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MSc Programme in Urban Management and Development

Rotterdam, The Netherlands

October 2016

Thesis

Title: **The Influence of Customers' Motivation Leading to the Contributions of Individuals and Communities to a Waste Bank Program**

(Case Study: Samici Waste Bank, Cimahi City, West Java, Indonesia)

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UMD 12

MASTER'S PROGRAMME IN URBAN MANAGEMENT AND DEVELOPMENT

(October 2015 – September 2016)

THE INFLUENCE OF CUSTOMERS' MOTIVATION LEADING TO THE CONTRIBUTIONS OF INDIVIDUALS AND COMMUNITIES TO A WASTE BANK PROGRAM

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Indonesia

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UMD 12 Report number: 919

Rotterdam, 31st October 2016

Summary

This research focused on the implementation of integrated sustainable waste management (ISWM) through household participation in a waste bank program. This study investigates the influence of customers' motivation in participating in a waste bank program, thereby affecting customers' contribution to the effectiveness of the waste bank program. The research examines two types of customers in Cimahi municipality: individuals and unit customers who have different characteristics and behaviors. The first part of the research explains implementation of Samici Waste Bank's program in Cimahi city, and how it operates on a daily basis. The second part of the research investigates the differences between individuals and unit customers in terms of motivation to participate in the waste bank program. The third part inspects whether discrepancies between the two types of customers influences the costumers' contribution to the waste bank, and how this affects the program's effectiveness in achieving waste reduction policy targets.

The study was an explanatory, single holistic case study. Various literature and case studies on ISWM were reviewed, particularly related to waste recycling activities, waste bank programs and household participation. Assessment variables and indicators were then formulated as analytic tools to assess the influence of customers' motivation to participate in a waste bank program, thereby contributing to the effectiveness of the program. The method of primary data collection involved questionnaires which were completed by waste bank customers. The selection of a sample for questionnaires was by stratified random sampling based on types of waste bank customers (individuals and units). In addition, semi-structured interviews were conducted with the waste bank director and with selected waste bank customers for data triangulation purpose, using single purposive sampling as sample selection method. Use was also made of reviewing secondary data as well as observation. The data from field work were then analyzed both qualitatively and quantitatively, assisted by SPSS, Microsoft Excel, and Atlas.ti program software in the forms of narratives, tables, chats and images.

The findings reveal that in terms of customers' motivation to participate in the waste bank program, there are four variables which demonstrate significant differences between individuals and unit customers, namely: socioeconomic condition (occupation and community level activity), attitude towards participation in a waste bank program, subjective norms, and convenience. It can be concluded that customers' motivation significantly influences each household's decision on the level of participation to which they want to become involved in the program, as individuals or unit customers. This research also shows a weak correlation between a customer's motivation and their contribution to the program in Samici Waste Bank. This means that customers' motivation to participate did not directly and significantly affect the amount of contributions made to the waste bank program. However, encouragement from external referents (friends, neighbors and community leaders) and convenience (accessibility to the service facilities) may influence people to participate and contribute more to the waste bank program. Furthermore, contributions to the waste bank program are more influenced by technical aspects such as frequency of depositing waste, number of recyclable materials delivered, and total amount of waste deposited.

To improve the effectiveness of the waste bank program, several recommendations are formulated. First, encouraging more socialization about Samici Waste Bank with related stakeholders to create awareness. Second, improving the quality of convenience which consists of availability of service facilities and accessibility.

Keywords: *sustainability, ISWM, waste bank, motivational factors, household behavior, participation, performance measurement, effectiveness*

Acknowledgement

First of all, I would like to express my greatest gratitude to God Almighty, Allah SWT, the compassionate and the merciful.

I would like to thank my parents, my husband, my sisters, my in-laws, and the rest of the family for their unconditional supports and prayers.

My sincerest gratitude to my supervisor, Raphaël Smals, for his patience, guidance and dedication in improving the quality of this research. Also, my grateful thanks to my second reader, Julia Skinner for her useful advice and opinions on this thesis.

I would also like to thank all the outstanding staff and professors at the IHS for sharing their knowledge and guidance throughout the study process.

I also acknowledge everyone who contributed during the field work and data collection in Cimahi city, especially the Director and the staff of Samici Waste Bank, the staff of the Cleaning and Landscape Agency of Cimahi city, my former office colleagues, and all respondents. Thank you for sharing the information and participating in the interviews.

To all my friends and colleagues, especially UMD12 Indonesia and PPI (Persatuan Pelajar Indonesia) Rotterdam, who have been like a family to me, thank you for making this year such a pleasant and memorable journey.

Last but not least, I would like to express my gratitude to LPDP Indonesia for their full financial support. Thank you for making my dream to study here come true.

Abbreviations

CBSWM	Community-Based Solid Waste Management
FDS	Final Disposal Site
ISWM	Integrated Sustainable Waste Management
MDGs	Millennium Development Goals
MSWM	Municipal Solid Waste Management
RT	Rukun Tetangga/Neighborhood Group, small citizens' organization comprising several households, supervised by RW
RW	Rukun Warga/Community Group, citizens' organization comprising several RTs, supervised by a subdistrict
SNI	Standar Nasional Indonesia/Indonesian National Standard
SUSENAS	Survey Sosial Ekonomi Nasional/National Social Economy Survey
SWM	Solid Waste Management
TPPAS	Tempat Pengelolaan dan Pembuangan Akhir Sampah/Solid Waste Treatment and Final Disposal Site
TPS	Tempat Pembuangan Sampah Sementara/Intermediate Collection Points
TPB	Theory of Planned Behavior
3R	Reduce, Reuse, Recycle
WB	Waste Bank/Bank Sampah
1 Euro (€)	14,819.4 IDR *(average exchange rate in August 2016)*

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Chapter 1: Introduction

This chapter provides brief information on Solid Waste Management in a global context and how it applies in Indonesia as one of Asia's developing countries. It is followed by a portrayal of issues relating to the solid waste management system in Cimahi municipality. Based on an elaboration of these matters, the researcher formulates research objectives and research questions which are addressed in this study. The significance and the limitations of the study are presented at the end of this chapter.

1.1 Background

Waste has become one of the main problems in urban areas as an inevitable outcome of human activities. The increasing population and economic growth have also led to an expansion in the quantity and quality of generated waste. Growth in income per capita and the urbanization rate is seen as a major contribution to waste accumulation. Nowadays, urban areas in the world generate approximately 1.3 billion tons of solid waste every year. This amount is estimated to rise to 2.2 billion tons by 2025. Moreover, in the case of lower-income countries, waste generation rates will more than double in volume over the next twenty years (Hoornweg and Bhada-Tata, 2012). This will drive demand for appropriate solid waste management to prevent adverse effects on the environment and human health, whereby responsibility lies with municipalities.

Environmentally acceptable municipal solid waste management (MSWM) has become a major challenge due to limited resources, an exponentially increasing population, rapid urbanization and worldwide industrialization. In developing countries like Indonesia, these factors are further exacerbated by insufficient financial resources, and inadequate management and technical skills within municipalities and government authorities (Hazra and Goel, 2009). Due to the high costs correlated with its management, the burden is mostly on the municipal budget, which influences the quality and quantity of service delivery. Therefore, some municipalities have still not been able to realize a satisfying service due to budget deficiency (Guerrero, Maas, et al., 2013).

Correspondingly, the Central Government of Indonesia has set a strategic objective concerning solid waste management in Indonesia. The National Mid-Term Development Plan for 2015-2019 stated that they want to achieve 100% access to an adequate sanitation delivery system in 2019, which is in line with implementation of the Millennium Development Goals (MDGs) in Indonesia. Within the context of solid waste management, the target consists of access to a Regional Disposal Site, a Municipal-scale Landfill Site, and Integrated Waste Treatment Facilities (3R). According to data from the National Social Economy Survey (SUSENAS) held by the Central Statistical Bureau in 2015, the target for access to adequate sanitation has reached 68%, which still leaves a considerable 32% gap that has to be achieved in the period 2016-2019 (National Development Planning Agency (BAPPENAS), 2014).
Nevertheless, there are several reasons why Indonesia is still unable to reach the target in MSWM service delivery. First, the high waste generation in Indonesia that is estimated to increase by about 170 million tons by the year 2035. If no solution is found, the generated waste will inevitably harm both the environment and human health. Secondly, the low quality of waste management services, e.g. low service coverage, lack of collection and transportation, illegal dumping, trash burning, etc. Thirdly, the limited capacity of Final Disposal Sites. Most existing landfill sites in Indonesia will be closed after reaching their limit. However, finding new landfill sites for replacement is difficult due to land prices, land availability, and public restrictions. Lastly, institutional arrangements and financial issues for realizing appropriate

SWM treatment cannot be carried out from an environmental and a technical perspective (Kardono, 2007)

Therefore, to address these problems, implementing an integrated sustainable waste management (ISWM) concept has become urgent. ISWM introduced a new system in the implementation of the solid waste management hierarchy, by changing the paradigm from "collect-transport-dispose" to waste reduction and separation at source with the 3R approach (reduce, reuse, recycle). Based on the implementation experience in Indonesia, it is claimed that applying this new ISWM concept can reduce the amount of waste generated by 18 percent. Thus, it could reduce transportation costs and prolong the life of final disposal sites (Kardono, 2007).

Implementing the new system of ISWM underlies the establishment of the waste Bank program in Indonesia which started in 2008 based on community initiatives. According to the Ministry of the Environment (Regulation No. 13/2012 about Waste Bank, 2012), a waste bank is a place for sorting and collecting waste that can still be recycled, reused, or which has an economic value and can be re-sold. The waste bank program was developed to promote behavioral change among households in managing waste with a 3R approach. The waste bank program developed very rapidly in several cities in Indonesia, with some of them becoming best practices that are now being replicated in other cities. By 2015, the number of cities that had developed a waste bank increased from 99 to 129 cities, increasing the number of waste bank units from 1,640 units to 2,861 units, with a total number of depositors amounting to 175,413 people. The amount of garbage managed in a waste bank has increased from 2,347.8 tons to 5,551 tons per month, with a total value transaction increase from 15 billion rupiahs (1.01 million Euros) to 34.3 billion rupiahs (2.3 million Euros) per month (Ministry of Environment and Forestry, Republic of Indonesia, 2015).

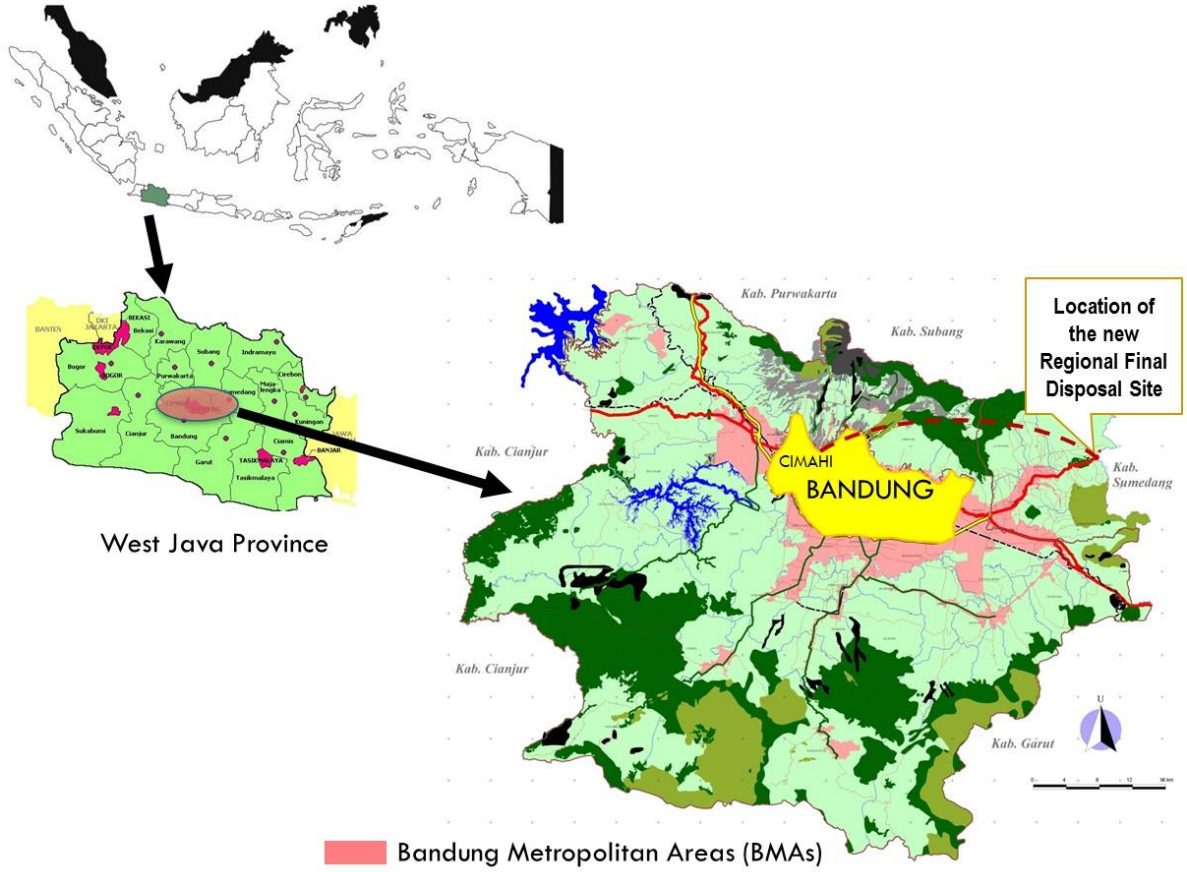
The waste bank system has integrated the system of conventional banks, which consists of customers, account books, directors and tellers, with community waste management. People can participate in the waste bank program as customers, whereby they are divided into two main types: individuals and communities; an individual customer represents one household, whereas collectives consist of groups and units. In this case, households and communities have played a significant role in realizing the success and effectiveness of the waste bank program, particularly by actively participating in separation at source and 3R implementation (Dai, Gordon, et al., 2015). It is therefore necessary that the local government, as decision-maker, takes into account household behavior, concerns and preferences that motivate people to actively engage in implementing the waste bank program (Chung and Lo, 2004).

1.2 Problem Statement

Cimahi is a city in West Java province which is part of the Bandung Metropolitan Areas (BMAs). Government Regulation No. 26/2006 on the National Spatial Plan stated that Bandung Metropolitan Areas (BMAs) has significant roles as a National Activity Center and a National Strategic Area. As an economic growth pole on both a regional and a national scale, and also the growth of the urban population, it has to be supported by providing it with regional infrastructures. In terms of managing solid waste, the regional Government of West Java will build a new regionalized Final Disposal Site to serve the Bandung Metropolitan Areas (BMAs) which consists of two cities and three regencies (Bandung City, Cimahi City, West Bandung Regency, Bandung Regency, and Sumedang Regency), and also to overcome the high dependency on landfill. The West Java Regional Solid Waste Treatment and Final Disposal Site (TPPAS) Legok Nangka, which will start operating in 2017, will replace the current one which will reach its limit by the end of 2016. With this relocation plan, local governments will be confronted with some implications which influence their performance in managing the delivery of services.

Cimahi city is one of the cities that will be confronted with the biggest implication due to the establishment of the regional disposal site plan, because it is located furthest from the new regional disposal site. The relocation plan is expected to increase waste transportation costs in Cimahi due to the increased distance to the new disposal site (Pojokjabar, 2016). Hence, the municipality will organize waste reduction policies, with the establishment of the city-scale waste bank called Samici Waste Bank as one of its programs. They have tried to replicate the waste bank program in Malang, as one of the best practices in waste bank program implementation in Indonesia.

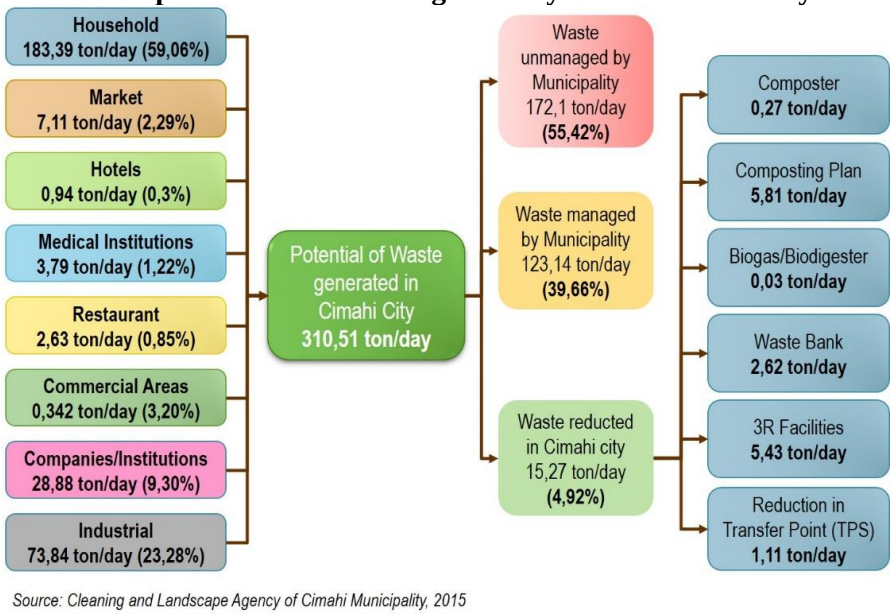
Figure 1 The location of Cimahi City in Bandung Metropolitan Areas in Indonesia



Source: (Hudalah, D., 2014)

Moreover, regarding the service coverage of SWM, the existing status in Cimahi shows that the municipality only manages 39.66% of the solid waste generated. Meanwhile, the community is still processing 55% of waste in undesirable ways. They either burn waste or they discard it in drainage channels or unused land. This is also mainly because the service is not yet being delivered in some areas. This illustrates how the performance of the service provider of MSWM is still insufficient and inefficient in terms of providing an adequate service to all users (Ismaria, R., 2015). In addition, the amount of waste being reduced through waste reduction programs is still very low. As show by recent data, the waste bank has reduced 2.62 ton of inorganic waste per day, from the total 15.27 ton of organic and inorganic waste that reduced per day in Cimahi City. This number can still potentially be increased. Up until now, since being established in 2013, Samici Waste Bank has grown significantly. It has managed 362.12 tons of recyclable and sellable waste, with a total of 679 customers and has generated income up to 502 million rupiah (32,909.97 Euros).

Figure 2 Municipal Solid Waste Management System in Cimahi City



Source: (Ismaria, R., 2015)

The establishment of Samici Waste Bank, as part of the Municipal Waste Reduction Program, aims to reduce the volume of waste ending up in landfills and to promote the economic value of waste, thereby encouraging more people in Cimahi to segregate their waste. However, Samici Waste Bank is still in its infancy and needs to improve further in respect of service coverage. This is necessary in order to enhance public participation as WB customers. Consequently, the growing number of waste bank customers can contribute more significantly to reducing the volume of waste. Therefore, to increase participation in waste bank systems, it is necessary to know more about the motivation of people to participate in them – as different types of customers – and how influence can be exerted on their contribution to the effectiveness of the waste bank program.

1.3 Research Objective

In connection with the above-mentioned problem statement, this research aims to explain the relationship between customers' motivation to participate in Samici Waste Bank and the contribution of customers to the program's effectiveness in implementing waste reduction policy on sustainable solid waste management in Cimahi. This research will be able to make recommendations to local government concerning interventions that may enhance community participation in waste bank programs.

1.4 Provisional Research Question

The main research question to achieve the following specific objective is:
To what extent does the difference of customers' motivation (individuals and units) to participate affect their contribution to the waste bank program, in this case Samici Waste Bank in Cimahi, Indonesia?
Sub-questions:

1. How was the Samici Waste Bank program implemented?
2. What differences exist between the motivation of people who participate in Samici Waste Bank as individuals, and those who participate as units?

3. How did the contribution of each type of customer differ within the context of the effectiveness of the Samici Waste Bank program?

1.5 Relevance of the Study

Within the context of academic relevance, the study expects to evaluate the implementation of waste management hierarchy of Integrated Sustainable Waste Management through waste reduction programs, particularly household participation in the waste bank program. Specifically, this research will investigate customers' motivation regarding their type of involvement in the waste bank, and how the behavior of these segmented customers contributes to the output and outcome (effectiveness) of the program by measuring their performance. The waste bank program is one of the best practices of ISWM implementation in Indonesia and several types of research on household behavior have already been conducted. However, research that emphasizes household behavior at different levels of participation is still limited (Arifiani, 2013). Therefore, this study analyzes the distinction between participating in the waste bank as individuals or as part of a collective (groups or units). Many theoretical perspectives have been used to identify several determinant factors that influence people to participate in waste recycling activities or programs. However, those determinant factors may arise differently for a household as an individual or as part of a community. This research will contribute to answering whether there is a difference between the motivation behind individual or collective participation in waste bank activities. Thus, this research can serve as an improved reference and provide relevant information for students and researchers conducting studies in the same subject area but in a different location, or for specific research related to the theory of behavior and performance measurements in a different program.

Within a practical context, the effectiveness of these programs on policy may also be influenced by many factors, and the household behavior of customers is one such factor. In this waste bank case, the success of a solid waste management program depends largely on household participation, and this is influenced by attitudes and behavior in society. Since such programs try to facilitate people on every scale, it is necessary to see whether it is better to adopt and implement these programs on the scale of individuals or on a community scale. It is important to distinguish between the two types being investigated in order to provide a comprehensive evaluation of program implementation. A better understanding of entire behavior patterns and attitudes of individuals and communities will help decision-makers to design and improve the effectiveness of solid waste management policies and programs. The output of the research may be useful in providing information that can help the government to analyze what factors motivate and trigger customers to participate more in waste bank activities. Thus, they can use this as a reference to improve and develop a policy or program that includes community preferences and thus enhances community participation. The findings of this study may also advance waste bank implementation in Indonesia, and lessons may be learned for other locations in implementing similar programs.

1.6 Scope and Limitations

This study focuses on the Samici Waste Bank as one of the waste reduction programs being implemented in Cimahi city, West Java, Indonesia. According to the Municipal Cleaning and Landscape Agency of Cimahi, since being established in 2013, Samici Waste Bank is one of the best-implemented projects that has a potential for continuous improvement. This is apparent from the growth in the number of customers and the volume in reduced waste managed by the waste bank. This study wants to emphasize that community participation is important for the sustainability of the program. For this reason, it is necessary to learn about household behavior towards the waste bank program. Thus, this research analyzes the behavior of the Samici Waste

Bank, whereby its customers are divided into three different categories: individuals, groups, and units. The study aims to explain the motivation of customers to participate in the waste bank program, and how the performance of each type of customer differs in respect of contribution to the effectiveness of the waste bank program.

For technical reasons, the research was conducted over approximately four months, and data collection took place during one month. This shows that time limitation is one issue of this research that could possibly affect the quality of the information and data collected. This research may lack in-depth analysis concerning the availability and quality of data and information. Besides, there are several limitations in terms of the content of this study. First, it was limited to several groups of stakeholder involved in waste bank implementation, e.g. waste bank management, households (as the waste bank's customers). Since the research focuses more on customers and the system of the waste bank, it does not assess the role of local government and the private sector in the waste bank system. Secondly, within the context of enabling aspects of sustainability, it focused only on the technical and social aspects of sustainability, since these are the main issues related to the waste bank and its customers. Thirdly, regarding performance measurement, this study only measured performance within the context of effectiveness (output and outcome) quantitatively. The researcher realizes that effectiveness is the most evident indicator in measuring waste bank performance that is influenced by customers' motivation. Fourthly, the sample selection technique used the 92% confidence level may affect the reliability factor in several analysis results. Finally, all the variable data input, which reflect contributions to the waste bank program, e.g. total savings received (cash), frequency of delivering waste, number of recyclable material types, and total amount of deposited waste (kg) per household by waste bank customers (individuals and units), were only measured over a 6-month period (January–June 2016) for the purpose of data aggregation. However, in order to measure the effectiveness of a program (output-based performance), measurements using at least one-year's data would improve the quality of data in this research.

Chapter 2: Literature Review

This chapter presents a review of existing literature on waste recycling implementation and household behavior when participating in a waste bank program. Firstly, this chapter explains the Integrated Sustainable Waste Management Framework, as the main underlying concept of the waste recycling program. This research focuses mainly on the waste management element and stakeholders involved in the waste management process. The second part of this chapter further explains how this waste recycling program was implemented; in this case, the waste bank program was established as part of the element of the waste management system. The next subchapter emphasizes households as stakeholders in the municipal waste management system, particularly in understanding the theory of Planned Behavior, Diffusion of innovation theory and other determinant factors which motivate households as individuals and communities to participate in a waste bank program. Given the importance of public participation to the success of the program, the fourth chapter describes the performance measurement paradigm for measuring the effectiveness of the waste bank program as reflected by the contributions of customers. The combination of different theories and concepts used in this research will improve the analysis and further our understanding of the behavior of households as waste bank customers, by investigating the distinction between the behavior of individuals and community customers, and by identifying its influence on the effectiveness of waste bank programs. The conceptual framework was built based on the theories and concepts used in this research, as highlighted at the end of this chapter

2.1 Integrated Sustainable Waste Management (ISWM) Framework

Integrated Sustainable Waste Management (ISWM) is a comprehensive framework established to address urban SWM problems. It is mainly being implemented in developing countries with constraints such as insufficient resources, high costs, and no effective means of recovery available (Joseph, 2006). The ISWM Framework provides a conceptual and systematic way of understanding waste problems and finding solutions. The framework consists of three interdependent and interconnected dimensions of ISWM, which need to be addressed when designing a sustainable solid waste management system: the stakeholders involved in waste management, elements of the waste management hierarchy system, and enabling aspects (political, institutional, social, financial, economic and technical). All components should be taken into account in planning and assessing waste management systems (Klundert and Anschütz, 2001, Wilson, Velis, et al., 2013). ISWM was initially promoted to improve elements of the efficiency of the MSWM system, namely, separation at source, collection, transportation, transfer station, treatment, and final disposal. ISWM is a system based on the 3R approach on a city scale, which covers all waste generation sectors and all stages of the waste management chain. It aims to minimize the volume of waste ending up in a landfill and to maximize the recovery of material and energy from waste (Memon, 2010).

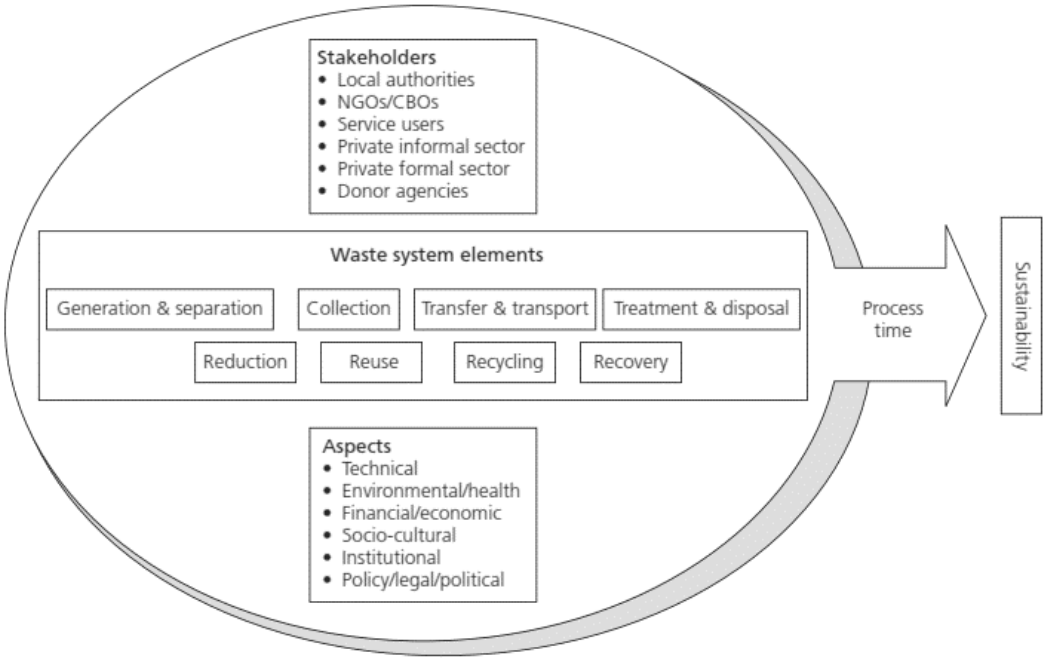
Hoornweg and Bhada-Tata (2012) explained all three dimensions, shown in Figure 3, as:

- **Elements (Process):** all practical and technical aspects of SWM. The stakeholders can influence one or more of the elements. The components need to be considered to create an efficient and effective SWM system and program. In this study, the process focuses on assessing the effects of implementing the 3R (Reduce, Reuse, Recycle) approach on the Waste Bank management system as one of the waste reduction programs.
- **Stakeholders:** all individuals or groups who have an interest – or play roles – in the waste management system. A distinction should be made between them and where they are practically involved in the program. This study focuses on households and communities as service-users of the waste bank program which was established by a municipality as

the local authority who implemented the ISWM framework for the waste reduction programs.

- **Aspects (Policies and Impacts):** this study addresses the interconnectedness of sociocultural and technical aspects within the context of waste bank program implementation. Sociocultural aspects refer to stakeholder analysis, particularly household behavior, by identifying a customer's motivation to participate in the waste bank program. Technical aspects are the discussion of performance measurements, by measuring the contribution of customers already participating on the effectiveness of the waste bank program.

