From Trash to Cash:

An Analysis of Wastebanks as Grassroots Innovations from Niche Management Perspective

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MSc Thesis Report

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Abstract

Solid waste in Makassar, Indonesia, appears to be a persisting issue, because the available landfill area cannot deal with the increase of solid waste volume. Moreover, it is known that the public sector in developing countries face challenges in providing the necessary waste services. Motivated by the goal of cleaner Makassar, a wastebank was established in 2009, as an innovative activity that encourages people to separate their waste and receive cash payments in return. Now, wastebanks are spread all over Makassar, mushrooming from one neighbourhood to another, established with 650 units of operation in schools, prisons, markets, and offices. However, whether and in which ways wastebanks are influencing the wider setting of solid waste management in Makassar is not yet known. A niche-based approach is employed to assess whether or not the innovation meets the requirements of a successful niche. The study includes document reviews, site visits, and interviews with the actors of wastebanks as well as municipal solid waste management in Makassar. The analysis of the actors' network, expectations, learning process, and protection given discloses that a wastebank is relatively successful in niche innovation. Niche diffusion into the regime indicates that the novel innovation, in some means, influences solid waste management in Makassar. However, in order to promote further development in the future, an independent network as well as de-politicization of wastebank niche is necessary. The results demonstrate that a citizen movement is likely to influence the mainstream regime if it is incorporated by a conducive niche and protection. I anticipate my thesis to be a starting point for more comprehensive research in the role of grassroots innovation for the betterment of solid waste management in Indonesia.

Keywords: wastebank, solid waste management, niche management, Makassar, grassroots innovation

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This thesis report is part of my study in Master of Environmental Sciences in Wageningen University and Research. Since the experiment was conducted in Makassar, I stayed for three months in Indonesia. During my stay in Makassar, I have learned a tremendous amount of lessons, not only for my study but also a lesson for me as a human being. I am fully aware that it is impossible to finish this thesis without help and supports of many people.

First, I would like to give my thanks to my supervisor, dr. ir. BJM van Vliet, for the guidance, support and suggestion. Also, I would like to say thanks to my family in Indonesia that always support and believe in me. Especially to my parents, Heni Hartini and Dadi Marhadi, who I believe always mention my name every time they pray.

Furthermore, I hope this research will be useful, especially for the solid waste management improvement in Indonesia.

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Bellia Bizarani

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Chapter 1 Introduction

1.1 Problem Description

1.1.1 Setting the Scene

The solid waste problem is one of the biggest environmental challenges faced by global community at large (Smith, Hargreaves, Hielscher, Martiskainen, & Seyfang, 2015; Wilson, 2007). However, this issue seems to put more pressure on developing countries, including Indonesia, because of the limited resources these countries possess (Marshall & Farahbakhsh, 2013). Population growth and unwise pattern of production and consumption have resulted in increasing volume of solid waste. In Indonesia, from all the solid waste that is produced, 48% is coming from (Wijayanti & Suryani, 2015). Solid waste generated has reached 38.5 million tons every year or 200,000 tons every day with increase of 2 to 4% annually (Wijayanti & Suryani, 2015). In 2019, this number is predicted to rise to 68 million tons (Ministry of Environment, 2016). Sixty percent of waste that is generated comes from organic waste (Rip & Kemp, 1997) and 14% is plastic waste, placing Indonesia as the second plastic polluters in the world (Rip & Kemp, 1997).

Makassar, where this research was conducted, is the capital of South Sulawesi province. It is home for 1.4 million people. Daily, the city generates 4000 m^3 of waste, whereas the Department of Cleanliness and Public Park of Makassar is only able to handle 3500 m^3 of waste (Mappasere & Idris, 2016). Moreover, the capacity of Tamangapa Antang landfill is only 2800 m3 per day (Mappasere & Idris, 2016). As the amount of waste generated is parallel with population, it is predicted to keep rising in the incoming years. The increasing volume of solid waste has been a problem because of limited capacity of the landfill area. Hence, solid waste in Indonesia appears to be an persisting issue.

1.1.2 Public Participation in Solid Waste Management

Waste issue is the intricate one. It is not solely depending on technical or engineering aspects to manage it. While “end of pipe” solutions deemed to be insufficient (Wijayanti & Suryani, 2015), an effective environmental management system is needed. Management shall involves a system management, including waste reduction from the sources, waste separation, as well as waste recycling. However, in 1980s, it was noticed that the public sector in developing countries faced challenges in providing the necessary waste service (Tahir, Harashina, & Yoshida, 2011). Public engagement in solid waste management practices promote the importance of public participation to solve this issue. Thus, this shows a shift in perceiving waste responsibilities, where community became

an active player in waste management. In Indonesia, community involvement is a mean to reduce the volume of waste from the source before going to the final disposal site (landfill).

1.1.3 Wastebanks as Grassroots Innovation

In 2009, the first waste bank was established in Makassar. Wastebanks are motivated by the goal of the access of cleaner Makassar. This innovative activities encourage people to separate their waste, and deposit it to the collector – just like a bank. The amount of the saving can be withdrawn in occasional time. Now, waste-bank has been all over Makassar, mushrooming from one neighbourhood to another, having its internet and mobile version, established with 650 units of operation in schools, prisons, markets, offices. Nationally speaking, waste bank manages more than 5000 tons of solid waste per month which equals to 2.4 million Euro per month (Ministry of Environment and Forestry, 2015).

Whereas on the one hand, many different types of grassroots initiatives in solid waste management sector (e.g. household composting, bio-pores and methane capture) do not get enough spotlight, waste-bank on the other hand prospectively make its way towards a bigger development. Then, what makes this initiative different? How wastebanks, as citizen initiative, influence the bigger setting of solid waste management in Makassar?

In recent years, literature on waste-bank has emerged. However, these literatures have focused its scope on the household recycling behaviour (Singhirunnusorn, Donlakorn, & Kaewhanin, 2012), its community participation level (Purba, Meidiana, & Adrianto, 2014), its public engagement (Wijayanti & Suryani, 2015), as well as its achievement and its effectiveness (Raharjo, Matsumoto, Ihsan, Rachman, & Gustin, 2015). Theoretically speaking, the use of niche management to frame a grassroots innovation is limited, as most research use niche management in the system innovation manner. As far as I acknowledge, research regarding the process of waste-bank development as a community-based initiative in solid waste management (in the form of niche) is, I perceived, under-researched.

By framing waste-bank as a grassroots initiative -- a niche of social innovations, I utilize what (Kemp, Schot, & Hoogma, 1998) introduced as Strategic Niche Management (SNM). SNM argued that there are three constituents of niche formation, namely coupling expectation, network formation, and learning process. Even though SNM normally deals with technological innovations and how they thrive in the mainstream market, the conceptual framework has extended to also view grassroots innovations (Seyfang & Haxeltine, 2012). According to (F. W. Geels, 2005), the reinforcement of these three processes will make a niche stable, growing and might affect the existing regime. Moreover, I try to extend the employment of niche management theories by incorporating other concepts, namely

conceptual niche management (Hegger, Van Vliet, & Van Vliet, 2007), and niche policy advocacy (Smith & Raven, 2012). That being said, I will use the combined frameworks to analyse what makes wastebanks thrive as a grassroots initiative by analysing its network and regime formation as well as its learning process. Furthermore, I will as well analyse how waste-bank interact with current solid waste management regime.

1.2 Research Aim and Questions

Following from the explanation above, the objective of this research is, therefore, to understand how does waste-bank, as a grassroots initiative, thrive as well as how does it influence the mainstream regime of solid waste management in Makassar. Specifically, I will examine how the network building, learning process, actors' expectation, as well as protection given, in shaping the development of wastebanks. Furthermore, I seek to understand how these constituents interlink to each other in stimulating the novel innovation.

