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Traditional Environment Friendly Market Waste Management Model (Study in Manado City)

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Abstract---*The traditional market space commodity transactions subsistence needs process which still thickly colored by rural economic atmosphere with strong traditions. Traditional markets Manado City is asset Manado City government, transferred to PD Manado City market. This study uses combination research methods between qualitative methods, quantitative methods with descriptive methods. Focus this research more dominant on study waste management. Data collection was carried out through stages questionnaires and interviews with several parties related this research, number informants determined by researchers themselves based certain considerations. Main consideration determining informant is mastery required data information number respondents 10 (ten) people based on gender, there 40% male and 60% female. This study examines formulation traditional market management model. First collaborative governance process begins with assessment process. Second arrangement regional zoning according goods and services commodities. Three prototype model designs were made help make real contribution city government and community carrying out waste management towards green technology-based smart city. The findings of formulation increase potential demand for traditional market traders. The main cause of competition between traditional markets and modern markets is the weak management system, poor traditional market infrastructure. Collaboration model, behavior mapping and prototype model, traditional markets will be better.*

Keywords---*environment, governance, smart city, traditional markets, waste*

Introduction

The traditional market in Manado city is an asset of the local government of Manado city, which is then delegated to PD. Pasar Manado city which is fully authorized to manage traditional markets in Manado city (Manado City Mayor Decree no. Regional Market Companies and determine the Initial Balance Sheet for Manado City Market Regional Companies). Before the Manado city government ratified the Mayor's Decree No. 23 of 2005, the Manado City Government had first made Regional Regulation No. 14 of 2000 concerning the establishment of the Manado City Market and then followed up with the Decree of the Mayor of Manado City No. 26 of 2003 concerning Instructions for the Implementation of Perda No. 14 of 2000 (Anggraini et al., 2017). Traditional markets in Manado City are

Pinasungkulan Ranotana, Bersehati Calaca, the new order Paal 2, Tuminting, and 66 Bahu (Adnani et al., 2018; Karnata & Putra, 2017).

The city of Manado is still faced with waste management which is quite complicated and worrying. It is observed from the heap of waste with a large amount in the watershed. The waste problem in Manado City is increasing every year due to a relatively large and significant increase in population growth. In 2011, waste production in Manado City reached 828,812 m³ and continued to increase in the amount of production every year, reaching 980,865 m³ in 2014. According to the Manado City Environmental Office data, the waste generated by the people of Manado City is around 326 kg per day or 10,123 kg per month. Thus, the waste generated by the people of Manado City in 2016 reached 121,484 Kg. This paper presents a review related to how people in the industrial era 4.0 evaluate and criticize the issue of government environmental and social accountability in Indonesia (Lo & Leung, 2000; Lihua et al., 2020).

Formulation of the problem

What is the management model for traditional market waste management in Manado City so that it becomes a Smart City that supports the concept of being environmentally friendly?

Objective

Formulate a management model for traditional market waste management in Manado City to become a Smart City that supports the concept of being environmentally friendly. Green marketing is an environmentally friendly marketing concept (Lo & Leung, 2000).

Research Method

Study specification

This study used a combination of study methods (mixed methods) between qualitative methods and quantitative methods with descriptive methods. Study on implementing local government policies in waste management efforts can use a quantitative study approach and a qualitative study approach. This study was intended to provide insight into the diversity (multi-paradigm) of alternative qualitative study in accounting science (Lo & Leung, 2000).

Study site

The study location used in this study was Manado City, located in North Sulawesi Province. The study subjects were the Department of Cooperatives, MSMEs, Industry, and Trade, Market Heads, Village Heads, and Market Traders.

Data collection tools

Data collection tools used in this study were questionnaires, interviews, and document studies. This questionnaire was prepared using a closed and semi-open system. The closed system was carried out to facilitate respondents to provide answers by choosing alternative answers that have been provided (Wang et al., 2016; Dijkema et al., 2000).

Literature

An essential element in descriptive study study because of the supporting literature, the study will experience many difficulties and obstacles to obtain data, both theoretical and practical data.

Data source

This study data collection activity was carried out on several sources: informants, phenomena or events, and documents.

Data analysis instruments

Data analysis used a qualitative approach which analyzes in-depth for later interpretation. In general, data collection from the subject begins with checking the data, whether the respondent has filled out the data collected through the questionnaire, or the notes from the interviews have been adjusted to the needs of study data, checking and inventorying books, laws, and other study results to support document studies. Waste management in Manado City is based on several regulations (Colding & Barthel, 2017; Aye & Widjaya, 2006). Law of the Republic of Indonesia Number 18 of 2008 concerning Waste Management, Government Regulation of the Republic of Indonesia Number 81 of 2012 concerning Management of Household Waste and Waste Similar to Household Waste. Meanwhile, Manado Mayor Regulation No. 50 of 2017 concerning the Manado City Waste Management System Master Plan and Manado Mayor Regulation No. 33 of 2018 concerning the reduction and handling of municipal-based waste (Brown & Caylor, 2006; Jucevičius et al., 2014).