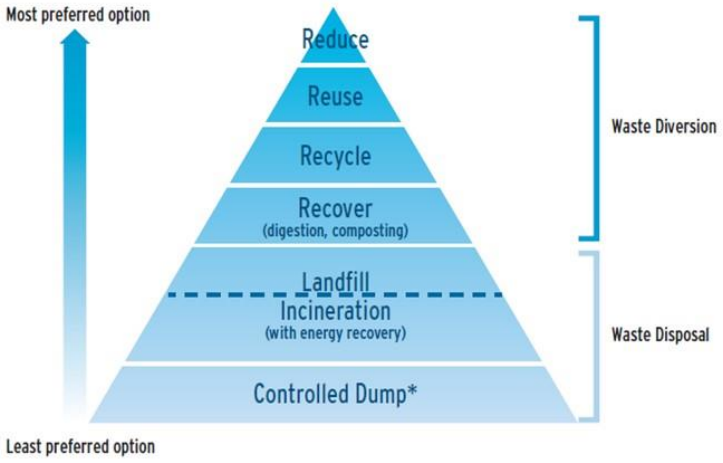
Figure 3: The Integrated Sustainable Waste Management Model



Source: (Klundert and Anschütz, 2001), updated version on (Hoornweg and Bhada-Tata, 2012)

The basis to implementing the ISWM concept is the waste management hierarchy. The waste management hierarchy is a tool used by policy-makers to manage waste by supporting its sustainability aspect. The main principle of the waste management hierarchy consists of separation at source and the 3R approach (reduce, reuse and recycle). Waste materials should be segregated at source as much as possible in order to enhance the quality of materials for reuse and recycling (including organic waste for composting), to reduce waste volume taken to landfill, as well as economizing on energy and costs in the waste collection process. Besides, waste recovery can also generate additional income for households (Klundert and Anschütz, 2001).

Figure 4: The Waste Management Hierarchy



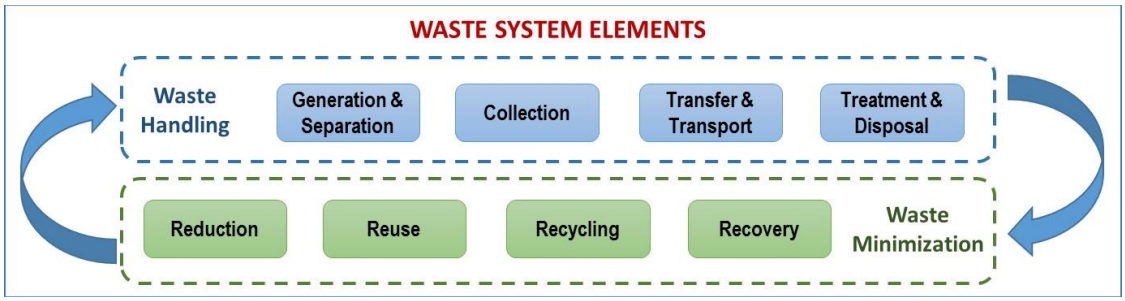
Source: (Hoornweg, Thomas, et al., 1999)

The paradigm depicted in Figure 4 shows that implementing this approach in waste treatment policy has become an important part of SWM: a more environmentally oriented waste treatment activity by promoting 3R (Reduce, Reuse, and Recycle), increasing material recovery to reduce waste for collection, transport and its disposal in landfills, and also the safe disposal of waste (in sanitary landfills or through incineration) (Baud and Post, 2003). This approach was applied by establishing the Waste Bank program, which is explained further in the next subchapter.

2.2 Waste Bank Program for implementing the new system of ISWM elements

ISWM elements can be divided into two main types as shown in Figure 5, namely waste handling and waste minimization. Waste handling is comprised of all activities from generation points to the final disposal site. It consists of four main stages which are generation and separation; collection; transfer and transportation; and treatment and disposal. Waste minimization is comprised of all activities conducted to reduce as many waste materials as possible that would otherwise end up in disposal sites. In order to achieve this, policy-makers are trying to encourage the 4R approach, i.e., reduction, reuse, recycle and recovery in waste treatment.

Figure 5 Waste System Elements



Source: adapted from Klundert and Anschütz (2001)

This study focused on the waste bank program implemented in the stage of waste separation conducted by households and the community, and applying the 3R approach (reduce, reuse, recycle). Thus, the explanation of the ISWM elements emphasizes the waste separation stage and the 3R approach as a waste minimization approach.

Waste Separation

Waste separation, or waste segregation, refers to the process by which waste is separated or divided into different elements. Waste-sorting can occur manually at household level and when collected through curb-side collection schemes, or automatically separated in material recovery facilities or mechanical biological treatment systems. Waste separation depends on waste composition which is influenced by culture, economic development, climate and energy sources. Waste composition impacts the frequency of waste collection and how it is disposed of. Municipal solid waste is mainly segregated into organic and inorganic type of waste. The volume of organic waste generally decreases in relative time, while inorganic materials such as paper and plastic keep increasing overall waste volume (Hoornweg and Bhada-Tata, 2012).

Waste Minimization

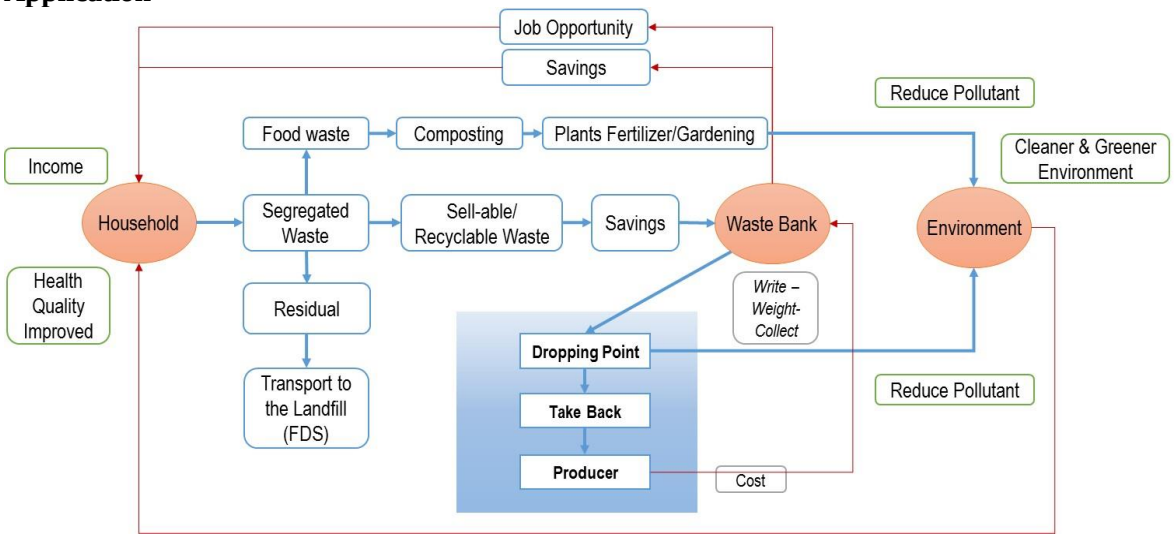
Basically, waste minimization is an initiative for treating waste as a means of reducing the amount of generated waste. There are four main ways of doing this, namely reduce, reuse, recycle and recovery. Waste reduction, commonly referred to as reduction at source, is comprised of prevention, minimization and reuse. It aims to reduce the volume of waste at generation points by changing patterns of production and consumption or by redesigning

product packaging (Hoornweg and Bhada-Tata, 2012). Households and communities play a potential role in recycling and reuse waste activities. They have the capacity to considerably reduce the amount of unwanted waste in households and on a community scale. By separating clean materials which still have a recyclable value, such as plastic, paper and glass, instead of mixing them with other kitchen waste and thus diminishing their potential value (Matter, Dietschi, et al., 2013). Waste recovery is a treatment process for discarded materials that generates energy for further use. Examples of waste recovery are organic waste with composting plants and a bio-digester, and the utilization of Waste-to-Energy (WTE) facilities in sanitary landfill. Due to the limitation of space for waste disposal, increasing effective collection only intensifies disposal problems which then leads to other concerns. Therefore, waste recovery and recycling are better alternative solutions that can contribute extensively to reducing waste flows (Baud and Post, 2003).

Hoornweg and Bhada-Tata (2012) also emphasized that the main benefits of recycling and recovery are reducing the volume of discarded waste, and returning materials that have some added value to the economy. Moreover, Matter, Dietschi, et al. (2013) also stated that household waste segregation can preserve the value of recyclable materials, enhance their accessibility to informal workers in the recycling sector and reduce overall waste flows. Based on this principle, the waste bank was established as a means to encourage waste segregation within households and the community in order to reduce the volume of waste ending up in a landfill.

Generally, the waste bank program implemented in Indonesia deploys the Extended Producer Responsibility (EPR) strategy with an environmental policy approach which places on the producer the responsibility to integrate environmental costs in all production processes, right up until the post-consumer stage of a product's life-cycle (Lifset, Atasu, et al., 2013). The EPR mechanism most commonly used is the take-back system as shown in Figure 6, which obliges producers (manufacturers, importers, distributors and retailers) to take back all post-consumer products from society. Members of the community are required to segregate, collect and deposit waste from related products at collection points or drop-off points. Within this context, the waste bank plays a role as collection point or dropping off point for products subject to EPR charges. The economic value of products has become an incentive for people, making them want to segregate and collect waste. For producers, the waste bank facilitates the process of a take-back system. Consequently, based on mutual agreement, producers have to pay for the operational costs of the waste bank (Ministry of Environment Regulation No. 13/2012 about Waste Bank, 2012, Ministry of Environment Regulation No. 13/2012 about Waste Bank, 2012).

Figure 6 Integrated Waste Bank System with Extended Producer Responsibility (EPR) Application

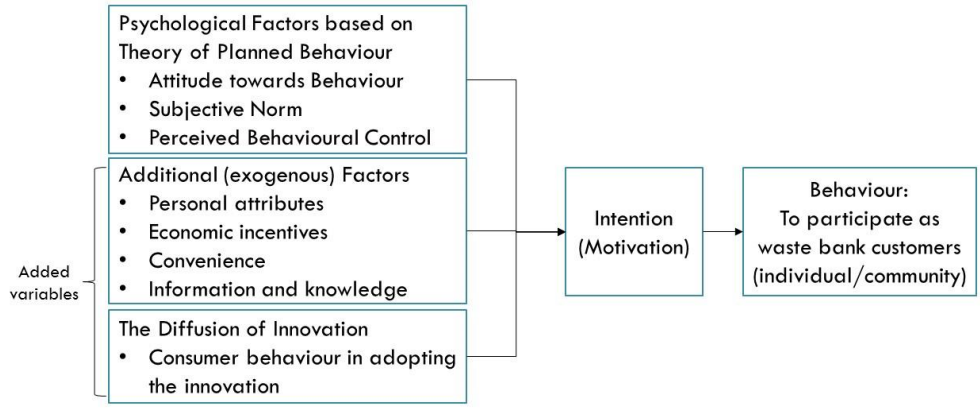


Source: (Ministry of Environment Regulation No. 13/2012 about Waste Bank, 2012)

2.3 Factors influencing Household and Community motivation to participate in the Waste Bank Program

In this case the success of the solid waste management program depends mainly on household and community participation. Participation is defined as a voluntary contribution by people in one or another public program that contributes to National Development, but people are not required to engage in developing the program or criticizing its content (Economic Commission for Latin America, 1973 as referenced in Kumar, Somesh, 2002). Community participation is an active process by which beneficiaries or client groups influence the direction and execution of the program to enhance their well-being in the form of income, personal growth, self-reliance, and other values they foster (Paul, 1987 as referenced in Kumar, Somesh 2002). People generally have a variety of motives for participating in waste recycling activities or a waste bank program. The three types of determinant factors that influence customers' motivation to participate in waste banks are examined in this research, as shown in Figure 7.

Figure 7 Utilizing Factors introduced by TPB and added variables for predicting motivation to participate in waste bank programs



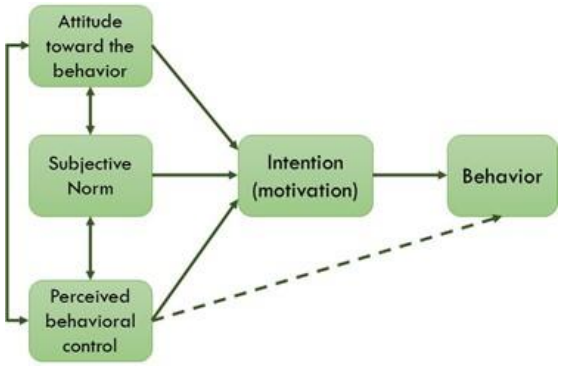
Source: Ajzen (1991), Karim Ghani, Wan Azlina Wan Ab., Rusli, et al. (2013), *with some modification by the author*

2.3.1 The Theory of Planned Behavior (TPB)

Based on the conceptual scheme of the Theory of Planned Behavior shown in Figure 8, a fundamental factor in the theory of planned behavior is the individual's intention to carry out a specific behavior. Intentions are presumed capable of determining motivational factors that influence behavior. Intention indicates how hard people are willing to try, how much of an effort they plan to exert in executing the behavior. The stronger the intention, the more likely people will be to engage in that behavior (Ajzen, 1991). In this research, people who participated as customers have motives or motivation as reflected by the terminology "*intention*" applied in the TPB. However, performance of the behavior also depends on at least some of the non-motivational factors, such as the availability of resources (time, money, skills, cooperation) and opportunity. These motivational factors embody actual control over the behavior. Thus, behavioral achievement is determined by the combination of motivational (intention) and ability (behavioral control) (Ajzen, 1991).

The analysis of motivation would be more effective if the behavior intended to increase motivation becomes a person's needs or concern. On the contrary, if the behavior being promoted is less important, it can easily be neglected, so increasing motivation will be ineffective (De Young, 2000). Ellis and Gaskell (1978, as reported in De Young, 2000) noted that a motive to conserve the environment can be derived from satisfaction of being directly involved or participating actively in community activities and valuing the opportunity of taking action that makes a difference. A program based on competence can succeed in realizing durability due to motivated behavior on the part of its participants. In the scheme of the Theory of Planned Behavior, motives or motivation are relevant to intention. Intention implies specific reasons that drive a person to perform specific action or behavior.

Figure 8 Theory of Planned Behavior



Source: (Ajzen, 1991)

The Theory of Planned Behavior (TPB) by Ajzen (1991) is a theoretical framework used to understand the perceived effectiveness and public attitudes towards the schemes studied. The use of a psychological model in this theory is important for understanding householders' reactions to waste recycling programs which require that these choices are underpinned (Tonglet, Phillips, et al., 2004). TPB is the extended and improved version of the theory of reasoned action. It is constructed based on two general premises. First, to act rationally, individuals use and process available information to establish their intentions and are expected to behave accordingly. Second, three main predictors of behavioral intention are attitude towards the behavior, subjective norms, and perceived behavior control (Ajzen, 1991). TPB provides an acceptable framework to better understand behavior in participating in waste recycling activities. TPB allows a direct and indirect relationship among relevant predictors in a waste segregation and recycling program (Valle, Rebelo, et al., 2005). In this case, the waste and recycling program is relevant to the waste bank system, since they are part of waste minimization methods by using the 3R approach.

Based on the Theory of Planned Behavior, in this research, measuring customer motivation is mainly influenced by three conceptual, independent predictors of intention:

(1) Attitude towards Behavior

An evaluation that reflects whether a person is in favor of or opposed to behavior (Ajzen, 1991; Valle, Rebelo, et al., 2005). Operationalization of the attitude towards behavior is divided in two ways: (a) degree of an individual's beliefs regarding the behavior's outcome based on his or her evaluation; (b) a direct measure of a person's positive and negative judgment in carrying out the behavior, but excluding an evaluation of the consequences of the behavior (Cheung et al.,1999; Corral-Verdugo, 1996, 1997; Guagnano, Stern, &Dietz, 1995; Hopper & Nielsen, 1991; McCarty & Shrum, 2001; Taylor & Todd, 1995a, 1995b as referenced in Valle, Rebelo, et al., 2005). In this research, for example, attitudes towards waste segregation and participating in the waste bank program. The attitude is a measure of people's perception of the importance or benefits of participating in waste segregation and becoming involved in the waste bank program. The behavior's outcome relates to the benefits people might gain within the context of the environment, health concerns and economic benefits.

(2) Subjective Norms

Normative beliefs are presumed to influence the determinants of subjective norms (Ajzen, 1991). These normative beliefs may come from family members (internal referents) or from individuals or groups outside the family, such as friends, neighbors, or social groups (external referents). Hence, an individual may sometimes be more engaged in certain behavior due to external influences on the his or her surrounding that regard the behavior as the appropriate thing to do (Valle, Rebelo, et al., 2005). In this research, subjective norms were measured by looking at the respondent's belief of whether the family, friends, neighbor or community expect he or she should participate in waste segregation and join the waste bank program. It is important to measure whether social pressure also has impact on behavior.

(3) Perceived Behavioral Control (PBC)

PBC denotes beliefs in terms of difficulty and ability to control in performing particular actions or behaviors (Ajzen, 1991). According to Valle, Rebelo, et al. (2005), there are two dimensions that determine perceived behavioral control:

(a). The presence of external circumstances that may enhance or restrain an individual's ability to implement certain behavior. This relies on performance, convenience of the service facilities provided by the program, and opportunity.

(b). The internal condition related to personal ability to perform the behavior. This relies on individual resources, such as knowledge, skills, and other related resources required to participate in the program.

According to this theory, PBC foresees behavior through direct and indirect intention (motivation).

2.3.2 Additional (exogenous) factors determining household participation in waste bank programs

According to Bernstad (2014), many scientific publications have discussed various factors influencing the household participation rate in waste recycling schemes. These factors can also be applied to participation in waste bank programs, since both have a similar situation that without household participation in the initial act of separating waste at source, the effectiveness of the program will be low. Other additional (exogenous) factors that motivate households to participate in waste recycling activities in their community are:

(1) **Personal Attributes,** socioeconomic factors such as age, gender, family size, occupation, education background, monthly income, and activity in community organization.

(2) **Economic incentives**, for example, weight-based taxes on residual waste have been suggested as an attractive strategy to increase recycling. In the case of a waste bank, since people can get income by selling their segregated waste to the waste bank and savings for their efforts, this too can be perceived as an incentive. The higher price of sellable waste materials can encourage the segregation of waste.

(3) **Convenience**, related to the context of accessibility and level of effort needed to participate in waste segregating, also influences the motivation of people to participate in a waste segregation and recycling scheme. This also relates to the availability of facilities provided by the service which also can motivate people to participate in the program. For example, adequate space for temporary storage of sellable and recyclable materials. To make the program successful, it is essential to provide processing and collecting facilities. However, it is useless if households or the community do not cooperate and separate their waste (Dai, Gordon, et al., 2015).

(4) **Information and Knowledge**: there is a positive relationship between receiving information about a waste recycling program through media and the participation of households in a program. As mentioned in the study by Valle, Rebelo, et al. (2005) on the waste recycling program in Portugal, it is necessary to examine whether participants understand waste-segregating procedures and the different classifications of recyclable wastes. Specific knowledge about waste segregation may become an internal constraint for people to participate in a waste bank program. Moreover, it also important to consider accessibility to information regarding waste banks. There is a positive relationship between receiving information about waste recycling through direct media (i.e. radio, television, newspaper ads) and participation in household waste recycling (Perrin and Barton, 2001; Williams and Taylor, 2004; Spaccarelli et al., 1989; and Vicente and Reis; 2008, as referenced in Bernstad, 2014). In the case of waste banks, the waste bank coordinator also ensures routine socialization by providing households and the community with information and knowledge in order to increase their participation in the program.

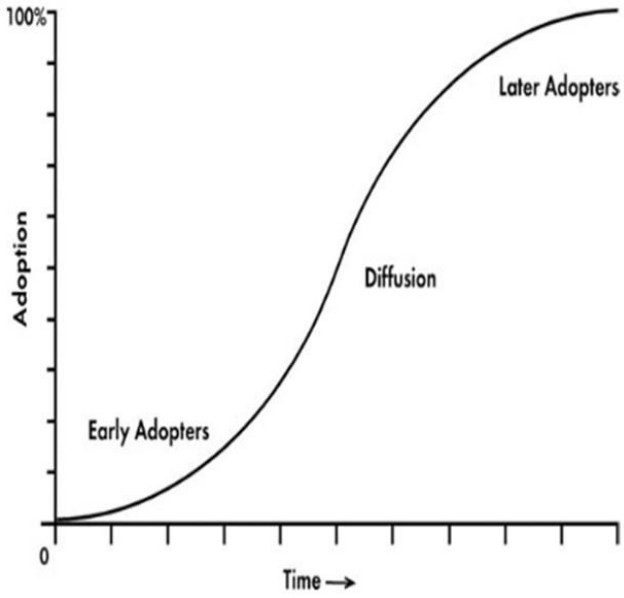
2.3.3 Diffusion of Innovation Theory

Diffusion of the Innovation theory of Rogers (2003) was used to find insight based on sociological theory relating to consumer behavior about how a new program, in this case a waste bank, gets from introduction to adoption in the mind of consumers. This theory will, hopefully, explain the phenomenon of when households perceive something as an innovation, they try to adopt it and persuade other people to follow them. This subchapter starts by providing definitions of key concepts, the elements, and specifically describes the innovation decision process.

Rogers's theory, which is one of the most popular models that explain the process of adopting new innovations, has been studied over 30 years. It makes use of three main terms, namely innovation, adoption, and diffusion. For Rogers (2003), an *innovation* is an idea, object or practice that is perceived as new by an individual or unit of adoption. When an innovation appears on the market, potential customers can decide to adopt the program; *adoption* is a decision to fully use an innovation as the best course of action available (Rogers, 2003). Meanwhile, *diffusion* is a process by which an innovation is communicated over time, through certain channels, among members of social systems (Rogers, 2003).

As expressed in the definitions above and shown in the Figure 9, there are four key elements to the diffusion of innovations: innovation, communication channels, time, and the social system.

Figure 9 The diffusion S-curve (Diffusion of Innovation Theory)



Source: Rogers (2003)

1) Innovation

Even though an innovation may have been created some time earlier, it may still be called an innovation if people perceive it as new. The newness characteristic of adoption in the innovation decision process is really about three steps: knowledge, persuasion, and decision. This process is explained in more detail in the next section. The innovation may generate uncertainty regarding the consequence, and this can be the case both for individuals and for a social system, depending on whether the innovation is adopted or rejected. To minimize uncertainty, it is necessary to inform individuals about the advantages and disadvantages, so they are aware of all its consequences. The consequences are divided into desirable versus undesirable (functional or dysfunctional), direct versus indirect (immediate result or result of the immediate result), and anticipated versus unanticipated (recognized and intended or not) (Rogers, 2003).

2) Communication Channels

Communication is a process of creating and sharing information between participants to reach mutual understanding, which occurs through channels between sources. A *source* is an individual or an institution that creates a message. While a *channel* is how a message gets from the source to the receiver. *Diffusion* is a specific kind of communication and includes these communication elements: an innovation, two individuals or other units of adoption, and a communication channel (Rogers, 2003).

Communication channels include mass media and interpersonal communication. The mass media channel includes TV, radio, newspapers, internet, leaflets, posters, while interpersonal communication is a two-way communication between two or more individuals, which is more powerful in creating or changing the attitudes of individuals. Moreover, realizing diffusion, which is a very social process, involves interpersonal communication relationships. For example, in the case of waste banks, information about the program spreads through mouth-to-mouth information and socialization within the community (Rogers, 2003).

Rogers (2003) categorized communication channels into two types, which he named *localite* channels and *cosmopolite* channels. A localite channel is a communication that occurs between an individual and his/her social system, while a cosmopolite channel occurs external to sources. Almost all mass media channels are cosmopolite, while interpersonal channels can be local or cosmopolite. Based on these characteristics, mass media channels and cosmopolite channels are more significant at the knowledge stage, while localite channels and interpersonal channels are more important at the persuasion stage of the innovation decision process.

3) Time

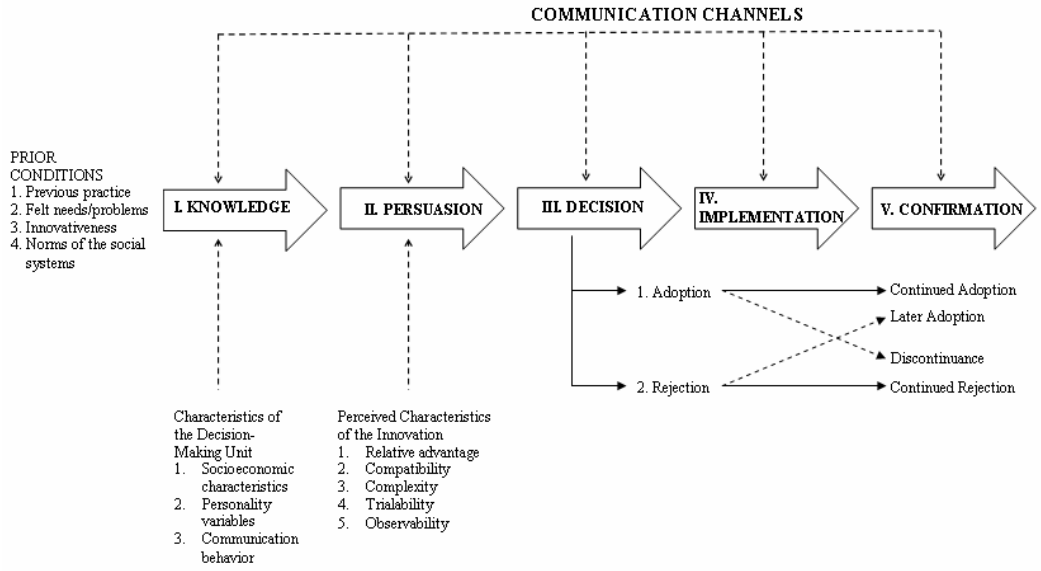
According to Rogers (2003), most behavioral research has ignored the aspect of time. He argues that the strong point of diffusion research is that it also takes the time dimension into account. The innovation diffusion process, adopter categorization, and rate of adoption all involve a time dimension. These aspects of Rogers' theory are discussed in more detail later.

4) Social System

The social system is the last element in the diffusion process. Rogers (2003) described the social system as a set of interrelated units engaged in joint problem-solving to accomplish a common goal. Since the diffusion of innovations takes place within a social system, it is influenced by the social structure of the social system. The social structure is the patterned arrangements of the units in a system. He claimed further that the nature of a social system affects individuals' innovativeness, which is the main criterion for categorizing adopters.

Rogers (2003) described the innovation-decision process as a series of information-seeking and information-processing activities. It involves a series of choices and actions whereby an individual evaluates an innovation to reduce uncertainty about its advantages and disadvantages. The innovation decision process consists of five stages: (1) knowledge, (2) persuasion, (3) decision, (4) implementation, and (5) confirmation, which follow each other in a time-ordered manner as shown in Figure 10 below.

Figure 10 A model of Five Stages in the Innovation Decision Process



Source: *Diffusion of Innovations, Fifth Edition* by Everett M. Rogers. Copyright (c) 2003, The Free Press.

1) **Knowledge** – The first stage begins with exposure to the innovation and an understanding of the innovation. The potential customer learns and seeks information regarding the innovation, e.g. what the innovation is, how and why it works. This stage forms three types of knowledge: (1) awareness knowledge, (2) how-to knowledge, (3) principles knowledge. The way an individual receives and interprets the knowledge is influenced by his or her personal characteristics (Rogers, 2003).
2) **Persuasion** – This stage arises when there is an approving or opposing attitude toward the innovation. In this stage, the individual becomes more psychologically involved after the attitude has been formed based on the knowledge the individual has about the innovation. The individual actively seeks any credible information about the new idea in order to reduce uncertainty. Other sources, e.g. subjective evaluation and social reinforcement from others (colleagues, peers, etc.), influence the individual's opinion and beliefs about the innovation. Such persuasion is expected to lead to a subsequent change in overt behavior (adoption or rejection), consistent with the individual's attitude (Rogers, 2003).

3) **Decision** – At this stage, an individual decides to either adopt or reject the innovation. Adopting the innovation means to continue to use it fully, as the best course of action available. However, consumers may reject the innovation and choose not to adopt it. There are two types of rejection. First, active rejection which is where the individual tries the innovation, considers it, but in the end, decides not to adopt it. The other type is passive rejection, which means the individual never considers using the innovation at all. The trial plays an important role in this stage, since people usually want to try an innovation first and then arrive at an acceptance or rejection decision (Rogers, 2003).
4) **Implementation –** This stage occurs when the innovation is put into practice. However, some degree of uncertainty about the outcomes is still involved in this phase, even though the decision to adopt has already been made. Users may need technical assistance from related agents or others to reduce the degree of uncertainty about the consequences. The implementation stage may proceed for an extensive timeframe, depending on the characteristics of the innovation itself. Eventually, it will reach a point at which the innovation is adopted and institutionalized. At this stage, a reinvention process might also take place, in which an innovation is changed or modified by the user in the process of its adoption and implementation. The more reinvention appears, the faster an innovation is adopted (Rogers, 2003).
5) **Confirmation –** At this stage, an individual seeks support for the decision he or she has made. However, exposure to conflicting messages regarding the innovation may reverse this decision (i.e. cause an individual to discontinue using a previously adopted innovation, or to decide to adopt a previously rejected innovation). The individual tends to avoid these messages and looks for supportive messages to confirm his/her decision. Therefore, the attitude becomes more vital in this phase. Later adoption or discontinuance occurs throughout this stage, depending on support and attitude towards the innovation. There are two types of discontinuance that can occur during this stage. *Replacement discontinuance* is when a person rejects the innovation to adopt a better innovation, while *enhancement discontinuance* is when a person rejects the innovation because it does not meet the person's needs or due to dissatisfaction with its performance (Rogers, 2003).