This thesis seeks to contribute to literature on the employment of transition management in grassroots innovation by focusing on the development of wastebanks, as a citizen movement as well as its role in the municipal solid waste management in Makassar. Furthermore, notwithstanding the particular focus on wastebanks development, wider understanding for other areas may be acquired, mainly in the context of how a novel innovation may affect the bigger and mainstream regime. Finally, this thesis may point out how the public authority of Makassar could stimulate the further development of wastebanks by providing policy recommendation.

In pursuit of these objectives, hence the main question is then asked:

How do wastebanks thrive and to what extent do they influence the mainstream regime of solid waste management in Makassar?

The main research question will be developed into several sub-research questions:

1) What theoretical concepts are relevant to analyse the development of wastebanks in Makassar?
2) In what state are wastebanks affecting the current regime of solid waste management in Makassar?
3) Who are the actors inside and outside the wastebanks niche and how do these actors interact with each other? How do these actors facilitate the niche to grow towards the mainstream regime in Makassar?
4) How does the learning process take place? And in which dimension does the learning process take place in wastebanks niche in Makassar?

5) What kind of expectations underlie the wastebanks innovation in Makassar?
6) To what extent do the constituents interlink to each other and how do they help building the stability or impede the development of the wastebanks niche in Makassar?

In order to answer the main research question, I will first investigate the conceptual framework as reflected in question 1). I, then, utilize the concept of niche stability which was introduced by (F. W. Geels, 2005), which reflect in sub-question 3), 4), and 5). In sub-question 6), I wish to explore the interlinkage of these key elements as Geels added, if all of these elements are supporting each other, the niche will gradually grow and become more secure and *vice versa*. Sub-question 2) is asked to reflect on the milestone of waste-bank practice so far at diffusing in mainstream solid waste management regime and will be reflected back on the stability of the niche from the questions 3), 4), and 5). A route developed by (Seyfang & Haxeltine, 2012)will be used to answer sub-question 2). According to the authors, there are three ways social initiatives could affect the mainstream regime, namely replication at the niche level, scaling-up, and transferring the niche ideas to mainstream settings.

1.3 Reading Guide

The remainder of the thesis is structured as follows. Chapter 2 outlines the theoretical framework employed for this research. It includes two transition theories (namely multi-level perspective and niche-based approaches), protection, niche diffusion, as well as the operationalization I have developed to be applicable in the field. Following by Chapter 3, I describe my research design as well as my methodology in data collection, data analysis, and scope and limitations. In Chapter 4 I explain wastebanks and municipal solid waste management in Makassar as background information. I present my empirical findings in Chapter 5. It displays results generated from interviews as well as observation in sub-chapters, including the influences, the niche elements, and the protection. Finally, I conclude by answering the research questions and constructing policy recommendation in Chapter 6. The discussion spotlight the elements that might stimulate or impede the development of wastebanks as novel innovations. The last but not the least, I also give insight for further research.

Chapter 2 Theoretical Framework

In the following chapter, the conceptual frameworks to analyse the influence of wastebanks, as a citizen movement, to solid waste management in Makassar will be developed. This will be done by first discussing the concept of transition, especially on how a novel innovation can influence the existing regime. Subsequently, in sub-chapter 2.2, the concept of the innovation itself, or in this research refers as citizen initiative innovation, or grassroots innovation, in general will be examined. Later, the routes of diffusion will be elaborated by taking into account grassroots innovation in transition management theory. Lastly, an attempt is made to explain the development of grassroots innovation by examining several niche-based approaches taken from literature on transition system, e.g., strategic niche management (Kemp et al., 1998), conceptual niche management (Hegger et al., 2007), and niche policy advocacy (Smith & Raven, 2012). At the end of this chapter, I will operationalize this concept into wastebanks development in Makassar.

2.1 Multi-Level Perspective

Socio-technical transitions is defined as considerable shifts in socio-technical regimes involving modification in the overall setting of a system (transport, energy, agri-food system), which entails technology, policy, markets, consumer practices, infrastructure, cultural meaning and scientific knowledge ((Rip & Kemp, 1997); (F. W. Geels, 2005)). Yet, why we need to do transition after all? Many environmental degradation are caused by societal problems, hence, in order to addressing the problems, a deep-structural change in the system is required. Transition management is a governance approach based on the point of view that society is an assortment of complex adaptive systems which will evolve, shift, adapt because of structural change (Loorbach & Raak, 2006). Transition researchers stress that transitions happen in long term time horizon and in a complex process, because the existing system tend to be stabilized and withstand any change (Raven, Bosch, & Weterings, 2010).

Having talked about transition, it is important to ask, *"Where is the transition heading to?"* There is an increasing interest in the governance of socio-technical transitions in term of how modern societies can attempt to be more sustainable (Grin, Rotmans, & Schot, 2010). Transitions toward sustainability possess several attributes that distinguish them from many transitions. The first is that sustainable transitions are purposive rather than emergent (F. W. Geels, 2011), meaning that the purpose of the transition is to address persistent environmental problems instead of exploring business opportunities related to new technologies. Second, sustainable transitions do not offer obvious user benefits because it usually has lower price than established technologies (F. W. Geels, 2011). Therefore, Geels added, it is unlikely for sustainable transition to replace current system without support, namely taxes,

subsidies, and regulatory frameworks. The last characteristic relates to the domain where sustainability is mostly needed where the firms might help the pioneering initiative and accelerate the breakthrough (F. W. Geels, 2011). These elements implicitly suggest that sustainability transitions involve interaction between technology, policy, market and public (F. W. Geels, 2011).

Gaining knowledge in transition theories is considered as essential, when sociotechnical systems that promised solutions are locked in while facing tenacious issues that are unable to be solved using the current approach, and while on the other hand, a pioneering innovation might offer more promising and sustainable alternative (Smith & Raven, 2012). Therefore, notion of transitions has recently gained attention in science and policy as a mean to comprehend shifts towards sustainability. One notion that has become widely applied in transition research is multi-level perspective (Rip and Kemp, 1997); Geels, 2005). This framework differentiates three concepts of niches, regimes, and landscape to grasp the interaction between micro-level actors and macro-level structures which might be important in ensuring the breakthrough in the regime and diffusion of innovations (Oyake-Ombis, van Vliet, & Mol, 2015; Seyfang & Haxeltine, 2012). The changes in one element of multi-level perspective will lead to changes in other element as well, because all of the elements in socio-technical system are co-evolved and were intermingled (F. W. Geels, 2005). Here, I attempt to extend this framework to see the role of citizen-led initiative in affecting the current regime and its ability to construct a niche where the novel innovation is developed.

The transition literature introduces the notion of socio-technical niches as a platform where novel innovations can grow because it is protected from regime selection pressures (Seyfang & Haxeltine, 2012) as illustrated in Figure 2.1. Transition is perceived as consequence of pressures given by the external 'landscape' upon reigning regime to allow access to 'windows of opportunity' that might be replenished by ground-breaking, sometimes radical innovations, developed in niche spaces (Schot & Geels, 2008). Ground-breaking innovations appear in niches which are often outside the existing regime. Niches are essentials for new innovations as they allow the seeds for change (Geels, 2005). Likewise, the occurrence of niches is influenced by existing regime and landscape. Event tough the force given by higher level is different (regime gives direct influence and landscape more indirect), the novelties are generated by taking into account existing knowledge and capabilities of existing regime (Geels, 2005). Internal tension also affects both the regime and the niche adapting (Ingram, Curry, Kirwan, Maye, & Kubinakova, 2014). The niche can link up with the tension in the existing regime (Smith et al., 2015), for instance, growing awareness in participatory solid waste management, might provide chance for the niche to give alternative and thus assist niche improvement. However, this attempt of linking depends on niche compatibility with the regime and its socio-technical dimensions. Being said that, a successful niche tends to be not too different from the incumbent regime. On the

other hand, niches can emerge as a result of difference view of the existing system, it thus has a contrast value. This can limit the growth of the niche to diffuse to the regime.

