojogan Sewu. This village has good potential because in it there are various tourism potentials that can be developed as well as centers of ornamental plants. The relatively dense population and economic development, on the other hand, have a negative impact on environmental damage due to waste that is not managed properly.

Nglurah village at first did not have a special unit to manage waste. So that people must independently manage each waste generated. There are people who are able to process organic



waste to become fertilizer, but most prefer to burn trash or throw it away in public places, such as in rivers. This has encouraged the establishment of waste management group Wagu Budoyo. This waste management group was initiated by the Wagu Budoyo art studio by a local.

Waste management in Nglurah Village is interesting because it is done independently by the Wagu Budoyo art group and is in an environment that is not yet aware of the importance of preserving the environment. So that further studies are needed to describe how waste management is carried out in Nglurah Village.

This research has three main objectives which are based on the formulation of a research problem. First, to describe the work system and the concept of waste management attending Wagu Budoyo in Nglurah Village. Second, to find out the reasons underlying the formation of the Wagu Budoyo waste management group. Third, to find out how the concept of optimizing economic value based on Wagu Budoyo independent waste management.

RESEARCH METHODS

This research uses a descriptive approach. Sukmadinata (2006) said that descriptive research is a form of research aimed at describing phenomena in the forms, activities, characteristics, changes, relationships, similarities, and differences between one phenomenon and another. Koentjaraningrat (1991) says that the purpose of descriptive research is to provide a precise description of the characteristics of individuals, circumstances, symptoms, or certain groups. Data collection in this study was carried out by observation and interview methods. Therefore, the data used in this study are primarily primary data. It also uses other data sources in the form of journal publications, books, official publications, and periodic reports or secondary data to support variation and deepening of primary data obtained in the field. The data collected is then analyzed by sorting, organizing, and combining existing data to be able to answer the research problem.

DATA ANALYSIS AND DISCUSSION

Factors underlying the establishment of waste management group in the village Wagu Budoyo Nglurah

Nglurah village is a village located in Tawangmangu, Karanganyar Kabupaten. Nglurah Village is close to the famous tourist attraction in Tawangmangu, namely Grojogan Sewu. The population in this village is relatively dense with most working as garden farmers.

Nglurah Village is planned to be a tourism village. This is because the typography of the beautiful Nglurah Village is felt to be able to attract tourists. In addition, this village is also known as a center for producing ornamental plants. Almost all of its citizens have a business of developing ornamental plants that are managed in their home yards. This condition is illustrated in the photo shown in Figure 1.



Figure 1. Ornamental Plant Business in Nglurah Villagers

In addition to the natural potential as well as a center for ornamental plants, in this village there is also an ancient site that is the Site of Mounting (Figure 2). The existence of this site is also considered to be an interesting potential for Nglurah Village to be promoted to become a Tourism Village. At certain times, various events are held at the Village Site and Village Hall, such as the Dukutan ceremony. With these various backgrounds, Nglurah Village has the potential to become a tourism village that is a new leading tourism destination in Tawangmangu, Karanganyar Regency.



Figure 2. Site Menggung as Cultural Tourism Potential

Source: Data processed, 2019

On the other hand, there is a problem that is quite disturbing, namely waste management. As the population grows, the volume of waste produced will also increase. This will certainly be a problem if not managed properly. The same thing happened in Nglurah Village. Even though Nglurah Village is now able to compete as a tourist village, in the past few years the village has a problem, namely the pollution of the river from the mountains due to plastic waste.

From the results of observations and interviews conducted by researchers, polluted river water flow is due to bad behavior of villagers who are still littering. Including throwing waste in the river. These wastes cannot be decomposed, causing siltation and damage to ecosystems downstream of the river.

In addition, Nglurah Village did not initially have a special unit to manage waste. So that people must independently manage each waste generated. There are people who are able to process organic waste to become fertilizer, but most prefer to burn trash or throw it away in public places, such as in rivers.

