

Conference Paper

The Determinant of Trash Management at Faculty of Health Sciences in a University in Banyumas Regency

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Abstract

Trash management is one of an effort to preserve the campus environment, so, it has to do right to avoid health problems. There are many factors that can influence the outcome of trash management on campus either directly or indirectly. This paper tried to discuss the five elements of management (men, money, materials, machines, and method) with the result of trash management at The Campus Faculty of Health Sciences (*FIKES*) on a University in Banyumas Regency. The type of research was descriptive-analysis with a quantitative approach and the design of the study of cross-sectional. Variables in this study were taken based on each aspect that existed in the five elements of management, they were the role of the leader, the role of cleaning officer, participation of campus community, condition of trash generation, adequacy of facilities, operational techniques applied, and the costs incurred for trash management in *FIKES*. Data of those variables were collected using a questionnaire consisting of 85 questions. The result of analysis bivariate showed there were only two variables that related with the result of trash management in the campus they were the condition of trash generation ($p= 0.003$) and sufficiency of means ($p= 0.028$).

Keywords: Campus, Result, Management, Trash

1. Introduction

Waste Management or Solid Waste Management is a service in which local authorities are responsible for it, but almost all administrations in developing countries failed to provide services to most communities (Pfammater 1996). Nowadays, universities can be considered small towns, as they have several campuses and buildings where a lot of people with various activities produced the amount of trash that generate several direct and indirect impacts on the environment (Gallardo et al. 2016). Law of The Republic of Indonesia No. 18 in 2008 about waste management mentions the need for management to take place, so as not to have a negative impact on public health and the environment.

The Office of Public Works – Human Settlements and Spatial Planning and The Environmental Agency of Banyumas Regency In 2013, said that urban waste production

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volume always increased, as in 2010 to 2013 the increase reached 48.307 m³ from 1.601.927 m³ to 1.650.234 m³.

According to Azwar (1998), there are six elements of management (the six M's) which can do the management jobs effectively and efficiently. The six M's are men, money, materials, machines, methods, and market. However, in the non-profit management, there are not only five M's with included market element.

Associated with the management or trash management of the first element that is men can be the role of leadership, the role of cleaning officer, and community participation. Hilma (2014) in her study said that there was a relationship between the role of officers market hygiene with waste management. Rizkiyana (2013) also mentioned that there was a relationship between the role of community leaders and source of funds with waste management in Gerendeng Village, Purwokerto. The second element of money is the cost used for the implementation of trash management. The third element there are materials that are materials that will be processed in the form of trash generation. Then the fourth element of the machines can be equipment or infrastructure used in trash management. Ashidiqy (2009) said that there was a relationship between existing infrastructure facilities and waste disposal behavior river. Rizkiyana (2013) also mentioned that there was a relationship between infrastructure facilities and waste management. The last element is the method is a way of working or operational techniques in trash management. Rizkiyana (2013) in her study said that process or implementation of management was related to waste management.

All activities within the campus have the potential to cause negative impacts to a certain extent on the environment. One such impact is the incidence of waste (Cervantes et al. 2010). Furthermore, higher education institutions bear the ethical responsibility to promote sustainability and environmental awareness of people inside and outside universities (Fagnani and Guimaraes 2017), especially in universities which has faculty with Environmental Health Major must provide good examples for other communities inside and outside the university.

Based on the preliminary survey conducted at the Faculty of Health Sciences on a University in Banyumas Regency, it had known that the trash management was still not good, but the environmental conditions were clean enough. Moreover, the most study on waste management on campus just examines the characteristics and composition of waste generation. There was nothing that has been discussed between waste management with some elements in management. Therefore, the researcher interested to research "Determinant of The Result of Trash Management at Faculty of Health Sciences on a University in Banyumas Regency".

2. Methods

This study was a descriptive-analytic research with a quantitative approach and cross-sectional study design. This study was located at the Faculty of Health Sciences (*FIK*es), on a university in Banyumas Regency. There were six buildings in this faculty such as Dekanat, Pharmacy, Science of Nutrition, Nursing, Public Health, and Physical Education and Sport. The variables in this study were the role of the leader, the role of the cleaning

officer, the participation of the campus community, the cost of trash management (this variable will only be described), the condition of trash generation, the adequacy of the facilities, the operational techniques applied, and the results of trash management.

Data of those variables were collected by using check list consisting of 29 points of observation and questionnaire consisting of 85 questions, and those questions were asked to 93 respondents consisting of cleaning services, lecturer, employee, and students from total population in *FIK*es as much as 1.689 people. Univariate data analysis was intended to know the frequency distribution of respondent characteristics and each research variable — the bivariate analysis used Chi-Square test to determine the factors associated with the results of trash management.