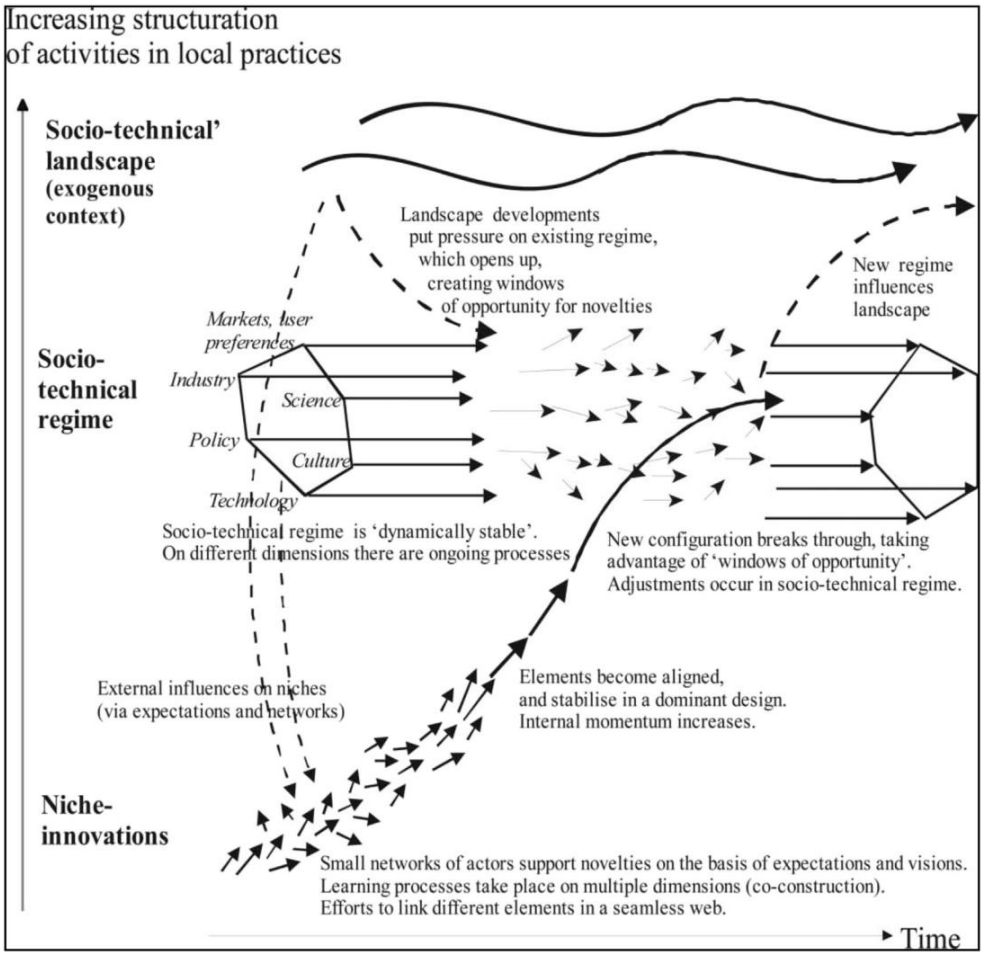

Figure 2.1 Multi-level perspective on transition (Geels, 2002)

However, innovation may also experience a lock-in situation, where their practice remains halted in the niche and fail to break through the regime. This usually occurs when there is incompatibility between the levels in multi-level perspective (Raven et al., 2010). The idea of regime is often associated with the failure of new innovation to diffuse, as Raven et al., (2010) explained, "the regime rules and institutions guide regime actors in a specific direction and make them "blind" for alternatives or even discourage or punish the development of alternatives" which will lead the actors to support the incumbent regime even when the new one is better. Furthermore, the lock-in can also emerge when there are too rigid institutional structures (regulations, financing schemes, and cultural values) as well as technological artefacts and infrastructure that represent interest of reigning actors (Raven et al., 2010).

Although the multi-level perspective offers admissible insights to transition management, it also has some faults. One of the weaknesses, which is emphasized by Geels (2005), is that multi-level

perspective has less recognition to the diffusion process. However, it is understandable noting that multi-level perspective focuses on the bigger 'picture', that is, windows of opportunity that occurs as a result of multiple processes. Moreover, these literatures generally manage niches of technological innovation which developed within commercial market contexts. (Seyfang & Smith, 2007) expand this concept into social economy by introducing the concept of grassroots innovations. Grassroots innovation formulates social movements as agent of change within socio-technical system.

2.2 Niche Management Perspectives

As hopeful as new innovation is, it is also monstrous at the same time (Mokyr, (1990) cited in Geels (2005)). New innovation is hopeful because they might contribute to the existing system in a positive way. On the other hand, it might also be monstrous because the performance of the relatively new innovation is not yet known, not to mention it also usually cumbersome and expensive. Hence, such innovation needs some protections to be able to thrive; which provided by the niches.

Niches have been studied under different headings, namely conceptual niche management (Hegger et al., 2007), niche policy advocacy (Smith & Raven, 2012), and strategic niche management (Kemp et al., 1998). At least, this research inventoried four concepts of niche management to construct the theoretical framework, namely network, learning, expectation, and niche protection (Table 2.2).

Sustainable innovation is known as novel product, process or service socio-technical configurations attending to environmental and social goals, which often perform poorly compared to the market criteria dominating incumbent regime. The incumbent regime receive an advantage of years of development hence it performs better (Rip & Kemp, 1997). Having said that, grassroots and other sustainability innovations engage organizational forms, technology uses, skills, infrastructures, market, and other institutional requirements maladapted and challenging to conventional regime (Smith et al., 2015). Niche-based approach is an essential part of transition concept. Niches can be special geographical locations or specific application domains, which function as stepping stone for learning and wider diffusion into the regime (Raven et al., 2010).

This comprehension have led much of the original strategic niche management concept (Kemp et al., 1998). Market, technologies and institution are required in a process of co-evolution for innovations to be sustained. This can be done by creating an artificial niches by safeguarding the innovation from cruel selection temporarily, for instance with investment grants, tax exemption, or other form of protection (Raven et al., 2010). Niches thus can be used as a space for learning, building social network, and sharing the expectation to improve the innovation in order to gain momentum for further diffusion to the regime (Raven et al., 2010). Network in niche development can be indicated

as network among actors inside and outside the niche development itself, how these actors interact with each other as well as how these actors can facilitate the niche development by using their sources. Then, learning is more of iterative cycle where the learning process based on evaluation and experiments during the development takes place. Expectation in network development can be interpreted as belief that underlie the innovation, namely towards a sustainable transformation that improve the quality of life both technologically and socially.

In the beginning, strategic niche management research emphasizes on individual innovation, but strategic niche management has shifted the focus from individual to sequences of experiments (Schot & Geels, 2008). These experiments can present at the same time and build on each other over time through social learning process which might lead to new trajectory (Figure 2.2).

