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Sorting Technic of Traditional Market Waste in Magelang City

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Abstract

The city of Magelang is a city that has a large population. Due to the automatic density of the population, there will be many shopping places, one of which is the market to meet the daily needs of the community. Magelang city is able to produce market waste up to 300 tons per day. The waste has not been used properly. This can cause environmental pollution. Market waste in the city of Magelang is a homework that must be immediately completed because all this time it has not been fully processed. The research objective is to sort out organic and inorganic waste at the Market in Magelang City. The sample of research includes five markets namely Rejowinangun, Gotong Royong, Kebonpolo, Cacaban and Sidomukti. The research method used survey method with questionnaire research tool aimed at market traders to know the characteristics of market traders, merchant waste, average amount of waste and its utilization, and other supporting components. Presentation of data analysis result obtained by descriptive analysis approach. The findings of the waste sorting from a total of 90 respondents, as many as 62.2% have not sorted out market waste. Find the average volume of waste that can be used as animal feed per m3 / day according to the market location that is Rejowinangun Market (9,2 m^3), Gotong Royong (5,2 m^3), Kebonpolo (3,3 m^3) Cacaban (1.8 m^3), and Sidomukti (2.1 m^3), it is expected that this research can be used as a reference for market waste treatment in determining the policy of the local Industry and Trade Office.

Keywords: Sorting technique, Traditional Market Waste, Magelang

Introduction

Magelang is a city that has a large population. As a result of the density of the automatic population, there will be many shopping places, one of them is traditional market to meet the daily needs of the community. Magelang city is capable of producing waste up to 280 m3 per day (DLH, 2016). The waste has not been used and it can cause environmental pollution. Market waste in the city of Magelang have to be solved but cannot be processed entirely.

Important process is sorting waste. This study aims to sort out what can be used as animal feed and which cannot be used as animal feed. Market waste that can be used as animal feed comes from organic waste, but cannot be called animal feed. Vegetable waste is one of the wastes that can be used as animal feed. One way of processing vegetable waste is by making vegetable waste flour, silage and wafers (Noviagama, 2002).

Technologies of using waste into animal feed have been widely studied, but so far it is still very much needed. In addition, ingredients that can be used as animal feed, are good nutrients for livestock, not dangerous for consumption and has large availability. This study is expected to obtain data about the types of waste that can be processed as animal feed. The data is expected to be an answer or reference for the community to determine long-term policies in managing waste that can be introduced as animal feed.