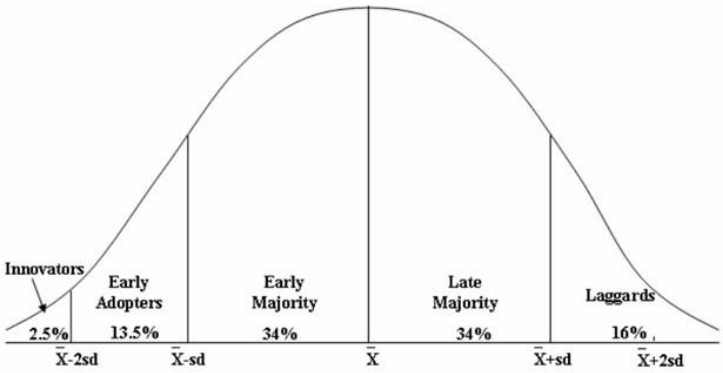
Rogers (2003) mentioned that the characteristics of attributes of an innovation influence the rate of adoption. The rate of adoption is the relative speed at which an innovation is adopted by members of a social system. He describes five characteristics:

1) **Relative Advantage** – this reflects the extent to which an innovation is ***perceived as better*** than any other alternative ideas. Elements of relative advantage are cost, social status, and motivational aspects. Because the advantage of preventive innovations is highly uncertain, they tend to have a slower rate of adoption than incremental innovations which provide beneficial outcomes in a short period. Higher relative advantages lead to a higher rate of adopting an innovation. Therefore, direct and indirect incentives may be needed to support users in adopting an innovation (Rogers, 2003).
2) **Compatibility –** this shows the degree to which an innovation is perceived as consistent with the existing values, previous experiences, and needs of potential users. Greater compatibility of an innovation with a user's needs will reduce uncertainty and increase the rate of adoption (Rogers, 2003)
3) **Complexity –** this illustrates the extent to which an innovation is *perceived as relatively difficult* to understand and to use. Hence, the excessive complexity of an innovation is a significant barrier to the adopting process (Rogers, 2003).
4) **Triability** – this explains the degree to which an innovation *may be tested* with a limited source. It is positively correlated with the rate of adoption, which means the greater the number of people who try the innovation, the faster they will adopt it. ((Rogers, 2003).

5) **Observability** – this defines the degree to which the results of an innovation are *visible to others*. Therefore, role modeling (or peer observation) is a key motivational factor in the adoption and diffusion of the innovation process (Rogers, 2003).

Rogers (2003) also defined the adopter categories which classify an individual as a member of a social system based on his/her innovativeness. Innovativeness means the degree in which an individual or unit of adoption is relatively quicker at adopting new ideas than other members of the system. It also implies the willingness of an individual to change his or her regular practices.

Figure 11 Adopter Categorization based on Innovativeness



Source: *Diffusion of Innovations, Fifth Edition* by Everett M. Rogers. Copyright (c) 2003 by The Free Press.

As illustrated in Figure 11 above, there are five categories of adopters which are explained in more detail in the table below:

Table 1 Categories of Innovation Adopters

1.	Innovator	An individual or unit of adoption who is willing to experience new ideas. These are the ones who introduce an innovation from outside the system. An innovator must have complex technical knowledge.	EARLIER ADOPTER
2.	Early Adopters	Individuals who are more likely to hold leadership roles in the social system, and whom other members ask for an advice or information regarding the innovation.	
3.	Early Majority	They interact well with other members of the social system, but usually do not have the leadership roles of early adopters. However, their interpersonal networks are still important in the innovation diffusion process.	
4.	Late Majority	This group consists of one-third of the members of a social system who tend to wait until most of their peers have adopted the innovation. Economic need and peer pressure may persuade them to adopt the innovation.	LATE ADOPTER
5.	Laggards	This group tends to have traditional views and is more skeptical towards innovations and agents of change than the late majority group. Due to lack of awareness, knowledge and limited resources about the innovation, they want to be sure the innovation works before they adopt it. Therefore, they tend to seek information about past experiences of other members of the social system regarding adoption of an innovation.	

Source: *Diffusion of Innovations, Fifth Edition* by Everett M. Rogers. Copyright (c) 2003, The Free Press.

2.4 The Importance of Measuring Waste Bank Customers' Participation

After reviewing sociocultural aspects (household behavior and participation) of the waste bank program, it is also important to examine the relationship between participation and technical aspects of the program. Several major advantages of people's participation that relate to technical aspects of waste bank program are mentioned by Oakley et al. (1991, as referenced in Kumar, Somesh, 2002), such as:

- *Efficiency*: Participation can ensure effective utilization of the available resources in achieving the program's objectives. People take part in various activities in the program which can improve the program's efficiency and cost-effectiveness.
- *Effectiveness*: Lack of people's involvement has been one of the major causes of the lack of efficacy of most programs. People's participation can make the project more effective, especially in the decision-making process related to objectives and strategies, also by participating in implementation.
- *Self-reliance*: The active involvement of the local community not only reduces the mentality of dependence, but also helps people to develop resources, for example, by increasing their awareness, self-confidence, and control over the development process.
- *Coverage*: People's participation can be a potent way of ensuring the flow of benefits to the target groups. Cost-effective operations can ensure that resources are made available with a wider coverage, including weaker sections of society.
- *Sustainability*: People's participation is regarded as an essential requirement for continuity of the activities. Involving local people and utilizing local resources generates a sense of ownership which is necessary for the sustainability of interventions.

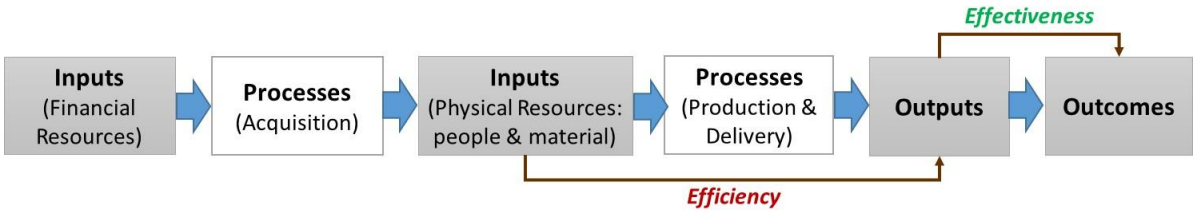
Those advantages must be addressed in order to improve the capacity of local government authorities in SWM delivery service. Several improvement strategies exist, such as monitoring and evaluating project performances, promoting recycling programs, encouraging public participation, improving the quality and quantity of manpower in SWM, increasing efficiency of waste collection fees, supporting private sector involvement in SWM services, reducing illegal dumpsites, and preparing an SWM database and information (Suttibak and Nitivattananon, 2005).

2.4.1 Performance Measurement Concept

Neely et al. (2005, as cited in Dickinson, 2008), defined a performance measurement as: "a metric used to quantify the efficiency and/or effectiveness of an action". Hatry (2006) defined it as a regular measurement of the results (outcome) and efficiency of a service or program. Dickinson (2008) also noted that three components indicate the objective and the definition of performance, and these are (1) targets to be achieved, (2) timeframe for realizing the target or milestones of that aim, and (3) rules about ways of getting there. One of the key characteristics of performance measurement is regular tracking. Agencies and service managers need more information on frequent outcomes in order to assess the success of their program activities, identify where significant problems exist, and motivate them to strive for continuous improvement in the services (Hatry, 2006).

There are four stages of performance review, namely (1) measuring performance, (2) assessing effectiveness and quality, (3) monitoring and reporting, and (4) implementation. The diagram shows the dimension or level at which measurement occurs (input, output and outcomes). It also shows the performance indicators and the relationship between measurements.

Figure 12 Level of Performance Measurement



Source: Hatry (2006), Raaum and Morgan (2001), Ghobadian and Ashworth (1994)

There are several important components to measuring system performance (Hatry, 2006):

(a) **Input**: the amount of resources used to carry out the program; this measurement reflects efficiency and productivity.

(b) **Process** (workload or activities): the amount of work in the program is not regarded as an indicator of performance measurement as it does not indicate how much production is generated by the program.

(c) **Output**: products and services delivered by the program or as a result of the activities.

(d) **Outcome**: something that the program wants to maximize or minimize, target of the desired output accomplished related to the program objectives. For example, service quality, accessibility, availability, convenience, customer satisfaction, etc. There are also intermediate outcomes, which means outcomes that are expected to lead to a desired end, i.e. service response time, customer participation. Success in realizing a certain participation level depends on the program's ability to maintain and increase the number of participants.

(e) **Efficiency** or unit-cost ratio: the relationship between the amount of input (i.e. expenditure or amount of employee time) and the number of products (output) or outcome of an activity or program. There are two main types of efficiency (1) technical efficiency is the ratio between costs and output; and (2) allocative efficiency, which is related to outcome. Efficiency also illustrates the condition where the volume and quality of the service provided at the lowest level of resources is able to meet the specifications (Ghobadian and Ashworth, 1994).

(f) **Effectiveness**: the relationship between output produced by the service and achieving the desired target by producing the service (outcome). It also means providing the right services, thereby allowing the government to perform its policies and fulfil its objectives (Ghobadian and Ashworth, 1994). Program effectiveness can be measured by an outcome-based indicator, since it provides more insight into how much the program is helping to accomplish the objective (Hatry, 2006). For example, in the case of this research, effectiveness describes how much the waste bank program is contributing to waste reduction policy, and more specifically it also measures the contribution of each type of customer (individuals, groups, units) to the waste bank program's effectiveness.

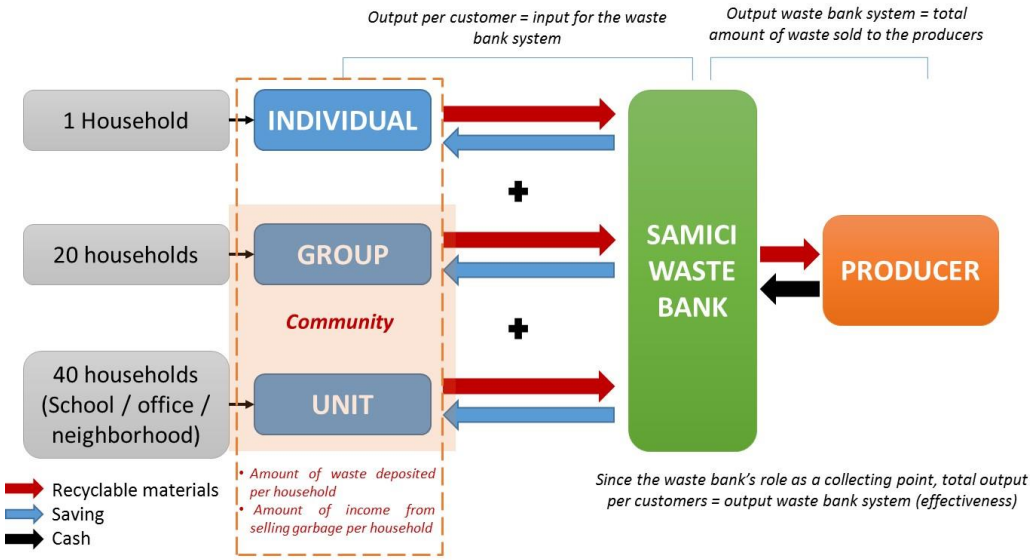
2.4.2 Measuring Customers' Contributions to Evaluate Performance of the Waste Bank Program

This research focuses on strategies for monitoring and evaluating performance and for promoting recycling programs as a means to achieve an integrated, sustainable waste management system of service delivery. Many local authorities have implemented waste reduction programs by promoting the 3R (reduce, reuse, recycle) approach.

The success of a solid waste management program, in this case the waste bank program, depends mainly on household participation, and this participation depends on attitudes and behavior within society. People's behavior controls their attitudes towards the waste bank participation process, for example, how much can they contribution to the program (Hilles and Abushbak, 2011). Therefore, in this research, performance measurement, which is reflected by the participation of waste bank customers, was carried out during the waste segregating process. An important part of the effectiveness of waste bank programs is measuring the contribution rate of households to programs. In brief, how can household motivation and attitudes be converted into effective participatory behavior, while remaining a voluntary activity. It is essential that participation is related to the output and outcome that need to be achieved. For example, the participation of a waste bank customer is measured based on the

total amount of waste deposited in the waste bank per household (output) and total savings gained from waste sold per household (outcome).

Figure 13 Customers' Contributions to the Samici Waste Bank system

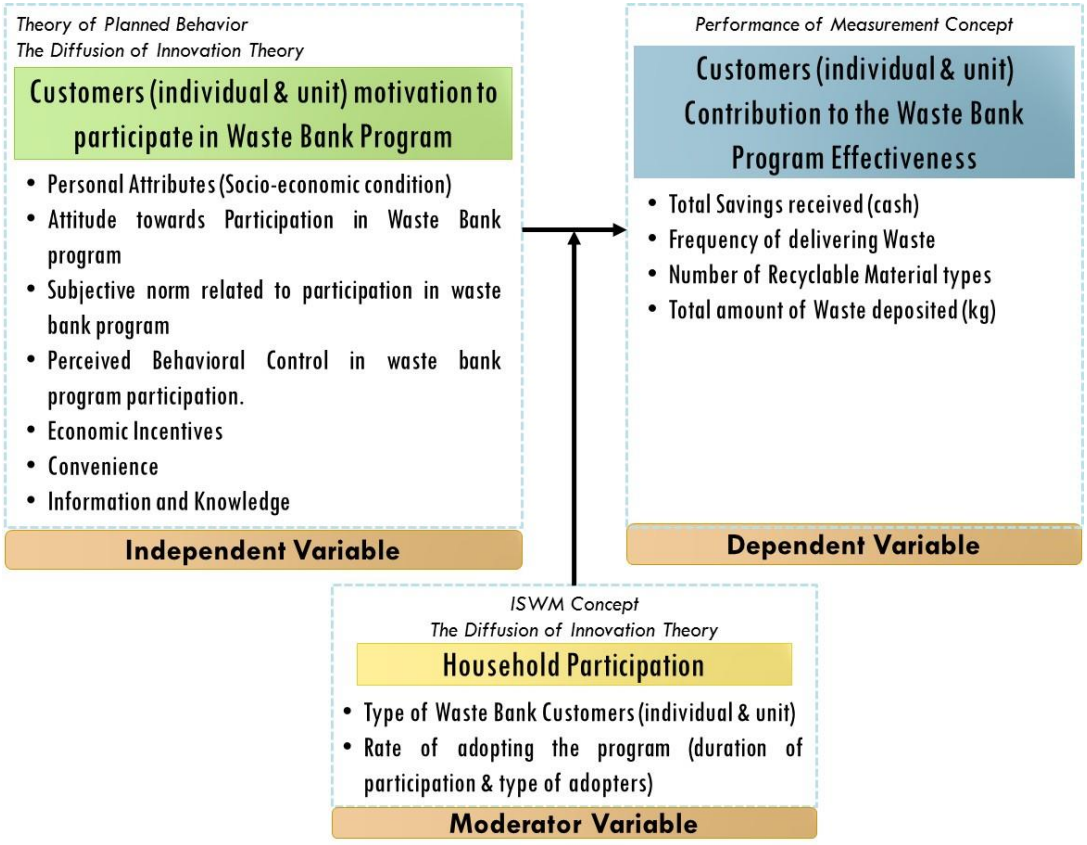


Source: Samici Waste Bank, 2015

2.5 Conceptual Framework

The framework of this research study was constructed based on theories which are relevant to building a fundamental concept, variables and a presumed relationship between those variables. This research aims to explain the influence of customers' motivation to participate in the waste bank program on their contribution to the program's effectiveness. The customers' motivation to participate as the independent variable is represented by psychological (attitude towards participation in the WB program, subjective norms relating to participation in the WB program, perceived behavioral control in WB program participation) and non-psychological (personal attributes, economic incentives, convenience, information and knowledge) determinant factors. The dependent variable, i.e. the customers' contribution, was measured mainly by looking at total savings received, but also by considering other indicators such as frequency of delivering waste, number of recyclable material types in relation to total amount of deposited waste. This research also used a moderator variable to alter the effect that an independent variable has on a dependent variable, based on the moderator's value. It is also referred to as the interaction effect. The moderator variable used is household participation in the waste bank program as a customer, and it was divided into three categories: individuals, groups and units. The analysis between an independent variable and a dependent variable is a comparative analysis based on type of customer. Type of customer reflects the different levels of participation in the waste bank program. Participation in the waste bank program was mainly at household level (individuals) and at community level (groups and units). However, since the groups and units have similar characteristics – the only difference being the number of members involved – they can be classified as a single entity on the same scale, that of community. Therefore, this research uses two terms to reflect the type of waste bank customer: individuals and units. The conceptual framework is shown in Figure 14.

Figure 14 Research Conceptual Framework



Source: Author's construct, 2016

The objective of this research was to discuss how customer motivation, in the form behavior in participating in waste bank program, influences their contribution to the program's effectiveness. Several studies relating to waste recycling activities, for example Dai, Gordon, et al. (2015), have proved that households and communities have significant roles in achieving the successfulness and effectiveness of waste bank programs, particularly by actively participating in separation at source and 3R implementation. In implementing a waste bank program, people participate at different levels, e.g. as individuals and as part of the community. This phenomenon should be investigated within the context of household behavior theory in order to identify which factors motivate them to participate in a particular way and whether there are any distinctive characteristics between the two types of waste bank customers. The stronger their motivation, the more likely people are to engage in behavior (Ajzen, 1991). However, other exogenous (non-psychological) factors also motivate households to participate in waste recycling activities in their community (Bernstad, 2014). Moreover, customers' participation, represented by their contribution to the program, has advantages for technical aspects of the program, for example, measuring its effectiveness. The more people who participate, the more effective the program is (Kumar, Somesh, 2002; Hatry, 2006). Measuring the program's performance is necessary as an evaluation tool in order to provide the right services that will allow the government to perform its policies and realize its objectives (Ghobadian and Ashworth, 1994). Moreover, the contribution of customers to the program is also influenced by how people adopt and implement the program as an innovation. The assumption is that in order for the program to be effective, the waste bank program must realize a high rate of adoption by people, by fulfilling such characteristics as greater relative advantage, compatibility with the user's needs, low complexity, testability, and with visible results (Rogers, 2003).

Chapter 3: Research Design and Methods

This chapter starts with an explanation of the research strategy used to carry out the research, followed by the operationalization of concepts used to identify the variables and indicators based on the literature review of the previous chapter. Appropriate data collection and sampling methods are also presented, corresponding with challenges encountered regarding validity and reliability, and how these were overcome. Finally, the methods and the tools needed to analyze data and generate the results capable of answering the research questions.

3.1 Research Strategy

This research used an explanatory approach since it explains the relationship between the motivation of a waste bank's customers (individual, groups, and units) and their contribution to the waste bank's performance. This is research in which the causes of a certain problem are sought or studied. Explanatory research can apply existing theories in searching for causes and in analyzing the findings based on the data. Thus, it is basically a deductive form of an empirical research cycle. In a deductive study, all steps taken in the research are determined beforehand based on the theory used and according to the research aims (Thiel, 2014).

This research implements the Case Study as research strategy. According to Yin (2009), a case study strategy is used when the study wants to investigate a contemporary phenomenon in depth and within its real-life context, particularly when the boundaries between phenomenon and context are not clearly visible, and control over the event is very limited. Such a strategy is appropriate for this research since the researcher intends to study the phenomenon of a waste bank program in Cimahi, specifically households as waste bank customers as research unit.

This research seeks to find a causal relationship between a single independent variable that influences a dependent variable. In this case, the independent variable is customer motivation to participate in the waste bank program, and the dependent variable is the contribution of customers (individuals, groups and units) to the waste bank system. This research was conducted with using case study strategy because, in reality, many factors may influence a waste bank system's performance based on the contributions of its customers on an individual and community level, but the research only focused on the motivation of members of society that resulted in the level of participation in the waste bank program. This study is categorized as a single holistic case study. A single case study focuses more on triangulation since only one case is investigated. There is a subvariant of the single case study that involves identifying various subcases, known as an embedded case study (Verschuren and Doorewaard, 2010).

In order to carry out this study, the researcher used co-variation as the case study variant. The co-variation approach was used to obtain conclusions on the condition that factors regarded as independent variables (customers' motives) will or will not influence the dependent variable (customers' contribution to the effectiveness of the waste bank program). Specifically, this co-variation concept comprised of conducting a comparative analysis of two groups of respondents, in this case the waste bank customers, divided into individuals and communities (groups and units). By investigating the motivation of customers to participate in a waste bank program, it is expected that this situation will also lead to differences in the performance quality of waste bank systems, in terms of output and outcome (effectiveness).

This research used a mixed methods approach involving qualitative and quantitative methods. Qualitative research was conducted to understand how people behave in a particular way, in this case what was the motivation of different types of customers (individuals, groups, units) in choosing to participate in the waste bank program. The qualitative method was used to analyze data from questionnaires and in-depth interviews to explain the motivations of

households to participate in the waste bank's activities. The quantitative method was used to analyze data from questionnaires and secondary data to measure the performance of each type of customer within the context of contribution to the waste bank program.

3.2 Operationalization: Variables and Indicators

This stage is the process of translating the concepts defined in the conceptual framework into variables and indicators in order to make the collection of data more practical. The table below describes the summary of operationalization, consisting of concepts, variables, subvariables, indicators, types of data and data sources.

For the purpose of the study, a customer motive is defined as the intention or motivation to carry out a specific behavior which is influenced by many motivational factors. These factors are attitude towards behavior, subjective norms, perceived behavioral control (PBC). However, some exogenous factors also need to be considered such as personal attributes, economic incentives, convenience, and access to information and knowledge.

The contribution of customers to the waste bank program's effectiveness is reflected by output generated by the service and the target to be achieved is providing the service (outcome). It is measured by the outcome-based indicator, since it provides more insight into how much the program is helping to accomplished the objective, in this case, how much the waste bank program has contributed to realizing waste reduction policy. Thus, this research emphasizes measurement of the contribution of each type of customer (individuals, units) to the waste bank program's effectiveness.

Mainly, two concepts were involved in measuring the dependent and independent variables in this research, namely the theory of planned behavior on measuring customers' motivation (independent variable), and performance measurement, as reflected in the customer's contribution (dependent variable). Nevertheless, these two concepts are still rooted in the core concept, which is Integrated Solid Waste Management (ISWM). Table 2 explains the subvariables, indicators and data collection methods used in this study to answer the research questions. The first concept, the theory of planned behavior, is equipped with subvariables and indicators used to answer the second research sub-question about customers' motivation, to see whether there is any distinction between the two groups of customers (individuals and units). The second concept, performance measurement, is used to answer the third research sub-question 3 regarding customers' contribution to the waste bank program, and whether it was also influenced by the distinction made in the second research sub-question. Simultaneously, the first research sub-question about implementing the Samici Waste Bank Program is answered by a qualitative and quantitative analysis of the data gathered by secondary data, observation and interviews.

Table 2 Operationalization: Variables and Indicators

RESEARCH QUESTION	THEORETICAL CONCEPT	VARIABLES	SUB-VARIABELS	INDICATORS	TYPE OF DATA	SCALE OF MEASUREMENT	DATA COLLECTON METHODS
1. How was the Samici Waste Bank program implemented?	Integrated Sustainable Waste Management (ISWM)	Household participation		• The management system of the Samici Waste Bank • Type of waste bank customers • Waste Composition managed by Waste Bank	Quantitative and Qualitative		• Observation • Secondary Data (Official Reports) • Semi-structured Interview with Waste Bank Officer
2. What differences exist between the motivation of people to participate, either as individuals or as units, in the Samici Waste Bank?	Theory of Planned Behavior	Customers' Motivation	• Personal Attributes (Socio-economic condition)	• Gender • Age • Family size • Occupation • Education background • Monthly income • Activity in community organization	Quantitative	Nominal & Ordinal	• Questionnaire to Waste Bank Customers
			• Attitude towards Participation in the waste bank program	• Perceptions of benefits of joining the waste bank program within the context of environmental awareness, health concerns, and economic benefits.	Quantitative & Qualitative	Ordinal with Likert scale (Agree – Disagree)	• Questionnaire to Waste Bank Customers • Semi-structured Interview with Respondent of WB Customers.
			• Subjective norms related to participation in the waste bank program	• Internal influence from family members to segregate waste and join the waste bank program	Quantitative & Qualitative	Ordinal with Likert scale (Agree – Disagree)	
				• External influence from friends/neighbors to segregate waste and join the waste bank program			
				• External influence from community/social groups to segregate waste and join the waste bank program			
			• Perceived Behavioral Control in participating	• Capacity to segregate waste and make deposits in the waste bank	Quantitative & Qualitative	Ordinal with Likert scale (Agree – Disagree)	
				• Time availability to segregate waste and make deposits in the waste bank		Ordinal with Likert scale (Agree – Disagree)	

RESEARCH QUESTION	THEORETICAL CONCEPT	VARIABLES	SUB-VARIABELS	INDICATORS	TYPE OF DATA	SCALE OF MEASUREMENT	DATA COLLECTON METHODS
			in the waste bank program	• Space availability to segregate waste before depositing in the waste bank		Ordinal with Likert scale (Agree – Disagree), nominal	
				• Constraint on participation in waste bank activities			
	Diffusion of Innovation Theory		• Convenience	• Accessibility to waste bank (distance and transport mode)	Quantitative	Nominal	• Questionnaire to Waste Bank Customers • Semi-structured Interview with Waste Bank Director, and Respondent of WB Customers.
				• Availability of waste bank facilities	Quantitative Qualitative	Nominal	
			• Information and Knowledge	• Access to information regarding the waste bank program	Quantitative	Nominal	• Questionnaire to Waste Bank Customers
				• Knowledge about types of waste and how to segregate properly	Qualitative	Nominal	
		Household participation	Rate of adopting the program	• Duration of participation • Type of adopters	Quantitative Qualitative	Nominal	• Questionnaire • Interview • WB Database
3. How did the contribution of each type of customer differ within the context of effectiveness of the Samici Waste Bank program?	Performance Measurement	Customers' contribution to the effectiveness of the waste bank program		• Total Savings received (cash)	Quantitative Qualitative	Ordinal/Scale	• Observation • Secondary Data (Official Reports) • Semi-structured Interview with Waste Bank Officer • Semi-structured interview with respondents of WB Customers.
				• Frequency of delivering Waste			
				• Number of Recyclable Material types			
				• Total amount of waste deposited (kg)			
				• Participation Characteristics (Type of Waste Bank Customers, Duration of Participation)	Quantitative	• Nominal/ordinal	

Source: Ajzen (1991); Valle, Rebelo, et al., (2005); Bernstad (2014); Neely et.al, (2001); Bull (2007); Dickinson (2008); Raaum and Morgan (2001); Hatry (2006); Broeckling (2010); Micheli and Mari (2014)

3.3 Data Collection Methods

This research required both qualitative and quantitative data collection with primary and secondary data as sources. Data for this research were mainly gathered from primary data sources such as observation, questionnaires, and semi-structured interviews. The research is also supported by secondary data collection in the form of monitoring reports, official documents and database from the website.

3.3.1 Primary Data Collection

Data collecting tools for primary data consist of observation, questionnaires (structured interviews), and semi-structured interviews. It was hoped that these methods would generate information regarding the actual condition of the research units in order to answer the research questions and to achieve reliability and validity of the research through triangulation of data.

1) ***Questionnaire***

   Questionnaires were distributed to some samples of the population to study characteristics, attitudes and behavior. By using this data collection method, the researcher relied on the honesty and accuracy of participants in their responses (Marshall and Rossman, 2006). In this research, the researcher administered the questionnaire which comprised mainly of closed questions but also contained several open questions. The questionnaire form is provided as an appendix (Annex 1). The purpose of using questionnaires was to generate some findings from waste bank customers as respondents regarding their motivation to participate in the program and how they contributed to the program.

   The respondent sample selection was based on the customer database of the Samici Waste Bank. The sample of respondents was chosen randomly by systematic sampling, for example, odd or even numbers from the list. The distribution of questionnaires was supported by surveyors, particularly for individual customers. The researcher distributed the questionnaires for groups & units parallel with the interviews. Due to the limitation of time and the current condition of the waste bank's customers, which is that not all the customers are internet users, and not all customer data include an e-mail address, it was more suitable and faster to approach them directly through written forms. The surveyors visited the households, distributed the questionnaires, helped the respondents to complete them, and retrieved the surveys on the same day. This method was used to optimize the response rate and ensure sufficient data. The number of questionnaires distributed was based on the sampling calculation (explained in more detail in subchapter 3.4). The use of online or digital forms, for example, Google forms, can still be used to make it easier to convert data input to Microsoft Excel or SPSS format.