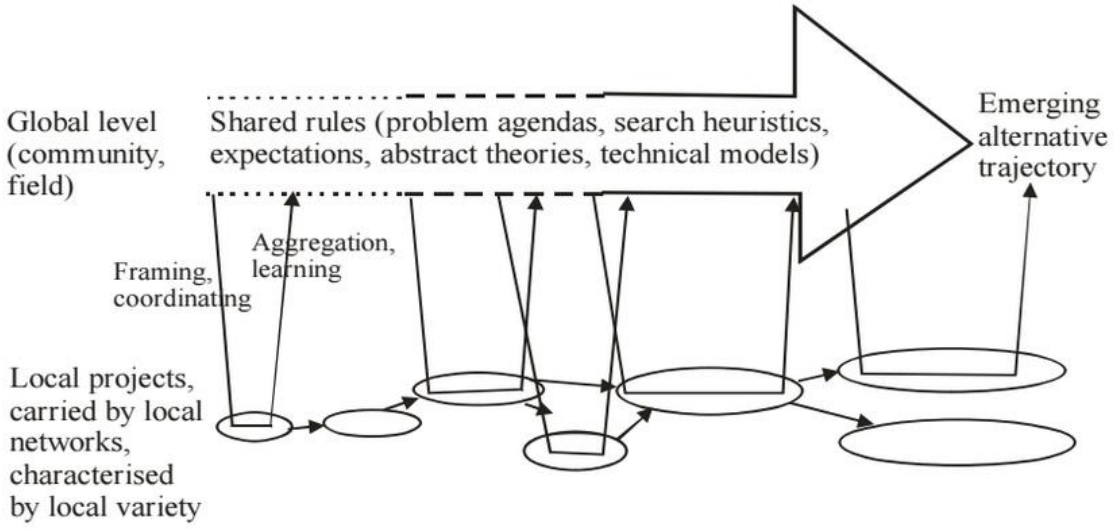

Figure 2.2 Niche diffusion by (F. Geels & Raven, 2006)

Some scholars claim critics that the strategic niche management concept is limited, self-evidently desirable and lack of political analysis and strategy because it put less attention to structural power shaping the terms of niche development ((Smith et al., 2015); (Shove & Walker, 2007)). Consequently, a concept with more political dimension is added to the theoretical framework: niche policy advocacy.

A self-evident niche performance is considered not enough to develop the niche further. A substantial amount of political work to gather support is required (Smith & Raven, 2012). The niche spaces have to be built upon advocacy work that represents niche performance favourable to influence discourses in the bigger settings. The successful advocacy might help niche actors to recruit new participants, mobilizing additional resources, and gaining wider social and political legitimacy as a voice that counts improving sustainability. Nevertheless, Clausen & Yoshinaka (2005) argue that policy support and

resources won trough an advocacy might have conditions in the deployment and it might impede the development of the niche if the organization works to a different agenda. Many criticisms arise about niche policy advocacy (Hommels et al., 2007; Geels and Schot, 2007), yet one of the most striking one is about some concern related to protection, namely what protection is, where protection comes from, how it is contested, who is involved in shaping protection, nor how protection is translated. (Smith & Raven, 2012) argue that protection can be distinguished into three elements, shielding, nurturing, and empowering. Shielding is defined as "those processes that hold at bay certain selection pressures from mainstream selection environments, actively or passively" (Smith & Raven, 2012). Then, these authors also introduce the notion of nurturing as 'processes that support the development of the path-breaking innovation". Lastly, empowering is done by "making the niche innovation competitive with mainstream socio-technical practices in other- wise unchanged selection environments" (Smith & Raven, 2012).

(Hegger et al., 2007) introduce conceptual niche management that can be defined as "the coordinated management of socio-technical experiments taking concepts of sustainable transformation of socio technical systems as their starting point, and being executed by all actors that are deemed relevant to fulfil the concept". The authors argue that strategic niche management put emphasizes on technological experimentation rather than the co-evolution of technology and society, or further, the form of social organization. One of the reason why a focus on technological experimentation is condemned is the fact that social development is seen as a by-product of a technological innovation rather than the starting point, or even an experimentation on its own. However, incorporation between technical and social developments is important to promote sustainable system innovation. This theory comes from the fact that technology implementation is often impeded by non-technical challenges, hence institutional changes and education of end users are essential to cope with it. Moreover, (Hegger et al., 2007) argue that thorough changes of complete socio-technical systems (technologies, institutions, cultural values, user practices, rules and regulations) may lead to substantial gain in eco-efficiency. Conceptual niche management promotes the real goal of the transformation hence it is based on sustainability, and the technological innovations, rules and regulations are only the means towards it. Therefore, (Hegger et al., 2007) emphasize that it is necessary to redirect towards sustainability concepts and guiding principles rather than technologies. By embedding social aspects into the niche-based approach, it is likely that the concept is moving toward regime change (Hegger et al., 2007). Moreover, to bring this theory into practice, (Hegger et al., 2007) introduce four iterative steps. First, by defining the focus of the program. A concept for sustainable transformation will not encourage sustainable technologies. Rather, the technologies will be used as means to reach the end goal, which is realizing the concept. Second is by investigating how

this social concept could be socially embedded. Next is by defining a reciprocal goal with the involved actors. This can be done by bringing actors together in workshop, expert meetings, and consensus conferences. Finally is by experimenting with integration of technologies and social organization. Noting that these are an iterative process, an evaluation and learning is conducted which can be a starting point for new project.

Synthesize of all frameworks is summarized in Table 2.1. From the three frameworks mentioned above (strategic niche management, conceptual niche management, and niche policy advocacy) I synthesize the components off each frameworks as seen in Table 2.1, and come with four elements of niche-based approach, network, learning, expectation, and protection. Even though these niche management concepts normally deal with technological or system innovations and how they thrive in the mainstream market, the conceptual frameworks have extended to also view grassroots innovations (Seyfang & Haxeltine, 2012). By extending niche innovation analyses into civil society contexts, (Seyfang & Smith, 2007) argue that community action is a promising but neglected site of system-changing innovation for sustainability.

Table 2.1 Synthesis of niche management component

Literature	Concept	Components	Synthesis
Kemp et al., 1998	**Strategic niche management**: focuses on the processes by which social learning , expectation and networks enable niches development	Network formation	Network
		Learning process	Learning
		Expectation	Expectation
Hegger et al., 2007	**Conceptual niche management**: focuses on social embedding of new innovations and technological experimentation and experiment in social organization	Defining a concept for sustainable transformation	Expectation
		Exploring social embedding of the concept	Expectation
		Start exploratory talks with the new actors	Network

Literature	Concept	Components	Synthesis
		Setting up experiments	Learning
		Evaluation and learning	Learning
Smith and Raven, 2012	**Niche policy advocacy**: focuses on discursive actions that are undertaken to convince the policy makers to support the innovations. Additionally, niche effectiveness might contributes to niche development	Shielding	Protection
		Nurturing	Protection
		Empowering	Protection

2.3 Niche Diffusion

Favourable key internal niche-development processes and external conditions in regime should make niche able to diffuse their innovative solutions into wider society, affecting, or even replacing the regime (Seyfang & Longhurst, 2015). In his book, (F. W. Geels, 2005) argues that diffusion is a complex process since it comprises changes on many dimensions and it does not occur all at once, but in subsequent pathways following the *trajectory of niche accumulation* as seen in Figure 2.3 (Levinthal, 1998 in Geels, 2005).