3. Results

Table 1 stated that funding for trash management at *FIK*es included salary cleaning service and trash transport. Salary of cleaning services at *FIK*es sourced from 75% Rectorat funding and 25% from *FIK*es itself. As for the transportation of trash in *FIK*es, funded entirely by Rector. In one yea, *FIK*es spent as much as IDR. 166.800.000,-. That amount did not include the cost of procurement facilities and infrastructures for trash management.

TABLE 1: Funding in *FIK*es Trash Management.

Expenditure	Source		Total per Month	Total per Year
	Rector	Dekanat <i>FIK</i> es		
Salary of Cleaning Service	IDR, 600.000-./person x 17 person	IDR. 200.000-./person x17 person	IDR. 13.600.000,-	IDR. 163.200.000,-
Trash Transport	IDR, 300.000-./month	-	IDR. 300.000,-	IDR. 3.600.000,-
Total Expenditure				IDR, 166.800.000,-

Table 2 showed that most of the respondents came from the Department of Public Health (29.0%) and Pharmacy (29.0%) and most of the students (69.9%). While Table 3 showed that As many as 51 (54.8%) of respondents stated the role of leader was good. A total of 50 (53.8%) of respondents stated the role of cleaning officer was good. Respondents who stated *FIK*es community participation in was good as much as 50 (53.8%). As many as 65 (69.9%) of respondents stated that the trash generation in *FIK*es only slightly, for the sufficiency of facilities as much as 55 (59.1%) stated enough. The operational techniques applied in *FIK*es as much as 54 (58.1%) respondents stated it was good. It caused 53 (57%) of respondents stated that *FIK*es trash management result was clean.

Meanwhile, the result of bivariate analyze in Table 4 showed that only the variable of waste generation condition and the adequacy of the means associated with the trash management result with the p-value of 0.003 and 0.028 respectively.

TABLE 2: Responden Characteristic.

Variable	Frequency	Percentage (%)
1. Location		
Dekanat	3	3.2
Pharmacy	27	29.0
Science of Nutrition	11	11.8
Nursing	21	22.6
Public Health	27	29.0
Physical Education and Sport	4	4.3
Total	93	100
2. Job		
<i>Cleaning Service</i>	14	15.1
Lecturer	2	2.2
Employee	12	12.9
Student	65	69.9
Total	93	100

4. Discussion

4.1. The cost of trash management in FIKes

The cost of waste management in different areas was generally not the same. There are many factors that influence it including the physical condition of the area, the length of the road, the type of settlement, the division of work area, the population density, the type of "container", the use of "incinerator", the economic and social level of the population, sorting of garbage and many others. Yulianti (2000) said that for the calculation of waste management cost was calculated per stage of waste processing, starting from the stage of the lug, collection, transfer, transportation, and until the final disposal.

The financing of trash management in *FIKes* was still not documented. As mentioned earlier, only data about financing for salary cleaning services and trash hauling existed, but data about the purchasing of the two did not exist yet. Data on the number of needs and expenditures for trash management were not documented nicely. Therefore, it could not be known whether the financing of trash management in *FIKes* had been efficient or not.

4.2. Relationship between the role of leader and the result of trash management

The result of the bivariate analysis showed that there was no correlation between the role of leader and the result of trash management with p-value (0.148) > alpha (0.05). The results of this study were in contradiction with research conducted by Rizkiyana (2013) stating that there was a significant relationship between the role of community leaders and waste management in Gerendeng Village. Purwokerto. The unrelated between the

TABLE 3: Frequency Distribution of Each Variable.

Variable	Total	Percentage (%)
The Role of Leader		
a. Less	42	45.2
b. Good	51	54.8
Total	93	100
Role of Cleaning Officer		
a. Less	22	23.7
b. Good	71	76.3
Total	93	100
Community Participation in <i>FIK</i> es		
a. Less	43	46.2
b. Good	50	53.8
Total	93	100
The condition of Trash Generation		
a. Many	28	30.1
b. A little	65	69.9
Total	93	100
Sufficiency of Facilities		
a. Less	38	40.9
b. Enough	55	59.1
Total	93	100
Operational and Technical Applied		
a. Less	39	41.9
b. Good	54	58.1
Total	93	100
The Result of Trash Management		
a. Dirty	40	43
b. Clean	53	57
Total	93	100

role of leader with the results of *FIK*es trash management was due to differences of respondents opinion about the role of leader in trash management in *FIK*es, affecting the results of the bivariate analysis in this study.