This is what drives the formation of the Wagu Budoyo waste management group. The waste management group was initiated by the Wagu Budoyo art studio with a local resident

named Sugeng who owns the studio. The character of Sugeng in the studio and Nglurah Village was finally able to construct a waste management group filled by village youth.

As an activist of arts and culture, Sugeng always instills to always take care of local culture (Javanese). The value that is instilled is like an effort to always preserve nature because life is always side by side, therefore the harmony of nature and all the creatures in it need to be maintained. In addition, there is also the value of mutual assistance, solidarity and harmony between people.

Internalization of these values indirectly participates in forming the foundation of the awareness of village youth to form a waste management group (Astoria, *et al.*, 2015). According to Poedjawijatna (*in* Neolaka, 2008) consciousness is knowledge, conscious and know, so that when someone is aware, their soul will be moved to do something. So it can be assumed that when an individual has an awareness, it will affect the mindset that will affect the actions taken (Racman, 2012). A green, clean, shady, and healthy environment and the minimum amount of environmental damage that occurs will have a positive impact on the quality of human life, because the activities carried out will produce maximum productivity.

Figure 3 tries to summarize the description of the relationship between the potential that exists in Nglurah Village which is not maximally useful because of the waste problem. The waste problem occurs because there is indeed no collective waste management from the community or the government. Therefore, to support the potential of Nglurah Village and in the context of preserving nature, an initiation of independent waste management emerged.

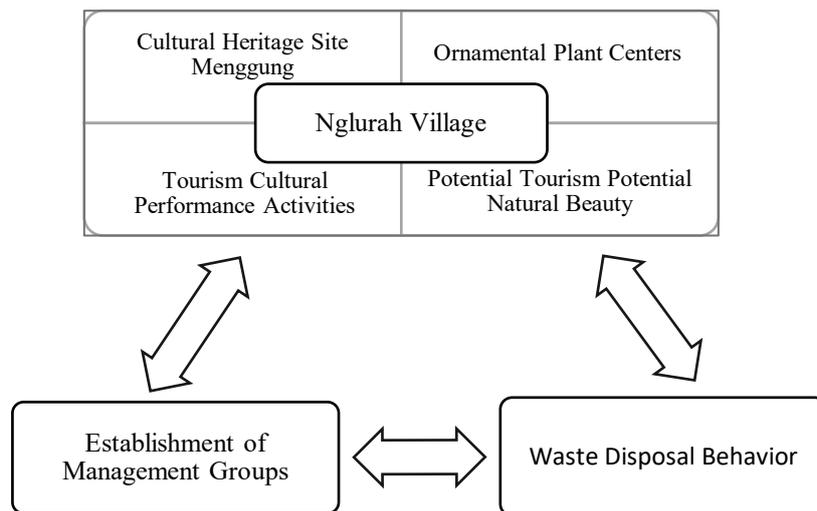


Figure 3. Characteristics Nglurah Village, Waste and Handling Problems
 Source: Data processed, 2019

Description of the work system of the waste management group Wagu Budoyo

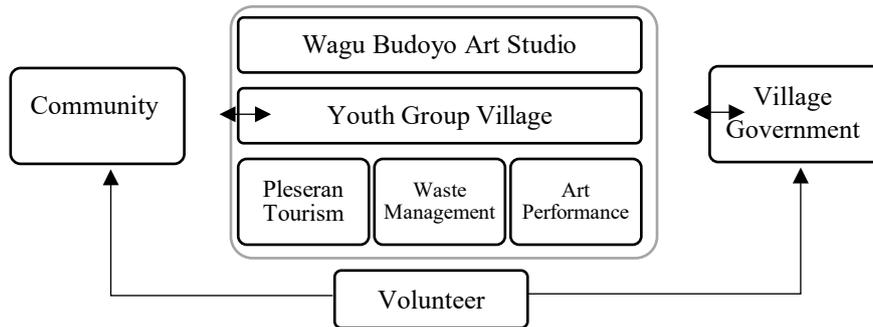


Figure 4. Organizational Description and Relationship with Stakeholders
 Source: Data processed, 2019

Figure 4 shows the flow of initiation of the waste management group. The beginning of the establishment of a waste management group came from the Wagu Budoyo art studio with its central figure, Sugeng. In this studio, Sugeng interacts with village youth in various activities. Activities carried out by Sugeng together with this youth group include building tourism tours, establishing waste management groups, and periodically becoming the main actor in organizing various arts performances in the village, including performing arts related to theungung site.