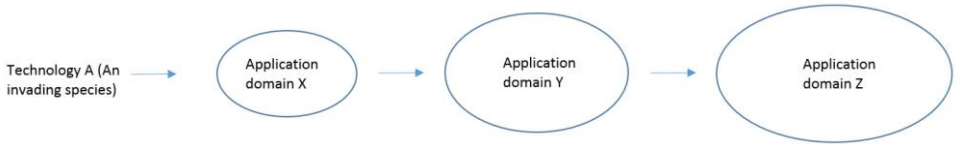

Figure 2.2 Diffusion as accumulation of niches (Levinthal, 1998)

The figure suggest that the niche is always present, waiting to be entered by novel technologies. On the other hand, (F. W. Geels, 2005) claims that it is not always true, as niches depend on "dedicated construction work of product champions and on windows of opportunities created by external circumstances". In short, this concept focuses on technological innovation.

However, grassroots innovation possesses divergent features from technological innovation. When talking about grassroots innovations, one thinks small local projects may seem almost irrelevant at city scale or above. However, if conducive niches lead to larger numbers of them, there is every reason to expect them in aggregate form to have proportionate impact on the regime (Church and Elster

2002). Affecting niches diffuse their innovations and practices along three routes, scaling up, replication, and translation (Seyfang & Haxeltine, 2012). The first one is scaling-up which involves recruiting more participants and develop in size, activity, and impact. In their research, (Seyfang & Longhurst, 2015) argue that a wider socio-cultural context is a significant success factor for a niche to scale up. Moreover, having adequate resources is also considered as important internal factor in scaling-up attempt. Secondly, replication comprises new establishment in innovative activity. The accomplishment of replication depends on several factors, one of them is niche activities, namely training, developing handbooks, and national conferences, which will make the replication easier. Lastly, through translation in which some elements of niche ideas that are transferred into mainstream context, yet missing their radical attributes (Seyfang & Smith, 2007). Niches capacity to be transferred into the bigger context relies on the regime that it is trying to affect, the more opposite the niches to the regime, the harder it will be transferred due to basic differences, such as values, idea, and practices (Seyfang & Haxeltine, 2010). In some cases, the goal of the niche is not always 'replacing' the existing regime but rather exhibit a complementary function by constructing corresponding infrastructure (Seyfang & Longhurst, 2015).

2.4 The Two Innovations: Market-based and Grassroots Innovation

At the heart of this research, a niche-based approach will be mainly discussed in this thesis. However, niche management theory is usually utilized in the context of system innovation (or market-based innovation), which entails technological artefacts. That is to say, wastebanks, as citizen movement, in fact do not possess that strand. Nonetheless, it is hard not to notice the "bank" from wastebank, leaving us with question: "*is it profit oriented just like any market-based innovation*?" Thus, where is wastebank's position between grassroots and market-based innovation?

Grassroots innovations are different from mainstream or market-based innovations, or as (F. W. Geels, 2005) introduced as system innovations. Geels (2005) defines system innovation as a transition from one socio-technical system to another, for instance, the transition from piston engines aircraft to jetliners in American aviation. This transition transforms not only the artefacts, but also everything related to it as system innovation is co-evolved and intermingled. But clearly, system innovations have technology as an entry point. Different from system innovations is grassroots innovations. (Seyfang & Smith, 2007) define grassroots innovations as a network of actors and organizations creating original bottom-up solutions that respond to the local circumstances and the concerns and values of the community involved. Hence, it usually include committed activists. Moreover, grassroots approaches express problem framing and solution finding instead of technical solutions that usually performed by technology demonstration projects.

Niche is a protective sphere for innovations to thrive as it usually provides protection. System innovations traditionally develops inside the niches within the market economy. This type of innovations is shielded from the market competition through subsidies, strategic investment from firms, and special purposes performance requirements for special applications. Grassroots innovation, on the other hand, prevails within the social economy of community activities and social enterprise, meaning that the entire fragment of the economy is built aiming at increasing social inclusion, especially of vulnerable individuals, reduce inequalities, and environmental sustainability while at the same time creating economic value. Additionally, grassroots innovations possess different social, ethical and cultural rules which enable different kind of incentive from mainstream economy (Seyfang & Smith, 2007), for instance, one of the waste bank program that can be used to redeem solid waste with electricity bills, phone credits, or health insurance. Having said that, grassroots innovations have different incentives from the mainstream economy (Seyfang & Haxeltine, 2010).

Speaking of institutions, system innovations have straightforward institutional form where the firms usually earn financial income from trading the products, thus their motivation is profit. Having said that, the innovation is used as a tools to maximize firm's efficiency so that it can compete in the market. Grassroots initiatives, on the other hand, are driven by two motives: social need and ideology (Seyfang & Smith, 2007). As one of the two motives mentioned above, ideology is also a motive in grassroots innovation. The ideology sometimes contradict the dominant idea of the regime and develop practices in alternative values (Seyfang & Smith, 2007). Likewise, the institutional form of grassroots innovations is usually small, low-profile, voluntary, citizen-led, and community driven groups (Chanan, 2004) where the resource usually come from grant funding, limited commercial activity, voluntary input, and mutual exchange (Seyfang & Haxeltine, 2010). The summary will be provided in Table 2.2.

Table 2.2Market based - grassroots innovation comparison (Seyfang and Smith, 2007)

Elements	**Market-based innovations**	**Grassroots innovations**
Context	Market economy	Social economy
Driving force	Profit	Social need; ideological
Niche	Market rules are different: tax and subsidies	Values are different: alternative social and cultural expressions enabled within niche
Organizational form	Firms	Diverse range of organizational types: voluntary associations,

Elements	Market-based innovations	Grassroots innovations
		co-ops, informal community groups
Resource base	Income from commercial activity	Grant funding, voluntary input, mutual exchanges, limited commercial activity

A translation of each concept of innovation is attempted into the concept of wastebanks itself. One might easily conclude that, in a glance, wastebanks are grassroots innovations. Wastebanks contain the traits of social economy, not to mention that it appears as a social economy organization. It also believes to carry the importance of social needs and ideology. The unfulfilled social need, in this case is a clean environment, is one of grassroots driver. Incumbent solid waste management system in Makassar might fail some communities, left the communities in an uncomfortable and dirty neighbourhood. Therefore, the grassroots innovations are able to provide a cleaner environment as well as extra income where the regime cannot. Moreover, the wastebanks activists believe ideology that solid waste management is not solely the responsible of the government, but also the citizen by participation. Hence, a bottom-up approach innovation like wastebaks is developed to ensure the involvement of the citizen of Makassar. However, if further examination is conducted, wastebanks might also have the characteristics of market-based innovations (Figure 2.4). Beside the fulfilment of social needs and ideological, wastebanks also profit from commercial activity --its solid waste buy and sell. Even wastebanks also receive grand funding and voluntary input as well as mutual exchange, its operation still depends on the profit each wastebank make.

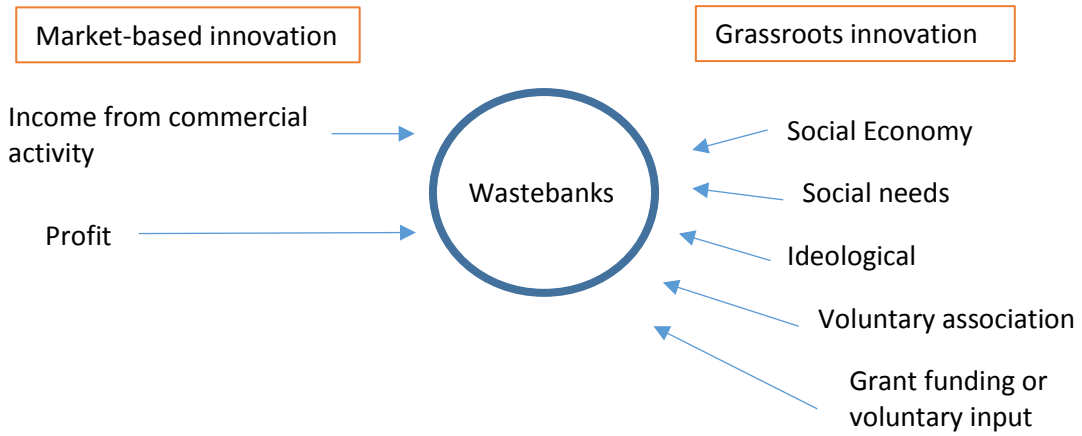

Figure 2.4 Wastebank between the two innovations

Beside grassroots innovation's ability to promote alternative green and progressive value, enable experiments with new system, as well as achieve environment and social sustainability improvements on a small scale; this innovation also face challenges namely securing funding, managing organizational change, making effective links, and diffusing oppositional ideas into wider society (Seyfang & Haxeltine, 2010, 2012).