4.3. Relationship between role of cleaning officer and the result of trash management

Based on bivariate analysis, it's known that there was no correlation between the role of cleaning officer with the result of trash management in *FIK*es because p-value was

TABLE 4: The result of Bivariate Analyze.

Variable	p-value	Relation
The Role of Leader	0.148	Not Related
Role of Cleaning Officer	0.134	Not Related
Community Participation in <i>FIKes</i>	0.673	Not Related
The condition of Trash Generation	0.003	Related
Sufficiency of Facilities	0.028	Related
Operational and Technical Applied	0.247	Not Related

(0.134) > alpha (0.05). Cleaning officer such as cleaning service was the spearhead in the cleanliness of the campus. Hartanto (2006) and Rondiyah (2014) in their research stated that the number of inadequate cleaners indirectly affected the effectiveness of waste management performance. If a cleaning officer was available to manage the amount of waste, it was less likely to result in an increased workload that was proportional to the extent of service coverage that increases, affecting the amount of waste transported to the landfill.

4.4. Relationship between community participation in *FIKes* and the result of trash management

Based on bivariate analysis, it found that there was no correlation between the participation of the campus community with the result of trash management with p-value (0.673) > alpha (0.05). The results of this study were not in line with Rondiyah (2014) and Hilma (2014) research which stated that merchant's participation could indirectly affect the performance of market waste management.

Although the result of the univariate analysis showed that 53.8% of *FIKes* community participation was good in trash management, from the bivariate analysis, it was known that between *FIKes* community participation and trash management result there was no relation. This was possible because most respondents had a habit of always throwing trash in the trash can, but almost all respondents did not separate organic trash and inorganic trash when disposing of trash and not doing 3R activities (*reuse, reduce, and recycle*) in which this 3R activity could reduce the amount of trash generation.

4.5. Relationship between the condition of trash generation and the result of trash management

Based on bivariate analysis, it was found that there was a correlation between trash generation and trash management with p-value (0.003) < alpha (0.05). There were several factors that could affect the generation and composition of waste. Based on the literature, the generation of trash generated was strongly influenced by nature and human/community factors. Azwar (1979). Tchobanoglous et al. (1993), and Damanhuri

and Padmi (2004) mentioned factors that affected the type and generation of trash., some of them, were climate, population, and human.

The large populations in *FIK*es had the potential to generate large amounts of waste, but a lot of trash was not too visible because the role of Cleaning Service that routinely collected trash every morning to be transferred to the temporary shelter. 69.9% of respondents stated that the waste in *FIK*es was only slightly seen. This was in line with the theory of Tchobanoglous et al. (1993), saying that the frequency of garbage collection was one of the factors that affected waste generation.

4.6. Relationship between the sufficiency of facilities and the result of trash management

Based on bivariate analysis, it was found that there was a relationship between the sufficiency of facilities and the result of trash management with p-value (0.028) < alpha (0.05). The results of this study were in line with Rizkiyana (2013) that there was a significant relationship between the availability of facilities with waste management in Kelurahan Gerendeng, Purwokerto. *FIK*es's clean-looking environments were supported by sufficient quantities of facilities to accommodate all trash generation.

4.7. Relationship between operational and technical applied and the result of trash management

Based on the result of the bivariate analysis, there was no relation between operational and technical applied with the result of trash management with p-value (0.247) > alpha (0.05). The results of this study contradicted with Rizkiyana (2013) stating that there was a significant relationship between the implementation or operation and waste management in Gerendeng Village, Purwokerto.

Sejati (2009) stated that the waste management procedure consisted of inclusion waste, waste, collecting, transporting, processing and final disposal. Law of The Republic of Indonesia No. 18 in 2008 stated that waste management was done by using methods and techniques that were environmentally friendly so as not to cause a negative impact on public health and the environment. As many as 58.1% of respondents considered that the operational techniques applied in *FIK*es were good enough from the side of the collection. Collection and transportation were enough to create a clean environment. However, the operational technique applied in *FIK*es had not yet processed its waste such as physical transformation which included separation and solidification of trash which aimed to facilitate storage and transportation. Also, it still did trash processing that was not environmentally friendly such as burning trash in an open area in *FIK*es area. It could have a negative impact on public health and the environment.

5. Conclusion

There were only two variables related to the results of trash management in this study such as the condition of trash generation and the sufficiency of facilities.

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