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Mind Map

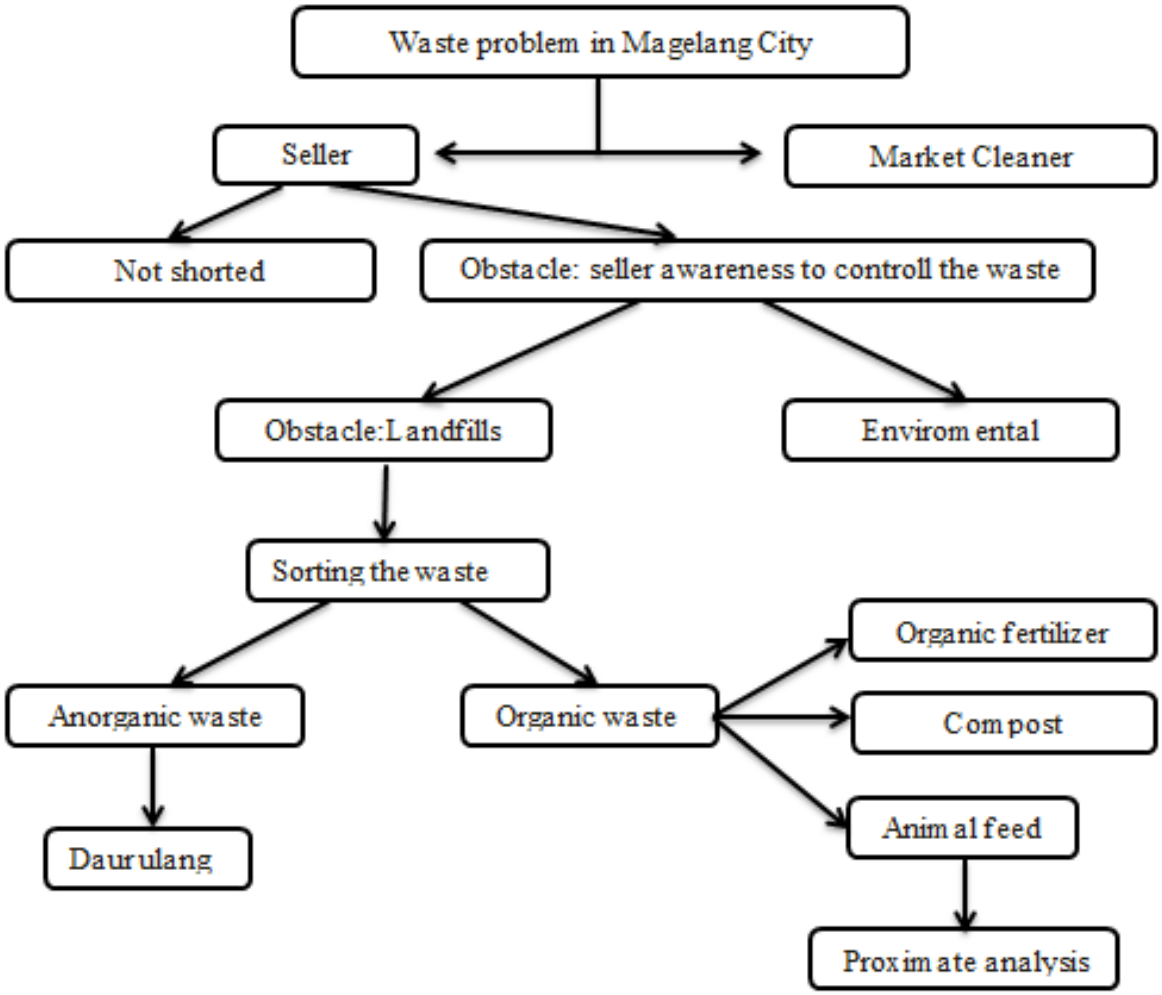

Figure 1. Research Mind Map

Materials and Methods

This research was conducted in the City of Magelang which consisted of five major markets namely Rejowinangun, Gotong Royong, Kebonpolo, Cacaban, and Sidomukti. The research method uses surveys by distributing questionnaires to market sellers. The research instrument used a questionnaire sheet which includes several indicators, namely the characteristics of market traders, market traders' waste, the average amount of market waste and its uses, and components. Data were analyzed using descriptive analysis.

Results and Discussion

Sorting characteristic

Table 1. Based on waste location

Markets	Seller				Total (person)
	Sorting		Never sorting		
	Person	%	Person	%	
Rejowinangun	13	43,3	17	56,7	30
Gotong Royong	9	36	16	64	25
Kebonpolo	10	66,7	5	33,3	15
Cacaban	1	10	9	90	10
Sidomukti	1	10	9	90	10
Total	**34**	**37,8**	**56**	**62,2**	**90**

Percentage of waste sorting from a total of 90 respondents, as much as 62.2% have not sorted out market waste. Most sellers from the Rejowinangun market (56.7%) did not sort waste. On the other hand, sellers from the Kebonpolo market in large part (66.7%) have already sorted waste. Sellers in the Kebonpolo market have separated their waste into organic and inorganic. For vegetable traders, in particular they separate their waste by type because later farmers will take it to be used as animal feed. This cannot be separated from the intervention of the market manager. Market managers provide trash bins according to their type so as to facilitate traders and visitors in disposing of trash as shown in Figure 2.

Figure 2. Waste sorting in Kebonpolo market

From the data above, it is necessary to hold a counseling so the merchants realize to sort the waste when it is disposed of. Hope, they want to throw trash in the trash that has been provided such as in the Kebonpolo market. It is expected that after counseling can affect vegetable traders to sort waste. This sorting of waste aims to facilitate the use of waste in the market. For example organic waste can be used as animal feed, while inorganic waste can be used as handicrafts from garbage. This in addition to reducing pollution can also provide additional income to traders.