2.5 Operationalization of the Concepts

Here, the operationalization of the concept is done. The operationalization table (Table 2.3) is divided into two, the operationalization for niche management and for niche diffusion. The concept that is presented in this section is built on several theoretical concepts, namely strategic niche management, conceptual niche management, and niche policy advocacy as mentioned in the previous section. These concepts consist of several elements including network, learning, expectation and protection. This approach is, of course, not an entirely new, but rather a combination of other three already existing concepts. A network is identified as well-built if it is a wide and cohesive network. A wide network of solid waste management involves many actors from inside and outside the niche, for instance, UPTD Bank Sampah (specific task group of government), waste bank manager, waste collector, waste buyer, customer, private sector, NCO/CBO, media, educator, facilitator, politician, informal leader, other local institutions as well as Cleanliness and Public Park Office of Makassar (transporter, landfill actors, etc) Ministry of Environment and Forestry (national level). A cohesive network is defined as a network in which the resource is effectively mobilized. A resource distribution, however, as a result of trust among the actors as they have a good relationship with each other. Thus, this can be seen through several evidence such as the presence of routine meeting, organization related to wastebank, and actors that are actively offer help to support the niche. Second is learning. A successful learning process is reflected in the presence of second order learning and as well as the learning that include sustainable transformation, or does not always include technical experimentation. Next is expectation that is shared and expressed. Moreover, actors shall have expectation which comprises sustainable transformation. And lastly is protection. For the detail of operationalization can be seen is Table 2.3 below.

Table 2.1 The synthesize of the concepts

Concepts	Indicator	Evidences
Niche Management		

Concepts	Indicator	Evidences
Network	Include a wide range variety of actors	1) Existence of actors inside the niche: UPTD Bank Sampah (specific task group of government), waste bank manager, waste collector, waste buyer, customer, private sector, NCO/CBO, media, educator, facilitator, politician, informal leader, other local institutions
		2) Existence of actors outside the niche: Cleanliness and Public Park Office of Makassar (transporter, landfill actors, etc) Ministry of Environment and Forestry (national level)
	The interaction among actors is cohesive	1) Some routine meetings among actors are present, with agenda related to the development of waste bank (Facilitating, sharing expertise and experience, disseminating information, consolidating learning, recruiting new actors)
		2) Organization related to waste bank are present
		3) Actors actively offer help and/or help resource (material, immaterial like legal issue, technical advice) they have to the niche

Concepts	Indicator	Evidences
		4) Actors consider other actors impede/stimulate the growth of waste bank (have disagreement)
Learning	The learning process is broad	1) The learning process not only focusing on techno-economic optimization, but also alignment between the technical and social
	The learning process is reflexive	1) The learning process not only directed as fact but also in terms of change to what best applied in the specific circumstances
	There is experiment(s) take place	1) The existence of new innovations/policy/settings inside the niche
		2) There is an evaluation program regarding those new innovations/policy/settings inside the niche
		3) Learning process is facilitated/supported (training, handbooks, user guides, software)
		4) There is an iterative process of implemented and re-implemented of those new innovations/policy/settings inside the niche
Expectation	Sustainable transformation	1) Actors have expectation which comprise sustainable transformations

Concepts	Indicator	Evidences
	Shared expectations	1) Actors' expectation is not solely for the benefit of themselves, but rather shared expectation for all (Expectation appear to be met amongst actors)
		2) Actor's expectation is realistic in the goal and time manner
	The expectations are expressed	1) There are platform for actors to share or introduce their expectation (Because this might attract new actors)
		2) Actors use this platform to introduce their expectation and actively follow up newly interested/potential actors
Protection	Shielding	1) Emerge programs that might enable the further growth of the niche by protect it, actively or passively (e.g regulation, certain circumstances)
		2) There are actors inside the niche that fully support/lobby it
		3) There are changes inside the niche in order to make the program happen

Concepts	Indicator	Evidences
	Nurturing	1) The program leads the niche to grow by enabling new entrance, enabling learning etc (by evidence)
	Empowerment	1) There is an attempt of alignment with the incumbent regime
		2) There is performance improvement that allow protection to be removed
Niche Diffusion		
Scaling up	Participants increase and develop in size, activity, and impact	Number of waste bank participants, programs, and its effectiveness in reducing solid waste since it was first established in 2008 until now (or the latest year)
Replication	Replication in new location or context multiplies in the number of participants and scale of innovative activity overall	Number of waste bank unit of operation (projects)
Translation	Partial elements of niche ideas are transferred into mainstream context to address regime crisis	There is niche innovation or elements of it which are taken up or adopted in regime context

2.6 Conclusion

In brief, this chapter has reviewed the transition management theory, including multi-level perspective and niche management perspective. The former will help the reader to understand the relationship between regime and niche, as well as to grasp how a transition is allowed. The latter will help gain knowledge on several requirements for a niche in order to make that transition attainable. In the next chapter, a concept of niche diffusion is explored. This is deemed to be necessary to

recognize if the niche is diffused and influence the regime. Finally the concepts have been operationalized by providing indicators and evidence to construct interview topic-lists as well as observation check lists, which will be elaborated further on the methodology section in next chapter.

Chapter 3 Research Methodology

Research, based on Kumar (2014), is developed in a way that logical and rational, encourages the researchers to critically assess a situation as well as progress and test new ways that contribute to the development of the practice. Grinnell (1993) further adds that in order to acquire that, a research methodology is needed which consist of systematic observation, classification and interpretation of data. Therefore, in this part I will try to explain how the concepts will be reflected within the context of waste-bank in Makassar case, logically and rationally. This section consists of general research design, data collection methods, and data analysis methods that I used.

3.1 General Research Design

If we take a look at the objective, this study seeks to understand how wastebanks, as grassroots initiatives do thrive as well as how do they influence the mainstream regime of solid waste management in Makassar. In order to achieve that, I comprehend the context or setting of the participants through visiting this context and gathering data personally. Then, I interpreted the data as well as inductively develop a theory related to niche management from the data collection in the field. Starting from those activities, and also the need of philosophical baseline as mentioned by (Creswell, 2013) to construct a research design, I approach this research from social constructivist worldview. By seeing this research through this lens, I recognize that the meanings are constructed by human as they engage with the world they are interpreting based on their historical and social perspective (Crotty, 1998).

Research philosophical worldview leads to different strategy to inquiry. In this research, I adopt multi-analysis single case study (Yin, 2009) because I aim at in-depth exploring and understanding the present circumstances of wastebanks in Makassar. Consequently, I consider the wastebanks as the unit of analysis. The rationale behind this is that I perceived Makassar, whose wastebank is regarded well developed[1], as a typical case to represent and study niche development of waste bank as a grassroots innovations. Hence, its circumtances and conditions might be informative and wished to be captured to be analyzed. The last but not the least, it is multi-analysis because the case entails several units of analysis following the research questions.