Research Result

Data collection was carried out through the stages of questionnaires and interviews with several parties related to this study. The demographics of the respondents were determined by data needs consisting of gender, age, education, and domicile. There were 60% of traders answering that the types of waste consist of organic and inorganic waste, while the remaining 40% answered wastes consist of wet and dry wastes. Traders also could distinguish between organic and inorganic waste. According to traders, organic waste consists of food scraps, fruit peels, flour, vegetables, leaves, and twigs. They argued that organic waste could be used as compost and animal feed. Meanwhile, according to them, examples of inorganic waste are plastic bottles, glass bottles, plastic bags, and cans (Ridd & Liu, 1998; Daily & Dalton, 1992).

Not all traders answered correctly in utilizing inorganic waste since 30% answered for compost and animal feed. According to 40% of traders, those responsible for market waste management are only the city cleaning office and traders. Meanwhile, 57% stated that apart from the two, the private sectors and NGOs. All traders had their waste collection, and they dumped the waste in such a place. However, the trash bins had not met health requirements (watertight, not easy to rust, robust, and easy to transport). Only some traders had trash bins according to standards. Therefore, most of them could not separate the easily decomposed waste and the length of its decay.

Effects of traditional market waste management

The impact on health if inappropriately managed waste following 85% of traders is causing diseases, such as diarrhea, jaundice, pest, and dengue fever. Meanwhile, the impacts of inappropriately managed waste on the environment, according to all traders, were causing flooding, as a place to nest and spread germs, air pollution due to burning, water pollution such as changes in color and smell of water. Traders advised disposing of organic waste generated 1 X 24 hours. Sustainability as a business model is a strategic tool to achieve the company's long-term goals (Riswati et al., 2017).

Discussion

Analysis of traditional market waste management condition

Traders' perception

Knowledge

The Law of the Republic of Indonesia No. 18 of 2008 states that waste is the residue of daily human activities and/or natural processes in solid form. Meanwhile, in SNI 19-2454-2002 concerning Operational Engineering Procedures for Urban Waste Management, waste is defined as solid waste consisting of organic and inorganic materials considered useless and must be managed not to harm the environment and protect development investment. From this statement, it can be observed that in the traditional market of Manado City, only 53% of traders could correctly name the types of existing wastes (Ying et al., 2002; Zuccato et al., 2000).

The quantity of daily waste generated in Manado City was 409.7 tons. The organic waste composition was higher than inorganic waste, with a percentage of 65% organic waste and 35% inorganic waste. In Manado City, 8.12% or

33.27 tons of waste came from traditional market waste. There are three traditional markets in Manado City, Bahu Market in Malalayang District, Karombasan Market in Wanea District, and Bersehati Market in Wenang District. According to [Aswadi \(2011\)](#), waste management consists of six steps: Waste generation control, Storage/Sorting, Collection, Transportation, Processing and Final disposal site.

Attitude

Protecting the environment requires all market traders' active and voluntary participation to reduce the volume of waste in temporary waste disposal sites (TPS). If market traders already know the benefits and impacts of managing market waste, the government and traders must think about how to process waste effectively and efficiently to reduce the pollution due to waste and make the environment clean and healthy. The legal basis for waste management refers to Law No. 18 of 2008, concerning Waste Management. The law states that waste is the rest of daily human activities and/or natural processes in the solid form.

Action

Handling the city's waste management system must be carried out efficiently and effectively so that maximum results can be achieved as expected by the community and government.

Buyers' perception

One of the reasons buyers choose to shop at traditional markets is that there is still a price bargaining process that allows for personal and emotional closeness between the seller and the buyer. The condition of traditional markets in Manado City, such as in the Pinasungkulan Karombasan Market, internal and external infrastructure in a state of disrepair.



Figure 1. Illustration of traditional market condition in Manado city

Manager perception

Planning

1) *Working plan*

The planning made by the Manado City Market Office has not been maximized, and there are still obstacles in the process of implementing market governance. Achieving unclear goals set and planning will complicate the performance of the office unit in the field, in this case, the UPTD in each market.

2) *Regulation*

The traditional market in Manado City is an asset of the Manado City Government delegated to the Manado City Government PD. Pasar City is fully authorized to manage traditional markets in Manado City (Decree of the Mayor of Manado City No. Regional Market Company and determine the Initial Balance Sheet of Manado City Market Regional Company) before the Manado City Government ratified the Mayor's Decree No. 23 of 2005, the Manado City Government had first made regional regulation No. 14 of 2000 concerning the formation of PD Pasar Manado City and then followed up with the Decree of the Mayor of Manado City No. 26 of 2003 concerning Instructions for the Implementation of Regional Regulation No. 14 of 2000.

3) *Levy target*

Market levy is one of the sources of regional retribution that needs attention because market levy revenue will support an increase in retribution income, encouraging an increase in regional original income ([Siswojo et al.](#),

2016). Traders pay their obligations directly to the appointed officer, no other officer in the field may receive money from the tenant. There is only 1 (one) fee charged to the tenant, including rental, cleaning, security, and maintenance costs. The amount of the fee has been mutually agreed upon between management and tenant.