According to Gilarso (2004) the notion of a market in a narrow sense is a place where on certain days sellers and

buyers can meet to buy and sell goods. While the understanding of the market in a broader sense that is the meeting between the seller and the buyer to carry out the sale and purchase transaction is no longer limited to a certain place or on a certain day (Gelbert et al., 1996). The results of the market survey in Magelang City contained five large markets managed by the Regional Government, namely the Rejowinangun Market, Gotong Royong, Kebonpolo, Cacaban and Sidomukti. The volume of waste produced by each market per day can be seen in Table 2.

Table 2. Waste volume from each market

No	Market	Waste volume (m^3)/ day	Type
1	Rejowinangun	13	Organic: 9,2 m^3 Anorganic: 3,8 m^3
2	Gotong Royong	8	Organic: 5,2 m^3 Anorganic: 2,8 m^3
3	Kebonpolo	5	Organic: 3,3 m^3 Anorganic: 1,7 m^3
4	Cacaban	3	Organic: 1,8 m^3 Anorganic: 1,2 m^3
5	Sidomukti	3	Organic: 2,1 m^3 Anorganic: 0,9 m^3

Based on the research results obtained that each market produces organic and inorganic waste with different volumes. The total waste generated by these five markets is 32 m3 / day. The waste consists of organic waste as much as 21.6 m3 / day, while inorganic waste is 10.4 m3 / day. When compared with data obtained from DLH City of Magelang (2016), the resulting waste has decreased. This is caused by several factors including the reduced purchasing power of the people of Magelang City because they prefer to shop in supermarkets compared to markets. This is as stated by Alhamda et al., 2015 that the factors that influence waste production are: population and density; level of activity; lifestyle or economic level; geographical location; climate; season; and technological progress.

In general, it can be explained that waste is an excessive material or product that is deemed to have no value for users (Madani, 2011). To create comfort, cleanliness and beauty in the market, an effective and efficient waste management system is needed to achieve maximum results as expected (Widodo, 2013). The more population there will be more volume of waste produced (Rahayu et al., 2013).

Kind of market waste

Market waste that found in the market of Magelang City is grouped into two groups, namely organic and inorganic. The waste of organic waste itself consists mostly of waste of vegetables and fruits. While inorganic waste consists of plastic bottles, plastic bags, cans, wrapping paper and others as shown in Figure 1.

Fig 2. Waste in South Rejowinangun Market

Types of market waste that can be used as animal feed

Market vegetable wastes that were often found in research locations include cabbage, caisim, cauliflower leaves, bean sprouts, spinach, cabbage, corn husk, kale leaves, cassava leaves, tomatoes, cucumbers, and chicory. According to Mansy (2002) and Trubus (1999) the composition of several types of vegetable waste is shown in Table 3.

Table 3. Composition of Several Types of Vegetable Waste

Kind of vegetable	Dry Matter (g)	Calori	Protein (g)	Fat (g)	Fiber (g)	Calcium (mg)	Iron (mg)	Ash (%)	Carbohydrate (g)	Water (g)
Spinach	15,20	43	5,20	-	1,00	340	4,1	-	6,5	86,9
Kale	10,00	30	2,70	-	1,10	60	2,5	-	-	-
Cabbage	7,00	22	1,60	-	0,80	55	0,8	-	-	-
Chinese cabbage	5,80	17	1,70	-	0,70	100	2,6	-	-	-
Sprouts	-	23	2,90	0,20	-	-	-	-	4,1	92,4
Kale leaves	23,80	-	8,93	1,03	3,19	-	-	1,82	-	-
Cassava leaves	-	-	-	-	-	-	-	1,77	-	-
Cauliflower leaves	-	3890	31,77	-	13,77	-	-	19,93	-	-
Corn skin	-	4351	1,94	-	34,15	-	-	2,97	-	-

- : no data found

Vegetable waste is a market waste that can be used as animal feed. According to Rusmana (2007), vegetable waste will be useful if used as feed through processing. One way of processing vegetable waste is by making market vegetable waste flour (Saenab et al., 2011), market vegetable waste silage (Muktiani et al., 2013; Umming et al., 2010) and feed wafers (Literally, 2005; Miftahudin et al., 2015; Noviagama, 2002; Retnani et al., 2009).