The three programs of art studio interaction with youth groups (tourism pleseran, waste management, cultural performances) relate reciprocally with the three main stakeholders, namely the village community, the government, and volunteers (mostly academics). The relationship with the village community in waste management is clear because the waste is managed by the community. The community enjoys a cleaner environment than waste management and can use organic fertilizer which is processed by the waste management group. Whereas waste managers can realize the form of environmental love internalized in art studios and can also be an alternative livelihood.

The relationship between waste managers and art studios with the government is indeed not firmly established. Relationships that occur are usually limited to cultural stage activities held regularly in the village. Whereas for the establishment of tourism activities, the government and waste management have not received assistance.

Then, there was a group of volunteers who came to the village, positioned to accompany Sugeng and interact in art studios. So that these volunteers can also relate to all activities initiated by the art studio. This volunteer group also helped to become a mediator in bridging the interests of art studio programs, including waste management. Roles are carried out such as helping to implement and coordinate activities, discuss potential tourism from the government to the village. In addition, through this volunteer, various art studio activities are sought to be legalized, so that with a clear legal basis this will facilitate in establishing relationships with external parties including the acquisition of assistance from the government.

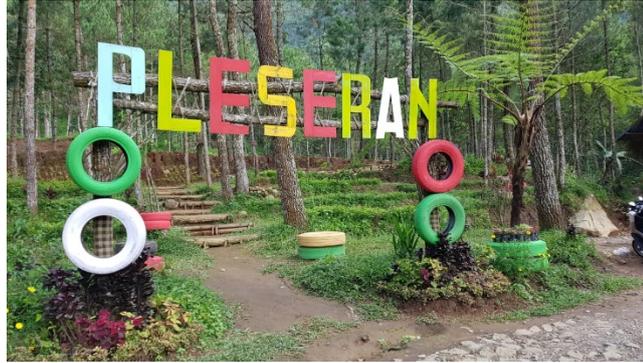


Figure 5. Pleseran Tourism
Source: Data processed, 2019



Figure 6. Discussion of Art Studio between Sugeng, Youth Group, and Volunteer
Source: Data processed, 2019

Regarding waste management, at the beginning it was formed, this waste management group working system has not been well managed. At first, there were 5 village youths under Sugeng's guidance to become waste managers in the village. The working system is that the manager goes to the houses of the people to collect the waste, then the waste is taken to the collection and sorting place. After sorting, the trash that is sold is usually plastic, then sold and the results are for the operational activities of the waste manager.

At present, there are only two people left in waste management, namely Ngadimin and Kliwon, and of course in foster care by Sugeng. Nevertheless, currently, the work management of the waste management group is relatively better with a clearer system.

The waste collection method is still the same, namely the waste manager goes to the houses one by one in the morning by using a three-wheeled motor vehicle. The waste from residents' houses has not been sorted, so it is still mixed between organic and inorganic waste. In addition, if at first the residents whose waste is taken are not charged a fee, they are replaced by paying the same amount, then the system is currently being implemented that houses whose waste is managed are asked for contributions every week. The money from the contributions is collected in the cash of the waste management group and is used for the operational activities of the waste manager. Even though it is a pro-contra, with this contribution, the waste management becomes more secure. Because managing waste is a difficult task and requires a long time, this

dedication is worthy of appreciation through the payment of contributions so that the income of the waste manager becomes more certain.

After the waste is collected from people's homes, the waste is then taken to a sorting place located on the outskirts of the village. Sorting places in the form of garden land that is on the hillside and quite far from the homes of residents. Access from the main road to the sorting area is approximately 300 m, so the waste manager makes a kind of rope stretched between trees to carry sacks of waste from the main road to the sorting place. Because in addition to being far away, motorized vehicles also cannot enter, so it will be quite tiring if you have to carry waste bags to the sorting place on foot.