2) ***Semi-structured Interview***

   In this research, interviews focused only on one institution, the Samici Waste Bank. The type of interview is semi-structured, making use of interview guidelines as a tool. A semi-structured interview makes it feasible to do intermediate follow-up and clarification. Also, the combination with observation provides information on the implications of daily events carried out by people (Marshall and Rossman, 2006). The semi-structured interview was used for the waste bank director and waste bank customers. Samples of waste bank customers were selected purposely, based on the questionnaire results of respondents, by choosing those who provided the most relevant and complete answers which could be elaborate upon further by means of an interview. The interview protocol, which consists of question lists, is provided in the appendix (Annex 2).

3) Observation

This activity involved a systematic stage of noticing and recording events, behaviors, or objects related to the research. This can also be used to uncover relationships, particular patterns of behavior and complex interactions in a natural social setting (Marshall and Rossman, 2006). This study used observation, along with the semi-structured interviews conducted with the waste bank director and customers (individuals and units). Observation was organized in order to identify the condition of the waste bank program implementation and its facilities that may influence customers' motivation to participate in the waste bank program and thus their influence on the effectiveness of the waste bank. When making observations, it is necessary to takes notes, record events by taking photographs and other means, and to prepare a checklist. Moreover, the results of observations are cross-checked with answers from questionnaires and interviews with respondents. The observation protocol, though more flexible, still relates to the indicators of each variable that have to be measured.

3.3.2 Secondary Data Collection

Secondary data were mainly collected from sources related with the research topic. The sources are monitoring & evaluation reports, official records, websites (database & information systems), statistical data, and other documentation. The secondary data were used for data triangulation to ensure the validity and reliability of the research results, and as an extra source of information to complement the primary data.

Table 3 Secondary Data types and Data sources

Secondary Data documents	Secondary data sources
Maps	Online Google search, Samici Waste Bank
Monitoring and evaluation reports	Website/staff Cleaning and Landscape Agency of Cimahi City
Official records	Website/staff Cleaning and Landscape Agency of Cimahi City/Samici Waste Bank
Website (database & information system)	Website/Samici Waste Bank
Statistical Data	Website/BPS Statistics of Cimahi City
Policy laws/regulations/Acts	Website
Academic journal and articles	Science direct and Google scholar
Existing studies on Solid Waste Management	Science direct and Google scholar

Source: Author's construct, 2016

Secondary data were gathered in two ways, online by accessing websites and databases, and also offline by getting data through the related institution. The limitations of the secondary data are that some of the data had not been updated or completed. Therefore, they were used mostly as a complement to the primary data.

3.4 Sample Size and Selection

This section focuses on defining the sample size and techniques for determining the samples for both the questionnaires (structured interviews) and the semi-structured interviews.

3.4.1 Questionnaire

The population of this research is waste bank customers who can be divided into three types with the following classification.

Table 4 Classification of Waste Bank Customers

Categories of Customers	Definition
Individuals	Registered in waste bank individually but representing 1 household.
Groups	Informal, consists on max 20 households, which can be divided based on two characteristics: • A group of individual customers (who have their own registered individual account), living in the same neighborhood, who choose to organize a collective pick-up on a fixed schedule. • A group of households in one neighborhood that is registered as a single joint/collective account for community purposes (similar to a unit).
Units	Formal, established (neighborhood, school or office unit), consisting of a minimum of 40 individual customers.

Source: Samici Waste Bank, 2016

Based on preliminary data, it became clear that the main types of waste bank customers are predominantly individuals and units. The "group" type was established due to particular conditions which happened during implementation of the program. The characteristic of groups proved to be the same as those of individuals or units. Some of them are included as individuals, while others are similar to units. The researcher therefore decided to merge the groups with units, because they have similar characteristics regarding waste bank participation on a community or collective level.

This research used Probability Sampling with a Stratified Sampling technique. The composition of the population is known (to a certain extent). Therefore, the ideal composition of a representative sample is known. The population was divided into subpopulations (strata) based on certain characteristics. Individuals in each stratum were subsequently randomly selected.

First, the total of samples is defined using the Slovin Equation (1960):

$$n = \frac{N}{1 + (N\ x\ e^2)} = \frac{670}{1 + (670\ x\ 0.082)} = \frac{670}{5.288} = 126.7 \sim 127$$

Remarks:

e: margin error 8% (0.08) with a 92% confidence level

N: Total number of Samici Waste Bank Customers

Table 5 Sampling for Quantitative Data (Questionnaire)

Samici WB Customers	Number of people in strata		Number of sample respondents	
			Planned	Collected
Individuals	551	(127/670) x 551	104	104
Units (merged with Groups)	119	(127/670) x 119	23	30*)
TOTAL POPULATION	**670**	**TOTAL SAMPLES**	**127**	**134**

**) added in order to fulfil the minimum requirement for statistical quantitative analysis*
Source: Author, 2016

3.4.2 Semi-structured Interview

The nonprobability sampling technique, specifically single purposive sampling, was used for the semi-structured interviews, in order to select interviewees who have a proper understanding of the study and who feel a sense of responsibility towards the implementation of a waste bank. The potential respondents for interview are the waste bank director and customers (individuals and units). They were interviewed to gain

certain information relating to the study and for data triangulation with quantitative data (questionnaire).

Table 6 Sampling for Qualitative Data (Semi-structured Interview)

Category of Respondents		Sample Size	Sampling technique	Data type	Research Instrument
Samici Waste Bank Director		1	Purposive	Primary	Semi-structured Interview
Samici Waste Bank Customers	Household	5			
	Group & Units	10			
TOTAL		**16**			

Source: Author, 2016

3.5 Validity and Reliability

Internal validity relates to whether this study measured what it attempted to measure. It reflects on operationalization of the research concepts and the formulation of data collection. Since the research is a case study with causal process tracing, internal validity could be the approximate truth about inferences regarding a causal relationship. Therefore, the internal validity of this study will only be relevant if it succeeds in establishing a causal relationship. Internal validity means there is evidence that what we studied caused what we observed to happen. This research wanted to prove whether different levels of participation in a waste bank program, as reflected by type of customer (individuals, groups, units), tends to cause a different contribution in terms of waste bank effectiveness. It measured performance in terms of output (amount of waste deposited in the waste bank) and outcome (amount of income from selling reclaimed waste) on a household level based on different types of customers. External validity is about whether the research findings can be generalized to other groups. This issue influences the process of defining the sample. The sample size and sample selection should be representative so that the results and findings can be generalized to a larger population. One of the main challenges of this research relates to the limited time for the data collecting process.

Since the research is a combination of quantitative and qualitative analysis, in order to ensure internal and external validity, the researcher must address concerns about the data collection methods and analysis methods used. For the data collection methods, the questions for the questionnaire and interview were designed based on the indicators. Moreover, triangulation techniques were applied using different data sources, data collection methods and analysis techniques to enhance the degree of validity. After distributing the questionnaire among the respondents, the researcher conducted further semi-structured interviews of selected respondents to cross-check the information obtained from respondents. Information from the interviews and questionnaires was also confirmed by direct observations of the actual conditions and reviews of related secondary data about the waste bank.

In terms of reliability, the research must reflect consistency and accuracy in terms of the research instrument and procedures. It aims to minimize errors and biased measurements. Therefore, it must provide a clear explanation regarding data collection and analysis, thus making it easier to understand and follow all stages, e.g. by designing the questionnaire and the interview guidelines effectively and comprehensively. To achieve this level of reliability, this research methodology tried to provide clear definitions, starting with the preparation stage, right through to analysis, as this will facilitate future replication. Nevertheless, this research may have some missing data or response or measurement errors due to respondents' condition. The sample size may also have resulted in a low degree of consistency. However, the triangulation data used in in this research can also increase the reliability of the research.

3.6 Data Analysis Methods

Both qualitative and quantitative analysis were carried out using the mixed method which combines these types of data. Quantitative data were analyzed using computer programs, mainly by SPSS and supported by Microsoft Excel. The quantitative data gathered from questionnaires were analyzed by multivariate analysis methods which also tries to address several issues involved in data collecting, such as accuracy of data, correlation and missing data. The multivariate analysis consists of several steps, such as a descriptive analysis to measure the normality of the data using a Shapiro Wilk test, linearity analysis using a scatterplot test, crosstab analysis to compare similarity or difference in responses from two different groups of waste bank customers, chi-square test and t-test to compare observed data with the data we expected to obtain based on the research hypothesis, correlation analysis to measure the relationship between the independent variable and the dependent variable. The results were also combined with the descriptive analysis of the dependent variable from secondary data (statistical data) on waste bank customers' contribution using Microsoft excel. All statistical analyses are presented in graphs, charts, and tables to make it easier to explain, analyze and understand the results.

Table 7 Quantitative Analysis for Questionnaire

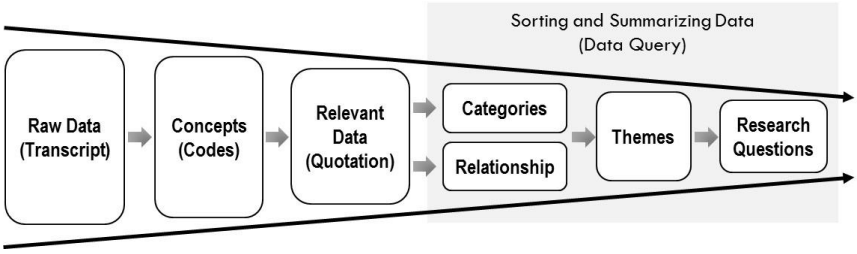
VARIABLES	SUB-VAR	INDICATORS	ANALYSIS METHOD
Customers' contribution to the effectiveness of the waste bank program		• The management system of the Samici Waste Bank • Type of waste bank customers • Waste composition managed by the waste bank	Descriptive analysis with excel
Customers' motivation	Personal Attributes (Socio-economic condition)	• Gender • Age • Family size • Occupation • Education background • Monthly income • Activity in community organization	• Crosstab analysis • Comparison/Association analysis - Chi-square analysis • Normality analysis - Shapiro Wilk test
	Attitude towards participation in the waste bank program	• Perception of benefits of joining the waste bank program within the context of environmental awareness, health concerns, and economic benefits.	• Crosstab analysis • Comparison/Association analysis - T-test analysis • Reliability analysis – Cronbach's Alpha test • Normality analysis - Shapiro Wilk test
	Subjective norms related to participation in the waste bank program	• Internal influence from family members to segregate waste and join the waste bank program	• Crosstab analysis • Comparison/Association analysis - T-test analysis • Reliability analysis – Cronbach's Alpha test • Normality analysis - Shapiro Wilk test
		• External influence from friends/neighbors to segregate waste and join the waste bank program	
		• External influence from community/social groups to segregate waste and join the waste bank program	
	Perceived Behavioral Control in waste bank program participation.	• Capacity to segregate waste and make deposits in the waste bank	• Crosstab analysis • Comparison/Association analysis - T-test analysis • Reliability analysis – Cronbach's Alpha test • Normality analysis - Shapiro Wilk test
		• Time availability to segregate waste and make deposits in the waste bank	
		• Space availability to segregate waste before making deposits in the waste bank	
		• Constraints on participation in waste bank activities	
	Convenience	• Accessibility to waste bank (distance and transport mode)	• Crosstab analysis • Comparison/Association analysis - Chi-square analysis • Normality analysis - Shapiro Wilk test • Non-parametric Correlation analysis - Spearman's Rho
		• Availability of waste bank facilities	
		• Access to information regarding waste bank program	• Crosstab analysis

VARIABLES	SUB-VAR	INDICATORS	ANALYSIS METHOD
	Information and Knowledge	• Knowledge about type of waste and how to segregate properly	• Comparison/Association analysis - Chi-square analysis • Normality analysis - Shapiro Wilk test
Household participation	Rate of adopting the program	• Rate of adopting the program	• Descriptive analysis with excel
Customers' contribution to the effectiveness of the waste bank program		• Total savings earned (cash) • Frequency of delivering Waste • Number of recyclable material types • Total amount of deposited waste (kg) • Participation Characteristics (type of waste bank customers, duration of participation)	• Crosstab analysis • Spearman's Rho Correlation analysis

Source: Author, 2016

The qualitative data collected from semi-structured interviews were analyzed using Atlas TI software and manually by means of content analysis using a coding process. There are several steps to managing all the raw data by a coding process. First, becoming familiar with the data and information gathered from the interviews as compiled in the transcripts. Second, constructing the code list. A code list is a group of keywords that is drawn up based on the variable and the indicator related to the research topic. The code list can be determined using the theoretical framework of the research (deductive approach). However, in the case of semi-structure interviews, it also should be open to a new or additional code derived from the interview results. Third, the data can be structured by labelling text fragments (quotations) as relevant data from the transcripts with a term from the initial code list or additional ones. Fourth, sorting and summarizing data (data query). Finally, categorizing the data to interpret the results in relation to the research topic. When interpreting data, it is necessary to look for patterns, e.g. negative, positive, similarities, and contradictive responses that might explain or answer the research question (Creswell, 2003). Together with the findings from the quantitative data, the qualitative data may provide better in-depth information to support a better analysis. In the research findings, information collected from interviews was regarded as opinions or quotations.

Figure 15 Flow of Qualitative Analysis for Interview using Atlas Ti



Source: Ducharme and Ed (2013) *with some modification*

Figure 15 explains the stages of the content analysis process, while Table 8 shows the corresponding functions in Atlas Ti software which are used in the process of generating results from the interviews.

Table 8 Quantitative Analysis for Questionnaire

Content Analysis Terms	ATLAS.ti Function
Raw Data	Primary Documents
Concepts (Codes)	Quotations
Relevant Data	Codes
Categories	Families
Relationships	Networks
Themes	Memos

Source: Ducharme and Ed (2013)

The narrative texts gathered as respondents' responses to open-ended questions during the interview, together with the observer's notes, known as Primary Documents, were up-loaded into Atlas Ti software (Figure 16). In this research, the primary documents consist of 15 transcripts divided into two main categories, individuals (5 transcripts) and units (10 transcripts).

Figure 16 Primary Documents

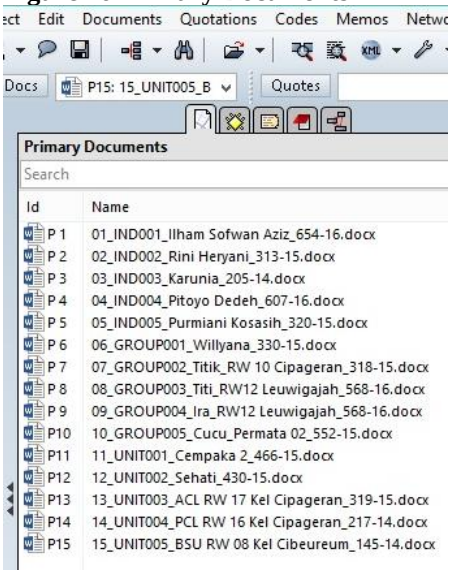


Figure 17 Codes Family and Codes

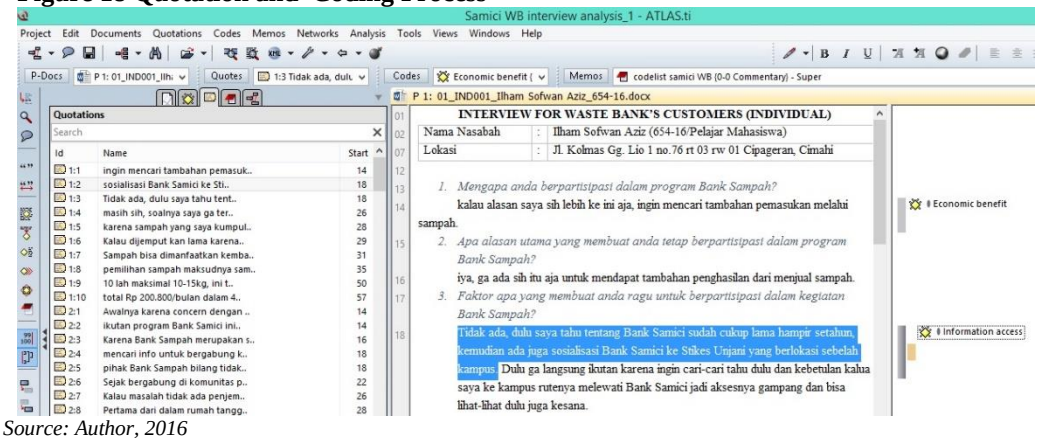
CODES FAMILY	CODE LIST
Socio-economic condition	• Family size • Occupation • Education Background • Organization Activity • Community Activity
Attitude towards Waste Bank Program	• Environmental awareness • Economic benefit • Health concern
Subjective Norm related to Waste Bank Program	• Family support • Friends/neighbors encouragement • Community encouragement • Self-initiative *)
Perceived Behavioral Control in Waste Bank Program	• Waste segregate capability • Time availability • Space availability • Participation constraints
Convenience	• Accessibility • Facilities availability
Information and knowledge	• Information access • Waste management knowledge
Customers contribution	• Amount of Waste deposit • Total of savings

**) additional code*

Source: Author, 2016

Codes family represents the subvariables while codes embody indicators used to measure the dependent and independent variables to answer the research questions (Figure 17). One additional code, 'self-initiative', was added due to a situation which emerged during the interview and observation process. The coding process is a stage of giving each quotation a code that contains relevant data to answer the research questions from a qualitative perspective. An example of the coding process is shown in figure 18 below.

Figure 18 Quotation and Coding Process



Source: Author, 2016

If necessary, the 'memo' function can be used to add important notes to explain the situation during the observation relating to an interview result. After the coding process is finished, data query is conducted to generate a list of quotations containing relevant data to support the results of the quantitative analysis in Chapter 4.

Chapter 4: Research Findings

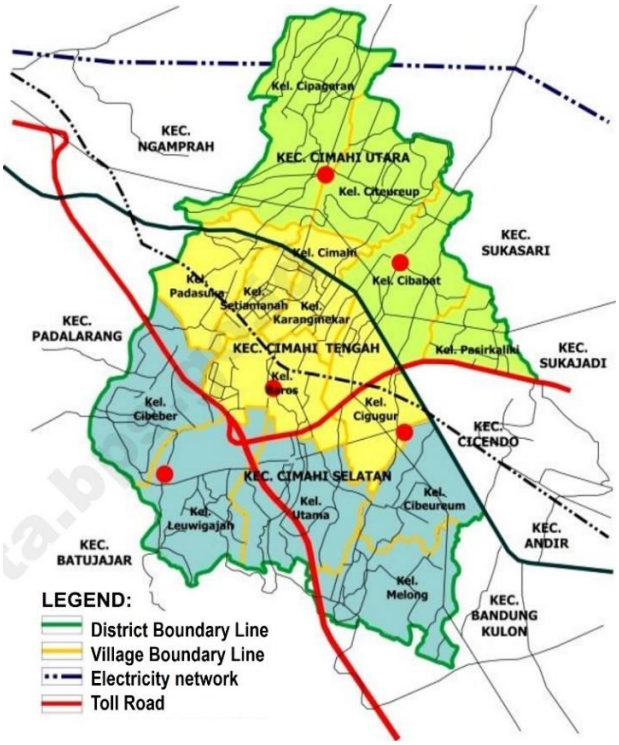
This chapter explains the main research findings and the analysis which has been divided into two main parts. The first part describes the case study location and the respondents, and the second part presents the data analysis with details of each research sub-question and relevant indicators, with discussion to answer each sub-research questions based on the research findings.

4.1 Description of the Case Study and the Respondents

4.1.1 Study Area Location

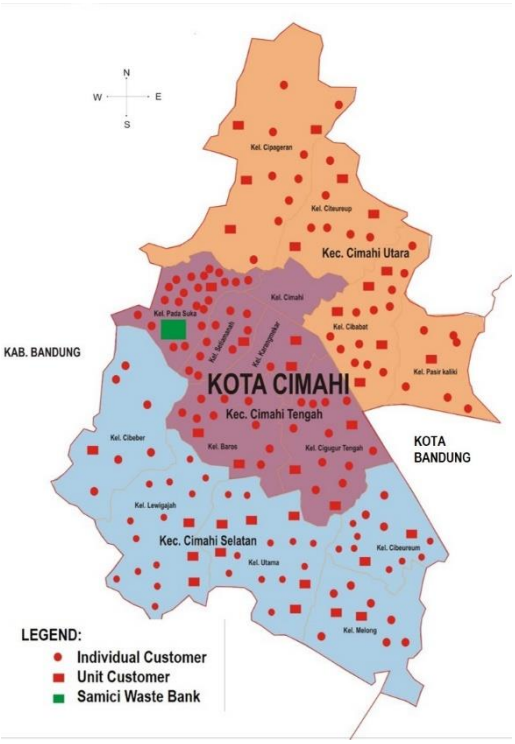
Cimahi city is located in Bandung Metropolitan Area in West Java province, Indonesia, has a total area of 40.42 km^2 and is spread over three districts, namely North Cimahi, Central Cimahi, and South Cimahi. North Cimahi district consists of 4 villages, Central Cimahi district consists of 6 villages and South Cimahi district consists of 5 villages. In 2015, Cimahi city had a population of 586,580 inhabitants. The population density in 2015 was 14,592 inhabitants/km^2, due to the high degree of population mobility, as the population is more concentrated in the urban center of Cimahi. The population density of Central Cimahi district is the highest compared to other districts, reaching 17,092 inhabitants/km^2. The Samici Waste Bank is also located in the Central Cimahi district, which makes it relatively accessible.

Figure 19 Administrative Area of Cimahi City



Source: Cimahi City in Figures, 2015

Figure 20 Distribution Map of Samici Waste Bank Customers



Source: Samici Waste Bank, 2015

The establishment of the Samici Waste Bank system in Cimahi was initiated by the Municipality of Cimahi under the supervision of the Cleaning and Landscaping Agency as part of a government waste reduction program. This program encourages people to separate their waste at source and to implement sustainable waste management using the 3R (reduce, reuse, recycle) approach at community level. Since coming into operation in October 2014, Samici Waste Bank has developed to be able to accommodate the separation and sale of inorganic waste materials that still have an economic value. The number of customers participating in the Samici Waste Bank program also keeps increasing due to a growing awareness of people's

behavior and the paradigm of waste management. People in Cimahi can participate in Samici waste bank as two main types of customers: individual and units.

As can be seen from figure 20, the distribution of waste bank customers is over all districts and subdistricts of Cimahi city. An individual customer represents one household, while a unit customer represents a group of households in one neighborhood, or it can also represent schools or offices. Based on recent data from 2016, the total number of customers registered as Samici Waste Bank customers is 630, consisting of 511 individuals and 119 groups and units.

4.1.2 Respondents

This section explains the characteristics of the respondents who are regarded as Samici Waste Bank customers. The total number of respondents in this research is 134 respondents who were divided into two groups: 104 individual customers and 30 unit customers. Respondents were selected by stratified random sampling based on the list of customers from the Samici Waste Bank database. Furthermore, for the additional interviews, five respondents were chosen from each type of customers, giving a total of 15 respondents who were interviewed to triangulate the questionnaire results.

According to the data shown in Chart 1, in both groups the number of female respondents is higher than the number of male respondents, 75% (78 people) of individual customers and 83% (25 people) of unit customers. Chart 2 shows that the majority of respondents in both groups were between 31 and 59 years old, 78% (81 people) of individual customers and 93% (28 people) of unit customers. The youngest respondent was 18 years old while the oldest one was 82 years old.

Chart 1:Number of Respondents by Gender

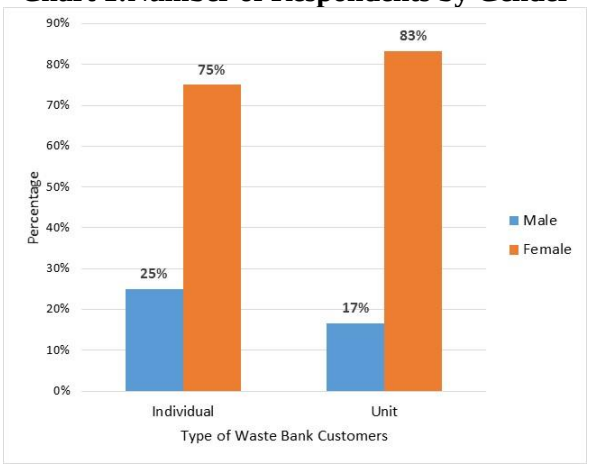
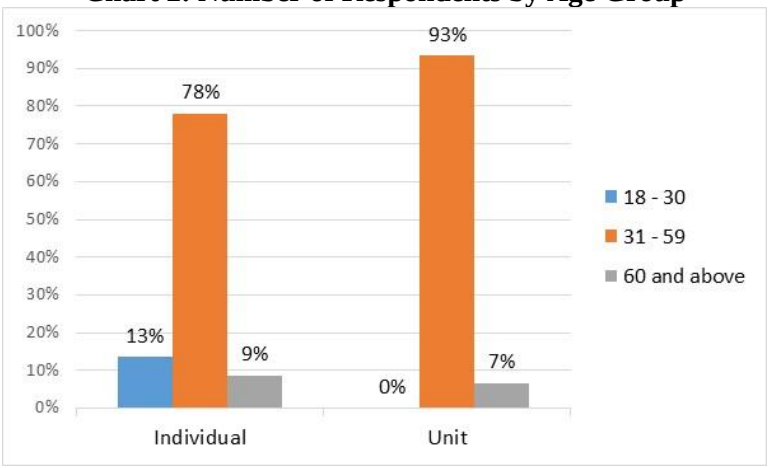


Chart 2: Number of Respondents by Age Group



Source: Analysis, 2016

In this research, the respondents were dominated by people who graduated from senior high school and have a bachelor's degree, as seen in chart 3. Of the individual customers, about 38% (40 people) had graduated from senior high school, and 25% (26 people) had completed their bachelor's degree. Unit customers were also mainly senior high school graduates with a bachelor's degree, about 33% (10 people) at both levels. The education level of respondents in both groups varied. Based on the data, the respondents in both groups were mostly housewives, government officials and self-employed. This related to the respondents 'gender, and most were female (Chart 4).

Chart 3: Number of Respondents by Education

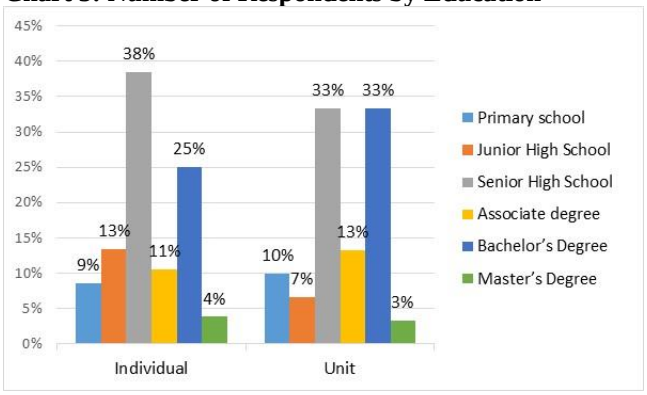
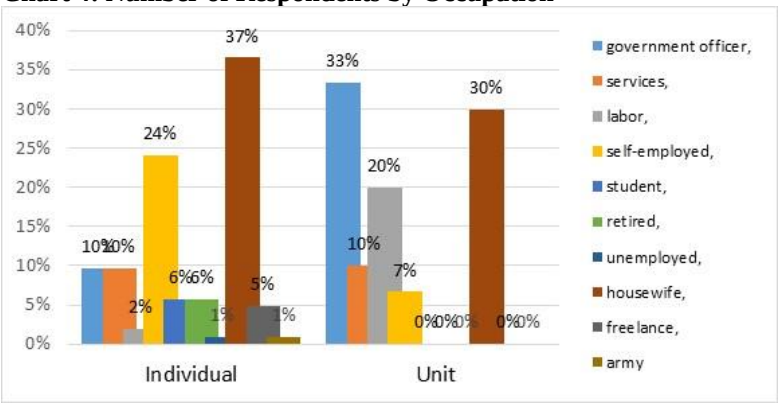


Chart 4: Number of Respondents by Occupation



4.2 Data Analysis

This section presents and analyses the data obtained from the questionnaires, interviews, secondary data and observations, which were used to triangulate the research findings. The analysis summary is divided into three subchapters based on the research sub-questions. It was compiled based on variables, indicators, and source of data. Furthermore, the additional source for triangulation purpose is also presented.

4.2.1 Sub-Question 1: How was the Samici Waste Bank program implemented?

Samici Waste Bank in Cimahi city was established to manage inorganic waste materials produced by activities in households, the community, schools, offices, etc., which still have an economic value for re-sale. Therefore, the aims of Samici Waste Bank are:

- To promote behavioral change in households in managing waste with a 3R approach.
- To motivate people in Cimahi city to segregate and manage their waste at source.
- To enhance the community's economy and create jobs by managing valuable inorganic waste.