Conclusion

It can be concluded that market waste in Magelang is classified as organic and inorganic waste. Most of the traders in Magelang City Market have not sorted garbage. So there is a need for counseling to increase the awareness of traders about the importance of sorting garbage. Market waste that can be used as animal feed is organic waste. These organic wastes include spinach, kale, cabbage, chicory, mung bean sprouts, kangkung leaves, cassava leaves, cauliflower leaves and corn

husk. The expected results of this research can be used as a reference for market waste treatment as well as determining the future policy of the Industry and Trade Office of Magelang City. In addition, further research is needed to find out the content of each of these wastes so that the content of each organic waste is known if it is used as animal feed.

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References

Alhamda. S. and Sriani, Y. 2015. *Buku Ajar Ilmu Kesehatan Masyarakat (IKM)*. Yogyakarta: Deepublish.

Dinas Lingkungan Hidup. 2016. *Volume Sampah Rata-rata per Hari (m3) menurut Wilayah Tahun 2016*. Magelang.

Gelbert, M., *et al*. 1996. *Konsep Pendidikan Lingkungan Hidup dan "Wall Chart", Buku Panduan Pendidikan Lingkungan Hidup*. Malang: PPPGT/VEDC.

Gilarso, T. 2004. *Pengantar Ekonomi Makro*. Yogyakarta: Kanisius.

Harfiah. 2005. *Penentuan nilai indek beberapa pakan hijauan ternak domba*. Jurnal Sains dan Teknologi. 5(3): 114 – 125.

Madani, M. 2011. *Agenda setting pengeolaan sampah pasar di kota Makassar*. Jurnal Ilmu Pemerintahan. Vol.1. No.1

Miftahudin, Liman, and F. Fathul. 2015. *Pengaruh masa simpan terhadap kualitas fisik dan kadar air pada wafer limbah pertanian berbasis wortel*. Jurnal Ilmiah Peternakan Terpadu vol 3(3): 121-126.

Muktiani A.J., Achmadi BIM, Tampoebolon, and Setyorini R. 2013. *Pemberian silase limbah sayuran yang disuplementasi dengan mineral dan alginat sebagai pakan domba*. Jurnal Pengembangan Peternakan Tropis. 2:144-150.

Rahayu, R.E., and Y. Sukmono. 2013. *Kajian Potensi Pemanfaatan Sampah Organik Pasar berdasarkan Karakteristiknya (Studi Kasus Pasar Segiri Kota Samarinda)*. Jurnal Sains dan Teknologi Lingkungan. 5 (2):77-90.

Retnani, Y., W. Widiarti, I. Amiroh, L. Herawati and K.B. Satoto. 2009. *Daya simpan dan palatabilitas wafer ransum komplit pucuk dan ampas tebu untuk sapi pedet*. Jurnal Media Peternakan 2(2): 130 – 136.

Retnani, Y., F.P. Syananta, W.Widiarti, L. Herawati and A. Saenab. 2010. *Physical characteristic and palatability of market vegetable waste wafer for sheep*. Journal Anim. Prod. 12(1): 29 – 33.

Rusmana, D., Abun and D. Saefulhadjar. 2007. *Pengaruh Pengolahan Limbah Sayuran secara Mekanis terhadap Kecernaan dan Efisiensi Penggunaan Protein pada Ayam Kampung Super*. Lembaga Penelitian Universitas Padjajaran, Bandung.

Saenab, A. and Y. Retnani. 2011. *Beberapa Model Teknologi Pengolahan Limbah Sayuran Pasar sebagai Pakan Alternatif pada Ternak (Kambing/Domba) di Perkotaan*. Workshop Nasional Diversifikasi Pangan Daging Ruminansia Kecil.

Umming, S., B. Bakrie, D. Andayani and N. Risris. 2010. *Kajian Pemanfaatan Limbah Pasar Sebagai Pakan Sapi Potong di DKI Jakarta*. Laporan Akhir Tahun 2010. Jakarta.

Widodo, T. 2013. *Studi tentang peranan unit pasar dalam pengelolaan sampah di Pasar Merdeka Kota Samarinda*. eJournal Administrasi Negara vol 1 (1): 1-7.