3.2 Data Collection

In this part, I will explain about how I gathered evidence for the case study. Case study evidence can come from many sources, however, the sources of evidence which are discussed here are the ones

[1] Makassar waste bank was the National Pilot Waste Bank for 2015

most commonly used in doing case study: interview, participant observation, direct observation, and documents review. I believe that no single source has a complete benefit over other methods, in fact, the various sources are complementary.

I exerted participant observation method in situation where I believe is advantageous to have an insightful information into interpersonal relationship among actors, such as in meetings, workshops, trainings, or even becoming a customer myself. Direct observation, on the other hand, allow me to be a passive observer in the natural setting of the case itself. I used observation sheet and photograph to help me record the evidences.

I also conduct several semi-structured interviews during the field work and for further use, this interview was recorded. A topic list will be used to guide me. I utilized purposive sampling method for the interview. However, I will also apply snowball sampling method during the field work to complete my source list. The list of my interviewees during the field work is as shown in Annex. All methods of data collection will be undertaken until saturation point is reached.

In order to translate the activities in the field to the concept that is developed in this research, it is essential to open its "blackbox". The guideline on Table 2.3 is derived from first two sub questions in this research. Firstly, how do the all elements of niche management contribute to the development of waste bank as a niche? I operationalized the concepts of five elements of niche management in this research, namely network, learning, expectation, critical learning, and protection by developing several evidences. Secondly, I wish to answer in what state are wastebanks affecting the current regime of solid waste management. The reason behind this question is to reflect the finding in the first question to the diffusion of the niche itself in the regime. By asking both question I want to analyse if a good niche management will ensure a niche diffusion and *vice versa*.

Afterward, I will use the result of this to answer the research question: to what extent do these constituents interlink to each other and how do they help to build the stability or impede the development of the waste bank niche in an analysis manner.

3.3 Data Analysis Methods

Afterward, we can identify data analysis methods in this research based on previous explanation. Based on (Creswell, 2013), qualitative research is an interpretative research which involved multiple forms of qualitative data. Analysing data starts with organizing and prepare the evidence. This involves transcribing interviews, scanning materials, typing up filed notes in order to attain general sense of the evidence. Later, the coding process will be undertaken for detailed analysis. The coding process by ATLAS.ti has generated a description of the situation as well as themes for analysis. The final step

of the analysis part is interpretation of the data. In fact, it might also emerge questions that I had not forseen earlier in the study. (Creswell, 2013) and (Silverman, 2015) explaine that a core activity in qualitative research is coding. Therefore, I used coding to organize collected data into several keywords.

3.4 Scope and limitations

I realize that that this research has several limitations. The first is generalization issue which leads us to external validity. According to (Yin, 2009), generalization is not automatic, hence a theory must be tested by replicating the findings in several sites. In this case, as I use single-case methods of inquiry, I clearly need more research to determine if the findings are applicable to other case. However, according to (Creswell, 2013), qualitative generalization is not always necessary, since this form of inquiry is not to generalize findings to beyond study area, yet to study particular themes developed in context of a specific site. The second challenge is related to construct validity of this research. (Yin, 2009) explains that sometime case study investigator fails to develop sufficiently operational set of measure and that subjective judgment are used to collect the data. This challenge might also be faced in this research; I, as the single observer, will interpret the situation I see in the observation on my own without second observer. Therefore, a triangulation of source is used in this research, including interviews. Moreover, the presence of me as the observer might change the natural event because the object is knowing that they are being studied. As much as I want to examine the natural situation, I will try to be as invisible as possible. The same goes with interview; reflexivity might occur when the interviewee give answer based on what the interviewer wants to hear. Hence, in order to minimize this, I will use multiple source of evidence to triangulate the result.

This research emphasizes on the niche development and how it might affect the incumbent regime. However, I realized that the constituent of multi-level perspective is influencing each other; the window of opportunity in regime might cause by pressure from landscape and niche development might also cause by the regime. Thus, an analysis on to what extent this niche affect the regime will be elaborated (in the sense of niche's scaling up, replication, and transferring that might affect the solid waste management regime). Secondly, this research also focuses only one aspect of regime. To begin with, when we talked about regime, it involves a lot of aspects. In this case, for instance, I will use the solid waste management of Makassar as the regime. The solid waste management regime of Makassar comprises of several elements, namely its policy, its actors, its solid waste management system, and else.

Finally, this research also examines some influences that is exerted by wastebanks, including what I see as a behaviour shift of its customers. However, this thesis will only describe the change from my

point of view as observer, and not going deeper into more behavioural research as presented from behavioural research.

Chapter 4 A Tale of Two: Wastebanks and Solid Waste Management in Makassar

In this chapter, some background information about the practice of wastebanks and solid waste management in Makassar will be provided. This chapter will help the readers to understand the existing condition where this research is conducted.

4.1 Solid Waste Management in Makassar

Makassar, where this research was conducted, is the capital of South Sulawesi province. According to Indonesia Statutes No. 18 (2008), solid waste management is the responsibility of every regional and municipality in Indonesia. The solid waste management, further explained, comprises of two main activities, reducing and waste handling. Waste reducing includes reuse and recycle activities, where waste handling consists of: a) waste separation; b) waste collection from source to landfill; c) waste transportation from source to landfill; d) waste treatment by altering its characterization, composition, and weight; e) waste final processing by discharging the residue to the environment safely.

However, solid waste management in Makassar is facing several challenges. As it is home for 1.4 million people, daily, the city generates 4000 m^3 of waste, whereas the Department of Cleanliness and Public Park of Makassar is only able to handle 3500 m^3 of waste (Mappasere & Idris, 2016). Moreover, the capacity of Tamangapa Antang landfill is only 2800 m^3 per day (Mappasere & Idris, 2016). As the amount of waste generated is parallel with population, it is predicted to keep rising in the incoming years. The second issue is the availability of human resources in the solid waste management system in Makassar (Tasdir, 2016). Tasdir (2016) further elaborated that the man power is not proportional with the workload which resulted in the lateness of waste transportation. The third issue in solid waste management problem in Makassar is the fact that the provided service by the government is not evenly distributed where in some middle-upper class areas receive more attention than low-middle class area (Nurelsan, 2016). Finally, some citizen in Makassar complain about the expensive service cost and sometimes they refuse to pay which leads to uncollected waste (Nurelsan, 2016).

Having seen several solid waste management challenges faced by Makassar, the government of Makassar has undergone several transformation to increase its responsiveness. The first one in a structural change. In the beginning, solid waste management system in Makassar was governed by the Department of Park and Cleanliness of Makassar. However, since 2015, the responsible for waste management is handed over to *kecamatan* and *kelurahan (*Makassar consists of 15 *kecamatans)*,

where the Department of Park and Cleanliness of Makassar is reorganized and diffused into the Environment Agency of Makassar (Agus, personal communication, May 15, 2017). This shift allows several changes in Makassar solid waste management system. The first one is the responsibilities of the involved organizations. When the Department of Park and Cleanliness was responsible for the whole solid waste management system, the organization was in charge of facilitating the infrastructure, coordinating, collecting, transporting, supervising, monitoring, and evaluating the whole system. However, since it was handed over, the responsibilities were divided. The Environmental Agency of Makassar is responsible for supervising and capacity building (Mayor Statute No. 93, 2016), while every *kecamatans* are in charge for coordinating the solid waste management system in their area, including the schedule of waste collection (Mayor Statute No. 113, 2016). In this newly established structure, *kelurahans* play an important role because *kelurahans* are responsible for managing the waste separation, waste collection, waste transportation and waste processing (Mayor Statute No. 115, 2016). In brief, the solid waste management system in Makassar possesses a shorter command of chain. Another change is the budgeting. After the change in the structure, *kecamatans* now receive annual budget from the municipality for cleanliness. The allocation of the budget is left up to every *kecamatan*. Hence, the usage of every *kecamatan* is different. Moreover, the budget given by the municipality also varies in every *kecamatan*, depending on its population and area.