> *"Samici Waste Bank is one of the local government programs in waste reduction. Cimahi City always receives a clean environment award from the National Government every year. One of its best practice relates to waste management. Therefore, the Municipality wants to improve sustainable waste management by promoting the 3R approach even more. Another important reason is that the government has to reduce 80% of the waste generated in Cimahi city, and this will also need support from society."*
>
> Samici Waste Bank Director, 2016

Implementation of the Samici Waste Bank program is explained further based on three main indicators, namely the system of the Samici Waste Bank program, the classification of customers, and the waste compositions managed by the waste bank. These indicators mainly explain how the Samici Waste Bank works and is managed on a daily basis. It can be viewed from two different aspects: from internally, i.e. how the Samici Waste Bank is structured, and externally, how they classify their customers and manage the waste.

4.2.1.1 The Management System of Samici Waste Bank

In terms of management, the system of the Samici Waste Bank program generally consists of its organizational structure, the resources, and the process of how it is managed on a daily basis. At this moment, Samici Waste Bank, which was established under the supervision of the Cleaning and Landscaping Agency of Cimahi Municipality, is managed with limited resources

consisting of six persons as shown in the organizational structure in Figure 21. All staff work in the same location, Samici Waste Bank central office. Since being established almost two years ago, Samici Waste Bank has still managed only the waste collecting, cleaning, and segregating stages based on types of waste. There is as yet no further treatment (advance waste processing), so it still has no production division. Therefore, Samici Waste Bank cooperates with a plastic milling company for further processing into the plastic pellets required by the manufacturer, and with a related factory for paper and cardboard.

To support the collecting stage, the Municipality of Cimahi has provided one unit in the form of a truck, and two units in the form of three-wheeled motorcycles. However, by the time this survey had taken place, unfortunately, the truck and one of the motorcycles were out of order due to lack of maintenance. Thus, only one unit in the form of a motorcycle was operational. This condition has influenced the waste pick-up service schedule. Because of limited vehicles, some waste collecting has been delayed. However, The Cimahi Municipality, under the Cleaning and Landscaping Agency, plans to add more facilities in the form of one unit of a car and to develop a 3R center to manufacture handicrafts from inorganic waste.

The operational hours of Samici Waste Bank are Monday to Friday between 08:00 and 16:00 hours and Saturdays from 08:00 until 14:00 hours. The officers and tellers serve customers first by weighing the waste and then recording it in the customer's account book based on the monetary value of the waste. Customers usually take out their savings after a certain period, for example, a month, three months or even once a year. Samici Waste Bank has a different price (monetary value) for savings or direct cash. Apparently, the price for savings is slightly higher than if a customer wants direct cash from the waste sold.

The waste pick-up schedule varies per customer, ranging from once or twice a week to once a month. Unit customers usually have a more routine schedule than individual customers, since they produce more waste than individuals. Individual customers can also ask for a pick-up service if they reach a minimum of 20 kg of waste, whereby terms and conditions apply. Moreover, the pick-up service is one of the facilities offered by the waste bank which also differs between individuals and unit customers. This service facility is explained in the flowchart of waste processing below (Figure 22).

Figure 21 Organizational Structure of Samici Waste Bank

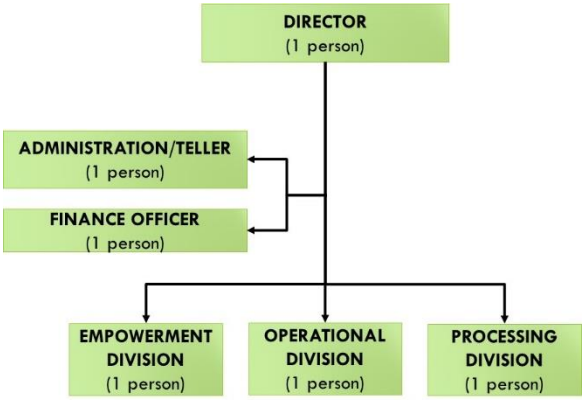
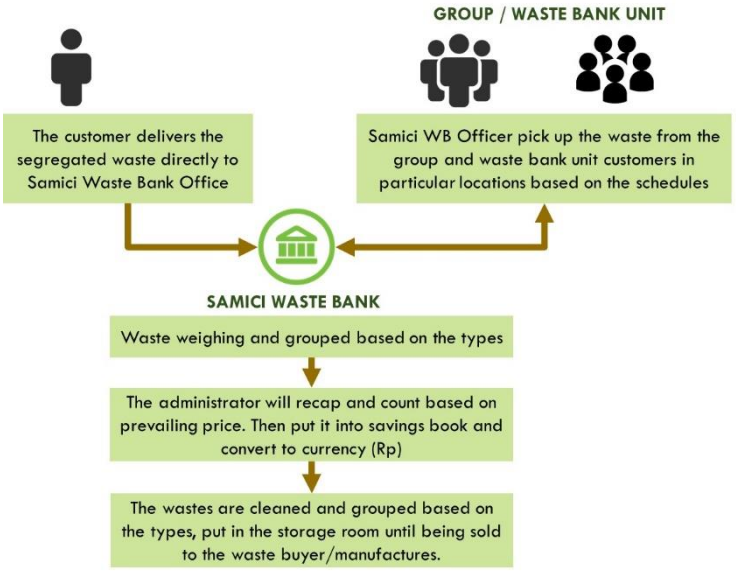


Figure 22 Flowchart of Waste Processing in Samici Waste Bank



Source: Samici waste Bank, 2016

In providing facilities, Samici Waste Bank also cooperates with other companies, both public and private, such as the conventional bank, the State Electricity company, and the service company. They offer additional services such as electricity and home bills payment. This means that customers can pay their bills with the money they earn from the waste bank. The mechanism is that the Samici Waste Bank puts a deposit in the cash management system of the cooperation company to pay the bills. In addition, Samici Waste Bank also provides socialization and workshops about the waste bank and waste management with the 3R (reuse, reduce, recycle) approach. The program aims to increase awareness among households and the community about household waste management and the benefits of waste segregation at source. These activities can be held upon request by contacting the waste bank and inviting an officer to provide the community with materials.

Figure 23 Activities in Samici Waste Bank

Tellers in Samici Waste Bank

Waste storage rooms

Waste Segregating Socialization to Community

Waste weighing and recording process

Transportation Modes

Source: Samici Waste Bank and Observation, 2016

4.2.1.2 Types of Waste Bank Customers

Generally, the classification of Samici Waste Bank customers takes place into two main categories: individuals and units. Households are selected that meet the requirements and can be registered as customers of Samici Waste Bank.

Table 9 Types of participation as Samici Waste Bank Customers

	Individuals	Units
Registration procedures	• One account represents one household. • Bring a photocopy of ID to register.	• 1 unit consist of at least 20 households as a member. • Apply for socialization to the Cleaning and Landscaping Agency. • Have an organizational structure with a minimum of 4 persons (head of unit, secretary, and operational staff)
Member's Privilege	• Can be used as regular savings account as with a conventional bank. • Savings can be redeemed for electricity, phone or water credits payment.	• Provided equipment by Samici Waste Bank • Partnership with Samici Waste Bank
Operational System	Customer delivers the recyclable waste directly to Samici Waste Bank office.	Samici Waste Bank officer collect the waste from each collection point (*pick-up service*).
Customer Target	Every household in Cimahi city that knows about Samici Waste Bank and is interested in segregating waste and participating as a waste bank member.	At least every neighborhood in Cimahi city has a minimum of 1 waste bank unit.

Source: Samici Waste Bank, 2015

Based on the interview and observations, it appears that there is a new addition to customer classification, called "group" customers. They were established incidentally due to exceptional circumstances. Group customers are individual customers consisting of 10-20 households who live in the same area, so the Waste Bank tries to facilitate the waste pick-up collectively. Some "group" members have their individual account, but several "groups" have made a joint account for one neighborhood level, whereby the money earned from waste-saving is not used by the members themselves but for community purposes. Based on that condition, a "group" can be categorized as "half individual, half unit". A "group" customer with a joint account can be included as a unit since its characteristics are generally similar, the only differences being the number of members and the legality aspect.

In terms of legal status, group and unit customers differ specifically in the organizational structure of their management. Groups are simply a number of individual customers who do not have official management, so they are managed by Samici Waste Bank directly but collectively. A unit established based on the Municipality's decree is expected to have a structural organizational management that is responsible for managing members' savings. They collect all the deposited waste from members which is then delivered to Samici Waste Bank. The group type of customer was established to facilitate those who cannot be classified as a unit because they do not fulfill the requirements, for instance number of members, space for a collecting point, official organizational structure management.

This research wanted to identify the difference in the motivation of people at two levels of participation, namely individual and community (collective). Therefore, waste bank customers were still divided into two main classifications: individuals and units. As has been noted, participation in the waste bank program at a community level consists of units and group customers.

4.2.1.3 Waste Composition Managed by the Waste Bank

Waste is separated into six main categories: paper, plastic, metal, glass, rubber and electronic waste. The segregated waste is also divided into subcategories based on shape, composition, and material density.

Table 10 Types of Recyclable Materials in Samici Waste Bank

CODE	TYPE	CODE	TYPE
PAPER (K)			
K1	Archives, Documents	K7	Cones
K2	Archives, Documents (color)	K8	CD
K3	Cardboard I (dry)	K9	Books
K4	Cardboard I (wet)	K10	Magazines
K5	Newspaper	K11	Cement Sack
K6	Duplex	K12	Scrap paper
PLASTIC (P)			
P1	PP Cups (Clean)	P15	Jerry can
P2	PP Cups (Dirty)	P16	Jerry can (black)
P3	PET Clear Bottle (Clean)	P17	Hard plastic
P4	PET Clear Bottle (Dirty)	P18	Crystal
P5	PET Color Bottle (Clean)	P19	Gallon cap
P6	PET Color Bottle (Dirty)	P20	Color Bottles cap
P7	Mixed plastic	P21	CD/DVD/MP3/Play Station Cassette
P8	*Monti* Cups	P22	Paralon pipe
P9	AGG (mixed cups and bottles)	P23	Carpet/plastic gutter/rain coat
P10	Clear PP	P24	Sandals/Shoes
P11	Kresek	P25	Water hose
P12	PVC	P26	Packaging
P13	Blowing (clean)	P27	Packaging of instant noodles
P14	Blowing (dirty)	P28	Gallons
METAL (L)			
L1	Iron 1	L7	Aluminum
L2	Iron II	L8	Bronze 1
L3	Nail/wire	L9	Bronze 2
L4	Can	L10	Copper
L5	Zinc	L12	Tin
L6	Pan	L3	Accu
GLASS (Kc)			
Kc1	Broken glass	Kc3	Small bottle
Kc2	Beer bottle		
ELECTRONICS			
E1	Refrigerator	E3	Washing Machines
E2	Air Conditioner	B1	Computer
OTHERS			
B2	Car tires	B4	Cycle tires
B3	Motorcycle tires	B5	Truck tires

Source: Samici Waste Bank, 2016

> *"The waste composition is also considered in determining the waste price. It becomes a challenge for waste bank officers to check carefully all the waste delivered during the weighing process. Quality control is a very important step in managing all the waste delivered to the waste bank."*
>
> Samici Waste Bank Director, 2016

The waste bank accepts various kinds of recyclable materials, whereby the type of waste and the price are adjusted according to the waste buyers' list. In general, the waste-handling method starts by requiring each customer to sort their waste according to types in a clean condition. Once customers arrive at the waste bank, or an officer comes to pick up waste, the waste is weighed, the teller recaps the total volume of waste deposit, then immediately puts the waste into the warehouse.

4.2.1.4 Discussion: implementation of the Samici Waste Bank program

Samici Waste Bank was established by referring to the best practice of waste bank management which had been implemented in Malang city, but with some adaptation and innovation based on the characteristics of Cimahi city. Due to limited resources, since being established about two years ago, Samici Waste Bank has only managed inorganic waste materials by collecting and selling them to the waste buyers or manufacturers. In the future, it plans to expand by creating a waste-processing facility in order to add more value to the waste materials. By applying the principle of sustainable waste management with the 3R approach, Samici Waste Bank has continued to grow and is contributing to waste reduction policy. Various types of waste are managed by the waste bank, and it is more beneficial for its customers compared to informal waste buyers. Moreover, the Samici Waste Bank is involved in the socialization of households and the community, by informing them about the program and enhancing people's awareness and persuading them to join the program.

The increasing number of customers reflects the higher household participation rate in the program. Based on observations and the interview with Samici Waste Bank's director, some overlap was found in the characteristics of individual customers and community customers (groups & units). Waste bank customers are generally classified into two main types: individuals and units. However, the "group" type emerged as a result of how the Waste Bank itself manages its customers and provides an adequate facility that motivates people to segregate waste, particularly in providing a door-to-door collection system to make it easier for customers to access the waste bank. Thus, the "group" and "unit" types differ only in terms of legal status and number of members. Apart from this, they have similar characteristics, and both are provided with the same facilities.

4.2.2 Sub-Question 2: What differences exist between the motivation of individuals and unit customers to participate in Samici Waste Bank?

To answer this research question, a comparison analysis was conducted using crosstab, chi-square, and t-test. The descriptive analysis showed that the matrix consists of the total number, percentages, and the probability value of each indicator for individuals and unit customers. To measure different scores and to make comparisons between groups by using chi-square and t-test analysis, the hypotheses used are:

- h_0: The null hypothesis is that there is no difference in the variable analyzed between individuals and unit customers or there is no association between the variable analyzed and the type of waste bank customers.
- H_1: There is a difference in the variable analyzed between individual and unit customers or there is an association between the variable and the type of waste bank customers.

If the probability (p) value is less than 0.05, then h_0 is rejected. Thus, the p-value shows whether there are any differences in motivation between individual and unit customers.
Moreover, this section explains mainly two outcomes of analysis based on the variables: firstly, the relative importance of each indicator for each group (individuals and units) separately. Secondly, to show in which cases there are differences between the two populations (individual and unit).

4.2.2.1 Variable: Personal Attributes (Socioeconomic condition)

Saphores, Nixon, et al. (2006) stated that, apart from behavioral aspects, several studies also looked at the relationship between socioeconomic condition and recycling involvement. The most commonly examined variables are gender, age, education and income. In this research, the socioeconomic condition of waste bank customers is described by means of several indicators such as gender, age, family size, occupation, educational level, monthly income and activity on a community level. This research wanted to analyze whether there is a difference

between individuals and unit customers in terms of socioeconomic condition. The analysis started with a crosstab analysis and a comparison test between the two groups using chi-square analysis, and the results are shown in Table 11 below.

Table 11 Chi Square Test Results on Personal Attributes (Socioeconomic Condition)

No.	Variables		INDIVIDUAL		COMMUNITY		Sig.(2-sided)
			N	%	N	%	p value
1.	Gender	Male	26	25%	4	13.3%	0.177
		Female	78	75%	26	86.7%	
			104	100%	30	100%	
2.	Age	Under 17	1	1%	0	0%	0.181
		18-30	14	13.5%	0	0%	
		31-59	80	76.9%	27	90%	
		60 and above	9	8.7%	3	10%	
			104	100%	30	100%	
3.	Family Size	1-3	27	26%	3	10%	0.135
		4-6	71	68.3%	26	86.7%	
		7-9	6	5.8%	1	3.3%	
			104	100%	30	100%	
4.	**Occupation**	Government Officer	10	9.6%	10	33.3%	**0.000**
		Private Company	10	9.6%	3	10%	
		Labor	2	1.9%	6	20%	
		Self-employed	25	24%	2	6.7%	
		Student	6	5.8%	0	0%	
		Retired	6	5.8%	0	0%	
		Unemployed	1	1%	0	0%	
		Housewife	38	36.5%	9	30%	
		Freelance	5	4.8%	0	0%	
		Army	1	1%	0	0%	
			104	100%	30	100%	
5.	Education Level	Primary school	9	8.7%	3	10%	0.864
		Junior High School	14	13.5%	2	6.7%	
		Senior High School	40	38.5%	10	33.3%	
		Associate degree	11	10.6%	4	13.3%	
		Bachelor's Degree	26	25%	10	33.3%	
		Master's Degree	4	3.8%	1	3.3%	
			104	100%	30	100%	
6.	Monthly Income	< Rp 2,000,000	49	47.1%	7	23.3%	0.077
		Rp 2,000.001 – Rp 3,000,000	19	18.3%	10	33.3%	
		3,000.001 – Rp 4,000,000	24	23.1%	7	23.3%	
		> Rp 4,000,000	12	11.5%	6	20%	
			104	100%	30	100%	
7.	**Activity in Community**	• Yes	71	68.3%	29	96.7%	**0.002**
		• No	33	31.7%	1	3.3%	
			104	100%	30	100%	

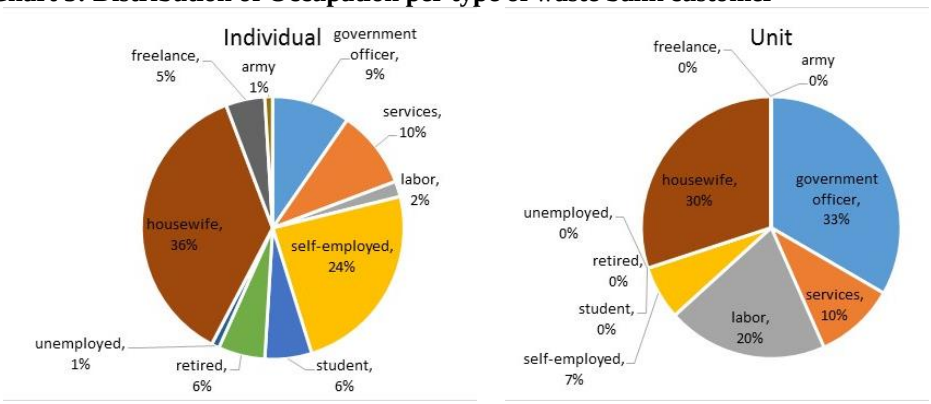
Source: Analysis result, 2016

The analysis results of SPSS in Table 11 show that indicators of personal attribute variables with a probability (p) value less than 0.05 are occupation and level of activity in the community. This means there is significant difference between individuals and units in terms of personal background, namely type of occupation and level of activity in the community. In fact, everyone, from any background, irrespective of gender, age, family size, or level of education, can participate in the waste bank program, without any restrictions.

Next, the productive age in Indonesia usually ranges from 15 to 64 years old, but the age of most people who participate in the waste bank program ranges from 31 to 59 years old. The total number of family members of most customers was about 4-6 persons per household. The level of education completed by the majority of customers is senior high school with a bachelor's degree. Average monthly income was less than 2 million rupiahs which is still under the regional minimum wage standard in Cimahi City. Nevertheless, there are many similar characteristics between individuals and unit customers. There are also some differences between the two groups, specifically occupation and level of activity in the community.

Chart 5 shows that 36% of individual customers are housewives, and 24% are self-employed. Of unit customers, 33% are governmental officers or civil servants and 30% are housewives. This result corresponds with the interview results and observations which show that a majority of people who participate are females and work as housewives. However, individual customers who are economically motivated to participate in the waste bank program are mostly self-employed persons who run a small shop. These customers tend to produce more inorganic waste from the products they sell. Some unit customers who work as civil servants are employed by the Cleaning and Landscaping Agency, or as teachers, and lecturers. They are motivated to participate in the waste bank program not only by concerns about environmental issues but also because they want to support the government's program. Some of them are personally motivated and others are motivated by their employer, especially those who work at the Cleaning and Landscaping Agency or for Cimahi Municipality. Therefore, they socialize the program and persuade people in their neighborhood to participate in the program.

Chart 5: Distribution of Occupation per type of waste bank customer



Source: Analysis result, 2016

Another reason for me to participate in the waste bank program is that I want to contribute to the success of the government program. Starting from waste management at a household level, then continuing to influence the neighborhood.

Male, individual customer

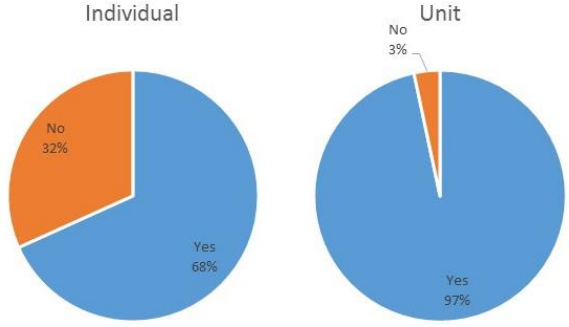
I am a civil servant and work as an elementary school teacher. I started the 3R program at school as part of a project study for students. Then I attended the workshop about waste management and got to know about the waste bank program of Cimahi Municipality, so I got more motivated to join the program, not only with my school but also with my neighbors.

Female, Civil Servant, initiator of Waste Bank Unit in School and Neighborhood

I work at the Cleaning and Landscaping Agency in Cimahi and each year we have a target of increasing people's awareness and getting them to participate in the waste bank program. To support my agency program, I cooperated with the community leader and cadres of Family Welfare Movement (PKK) organization to create a unit in my neighborhood. I invited the Samici Waste Bank to do a socialization and try to persuade people to participate in the program.

Male, Civil servant, initiator of Waste Bank Unit

Chart 6: Perception of Activity on a Community Level



Source: Analysis result, 2016

Activity on a community level indicates the level of participation in a community organization or activities. This situation can also prompt people to join the waste bank program, whether they are motivated or not. Chart 6 shows that 32% of individual customers were not active in any community organization or activities. In contrast, only 3% of unit customers were not involved in any organization or activities in their neighborhood. The interview with the respondents also provided information showing that some people joined the waste program as individuals because there is no waste bank-related activity in their neighborhood. Most customers who joined as members of a waste bank unit were also active in some community activities, or at least perceived the importance of being actively involved in the community. However, few unit customers were active in any community activities apart from the waste bank unit. This condition may be due to the time availability factor in respect of being active in the community.

"It was on my own initiative to join the waste bank program as an individual customer because there is no community activity or organization related to the waste bank in my neighborhood. Moreover, there is also no support from the community leader yet. I also persuaded my neighbor to segregate inorganic waste and make deposits in the waste bank."

Female, individual customer

"Since I am the neighborhood (RT) leader here, I feel responsible to socialize the waste bank program since it is very beneficial to society. I started from my neighborhood, then after having gained some members, I put a proposition to my community leader (RW) and asked other neighborhoods (RT) to join us in establishing a waste bank unit."

Female, head of neighborhood (RT), unit customer

I just joined as a member of a waste bank unit, in order to contribute more towards community-organized activities and because the community leader persuaded me to become involved in the program.

Female, member of a unit customer

Based on the interview results on both types of customers above, it appears that some of them have different perspectives and circumstances. Individual units mostly joined on their own initiative because there was no activity related to the waste bank yet, and they actively became involved in community activities. Some unit customers had a role as neighborhood leader or community leader, so they were very motivated to persuade their members to participate in the program. Others became members of a waste bank unit because they like to be involved in community activities, so they were interested or they simply followed their leader in joining the program.

4.2.2.2 Variable: Attitude Towards Participation in the Waste Bank Program

This variable mainly examined the level of respondents' attitude by using people's perceptions regarding outcomes that might arise due to participating in waste segregation and the waste bank program. The variable is divided into five indicators show in Table 12 below. The analysis results of the variable explain two key results. First, the most important indicators which showed a discrepancy between the two types of customers. Second, the deeper analysis result shows in which cases differences exist between individuals and unit customers. The results are expected to show whether people's perceptions or judgment about the importance of the program outcomes influenced or motivated a household to join the program.

Table 12 t-Test Results of Variable: Attitude towards Participation in the Waste Bank Program

No.	Variables	INDIVIDUAL		COMMUNITY		Asymp.Sig.(2-sided)
		N	Mean	N	Mean	p-value
1.	Perception of environmental awareness as waste bank program outcome	104	**4.38**	30	**4.90**	**0.000001**
2.	Perception of income benefit as waste bank program outcome	104	4.08	30	4.30	**0.046**
3.	Perception of health concerns as waste bank program outcome	104	**4.21**	30	4.40	0.189
4.	Perception of waste bank program implementation	104	**4.10**	30	**4.53**	**0.000101**
5.	Perception of participation in waste bank program	104	3.91	30	**4.43**	**0.000037**

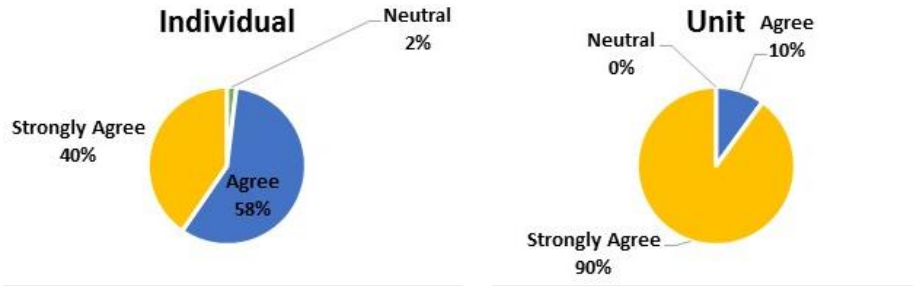
Source: Analysis result, 2016

According to the analysis results above, 4 out of 5 indicators have a p-value less than 0.05. This means that there is a significant difference between individuals and unit customers in their perception of the waste bank program, except in their perception of health concerns as one of the outcomes of waste bank participation. Next, for each indicator a more detailed explanation is given of the discrepancy between the two groups.

a) Perception of environmental awareness as a waste bank program outcome

This indicator reflects the level of agreement of a customer's belief that the outcome of the waste bank program focuses mainly on environmental issues based on his or her evaluation. The t-test analysis in Table 7 shows that there is a significant difference between individuals and unit customers in their perception that environmental awareness was a motive to participate in the waste bank program (p-value 0.000001). As shown in chart 8, 90% of unit customers strongly agree that the most beneficial outcome from participating in the waste bank is an environmental quality improvement, while only 40% of individual customers have the same impression. However, 58% of individual customers seem to agree with this idea but to a different degree of judgment.

Chart 7: Perception of environmental awareness as a waste bank program outcome



Source: Analysis result, 2016

"Initially, I was concerned about household waste management and then I joined the environmental care community. After that, I came to know and understand the 3R method as one of the solutions in sustainable waste management. Through the waste bank, I can reduce inorganic waste, primarily plastic, without burning them, which causes pollution."

Female, individual customer

"We want to improve our neighborhood environmental quality and to tackle the rise in illegal dumping sites that emerged in our residential areas. We made green spaces with polybag plants, greenhouses, and we control the volume of waste through waste segregation."

Female, member of Sehati Waste Bank Unit

"Since we live in the transition area between villages and have a lot of migrants, our neighborhood is more populated. Poor waste management had become our biggest problem here. Therefore, we decided to create a waste bank unit to manage waste more sustainably, especially inorganic waste."

Female, member of Cempaka 2 Waste Bank Unit

"Since our neighborhood is vulnerable to flooding, we wanted to minimize the risk by reducing the waste volume, especially plastics. By depositing waste with the waste bank, the utilization of inorganic waste will be optimal, and it has also reduced the volume of waste collected by the garbage truck."

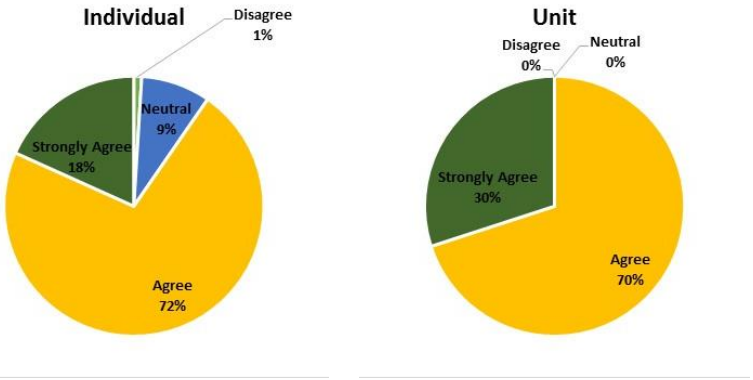
Female, member of Cibeureum Waste Bank Unit

Based on the interview results above, it appears that the environmental condition was one of the factors that trigger many people to participate in a waste bank program, but there are some comparable perception levels between individuals and unit customers. Individual customers agree with the idea. They perceive that taking part in the waste bank could have long-term benefits from an environmental aspect. However, unit customers have a wide range of reasons relating to the environmental condition that trigger them (*as shown in the box above*), such as illegal dumping sites, poor waste management, the risk of flooding caused by waste. Thus, they strongly agree with the idea since there are bigger issues to be tackled.

b) Perception of income benefits as a waste bank program outcome

This indicator reflects the degree of a customer's belief whether waste bank participation can provide income incentives as the main outcome based on his or her evaluation. The t-test analysis in Table 7 shows that there is a significant difference between individuals and unit customers in perceiving economic benefits as a motive for participating in a waste bank program (p-value 0.046). Chart 8 shows that around 70% of the respondents, both individuals and units, agree on this notion. On the one hand, 30% of unit customers strongly agree with this perception, while on the other hand, only 18% of individual customers strongly agree. By contrast, 9% of the individual customers feel neutral and only 1% disagree with this viewpoint. This condition may reflect the fact that some individual customers feel that not much money can be earned from depositing garbage in the waste bank. It was just a bonus or small incentive for them.

Chart 8: Perception of income benefits as a waste bank program outcome



Source: Analysis result, 2016

"Another benefit that we can gain from depositing garbage with the waste bank is additional income, not much, but sufficient for daily needs. However, it was not my first motive for participating in the waste bank program."