An officer carries out the collection of levies appointed to collect the levy for cleaning and kiosks daily and collected to the General Coordinator or Collector Coordinator who makes a recapitulation of the amount and will then be deposited to the Head of the Levy Section.

Organizing

1) *Employment*

The Manado City Market Office also needs to make clear assignments and task distribution in traditional market governance.

2) *Facilities and infrastructure*

The facilities and infrastructure provided are effective if used optimally and can provide benefits for all parties involved.

3) *Funding allocation*

Funds prepared by the government through the Manado City Regional Budget to manage traditional markets in Manado City are still very minimal.

Actuating

1) Working mechanism

2) Task distribution

3) Working hour distribution

4) Controlling; Job evaluation and Revenue evaluation

Perception of market and sanitary offices

1) Stakeholder Perception

2) Market managers' perception

3) Perception regarding sanitary facilities

4) People in charge's perception

Analysis of traditional market waste management effect

In a study by [Patadjenu et al. \(2020\)](#), the waste composition of Bersehati Market was carried out with a sample of 60 kg of waste, the percentages of which were 91.67% organic waste. The waste composition of Bahu Market was carried out with a sample of 47.5 kg of waste, the percentages of which were 84.21% organic waste. The waste composition of Karombasan Market was carried out with a sample of 61.3 kg of waste, the percentages of which were 89.72% organic waste. Traditional markets are identical as a place of buying and selling which is a source of waste pollution ([Sukresno et al., 2019](#)).

Traditional market waste management model

Policy implementation, in principle, is a way for a policy to achieve its goals. No more and no less. There are two choices of steps to implement public policy, i.e., directly implementing it in the form of a program or through the formulation of derivative policies or derivatives of these public policies ([Nugroho, 2014](#)).

Collaboration step

The initial stage is a collaborative process which is the initial strategy in implementing governance. Collaborative Governance stages described by [Morse & Stephens \(2012\)](#), previously mentioned, it consists of four stages: assessment, initiation, deliberation, and implementation. The first stage in the collaboration process is the interpretation (assessment). The assessment phase begins with exploring the conditions and needs (assessment) of the

traditional market. The second stage is the initiation stage. As previously mentioned, this stage includes the identification of conveners and the role of sponsors who may become human resources and sources of funds in managing traditional markets, stakeholder meeting activities to build a working group in the design process.

After the previous stage, the third stage succeeded in building commitment among stakeholders to work together is the deliberation stage. The government has set the basic rules for managing traditional markets. In socializing these rules, there is a need for deliberation and dialogue activities as part of a collaborative learning process that aims to create and explore options to reach a collaborative agreement or cooperation agreement. This stage has 3 (three) ways: Designing the organizational structure of traditional market management, building constituent support, and monitoring and evaluating.

Behavior mapping of market users

By mapping and setting user behavior (Behavior Mapping) makes an architectural design adaptable, flexible or open (Laurens, 2004). Traditional markets need to continue to exist and compete with modern markets that have sprung up in urban areas so that there is a need for revitalization. The behavioral mapping approach process is carried out based on:

- 1) *Person-centre maps*
This method focuses on observing human movements over a certain period (illustrating the current configuration and zoning of the market area related to the waste problem).
- 2) *Place-cantered maps*
This section focuses on how users organize themselves in a location (how to communicate and interact, the effective hours of the waste generation process, and activities indicated to impact waste generation).
- 3) *Physical trace*
The approach is taken to obtain the signs left by the user after the activity (position of trash bins, size of waste collection area, and support for waste management facilities and infrastructure from management policies).

Prototype design

This stage has five steps:

- 1) **Communication**
This stage is carried out by communicating with the Sanitation Office, Communication and Information Office, and the public using traditional market offices in Manado City.
- 2) **Quick Plan**
After obtaining the necessary information, the next step is to make a quick plan based on the needs of users and society in general
- 3) **Modelling Quick Design**
This design includes web applications, android applications, and waste-type management websites. The design is based on the needs of various related parties such as the community, buyers, and traders.
- 4) **Construction of Prototype**
The designed application is called the Waste Management Application towards a smart city. In the future, this application can provide ideas and ideas for development towards a Green Technology-based direction that can integrate other systems in Manado such as smart government (smart government), smart economy (smart economy), smart society (smart social life), smart mobility (intelligent mobility), smart environment (smart environment).
- 5) **Deployment Delivery and Feedback**
In determining the effectiveness of making the system, it is necessary to get feedback from system users. The design results need to get input from stakeholders to be developed in the future according to their expectations and needs. Sustainability as a business model is a strategic tool to achieve the company's long-term goals. (Sukoharsono, 2014).

Conclusion

- 1) The approach to user activities and activities needs to be one of the concerns in determining waste and waste management systems in traditional markets.

- 2) There are three stages in the traditional market management model that must be considered. First, the collaborative governance process begins with an assessment process or identification of environmental problems related to waste. Second, regional zoning arrangements under goods and services commodities have been implemented in the market, but there is no clarity in preparing the layout of supporting facilities for waste disposal and processing. Third, the prototype model design can help and make a real contribution to the city government and the people of Manado in carrying out waste management towards a smart city based on green technology.

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