The land where sorting is owned by Sugeng is used by voluntary waste management groups without paying rent. Sorting is not too wide, which is around 70m². In the sorting place, it becomes an office for waste managers. The place has not yet been electrified, so sorting activities must be completed from afternoon to evening every day. At the sorting site, large 4x8x1m squares are constructed as a place to sort the collected waste.

After sorting, the waste is then processed. For organic waste, it is processed into compost. The making of compost fertilizer has the potential to see Nglurah Village as a center of ornamental plants, of course, requires a supply of fertilizers, especially organic fertilizers, especially those that can be produced locally. In addition to fertilizer, inorganic waste is sold to increase the operational costs of the waste manager.

The flow of waste management carried out by the waste management group is depicted in Figure 7. In the figure, the waste management processes from numbers 2, 3, 4, and 5. The dashed line from the end of processing waste to the community shows indirect benefits received by the community, such as a clean and sustainable environment so that it can support the tourism potential in the village which then brings tourists.

Finance in this waste manager is managed independently, without village intervention, or from the Wagu Budoyo art studio. But the unfortunate thing is that there is no structured bookkeeping system to record the flow of money in and out of the waste management group.

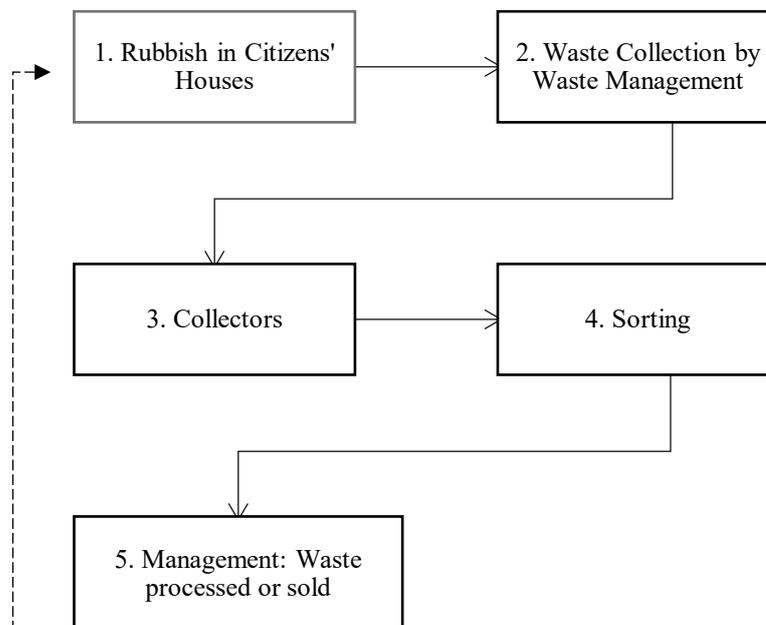


Figure 7. The flow of Waste Management
Source: Data processed, 2019

The concept of economic optimization and direction of development

Waste management in the waste management group Wagu Budoyo has been quite good and continues to grow. This shows the management's commitment to continue to run waste management. The shift that occurred from the outset was only voluntary and later developed into a livelihood, not eliminating the benefits of concrete efforts taken as a step towards conservation of river flow.

The details of waste from residents who have an assessment are as follows (Figure 8):

- 1) Organic waste can be recycled such as paper, opaque paper, cardboard, newspapers, etc.:
- 2) Organic waste cannot be recycled like leftovers, leaves, leftover vegetables, and the like.
- 3) Non-organic waste can be recycled from all types of metals such as iron, aluminum, copper and various kinds of glass bottles, beverage bottles, cans, plastic, and others.
- 4) Non-organic waste cannot be recycled like non-recyclable plastics, used batteries, home waste liquids. Recyclables that are both organic and non-organic can be sold. Typically collectors of used goods come to the waste management location. In a minimum of one week, they can get additional funds from these recycled used goods. This amount is actually higher in value than processing organic waste into compost. Compost can be processed again into organic fertilizer for sale. Or used alone to grow ornamental plants, live pharmacy plants, or vegetable or fruit plants.