Female, individual customer

"Since I am self-employed and run a shop, I can utilize all inorganic materials such as cardboard and plastic for packaging. I segregate all these resources and sell them to the

waste bank. I gain additional income, not much actually, but it is a good deal as I get two benefits: reduced waste and money."

Female, individual customer

"The money we receive for selling waste to the waste bank can be used to fund neighborhood quality improvements and maintenance."

Male, head of neighborhood (RT) 02, Leuwigajah Waste Bank Unit

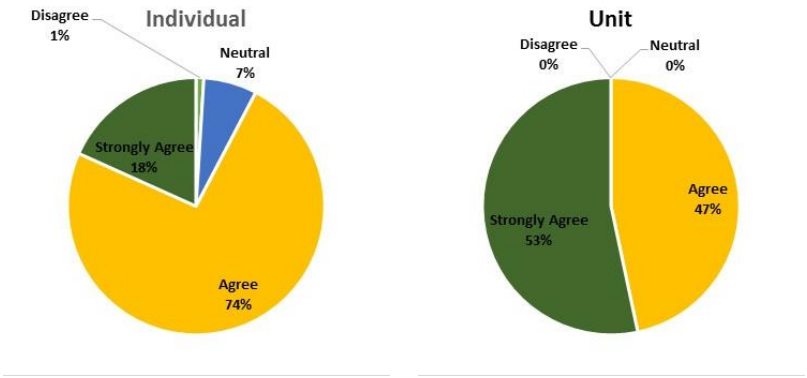
c) Perception of health concerns as a waste bank program outcome

According to the probability value in Table 7, there is no significant difference between individuals and unit customers in their perception of the improvements in health quality they would gain as a main outcome and which motivates them to participate in the waste bank program. Both groups of costumers see that advantages in health is a long-term and indirect effect, and this is why they gave it third place in prioritizing the reasons that motivated them to join the program. Thus, based on this observation, it seems that health issues associated with waste management is not a primary concern in Cimahi city.

d) Perception of waste bank program implementation

According to Valle, Rebelo, et al. (2005), another way to operationalize attitudes towards changing behavior is by measuring a person's positive and negative judgment in carrying out the behavior, in this case, implementing the Samici Waste Program and participating in it. Three main reasons that motivate people to participate in a waste bank program are environmental awareness, income, and health concerns. This indicator shows whether people agree or disagree about whether implementing this program would result in these outcomes as mentioned earlier.

Chart 9: Perception of waste bank program implementation



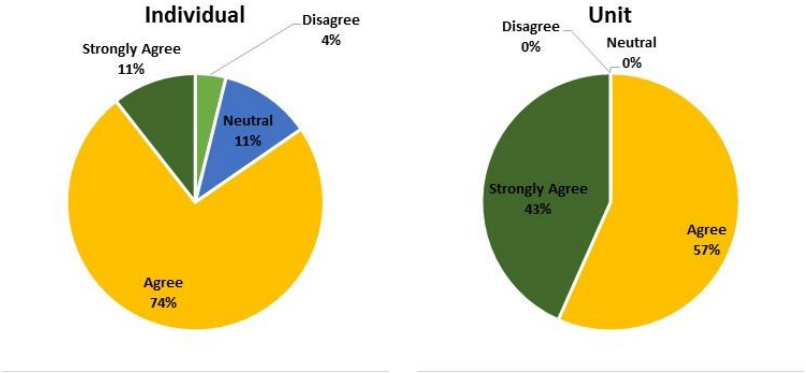
Source: Analysis result, 2016

Chart 9 shows that unit customers judged this notion more positively. Almost 53% of unit customers strongly agreed that implementing the waste bank program could achieve these three outcomes, while only 18% of individual customers strongly agree with this. Nevertheless, the responses of 74% of individual customers and 47% of unit customers were also less positive in judging this notion.

e) Perception of participation in the waste bank program

The last indicator explained customers' judgment about whether their participation would help them to achieve the outcomes. There is a significant difference between individuals and unit customers in their views on participation in the waste bank program, with a probability (p-) value of 0.000037. More positive responses were given by 43% of unit customers than by individual customers, of whom only about 11% strongly agree with the notion.

Chart 10: Perception of participation in the waste bank program



Source: Analysis result, 2016

Apparently, the two indicators have the same results regarding perception of waste bank program implementation and participation in it. In general, it can be concluded that people who participate as unit customers have a more positive judgment than individual customers in supporting the government's program.

Since indicators of the variable attitude towards behavior used multiple Likert questions in a survey/questionnaire that form a scale, this research also used Cronbach's alpha analysis to measure internal consistency (reliability). The results of the analysis show that this variable has Cronbach's Alpha value 0.783. This means that the indicators of this variable have a relatively high internal consistency.

Table 13 Reliability Statistics of Variable: Attitude Towards Participation in the Waste Bank program

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.783	.787	5

Source: Analysis result, 2016

4.2.2.3 Variable: Subjective Norms related to participation in the Waste Bank Program

The subjective norms variable measures whether there is any influence that motivates a person to participate in the waste bank program. Based on t-test analysis, the result shows p-values were <0.05, which means that all three indicators have significant differences between individuals and unit customers (Table 14).

Table 14 t-Test Results Subjective Norms – Internal and External Influences

No.	Variables	INDIVIDUAL		COMMUNITY		Asymp.Sig.(2-sided)
		N	Mean	N	Mean	p value
1.	Influence of family members	104	3.29	30	3.97	**0.002**
2.	Influence of friends or neighbors	104	3.07	30	3.60	**0.011**
3.	Influence of head of community or social groups	104	2.75	30	3.73	**0,000015**

Source: Analysis result, 2016

However, Cronbach's alpha analysis shows that the α-value is 0.588 and is considered to have a weak internal consistency (reliability). This condition may have happened because the sample of respondents for the questionnaire was measured using the Slovin equation with a marginal error 8% (0.08), confidence level 92%. Therefore, to support data validity, this research was also equipped with qualitative analysis of the interview in the form of triangulation data.

Table 15 Reliability Statistics of Variable: Subjective Norms related to participation in he Waste Bank Program

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.588	.589	3

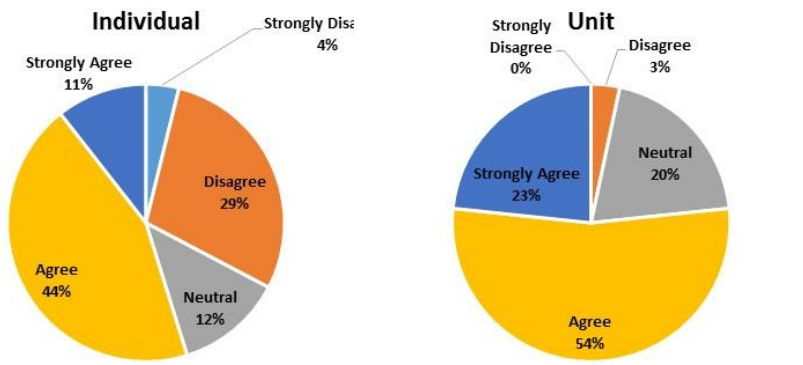
Source: Analysis result, 2016

a) Internal influence of family members

There is a significant difference between individuals and unit customers in terms of internal influence of family members on joining the waste bank program (probability value = 0.002). The majority of customers in both groups claim that encouragement from their family was important. However, there is a contrary condition, in that 23% of unit customers strongly agree that their family members expect them to segregate waste and join the waste bank program, while 29% of individual customers disagree with this. Based on the interview and observations, many individual customers had their own motives for segregating waste and joining the waste bank program, even without encouragement from their family members, even those who persuaded their own family members to participate.

The results show insight into the fact that implementing the waste bank program requires an active commitment from all family members in a household. As everyone produces waste, in order to implement waste segregation at source, the participation of every individual is needed.

Chart 11: Subjective Norm – Influence of family members



Source: Analysis result, 2016

> *"Initially, it was my initiative to get to know about the waste bank and waste segregation. After joining, I asked my family members to support me in trying to separate waste at home."*
>
> *Female, Individual customer*

> *"The active members are mostly housewives. But they were also supported by their families, who also join in and collect and segregate waste in their house. Even the men in our neighborhood help us by collecting waste while carrying out night-watch."*
>
> *Female, member of Cipageran Waste Bank Unit*

b) External Influence: from friends, neighbors and head of community or social groups

The probability value of the two indicators shows a significant difference between individuals and unit customers. Around 40% of customers, both individuals and units, agreed that their friends or neighbors influenced them to join the waste program. Some of them even found out about the existence of the Samici Waste Bank program from their friends or neighbors. However, about 36% of individual customers disagree because they claim that it was their own initiative to find information about the program before they subsequently joined.

In the case of external influence from the community or social group's leader, the results were notably similar, with an even more contradictory situation between individuals and unit customers. 43% of unit customers agree that their community or social group's leader persuaded them to participate in the waste bank program, while on the contrary, almost 47% of individual customers disagree because they state that they had no support from the community leader in relation to waste bank activity in their neighborhood.

Chart 12: Subjective Norm – Influence of friends or neighbors

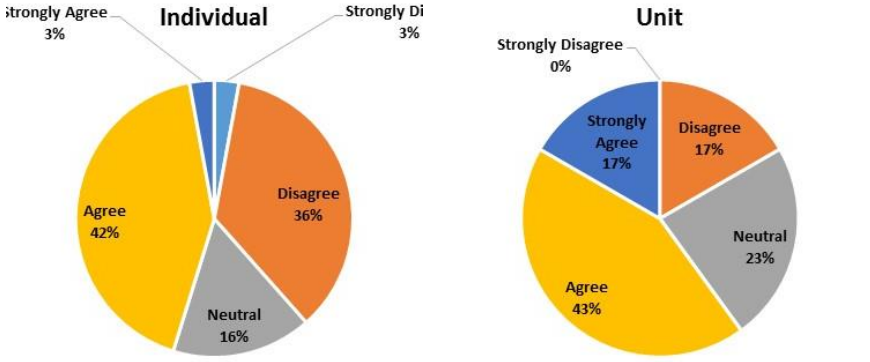
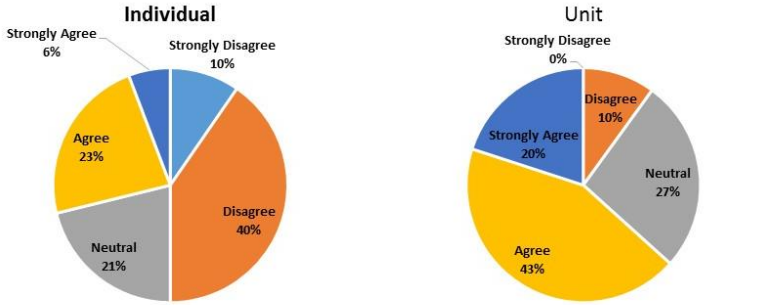


Chart 13: Subjective Norms – Influence of community or social groups



Source: Analysis result, 2016

"Bandung Polytechnic University, which is located near our neighborhood, offered cooperation in improving household waste management. They wanted to establish a Waste Bank Unit as a part of their community development program. As a neighborhood (RT) leader here, a few neighbors and I created an organizational structure to manage the waste bank unit. The University and my neighbors, who worked hard together with me, motivated me to maintain this program."

Female, member of Cempaka 2 Waste Bank Unit

"At first, I heard a suggestion from my neighborhood who had opened a restaurant and had been segregating inorganic waste for a long time. She told me about the benefits of waste segregation and depositing it in the waste bank. She then recommended that I should create a waste bank unit, at least for our neighborhood area."

Female, member of Sehati Waste Bank Unit

"It started from my initiative to join the waste bank as an individual since as yet there is no related program in my neighborhood. But after my husband became head of the neighborhood here (RT 02), we persuaded people to participate with us in waste segregation and decided to create a waste bank unit. We especially want to reduce the volume of plastic waste."

Female, member of Leuwigajah Permai Waste Bank Unit

"At first, there were no community activities related to waste management in my neighborhood, so I decided to join an environmental care community at my campus. After I had gained a lot of information about waste segregation and joined the waste bank program, I decided to implement it in my neighborhood. I cooperated with the women's organization in my neighborhood, and they were very interested in the program. But since the number of members is still quite small and we do not yet have any support from the community leader, we cannot establish a waste bank unit yet."

Female, Individual customer

4.2.2.4 Variable: Perceived Behavior Control in Participation in the Waste Bank Program

In this research, the variable perceived behavior control measures whether the internal condition influences a person's decision to participate in the waste bank program. The internal condition relating to a personal ability to perform behavior consists of three indicators, namely capability, time availability and space availability. According to the results of the t-test analysis, only one indicator has p-values of <0.05, meaning there is a significant difference between the capability to segregate waste of individuals and unit customers.

Table 16 t-Test Results of the Variable: Perceived Behavioral Control in Participation in the Waste Bank Program

No.	Variables	INDIVIDUAL		COMMUNITY		Asymp.Sig.(2-sided)
		N	Mean	N	Mean	p value
1.	Capability to segregate waste	104	3.99	30	4.20	0.075
2.	Time availability to segregate waste and deliver it to the waste bank	104	3.78	30	4.00	0.133
3.	Space availability to segregate waste	104	3.54	30	3.60	0.702

Source: Analysis result, 2016

However, Cronbach's alpha analysis shows that the α-value is 0.621 and is regarded as having weak internal consistency (reliability). Similar to the variable subjective norms, this too may have happened because of the condition of the sample of respondents for the questionnaire. Consequently, this research added some additional information based on qualitative analysis through the interview to support the data validity (triangulation data).

Table 17 Reliability Statistics of the Variable: Perceived Behavior Control in participation in the Waste Bank Program

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.621	.632	3

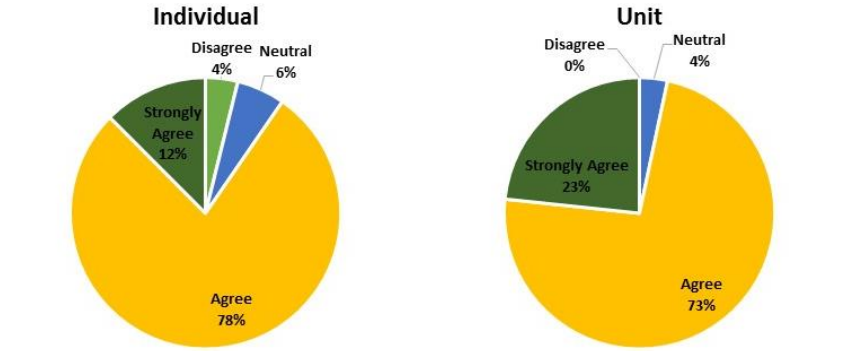
Source: Analysis result, 2016

a) Capability to segregate waste

The capability to segregate waste is crucial in producing valuable inorganic materials as essential resources for delivery to the waste bank. As explained in subchapter 4.2.1.3, the waste bank manages a wide range of waste types. Inorganic waste materials accepted by the waste bank are ones that have been selected and are in a clean state. Therefore, a better capability of waste segregation may yield a better quality of inorganic waste deposits to the waste bank. This study measures how the capability to segregate waste may trigger a household to participate in the waste bank program based on their evaluation.

Around 70% of customers, both individuals and units, agree that they are capable of segregating the waste. This was why they wanted to participate in the program. Nevertheless, unit customers appear to be more motivated since they think they are very capable of segregating waste. This is apparent from the 27% respondents who strongly agree with the statement. Meanwhile, only 12% of individual customers strongly agree with the statement and there were even 4% who disagree. The interviews also show that the main internal constraint felt by individual customers is that the quantity of inorganic and valuable waste produced by households is quite small. Thus, individual customers (apart from customers who are self-employed) cannot deposit waste regularly and the volume of their waste is uncertain. It all depends on the waste volume they can deposit, so they mostly deliver waste once a month or even once every 2-3 months. It takes determination to perform this action continuously.

Chart 14: Perceived Behavior Control – Capability to segregate Waste



Source: Analysis result, 2016

b) Time and space availability to segregate waste and deliver it to the waste bank

There is no significant difference in the time and space availability indicator between individuals and unit customers. The majority of respondents in both groups agree that they participate in the waste bank program because they have time to segregate the waste they deliver to the Samici Waste Bank/collecting point for unit customers. The percentage of individual customers is slightly higher because they have to make a greater effort to deliver to the waste bank, particularly customers who live far from Samici Waste Bank's premises. Moreover, 20% of the respondents strongly agree with this statement, because some unit customers have roles as managers, and they have to make a bigger effort in combining all the garbage from various members and separating them according to types so they are ready to sell to the waste bank.

Chart 15: Perceived Behavior Control – Time availability to segregate Waste

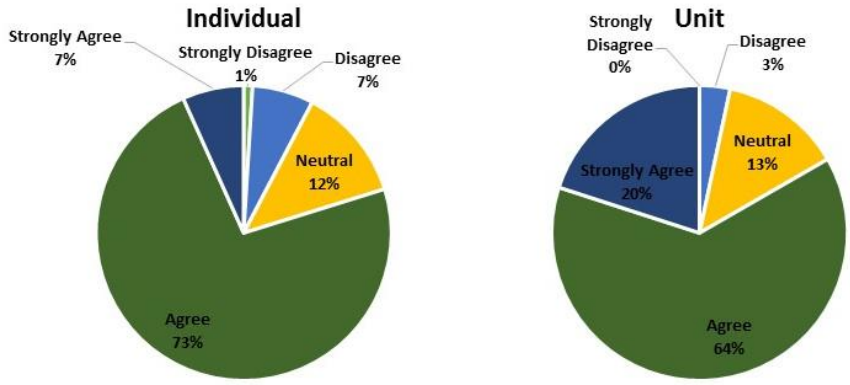
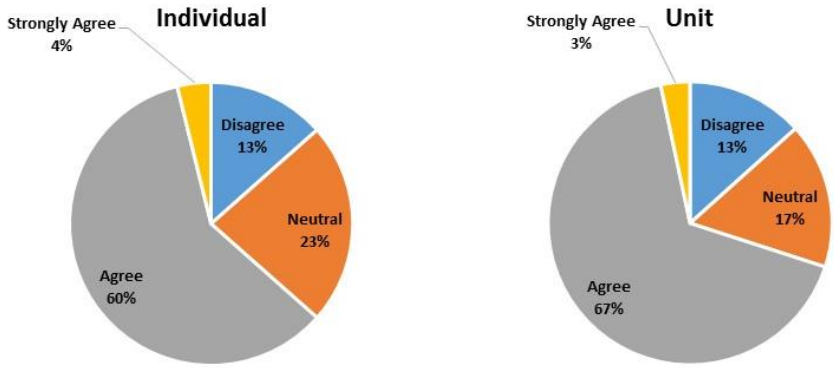


Chart 16: Perceived Behavior Control – Space availability to segregate Waste



Source: Analysis result, 2016

Similarly, the results for space availability were the same as for the previous indicator. Around 60% in both groups agree that they have space available for segregating waste and they participate in the waste bank continuously. There were also around 13% of respondents in both groups who claim that one of the difficulties they face is limited space to store inorganic material before it is delivered to the waste bank. Several materials, such as cardboard or electronics, are space-consuming, and delays in the pick-up service place a considerable burden on customers.

4.2.2.5 Variable: Convenience

As mentioned by Singhirunnusorn, Donlakorn, et al. (2012, referred to by Nixon and Saphores, 2009), convenience plays a significant role in motivating people to participate in a waste bank program. People are more likely to join a program if they have convenient access, even people who not particularly concerned about the environment. This variable was measured by four indicators which reflect availability and accessibility of waste bank facilities. Table 18 shows that all indicators have a probability value less than 0.05 except distance to the waste bank. This means there is a discrepancy between individuals and unit customers in terms of number of facilities accessed, perception of distance as a constraint, and transportation modes used to access the waste bank.

Table 18 Chi-Square Test Results of the Variable Convenience

No.	Variables		INDIVIDUAL		COMMUNITY		Sig.(2-sided)
			N	%	N	%	p-value
1.	**Number of WB facilities accessed by customers**	0	12	11.5%	0	0%	**0.041**
		1-3	85	81.7%	30	100%	
		4 and more	7	6.7%	0	0%	
			104	100%	30	100%	
2.	Distance to the WB	< 1 km	18	17.3%	2	6.7%	0.482
		1 km – 2.5 km	24	23.1%	5	16.7%	
		2.6 km – 5 km	31	29.8%	14	46.7%	
		5.1 km – 7.5 km	13	12.5%	4	13.3%	
		7.6 km - 10 km	17	16.3%	5	16.7%	
		> 10 km	1	1%	0	0%	
			104	100%	30	100%	
3	**Distance as constraint to participate**	Not at all	15	15.4%	0	0%	**0.001**
		Not really	44	42.3%	5	16.7%	
		Neutral	10	9.6%	4	13.3%	
		Somewhat	29	27.9%	16	53.3%	
		Very Much	5	4.8%	5	16.7%	
			104	100%	30	100%	
4.	**Means of transport to go to Waste Bank**	By walking	5	4.8%	0	0%	**0,000005**
		By motorcycle	32	30.8%	0	0%	
		By public transport	10	9.6%	0	0%	
		By car	13	12.5%	0	0%	
		Picked up by the WB door-to-door collection service	43	41.3%	30	100%	
		Vehicle owned by community	1	1%	0	0%	
			104	100%	30	100%	

Source: Analysis result, 2016

a) Availability of Service Facilities

Chart 17 shows that the waste bank provides a door-to-door collection service for both types of customers, but terms and conditions apply to individual customers. For instance, the minimum waste volume to be picked up should be at least 20 kilograms and the customer has to make an appointment by means of a phone call or message. Other services provided for both types of customers are the awareness campaign and waste bins. However, facilities such as the pick-up service and equipment are still prioritized for unit customers.

b) Accessibility

Accessibility is about the distance and means of transportation used to get to the waste bank. Chart 18 shows that in most cases the distance from a customer's house to Samici Waste Bank is around 2.6–5 km. The other interesting thing about the distribution of both types of customers (individuals and units) is their spread over the entire district in Cimahi city. This shows that the level of service of Samici Waste Bank is dispersed. The furthest distance of customers is 10.9 km, while the shortest is 0.1 km which is near Samici Waste Bank's office.

Chart 17: Availability of service facilities provided by Samici Waste Bank

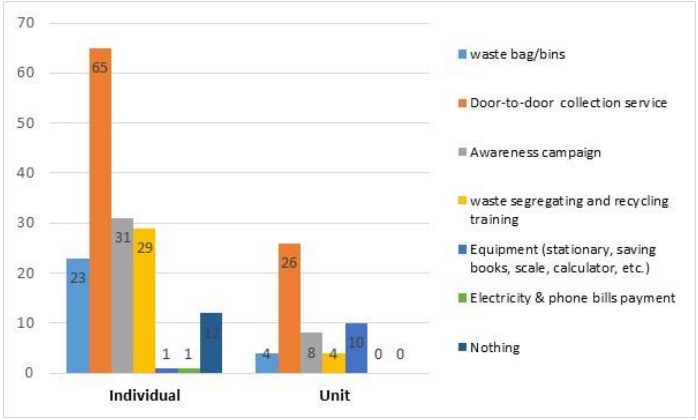
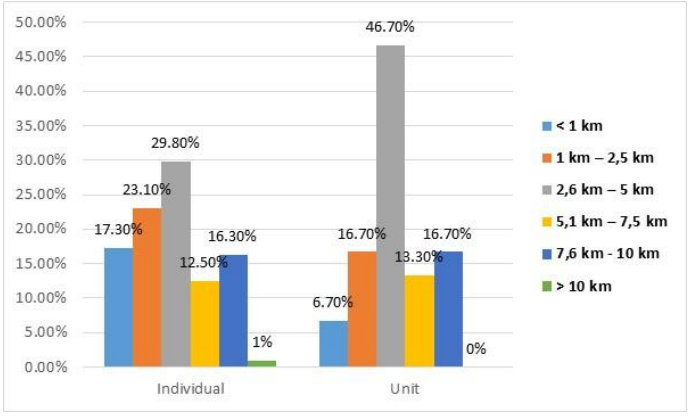
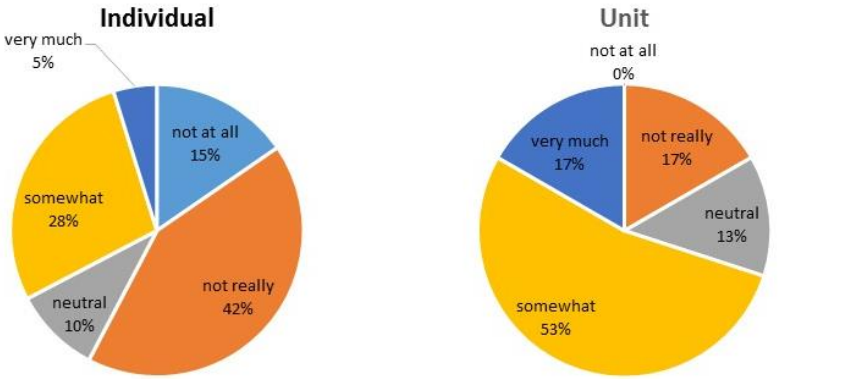


Chart 18: Distance to Samici Waste Bank



However, the results of customers' perception of whether the distance is a constraint for them to participate in the waste bank program show a significant difference between individuals and unit customers (Chart 19). Around 53% of unit customers perceived distance as one of the restraining factors for them to participate, therefore they benefited considerably from the pick-up service of the Samici Waste Bank. They probably dislike having to deliver their waste to the waste bank themselves. On the other hand, individual customers felt that distance is not an issue for them to participate in the waste bank program. Some individual customers live quite far from the waste bank's office; around 12.5% of individual customers are located at a distance of 5.1-7.5 km, and 16.30% of customers are located at a distance of 7.6-10 km from the waste bank. Waste bank customers are quite evenly distributed across districts in Cimahi city.

Chart 19: Perception of Distance as a constraint in participating in the Waste Bank program

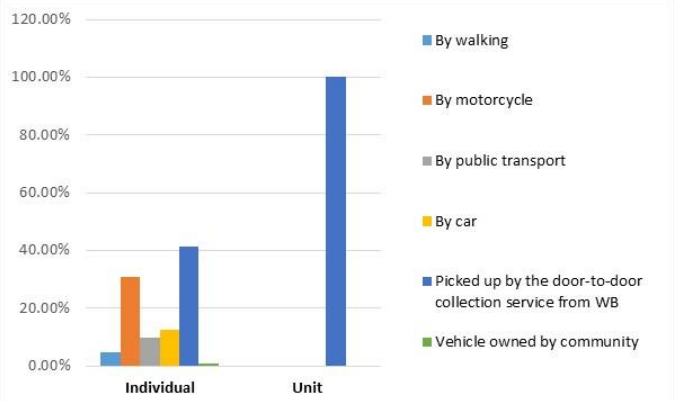


Source: Analysis result, 2016

Regarding means of transport, since it is already clear that unit customers are served by the pick-up service of Samici Waste Bank, all unit respondents chose the pick-up service as their main means of transportation. Nevertheless, they still use their own vehicle or public transportation to go to Samici Waste Bank's office if they want to withdraw their savings.

Some individual customers also utilize the pick-up service, but others used their own vehicles, e.g. a motorcycle or car, to deliver their waste (Chart 20).

Chart 20: Means of transportation to access the Samici Waste Bank



Source: Analysis result, 2016

4.2.2.6 Variable: Information and Knowledge

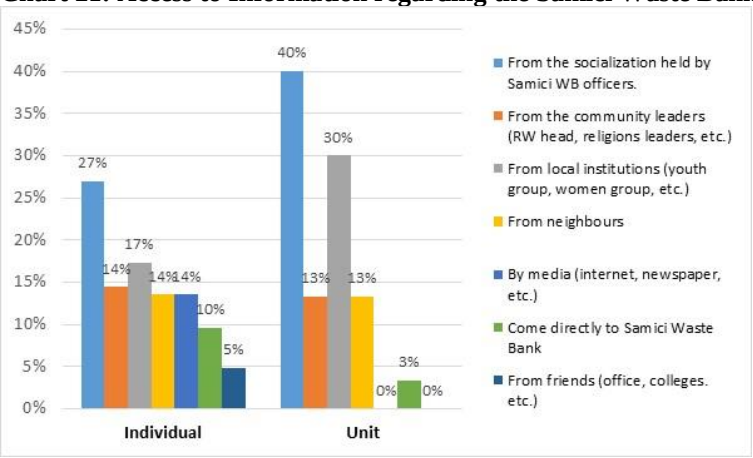
According to Bernstad (2014), it is important for a person to have enough knowledge regarding waste segregating and access to information related to a waste bank before he or she participates in the program. Therefore, these indicators have to be measured for whether this condition can be an internal constraint on people in taking part in the program. Overall, the results of the chi-square analysis show that there is no significant difference between individuals and unit customers in terms of information and knowledge.