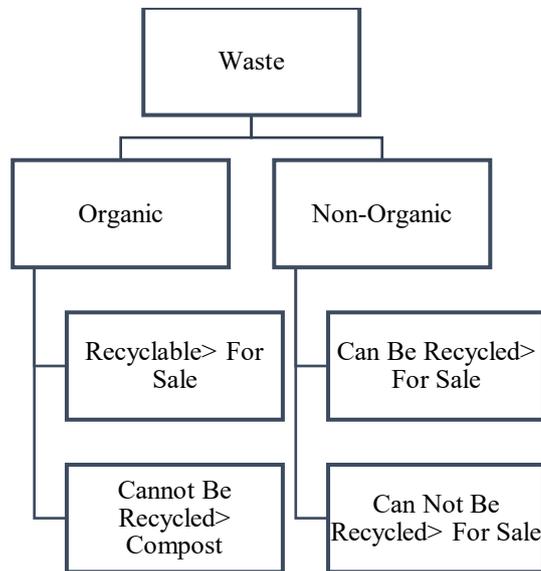


Figure 8. The flow of Waste Cycle
 Source: Data processed, 2019

As explained earlier, waste managers get income from residents' fees, compost sales, and sell inorganic waste that is sold. At present, there is no opening system from waste management so that there is no empirical evidence regarding the income of the waste manager. Sugeng did not get the economic benefits from waste management, he fulfilled his life needs from his main livelihood as a garden farmer and sold ornamental plants. While the two waste managers, namely Ngadimin and Kliwon, get profit sharing because they both handle waste management in real and technical terms. This work as waste management is a side job besides being a garden farmer.



Although the waste manager and Sugeng realized that waste management should still be able to be developed, the problem of capital was a problem that had not been found a solution. The waste management group plans to make briquettes made from waste to become renewable alternative energy for the villagers. However, this requires capital in the form of a waste counting machine and briquette maker.

In addition, there is still the potential for developing a waste management group to be developed into a Waste Bank. Waste will have economic value if there is sufficient amount to be traded or further processed as economic goods, both as raw material (recycling) and as a trading commodity. If the community as the producer of waste does a role in waste management, then accommodating and marketing the waste needs a container. It is here that the importance of the Waste Bank can be seen as a means for people to save, improve socio-economy while empowering people in more structured waste management.

The work system of the waste manager will remain the same as before, that is, the waste deposited to the waste bank is divided into several types, for example, organic waste, such as pieces of vegetables or food scraps; and inorganic like plastic, iron, and others. The Waste Bank sets the purchase price for each type of waste. Then the results of the waste deposit will be saved and can be taken or disbursed within a certain period of time by adopting the banking principle, so the waste depositor will get a savings book.

The account balance in this waste savings book can be allocated to various fields, so it does not have to be in the form of money. For example, the savings provided are in the form of compost according to the balance held. Or you can also collaborate with health service providers to design a free health service scheme from the collected bank waste balance.

CONCLUSION

This descriptive study describes the establishment, working system of development direction funds from the waste management group Wagu Budoyo, Nglurah Village, Tanggamanunggal, Karanganyar Regency. The formation of this waste management group is based on concerns over the pollution of river water flow due to waste that is not carelessly managed and disposed of. Therefore, the waste management group was present to independently carry out conservation efforts by managing the waste of the residents of Nglurah Village. The formation of this waste management group was initiated by Sugeng from the Wagu Budoyo art studio which is also located in the same village. Although in the end it was not directly involved, he succeeded in igniting the awareness of village youth to do more with the village community by instilling values such as love of the environment, help, and live-in harmony with nature. This waste management group is very possible to be developed both in the aspect of waste management that has been sorted or group management to be developed into a waste bank.

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