Table 19 Chi-Square Test Results of the Variable: Information and Knowledge

No.	Variables		INDIVIDUAL		COMMUNITY		Asymp.Sig. (2-sided)
			N	%	N	%	p-value
1.	Information	From socialization held by Samici WB officers.	28	26.9%	12	40%	0.133
		From community leaders (RW head, religions leaders, etc.)	15	14.4%	4	13.3%	
		From local institutions (youth group, women's group, etc.)	18	17.3%	9	30%	
		From neighbors	14	13.5%	4	13.3%	
		By media (internet, newspaper, etc.)	14	13.5%	0	0%	
		Come directly to the Samici Waste Bank	10	9.6%	1	3.3%	
		From friends (office, colleagues. etc.)	5	4.8%	0	0%	
			104	100%	30	100%	
2.	Knowledge	• 0-4	37	35.6%	6	20%	0.063
		• 5-7	44	42.3%	20	66.7%	
		• 8 and above	23	22.1%	4	13.3%	
			104	100%	30	100%	

Source: Analysis result, 2016

Chart 21: Access to Information regarding the Samici Waste Bank



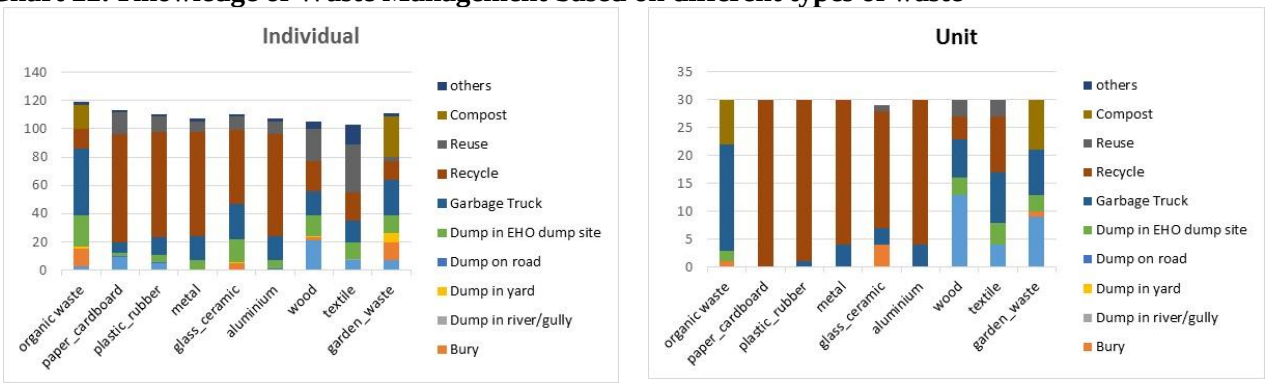
Source: Analysis result, 2016

Table 19 shows that there is no significant difference between individuals and unit customers in terms of information regarding the waste bank (p-value is more than 0.05). Chart 21 shows that both types of customers (individuals and units) mostly know about Samici Waste Bank from the socialization held by Samici officers and from local institutions in their neighborhood. However, only a few of them accessed the information through media. This condition reflects that the efforts made by Samici Waste Bank to gain members through socialization are quite successful. It is also in accordance with the target of Cimahi municipality to increase the participation level of people in the waste bank program. Their goal is that every community (RW) should have a minimum of one waste bank unit.

In terms of knowledge, this research measured how much a person knows, understands, and puts into practice about which waste materials can be segregated for further processing using the 3R approach. Overall, customers' knowledge about household waste management in Cimahi city is at a moderate level. Table 19 shows that even though the p-value is more than 0.05, quite different numbers of individuals and unit customers have an understanding of recyclable materials. Almost 66.7% of unit customers scored around 5-7 points for correct answers, while only 42.3% of individual customers had the same score. This means that they know several inorganic and valuable materials that can be sold to the waste bank. This may be due to the results being based on observations; many unit customers usually routinely provide their members with information about recyclable waste and putting it into practice.

Additionally, chart 22 shows that there are several elements that people generally tend to recycle, such as paper, cardboard, plastic, rubber, metal and glass. This is in accordance with the types of materials managed by the Samici Waste Bank. Thus, this condition is probably the result mainly of socialization and training done by Samici Waste Bank. The waste bank has tried to increase the level of knowledge through teaching and training, as knowledge plays a major role in the waste bank participation process of people, e.g. in accepting things either from someone else or via the media. Moreover, in terms of waste bank effectiveness, this result also influences the output of customers, such as the number of recyclable material types and the total amount of deposited waste. This is explained further in the following subchapter.

Chart 22: Knowledge of Waste Management based on different types of waste



Source: Analysis result, 2016

4.2.2.7 Discussion: Comparing Individual customers and Unit customers in terms of motivational factors to participate in the waste bank program

In terms of customers' motivation to participate in a waste bank program, this research found significant differences in four of the six variables measured between individuals and unit customers, namely: socioeconomic condition (occupation and level of activity in the community), attitude towards participation in a waste bank program, subjective norms, and convenience.

Personal attributes (Socioeconomic condition)

Regarding socioeconomic condition, this study found that age, gender, education do not necessarily influence whether a household decides to join a waste bank program as an individual or a unit. This is in line with the Saphores, Nixon, et al. (2006) study which also pointed out that a higher education does not necessarily influence recycling behavior. The majority of people who participated in both groups (individuals and units) were female. This shows the same results as the research conducted by Ali and Siong (2013) which stated that females tend to be more committed to an issue relating to household waste management than men. It can be said that women are more willing to participate in a waste bank program by actively engaging in waste segregation at source and in recycling activity. However, there are indicators that reflect a discrepancy between the two types of customers: occupation and level of activity in the community. This study found that even though the main occupation in both groups is housewife, the second main occupation of individual customers is self-employment, while for unit customers it is working as civil servants. Another difference is level of activity in the community: individual customers tend not to be actively involved in community activities compared to unit customers.

Attitude towards Participation in the Waste Bank Program

In terms of psychological factors, this research found that there was a significant difference regarding attitude towards waste bank program participation between individuals and unit customers. It found that unit customers have a more positive attitude towards the outcome of the waste bank program (environmental and economic aspects), implementing the program and participating in it. However, both type of customers have a similar positive view about the program. This is in accordance with the findings of Karim Ghani,Wan Azlina Wan Ab., Rusli, et al. (2013), that in terms of environmental concern, waste separation at source is viewed as an effective way of reducing the amount of waste sent to landfill. Other research by Timlett and Williams (2008) and Bernstad (2014) mentioned that financial incentives potentially increase the rate of household participation in recycling activities. De Young (2000) also pointed out that incentives may affect the recycling frequency but not in respect of long-term

behavioral change. Parallel with the previous study, this research also shows that people were motivated to join the waste bank program because they had discovered the economic value of recyclable waste as one of the relative advantages, as mentioned by Rogers (2003) in his study.

Subjective Norms in Waste Bank Program Participation

In addition, this research also found a significant difference regarding subjective norms, both internally and externally between households as individual customers and households as members of unit customers. Households in a unit feel more social pressure upon them to participate in a waste bank program compared to households of individual customers. This proves the theory of Valle, Rebelo, et al. (2005), which states that a person can sometimes be more engaged in a particular activity or behavior because external influence from his or her surroundings acknowledge that the activity or behavior is the appropriate thing to do.

Some phenomena also emerged from this research that prove the diffusion of the innovation theory of Rogers (2003). It found that individual customers tend to be more self-innovative in adopting the new program compared to unit customers. In other words, more individual customers are innovators, while unit customers are more likely to be followers. Based on the theory, waste bank customers can be classified into several adopter categories. The majority of individual customers are the *innovator* type who undertake more self-initiatives in seeking information regarding the advantages and disadvantages and finally deciding to join the program. Few individual customers and most members of unit customers fall into the *early adopters* category. Both individuals and unit customers who are *early adopters* are people who hold positions as community leaders (e.g. community leader or women's organization cadres). After they have adopted and implemented the program themselves, they then try to stimulate other members of the community to participate in the program. Notably, this makes sense of what occurred among unit customers, as they can only become a unit customer if they reach the critical mass of 20 members (though this is slightly different from group customers, as they require ten households). Moreover, there is a member of each group or unit customer who can also can be classified as the *early majority* type. Since they are actively involved in various community activities, they tend to interact well with other members and their leaders. In this case, the persuasion stage is very important since people tend to seek any credible information, such as subjective evaluation and social reinforcement from their peers and leaders. Through such channels, they discover the advantages of the program that motivate them to join the program.

Perceived Behavioral Control in Waste Bank Program Participation

This research found no significant difference between the two types of customers. When a household decides to participate in the waste bank program, either as an individual or as part of a unit customer, they agree that they are capable in terms of skill, time and space of segregating the waste and participating in the waste bank program. These research findings confirm the study conducted by Matter, Dietschi, et al. (2013) who pointed out that waste segregation at source involves extra effort and time, particularly because storing valuable recyclable materials requires more space. Moreover, Keramitsoglou and Tsagarakis (2013) stated that the amount of effort and time needed to participate in recycling activities mainly depends on the characteristics of the program itself. In the case of a waste bank program, a drop-off system or a door-to-door collection system. In a drop-off system, households segregate the waste at whatever time and day they can. This offers more flexibility than door-to-door collection because the waste bank requires customers to have at least 20 kilograms of waste if they want it to be picked up by the waste bank. A door-to-door collection system tends to be more demanding, particularly in respect of having a sufficient quantity of recyclable materials and the specific pick-up schedule. This may be easier for unit customers with at least 20 households as members, than for an individual customer with only a single household.

Convenience

In terms of access to service facilities, this research found that unit customers have more access to services than individuals. In this particular case, for example, the door-to-door collection system prioritizes unit customers. Terms and conditions apply for individual customers if they want to use the door-to-door collection service. Regarding accessibility, individual customers do not regard distance as an obstacle to participating in the Waste Bank program, while unit customers feel differently. This is evident from the fact that almost 100% of unit customers utilize the door-to-door collection system to transport their waste to the waste bank, while individual customers usually use a motorcycle or car, though in certain circumstances they too use door-to-door collection.

Within the context of convenience, this research found that the waste bank tries to provide services to minimize the constraints facing customers to participate in the program, mainly in relation to the distance for dropping off recyclable materials. This finding agrees with the research of Dai, Gordon, et al. (2015) who stated that service is an essential element for a program to achieve success. The more people utilize it, the faster the participation rate in the program will increase. Even though this program is still in the developing phase, the waste bank customers perceive that the services provided are quite useful in supporting their active involvement in the program. In other words, customers recognize that the services are one of the advantages of the program that trigger people to adopt the program, as pointed out by Rogers (2003) in his theory.

Information and knowledge

In terms of access to information about the waste bank, this research found that there is no significant difference between individuals and unit customers. Both types of customers gain information about the waste bank mostly through socialization or campaigns held by waste bank officers, a local institution, community leader, or a neighbor. However, it seems that individual customers undertake more self-initiatives in seeking information through another channel such as the internet. In terms of level of knowledge, both types of customers have a moderate level of knowledge regarding waste segregation and recycling activities. However, in practice, unit customers are more active in implementing waste recycling. This can be seen from the more varied types of recyclables collected by unit customers than by individuals. Since they collect waste communally, the types of recyclable materials are more varied compared to those of individual customers.

These findings confirm the study conducted by Timlett and Williams (2008) which explained the positive correlation between the acknowledgment of information with the recycling rate. Moreover, education, increasing awareness, and information are essential to enhance recycling performance. It also found that the doorstep (face-to-face) approach is effective in changing behavior. (Sidique, Lupi, et al., 2010) also mentioned that knowledge about the availability of recycling programs and facilities is necessary for active participation in recycling. Therefore, the waste bank implemented socialization and campaigns to increase people's awareness of the benefits of the program and to encourage people to participate in the program.

4.2.3 Sub-Question 3: What difference was there in the contribution of each type of customer to the effectiveness of the Samici Waste Bank program?

Crosstab and Chi-square analysis was used to measure the different contributions and to make a comparison between individuals and unit customers. If the probability (p) value is less than 0.05 it means there are differences in the contribution between individuals and unit customers. The contribution to the waste bank was measured by four indicators in the same period (January–June 2016) and is explained in Table 20 as follows.

Table 20 Chi-Square Test Results of Variables: Contribution to the Waste Bank Program

VARIABLES		INDIVIDUAL		UNIT		Sig.(2-sided)
		N	%	N	%	p-value
Total Amounts of Savings (Rp)	Rp 1,000 - Rp 25,000	15	14.4%	3	10.0%	**0,000**
	Rp 26,000 - Rp 50,000	15	14.4%	**10**	**33.3%**	
	Rp 51,000 - Rp 75,000	14	13.5%	3	10.0%	
	Rp 76,000 - Rp 100,000	11	10.6%	0	0.0%	
	Rp 101,000 - Rp 125,000	3	2.9%	1	3.3%	
	Rp 126,000 - Rp 150,000	3	2.9%	4	13.3%	
	Rp 151,000 - Rp 175,000	3	2.9%	0	0.0%	
	RP 176,000 - Rp 200,000	2	1.9%	1	3.3%	
	Rp 201,000 - Rp 225,000	**32**	**30.8%**	0	0.0%	
	Rp 226,000 - Rp 250,000	1	1.0%	0	0.0%	
	> Rp 251,000	5	4.8%	8	26.7%	
		104	100.0%	30	100.0%	
Frequency of delivering waste (times)	1-3	**56**	**53.8%**	7	23.3%	**0,000**
	4-8	45	43.3%	**14**	**46.7%**	
	9-12	2	1.9%	5	16.7%	
	13-15	0	0.0%	1	3.3%	
	16-18	0	0.0%	2	6.7%	
	19-21	0	0.0%	1	3.3%	
	> 25	1	1.0%	0	0.0%	
		104	**100.0%**	**30**	**100.0%**	
Number of recycled materials (types)	1-3	26	25.0%	6	20.0%	0.325
	4-6	**69**	**66.3%**	**24**	**80.0%**	
	7-9	7	6.7%	0	0.0%	
	> 10	2	1.9%	0	0.0%	
		104	**100.0%**	**30**	**100.0%**	
Total Amount of Deposited Waste (kg)	1-25	21	20.2%	1	3.3%	0.050
	26-50	23	22.1%	**14**	**46.7%**	
	51-75	9	8.7%	3	10.0%	
	76-100	6	5.8%	3	10.0%	
	101-125	**34**	**32.7%**	6	20.0%	
	> 126	11	10.6%	3	10.0%	
		104	**100.0%**	**30**	**100.0%**	

Source: Analysis results, 2016

According to the results in Table 20, the different contribution between both types of customers is shown by three indicators, namely total amounts of savings, frequency of delivering waste, and the total amount of deposited waste. First, the total amount of savings by customers is quite different for the two types of groups. The majority of individual customers (31%) received money by selling recyclable materials to the waste bank amounting to approximately Rp 201,000 to Rp 225,000 in a 6-month period (January–June 2016). In contrast, about 34% of unit customers saved only approximately Rp 26,000 to Rp 50,000 in the same period (chart 23). Based on observation, it was clear that a lot of individual customers are self-employed persons who run a shop or kiosk, and they tend to produce more recyclable materials than a regular household. However, individual customers delivered their waste less frequently than unit customers, with around 54% of individual customers delivering 1-3 times compared to 47% of units that deposited around 4-8 times in the last six months (chart 24). However, the total waste volume from individuals is larger than that of units. 33% of individual customers deposited a total volume of waste of about 101-125 kilograms, while units mostly saved only about 26-50 kilograms during the last six months (Chart 25). It can be concluded that individual customers may deposit their waste less frequently.

Chart 23: Total Amounts of Savings (Rp) per type of customer

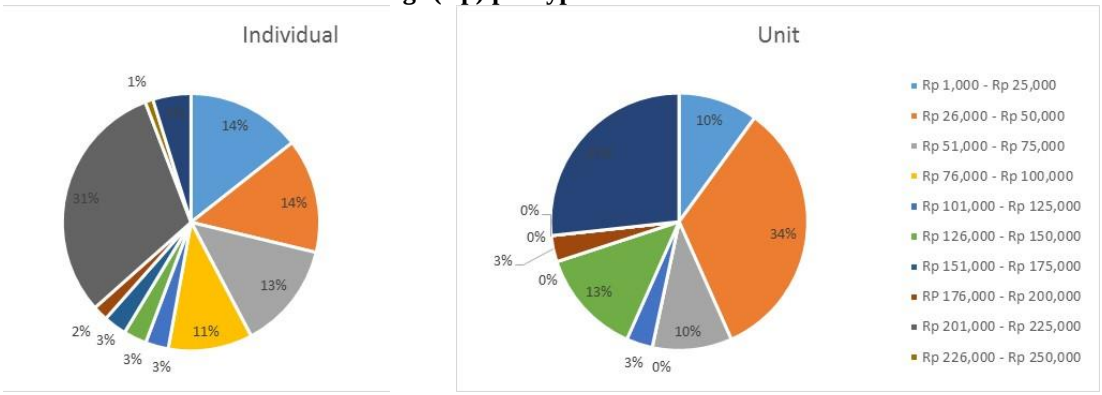


Chart 24: Frequency of delivering waste per type of customer

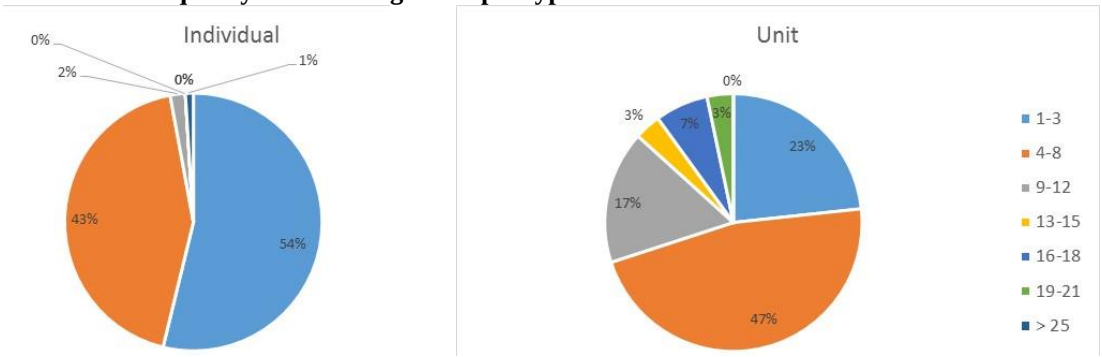
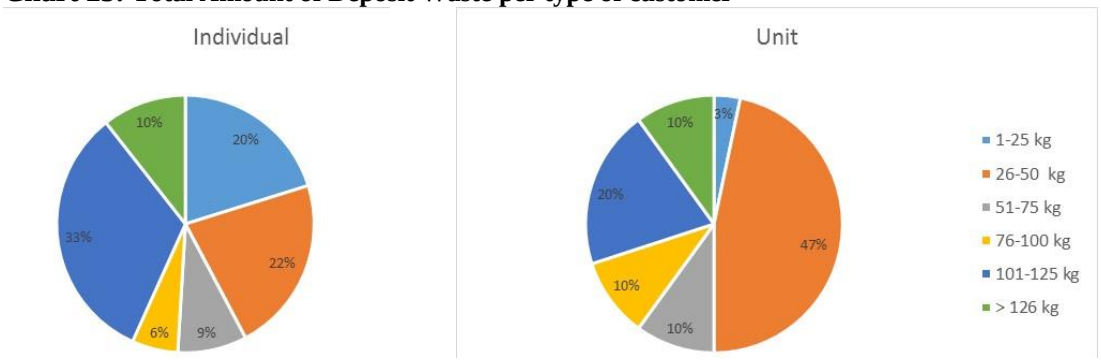


Chart 25: Total Amount of Deposit Waste per type of customer



Source: Analysis results, 2016

4.2.3.1 Correlation Analysis

Next, a non-parametric correlation analysis with Spearman's Rho-test was performed since the data are mostly ordinal and not normally distributed. The normality test using Shapiro-Wilk value was conducted beforehand to check the data normality (if the Shapiro-Wilk value < 1, it means that the data are not normally distributed). This analysis measures the correlation between customers' motivation as an independent variable and customers' contribution as the dependent variable, with all the representative indicators. The correlation test provides information about the probability value (sig.2-tailed), and the hypotheses of the test are:

H_0: No correlation between two variables.

H_1: There is a correlation between the variables

If the probability (p) value is more than 0.05, it means that H_0 (the null hypothesis) is accepted.

DV: Customers' Motivation to participate in the waste bank program	IV: Customers' contribution to the waste bank program's effectiveness
Indicators: (1) Total amounts of Savings (2) Type of Waste Bank Customers (3) Duration of participation in the waste bank program (4) Frequency of delivering waste (5) Number of recyclable materials (6) Total Amount of Deposited Waste	**Indicators:** (1) Personal Attributes: Occupation (2) Personal Attributes: Activity in community organization (3) ATP: Perception of environmental awareness, as WB's program outcomes (4) ATP: Perception of income benefit as WB's program outcomes (5) ATP: Perception of waste bank program implementation (6) ATP: Perception of participation in waste bank program (7) Subjective Norm: Influence of family members (8) Subjective Norm: Influence of friends or neighbors (9) Subjective Norm: Influence of head of community or social groups (10) Convenience: Number of WB facilities accessed by customer (11) Convenience: Means of Transportation to Waste Bank

The results of the correlation test between independent variables and dependent variables, as shown in Table 21, are discussed as follows:

(1) **Total savings - Influence of internal and external referents**

There is a relatively negative weak correlation between total savings and influence of internal and external referents, particularly the influence of friends or neighbors (p-value 0.029 and correlation coefficient -0.189), and the influence of the community or social group leader (p-value 0.002 and correlation coefficient -0.261). This correlation may particularly apply in a condition for unit customers, where neighbors or the community leader encourage members to collect inorganic materials and deposit them collectively in the waste bank for community purposes. The more influence a leader has in doing this may possibly decrease the total savings gained by individual households. This is because households have to divide the waste deposited over their own account and collectively as a single community.

(2) **Type of waste bank customers – Occupation**

A relatively weak relationship was found between type of waste bank customers and their occupation (p-value 0.002 and correlation coefficient -0.266). This condition may occur because the majority of people who choose to actively participate in a waste bank, both individuals and units, are housewives, as they do not have a formal job and probably have more time to segregate waste. Moreover, self-employed persons may also be motivated to participate in the program because they have more resources to separate and sell to the waste bank.

(3) **Type of waste bank customers – Level of activity in the community**

There is a weak but positive correlation between type of waste bank customer and level of activity in the community (p-value 0.001 and correlation coefficient 0.272). This means that the more active people are in the community, the more they are motivated to join the waste bank program, especially as a member of a waste bank unit.

(4) **Type of waste bank customers – Perception of environmental awareness as waste bank program's outcome**

A moderate positive relationship was shown between the two variables with p-value 0.000 and correlation coefficient 0.413. This means the more people are concerned about the environment and understand that joining the waste bank could be related to a positive outcome, the more people will participate as customers.

(5) **Type of waste bank customers and perception of waste bank program implementation and participation.**

The relationship between type of customers and both independent variables showed a similar, relatively weak value. Perception related to implementation with p-value 0.000 and correlation coefficient 0.341; and perception of participating in the program with p-value 0.000 and correlation coefficient 0.372. This means that people who feel that implementation of the waste bank program is beneficial for them are motivated to participate as customers.

(6) **Type of waste bank customers and means of transportation to access the waste bank**

There is a moderate relationship between the two variables shown by p-value 0.000 and coefficient correlation 0.451. This means that if it is easier to access the waste bank, more people will be motivated to join the program. The interview results and observation also show that people who join the Samici Waste Bank program are interested because the program offers its customers the waste pick-up service. This facility makes it easier for customers to deposit waste.

(7) **Frequency of delivering waste – Means of transport to access the waste bank**

In line with the previous correlation (point. 6), there is also a positive but relatively weak relationship between frequency of delivering waste and transportation mode to access the waste bank (p-value 0.019 and coefficient correlation 0.231). This shows that the more the waste bank offers a facility to pick up recyclable waste from its customers, the more customers will be triggered to deposit their waste more often.

(8) **Number of recyclable materials – Means of transport to access the waste bank**

There is also a weak positive relationship between the number of recyclable materials and the transportation modes to get to waste bank (p-value 0.019 and coefficient correlation 0.231). This shows that the more the Samici Waste Bank provides a facility that increases its accessibility, the greater the variety of waste materials people bring to the waste bank.

(9) **Total amount of deposit waste – Influence of external head of community or social groups**

There is a weak negative relationship between the variables with p-value 0.024 and coefficient correlation -0.231). This is a similar condition to the relationship in point (1). This correlation may also be due to particular circumstances, specifically for unit customers. When a leader has more influence in encouraging members to collect inorganic materials and deposit them collectively in the waste bank for a community purpose, it decreases the total amount of waste collected by households. There are several cases of respondents who used to be individual customers, and because the members of the community kept growing, the leader decided to make a waste bank unit. The money gain from depositing waste is used for community purposes. Therefore, several respondents in these area have their own account and a collective account. Consequently, these household divide the waste into deposits into their own account and deposits made collectively as a single community.

Table 21 Spearman's Correlation Test Result

		Total Savings	Type of WB Customers	Duration of participation in WB	Frequency of delivering waste	Number of recyclable materials types	Total Amount of Deposited Waste	Occupation	Activity in community organization	Perception of environmental awareness as WB's program outcomes	Perception of income benefit as WB' program outcomes	Perception of waste bank program implementation	Perception of participation in waste bank program	Influence of family members	Influence of friends or neighbors	Influence of head of community or social groups	Number of WB facilities accessed by customer	Means of Transportation to waste bank
Total amounts of Savings	Correlation Coefficient	**1.000**	-.014	.056	.632**	.470**	.851**	-.035	-.098	-.109	.075	.073	.075	-.075	-.189*	-.261**	.156	.108
	Sig. (2-tailed)	.	.872	.518	.000	.000	.000	.686	.258	.212	.389	.400	.391	.392	.029	.002	.072	.215
Type of Waste Bank Customer	Correlation Coefficient	-.014	**1.000**	-.148	.338**	-.017	-.014	-.266**	.272**	.413**	.169	.341**	.372**	.252**	.210*	.365**	.057	.451**
	Sig. (2-tailed)	.872	.	.087	.000	.844	.872	.002	.001	.000	.051	.000	.000	.003	.015	.000	.511	.000
Duration of participation in waste bank	Correlation Coefficient	.056	-.148	**1.000**	-.049	.012	.074	.095	.072	-.022	-.061	-.066	-.165	-.052	-.068	-.044	-.056	-.073
	Sig. (2-tailed)	.518	.087	.	.575	.889	.396	.277	.410	.799	.483	.446	.056	.548	.435	.617	.517	.401
Frequency of delivering waste	Correlation Coefficient	.632**	.338**	-.049	**1.000**	.447**	.522**	-.003	.018	.118	.128	.194*	.216*	.016	-.055	-.084	-.022	.203*
	Sig. (2-tailed)	.000	.000	.575	.	.000	.000	.971	.839	.173	.140	.025	.012	.857	.527	.337	.799	.019
Number of recyclable materials	Correlation Coefficient	.470**	-.017	.012	.447**	**1.000**	.513**	.033	.078	-.045	.069	.110	.049	-.051	.032	-.035	.012	.233**
	Sig. (2-tailed)	.000	.844	.889	.000	.	.000	.704	.371	.607	.426	.204	.574	.559	.710	.685	.886	.007
Total Amount of Deposited Waste	Correlation Coefficient	.851**	-.014	.074	.522**	.513**	**1.000**	-.075	-.063	-.104	.085	.068	.046	-.103	-.151	-.196*	.131	.143
	Sig. (2-tailed)	.000	.872	.396	.000	.000	.	.390	.469	.234	.326	.436	.599	.237	.082	.024	.133	.099

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

Correlation between dependent variables and independent variables
Correlation inter-dependent variables

Note:
Indicators of independent variables used for this correlation analysis were selected based on the earlier analysis in subchapter 4.2.2, including only ones with probability value < 0.05.

Besides measuring the correlation between independent variables and dependent variables, within the context of measuring the waste bank program's performance, it is also important to look at the relationship between interdependent variables.

(1) **Total Savings - Frequency of delivering Waste**
A strong positive correlation was found between totals savings as a contribution to the waste bank program and frequency of depositing waste (probability value 0.000 and correlation coefficient 0.632). The more often people bring their recyclable waste to the waste bank, the more savings they receive.

(2) **Total Savings - Number of Recycle Materials**
There is a moderate correlation between total savings received by customers and number of recyclable materials delivered to the waste bank (probability value 0.000 and correlation coefficient 0.470). The greater the variety of recyclable materials that customers bring to the waste bank, the more money they receive.

(3) **Total Savings -Total Waste Deposit**
There is a very strong correlation between total savings and total waste deposited (probability value 0.000 and correlation coefficient 0.851). It is notably evident that total amount of waste also reflects total savings and vice versa. The greater the amount of waste deposited in the waste bank, the more money customers received.

(4) **Type of waste bank customers – Frequency of delivering waste**
There is a weak correlation between type of waste bank customers and frequency of delivering waste (probability value 0.000 and correlation coefficient 0.338). This condition can happen in two different circumstances for both types of customers: individual customers, particularly those who have more material resources, tend to deliver more frequently than others; unit customers probably because they have routine waste pick-up schedule, for instance, once a week or twice monthly.

(5) **Frequency of delivering waste – Number of recyclable materials**
In line with the previous point, there is a moderate correlation between frequency of delivering waste and number of recyclable materials (probability value 0.000 and correlation coefficient 0.447). Particularly customers who have a more varied range of material resources tend to deliver more frequently than others.

(6) **Frequency of delivering waste – Total amount of deposit waste**
A moderate relationship was found between these two variables with probability value 0.000 and correlation coefficient 0.522. The more often customers deliver their waste to the waste bank, the larger the total amount of deposited waste they generated.

(7) **Number of recyclable materials – Total amount of deposit waste**
A moderate relationship is found between these two variables with probability value 0.000 and correlation coefficient 0.513. A more varied type of recyclable materials leads to a larger amount of deposited waste generated by customers.

4.2.3.2 Discussion: Comparison between individuals and unit customers of their contribution to the waste bank program's effectiveness

In terms of customers' contribution to the program's effectiveness, this research found that individuals and unit customers have slightly different performances. Some results of the analysis, which are also consistent with the findings in the field and the results of interviews, show that:

a. The totals savings per household in a 6-month period (January–June 2016) of individual customers are **higher** than those of unit customers. The majority of individual customers (31%) received money by selling recyclable materials to the waste bank amounting to approximately Rp 201,000 to Rp 225,000, while 34% of unit customers saved only approximately Rp 26,000 to Rp 50,000 in the same period.
b. The total amount of waste delivered per household in a 6-month period (January–June 2016) by individual customers was **larger** than that of unit customers. 33% of individual customers had a total volume of waste deposited amounting to approximately 101-125 kilograms, while units generally saved only about 26-50 kilograms.
c. Unit customers tend to **deliver waste more often** than individual customers since they have the routinely scheduled waste pick-up service of Samici Waste Bank. Around 54% of individual customers delivered 1-3 times compared to 47% of units who deposited around 4-8 times in the last six-month period.
d. Both individuals and unit costumers deposited various types of recyclable materials, which can be divided into five main types, namely paper, plastic, rubber, glass, and electronics.

The findings above show that customers' motivation significantly influences a household's decision on their level of participation, whether they want to be involved in the program (type of customers: individuals or units). However, in implementing household participation in the program, their behavior has fewer and mostly indirect effects on their contribution to the program's effectiveness, mainly due to such variables as the influence of external referents and accessibility of the waste bank. A higher motivation of customers to participate to may increase this level of contribution. These findings confirm the theory of Kumar, Somesh (2002), who stated that people's participation can make the project more effective, especially by participating in the implementation.

The correlation between interdependent variables is much stronger, which means they influence one another's results. For example, total savings depend on the frequency of waste delivery, the number of recyclable materials, and the total amount of deposited waste. This is also consistent with the findings based on observation, which showed that larger amounts of waste deposited to the waste bank consist of various types of recyclable materials and depend on how often customers deliver waste, and increase the savings customers receive. These findings confirm the theory of performance measure model of Hatry (2006), which stated that program effectiveness measured by output and outcomes is influenced by the previous stages, namely input and process. Input is the amount of resources used to carry out the program, in this case, the number of recyclable materials and the total amount of deposited waste. Means of transportation is an important resource in supporting the waste collecting process for customers. The findings also shows that the frequency of waste delivery and number of recyclable materials deposited to the waste bank are connected with the means of transport used by customers. It can be concluded that accessibility is essential to support implementation of the program. The outcome of this process is total savings which reflect the effectiveness of the program.

Chapter 5 Conclusions and Recommendations

This chapter explains the discussion that answers the main research question. To reflect, the purpose of this research was to explain the relationship between customers' motivation to participate in the waste bank and the contribution of customers to the program's effectiveness in implementing waste reduction policy in Cimahi city. The first step was to describe the waste bank program's role in addressing the waste reduction issue, how it was managed and operationalization regarding customers' participation. The next step was to connect customers' motivation (independent variable as a background factor for why people participate in the program), to costumers' contribution to the program (dependent variable). Several sub variables and indicators were measured and analyzed to arrive at the results. The conclusion is made by linking them with the literature, making recommendations according to the analysis results from the previous chapters, and making suggestions for possible further studies.

5.1 Conclusions

The waste bank system is one way of implementing Integrated Sustainable Waste Management using the 3R (reduce, reuse, recycle) approach. The first waste bank in Indonesia was established in Bantul, Yogyakarta in 2008. Since then, the waste bank program has developed very rapidly in several cities in Indonesia. By 2015, there were 2,861 waste banks in 129 cities in Indonesia (Ministry of Environment and Forestry Republic of Indonesia, 2015). Some of them became best practices, and are now systems that are is being replicated in other cities. For instance, the best practice of the waste bank in Malang formed point of reference for establishing the Samici Waste Bank as part of waste reduction policy in Cimahi city.

Samici Waste Bank was established on October 2014, under the supervision of the Cleaning and Landscaping Agency of Cimahi Municipality. It is managed with limited resources consisting of one director, supported by one teller and four members of staff. The working methods Samici Waste Bank has adopted are those of a conventional bank with a 'waste-saving' concept, which involves collecting and sorting inorganic waste based on several categories and making deposits into a savings account. The amount saved can be withdrawn from time to time. The waste bank then sells the segregated waste of customers to waste collectors or manufactures for further reuse or recycling (Wijayanti and Suryani, 2015). To support implementation of the program, the waste bank provides several facilities, particularly door-to-door collection, and socialization about the program for households and communities. Essentially, there are two types of waste bank customers, individuals and units. However, during implementation, due to the way the waste bank managed its customers, another type emerged known as 'group' customers. A 'group' customer was initially a group of individual customers consisting of at least 20 households living in the same area, thus making them easier to manage, so the waste bank offered them the privilege of a door-to-door collection system. This would make it easier for these customers to deposit their waste collectively. This resulted in some overlap characteristics between individuals and community-scale customers (groups and units). The difference between a 'group' and a 'unit' is only one of legal status and number of members. It became an issue because it was not easy for a community to establish a waste bank unit due to several requirements that had to be fulfilled, such as the availability of storage space, a minimum of 40 households as members, and an organization to manage collections for the waste bank. 'Group' customers enabled the waste bank to facilitate all customers. It was part of the waste bank's efforts to provide adequate facilities to motivate people to participate in the program. However, it produced an interesting finding in implementing the waste bank program in relation to household participation.

Dai, Gordon, et al. (2015) pointed out that achieving success of a program requires active participation from households and communities in waste segregation at source and 3R implementation. Chung and Lo (2004) also stated that it is necessary to consider household

behavior, concerns and preferences in order to motivate people to participate in a waste bank program. Their statements are also supported by Rogers (2003) who mentioned that such an innovation should take into account such characteristics as scale advantages, compatibility, low complexity, testability, and visible results. Those characteristics can be measured by household behavior and perceptions towards a program. In general, many studies have been conducted that analyze household participation in waste recycling programs with the aim of enhancing participation. Motivational factors that influence household participation consist of psychological factors and non-psychological factors (Ajzen, 1991; (Valle, Rebelo, et al., 2005 and Bernstad, 2014), since household participation in recycling activities also relies on practical aspects. In the case of Samici Waste Bank, two types of customers reflect the level of household participation. Therefore, this research tried to investigate whether there is any discrepancy between the motivation of individual and unit customers, and to what extend this motivation influences their contribution to the waste bank program's effectiveness.

Based on an analysis of the results and the research findings, it can be concluded that several factors differentiate the motivation of individuals and unit customers to participate in the waste bank program. First, personal attributes such as occupation, background and level of participation in community activities are significantly different between the two types of customers. The study found that individual customers who actively participate in the WB are mainly either housewives or self-employed. They appear to be motivated to participate because they have the time, space and resources availability. Unit customers on the other hand, who are mainly housewives or civil servants, are motivated to join the program due to peer pressure from their colleagues, neighbors, or community leader. In terms of level of activity in the community, individuals tend to be less active than unit customers. This may be due to the lack of community activities in their neighborhood. This phenomenon gave rise to some interesting facts that explain the diffusion of the innovation theory of Rogers (2003). In this waste bank case, individual customers tend to be innovators, while households that become members of a unit customer are mostly followers. Individual customers seem faster at adopting an innovation than unit customers.

The second variable, which is attitude towards participation in the waste bank program, revealed that unit customers have a more positive attitude compared to individual customers. Generally, however, both types of customer have a positive perception of the benefits of the program in environmental and economic terms, and that these can be realized by active involvement in the program. Thirdly, within the context of subjective norms, it found that individual customers develop more self-initiatives than unit customers who are more influenced either by internal (family members) or external (friends, neighbors, community/social leaders) influence. The last motivational factor that differs between individuals and unit customers is convenience. Convenience is about the availability of service facilities and accessibility. Since the waste bank serves on a city scale and its customers are evenly distributed across the city, accessibility is an important concern. However, this research found an interesting fact in that individual customers did not regard distance from the waste bank as a problem. They assumed that going to the waste bank office to deposit waste was part of their efforts in participating in the waste bank. On the contrary, members of unit customers perceived distance as a constraint, so they regarded the door-to-door collection system provided by the waste bank as beneficial to them. The facility provided by the waste bank, particularly the pick-up service, plays an important role in determining household participation in the waste bank.

For other sub variables, the analysis results agree with the observed findings that people from any socioeconomic background can participate in the program, as long as they have enough capability in terms of knowledge, skills, time and space availability. Moreover, a good

perception of this program and strong determination can also motivate people to actively participate and make a significant contribution.

According to Hatry (2006), outputs and outcomes are important variables in measuring the performance of a system. The output gained by this program is an increase in the total amount of reduced waste in Cimahi city. Samici Waste Bank plays a major role in encouraging people to become involved in sustainable waste management. Based on the data over the period January 2016 to June 2016, it has contributed by reducing approximately 110 tons of inorganic waste in Cimahi. The total amounts of waste managed have constantly increased since being established in 2013 and there is potential to improve even more in management aspects, such as resources, finance, and facilities. Moreover, the program's outcome is represented by the increases in the number of customers and the income received by the waste bank. From the perspective of customers, it is reflected by the total savings earned per household.

Chart 26: Total Amount of Waste managed by Samici WB (Kg)

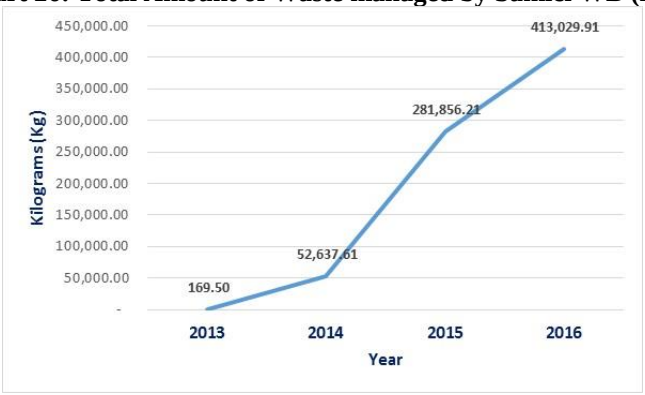


Chart 27: Waste Composition managed by Samici WB

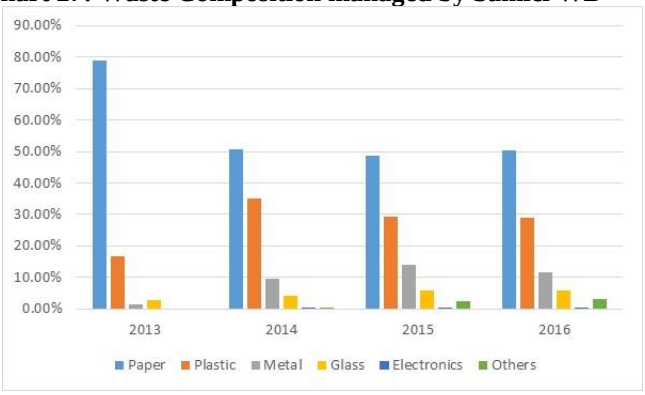


Chart 28: Total income of Waste Bank

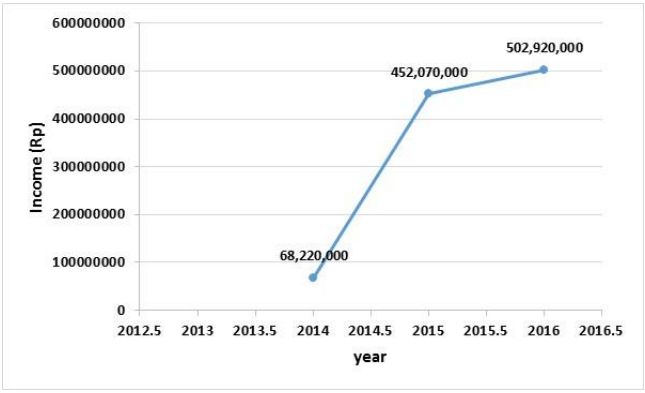
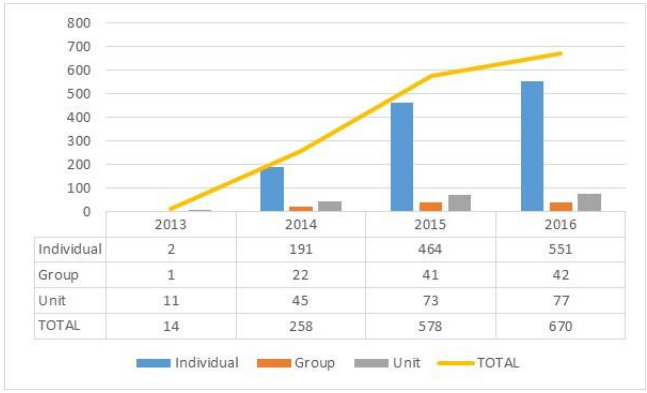


Chart 29: Number of Waste Bank Customers



	2013	2014	2015	2016
Individual	2	191	464	551
Group	1	22	41	42
Unit	11	45	73	77
TOTAL	14	258	578	670

Source: Samici Waste Bank database, 2016

By looking at the results of the output and the outcome, in can be concluded that this Samici program is reasonably effective and can potentially be improved. However, to achieve optimal performance, the input and the process of how the system is managed should be taken into account. Therefore, not only effectiveness but also efficiency and productivity of the program are important.

In general, it can be concluded that there is a weak correlation between customers' motivation and their contribution to the effectiveness of the Samici Waste Bank program. This means that customer's motivation to participate did not significantly affect the amount of contributions made to the waste Bank program, apart from two conditions: the influence of external referents such as friends, neighbors and the community leader, and convenience such as accessibility to the services facility which might influence people to participate and contribute more to the waste bank program. Moreover, contributions to the waste bank program are influenced more by technical aspects such as frequency of depositing waste, number of recyclable materials delivered, and total amount of waste deposited.

5.2 Recommendations and suggestions for further research

To improve participation in the Samici Waste Bank program, which could lead to a greater contribution to this program's effectiveness, several recommendations are proposed as follows: More socialization should be encouraged to enhance household participation by increasing awareness of the waste bank program and waste recycling activities, particularly in an area or neighborhood with a low participation rate in community activities. For effective socializations, the waste bank should broaden the cooperation network with the community and neighborhood leaders, community organization cadres, local institutions, and the private sector. The waste bank could apply the new approach to socialization, by providing a forum enabling existing customers to share success stories about waste bank participation with potential new customers. Collaboration can take place by recruiting existing customers as representatives or speakers to share their success stories about participating in the waste bank program. By applying this approach, hopefully, socialization will become more inspiring and thus encourage people to participate.

These research findings reveal that the motivation of many households to participate in waste bank activities was due to awareness of SWM issues, in the case of the waste bank, particularly environmental awareness and economic benefits. Therefore, by raising the awareness of households about these issues, logically, the municipality will easily be able to persuade them to participate in waste bank activities, by providing SWM awareness campaigns for households on a regular basis. Moreover, since many participants in waste bank program are housewives, it is necessary to empower them in the field of knowledge and skills. A municipality could conduct more training related to household waste management, such as creating recycled craft products from inorganic waste materials. This would provide households with a possibility for earning extra income from recycled waste products. On the other hand, the municipality can also use this recycling waste training as an effort to raise awareness among women about taking care of inorganic waste in households. Moreover, the dissemination of information can be enhanced by improving the utilization of social or local media to socialize the Samici Waste Bank program and its best practices to increase public interest. The waste bank can cooperate with the private sector to create a useful application that people can use to access all relevant information.

Local governments need to improve the quantity and quality of the service facilities, particularly, the transportation modes for the waste pick-up service. They must realize not only more vehicles units but also pay more attention to maintenance funds for all the vehicles. Moreover, it is also essential to provide more equipment to facilitate operationalization of the waste bank unit, for instance: stationary, scales, savings books for waste bank unit members, garbage bins, banners, etc. Based on observation and interviews with unit customers, the more supporting facilities the municipality provides, the more customers will be motivated to increase their performance in waste segregation and recycling activities.

Several issues, for instance, the management of waste bank efficiency and productivity (cost benefit aspects, human resources), social conflict, and government policy related to the Samici Waste Bank system could be interesting for identifying improvements in other aspects of the waste bank as for further research. Moreover, the emphasis of research should be on household behavior in segregating waste and participating in the waste bank program. Another interesting topic to address is a comparison study between those who do and those who do not join the waste bank program. There is still only limited research that emphasizes household behavior in relation to different levels of participation, and the results of this research about distinctions between types of customer was not particularly effective due to the use of limited data. It is suggested that this research topic could be conducted differently and include more data in a comparison study of several waste banks, or it could carry out a deeper investigation into the dynamics of unit customers.

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Annexes

Annex 1: Questionnaire for Waste Bank Customers

Date	:	
Respondent Number	:	*(left it blank, it will be filled by surveyor)*
Type of Waste Bank Customer *(Check one)*	:	□ Individual □ Group □ Unit (neighborhood/school/office)

Note:
- *Individual: Registered in waste bank individually and represents 1 household.*
- *Groups: formed by maximum 20 individual customers which have the same interest or background to join the waste bank collectively.*
- *Units: Formally established could be the neighborhood, school or office unit) which consist of minimum 40 individual customers.*

Dear respondent,

This questionnaire is a part of master thesis research on solid waste management topic at the Institute of Housing and Urban Development Studies, Erasmus University in Rotterdam. The Netherlands, entitled "***The Influence of Customer Motivation Led to The Contribution to the Waste Bank Program Effectiveness, case study in Samici Waste Bank, Cimahi***." The data obtained from this questionnaire will help to answer the research question, which is to what extend does motive of customers (individuals, groups and units) contribute to the waste bank program effectiveness, in the case of Samici Waste Bank in Cimahi. We greatly appreciate your inputs in this survey. All of your information will be treated confidentially and will be used for academic purpose only.

Please answer the questions that indicate an opinion you agree with.

1. Personal Attributes (Socio-economic condition)

a. Gender : □ Male □ Female

b. Age : ..... years old

c. Family size : Including yourself, how many people the respondent's household consist of?

□ 1 □ 2 □ 3 □ 4

□ Other (Please specify) …...

d. Occupation

□ Government Officer	□ Farmer/Fishermen	□ Services
□ Labour	□ Self-employed	□ Student
□ Retired	□ Unemployed	□ Other…….

e. Highest degree of completed education : □ No schooling completed □ Primary school □ Junior High School □ Senior High School

□ Associate degree □ Bachelor's Degree □ Master's Degree □ Other……

e. Monthly income : □ Less than Rp 2,000,000

□ Rp 2,000,000 – Rp 3,000,000

□ Rp 3,000,000 – Rp 4,000,000

□ More than Rp 4,000,000

f. Activity in community organization

- Have you participated in any community organization in your neighborhood?

  □ Yes □ No

  Note:
  Community organization is a series of activities at the community level aimed to improve the social wellbeing of individuals, groups, and neighborhoods. For example: Community Self-Reliance Agency, Saving Group, Religion Organization, Women Gathering, Youth Organization, etc.
- Do you think it is important to participate in or contribute to community/neighborhood activities? Please give a circle (○) in the preferred scored below.

1 Strongly Disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly Agree

2. Perception towards participation in waste bank program

To what extent do you agree or disagree with the following statements? Please circle (○) the preferred scored below.

	How important are these outcomes to be gained by participating in the waste bank program?	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
a.	By participating in the waste bank program and doing waste segregation, can help to reduce the amount of waste which contribute to a cleaner neighborhood.	**1**	**2**	**3**	**4**	**5**
b.	By participating in the waste bank program and doing waste segregation, can give extra income to the household.	**1**	**2**	**3**	**4**	**5**
c.	By participating in the waste bank program and doing waste segregation, can help to reduce waste pollution and thereby positively influence public health.	**1**	**2**	**3**	**4**	**5**

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
d.	The implementation of Samici Waste Bank program has the potential to give benefits for people (cleanliness, income, and hygiene).	**1**	**2**	**3**	**4**	**5**
e.	By participating in the Samici Waste Bank Program can contribute to the achievement of the program's outcomes (cleanliness, income and hygiene).	**1**	**2**	**3**	**4**	**5**

3. Subjective Norms related to Participation in Waste Bank Program

To what extent do you agree or disagree with the following statement. Please give a circle (○) in the preferred scored below.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a.	I participate in the waste bank's activities because my family members encourage me to participate in it.	**1**	**2**	**3**	**4**	**5**
b.	I participate in the waste bank's activities because my friends or neighbors participate in it.	**1**	**2**	**3**	**4**	**5**
c.	I participate in the waste bank's activities because the community leaders encourage to participate in it.	**1**	**2**	**3**	**4**	**5**

4. Perceived Behavioral Control in Waste Bank Program Participation

To what extent do you agree or disagree with the following statement. Please give a circle (○) in the preferred scored below.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a.	I am capable of doing waste segregation and deposits to the waste bank	**1**	**2**	**3**	**4**	**5**
b.	I have time to do waste segregating and deposit them to waste bank	**1**	**2**	**3**	**4**	**5**
c.	I have sufficient space to do waste segregating and to store the waste before delivering it to the waste bank	**1**	**2**	**3**	**4**	**5**

5. Economic Incentives

For Individual customers:

How much money do you get on average per month from saving waste in the waste bank?

□ Less than Rp 5,000 □ Rp 11,000 – Rp 15,000 □ More than Rp 20,000

□ Rp 5,000 – Rp 10,000 □ Rp 16,000 – Rp 20,000

For Group and Units customers:

How much money do your group or unit get on average per month from saving waste in the waste bank?

□ Less than Rp 10,000 □ Rp 26,000 – Rp 50,000 □ Rp 76,000 – Rp 100,000

□ Rp 10,000 – Rp 25,000 □ Rp 51,000 – Rp 75,000 □ More than Rp 100,000

How many households are part of your group/unit? ……households.

How much money does your member (household) receive per month averagely from saving waste in the waste bank?

□ Less than Rp 5,000 □ Rp 11,000 – Rp 15,000 □ More than Rp 20,000

□ Rp 5,000 – Rp 10,000 □ Rp 16,000 – Rp 20,000

6. Convenience

a. Availability of the service

What services are offered by the waste bank? *Please give a check (V) in the preferred answers below, more than one choice is possible.*

□ Provision of segregated waste bag/bins

□ Door-to-door inorganic waste collection service

□ Awareness campaign

□ Training on waste segregating and recycling

□ Others (please specify) ……

b. Accessibility

- How far is your home from the Samici Waste Bank?

  □ Less than 100 m □ 200 m – 300 m □ more than 400 m

  □ 100 m – 200 m □ 300 m – 400 m

- How do you transport to the Samici Waste Bank?

  □ By walking □ By motorcycle □ By public transport □ By biking

  □ By car □ Picked up by the *door-to-door* collection service from Waste Bank □ Other (please specify): ……

- Please give a circle (○) in the preferred scored below.

	not at all	not really	neutral	somewhat	very much
To what extent is the distance to the waste bank an inconvenience to you in bringing your waste to the bank?	**1**	**2**	**3**	**4**	**5**

Additional question for Group and Units customers:

- How far is your home to the waste bank unit's/group's collecting point?

  □ Less than 100 m □ 200 m – 300 m □ more than 400 m

  □ 100 m – 200 m □ 300 m – 400 m

- How do you transport to the waste bank units/groups collecting point?

  □ By walking □ By motorcycle □ By public transport

  □ By biking □ By car □ Other (please specify): ….

- Please give a circle (○) in the preferred scored below.

	not at all	not really	neutral	somewhat	very much
To what extent is the distance becoming an inconvenience to you in bringing your waste to the unit/groups' collecting point?	**1**	**2**	**3**	**4**	**5**

7. Information and Knowledge

a. Access to the information regarding waste bank.

How did you learn about the Samici Waste Bank? *Please give a check (V) in the preferred answers below.*

□ From the socialization held by Samici Waste Bank officers. (school/neighborhood visits, waste segregating workshop/counselling, etc.)

□ From the community leaders (RW head, religions leaders, etc.)

□ From local institutions (youth group, women group, etc.)

□ From neighbors

□ By media (internet, newspaper, etc.)

□ Others (please specify) ……

b. Knowledge about waste management

Please describe how your household manages the following types of waste. (Select the choice below that best fits your current condition).

Types of Waste	**Burn**	**Bury**	**Dump**				**Garbage Truck**	**Recycle**	**Reuse**	**Compost**	**Other *(Specify)***
			River / Gully	**In yard**	**On road**	**EHO Dump site**					
Food waste (organic & vegetables)											
Paper/cardboard											
Plastic and rubber											
Metals											
Glass and ceramic											
Aluminium											
Wood											
Textile											
Garden waste											

Source: types of waste taken from (World Health Organization (WHO), 1996)

This is the end of the questionnaire.

Thank You.

If you allow me to do further interview, please provide your name and contact number.

Name :

Contact Number :

Annex 2: Interview Guide

INTERVIEW GUIDE FOR SAMICI WASTE BANK DIRECTOR & STAFF

Variables	Indicators	Questions
Customers' contribution to waste bank program effectiveness	• Classification of Waste Bank Customers	1) What is the basis in determining the category of waste bank's customer (individuals, groups, units?
	• Waste Composition managed by Waste Bank	2) What types of waste are received and how they are handled in the waste bank? 3) How is the composition of the waste taken into account when determining the price paid for waste delivered to your bank?
	• Operationalization of Waste Bank System	4) How is the Municipality's support in the operationalization of Waste Bank? 5) Can you describe the operation process after the customers deposited the waste? Is there any further process before it got sold to the producer? 6) Can you explain the process of the door-to-door collecting service provided for groups and units customers? How many times the pickup is done in a week?
	• Availability of waste bank facilities	7) Are there any facilities other than door-to-door collecting service provided for customers? 8) Are there any services that distinguish for different types of customers other than waste pickup services? 9) Is the facilities provision involving the partnership with external stakeholders or support from the municipality?
Customers Motivation		10) Based on your experience in doing socialization of waste bank program, what is your opinion regarding people's motivation to participate in the program? 11) In your opinion, why did more people participate as a customer individually than in the group or unit? 12) To what extent do you believe that certain motivation plays a role in people's participation? 13) To what extent has the Samici Waste Bank tried to optimize the waste bank's services and information offering to meet those motivation? 14) What are the known barriers to participation? Why do they still exist and are they difficult to overcome? 15) Which groups of people have proven to be difficult to reach by the waste bank? To what extent are their motivation to not participate known by the waste bank?

INTERVIEW GUIDE FOR WASTE BANK'S CUSTOMERS
(INDIVIDUAL, GROUP & UNIT)

Name of Group/Unit :

Location :

Variables	Indicators	Questions
Customer' Motivation	• Attitude towards Participation in Waste Bank program • Subjective norms related to participation in waste bank program • Perceived Behavioral Control in waste bank program participation. • Convenience	1) Why do you participate in the waste bank? 2) What is the most important reason to keep you participating in waste bank? 3) What factors make you doubt your participation in the waste bank? *For respondent who participate as the individual customer* 4) Would you also participate in the group/unit? Why (not)? *For respondent who participate as the group/unit customer* Would you also participate as an individual? Why (not)? 5) What role does a desire to improve the environment/increase your income/please your peers/improve public health influence your decision to participate in waste bank program? 6) What barriers did you have to overcome in order to participate? 7) What difficulties do you currently face in your participation? 8) How much effort do you need to invest in physically transporting your waste to the collection point/waste bank? 9) To what extent do you feel that participating in the waste bank brought you what you expected from it when you first started?
	• Information and Knowledge	10) What information were you missing when you first heard of the waste bank that you did need in order to start participating and how did you find this information after all?" 11) Do you currently feel that you know what you need/want to know about the waste bank and its services? Why (not)? 12) Have you stimulated others to participate in the waste bank? Why (not)?
Customers' contribution to waste bank program effectiveness	• Number of member (household) in units and groups	13) Since when did you participate as individual customer in the waste bank activities? *For respondent who participate as the group/unit customer* 14) Since when did this group/unit participate in the waste bank activities? 15) How many members does the group /unit have? Is there any increasing in the number of members since this group/unit running?

Variables	Indicators	Questions
		16) Can you describe the characteristic and the proportion of the members? (For example based on gender, age, occupation, education, and monthly income).
	• Amount of waste deposit to the waste bank per households (in individuals, units and groups)	17) How much waste in average does household (individual) /each member (of the group/unit) deliver to the waste bank in a month?
	• Amount of income from selling garbage per household (in individuals, units and groups) /Economic Incentives	18) How much average monthly income does household (individual) /each member (of the group/unit) get from saving waste in the waste bank?

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