Solid waste issues seem to be a priority for the government of Makassar (Ismail, personal communication, June 5, 2017). It is reflected by some of the Mayor's primary programs which incorporated solid waste management improvements. The government also promotes the importance of public participation in solid waste management system as regulated in The Government Statute No. 81 (2012). The regulation emphasizes that it is an individual responsibility to do waste reducing, waste reusing, and waste recycling, or to put it another way, to do waste management from source. Thus, the load of solid waste in the landfill and solid waste to be treated will reduce.

4.2 Wastebanks in Makassar

In 2009, the first wastebank was established in Makassar. Wastebanks are motivated by the goal of the access of cleaner Makassar through public participation. This innovative activities encourage people to separate their waste, and deposit it to the collector – just like a bank. The amount of the saving can be withdrawn in occasional time. Now, wastebanks have been all over Makassar, mushrooming from one neighbourhood to another, having its internet and mobile version, established with 650 units of operation in schools, prisons, markets, offices. Nationally speaking, wastebanks

manage more than 5000 tons of solid waste per month which equals to 2.4 million Euro per month (Ministry of Environment and Forestry, 2015).

Wastebanks operate in different levels, namely wastebank-units and wastebank-central. Wastebank-units are spread out in many neighbourhoods in Makassar. Every *RW* is encouraged by the municipal government to have one wastebank in their area. However, there cannot be more than one wastebank-unit in one *RW*. Wastebank-units are the heart of wastebanks activities. Every wastebank-unit usually has around 20 – 70 participants (Nurdianza, personal communication, May 18, 2017). Wastebank-units are organized by a board. The board is usually consist of 7 to 10 people depending on the participants that they handled. These people pose as director, secretary, treasury, technical manager, or other division, such as composting and scaling and work in organization. The board members selection is based on voluntary action, yet, the board is formally acknowledge by *kelurahan* as formal organization. Therefore, after the *RW* has agreed upon their wastebank-unit board, the *kelurahan* will issue a decree regarding the wastebank-unit oganization. However, there is no consequence if one member chooses to opt out from the wastebank-unit board member. He/she will be replaced by someone else who voluntarily registers to be board members. Wastebank-units conduct several main activities as shown in Figure 4.1.

Every wastebank-unit customer is encouraged to separate their waste in their home (Ministry of Environment and Forestry Statutes No. 13). The waste is collected from daily household activity, mainly plastic or paper.

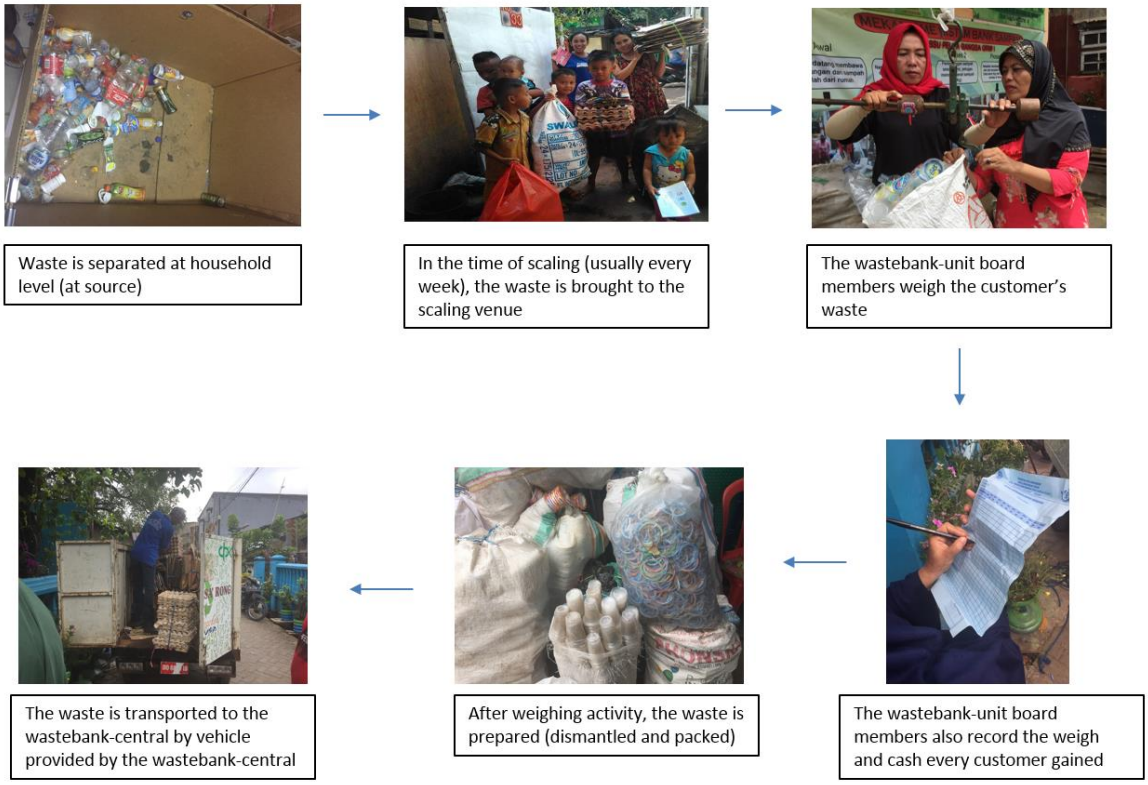

Figure 4.1 Wastebank-unit way of work

After some times, usually a week or two, the wastebank-units will announce for scaling activity. It is observed from the field that the time of scaling activity is different among wastebank-units. Some wastebank-units conduct the scaling once in a week, yet there are also other wastebank-units who conduct it once in a month. In the time of waste scaling, the customers bring their collected and separated waste to the designated place. In most cases, the waste scaling venue is usually the house of one of wastebank-unit board members. The waste is weighed by one of the member, while the other member is making a note of how much money the customer has gained. After weighing activity is finished, the members of the wastebank-unit work together to pack, or sometime dismantle the waste. The waste packing and cleaning are deemed as necessary by several wastebank-units to earn higher selling price in the wastebank-central. Finally, the wastebank-unit informed the wastebank-central to pick up their waste. This can be done by messages or phone calls. However, due to an increase in wastebank-units in Makassar, and vehicle limitation possessed by the wastebank-central, the pick-up waiting time is up-to five days (Dewi, personal communication, May 4, 2017).

Wastebank-central, on the other hand, differs from wastebank-units. Wastebank-central is a governmental organization who reports to Environmental Agency of Makassar. One of the main purpose of wastebank-central is to regulate the waste pricing on the market. Before there was

wastebank-central, watebank-units sold their waste directly to waste pickers or waste vendor. However, many wastebank-units have experienced unstable and unfair pricing system because both waste pickers and waste vendors determine the price with no transparency (Surasmi, May 31, 2017). By establishing price, wastebank-central ensures all wastebank-units to get a stable and comparative price with the market.

Wastebank-central issues the price of the waste to be used by wastebank-units. This price is updated every three months, following the fluctuation of price from waste vendors. To illustrate the pricing mechanism of the waste, I will provide an example. Suppose the wastebank-central issues the price for untreated PET is IDR 3000 per kilogram, and IDR 7000 per kilogram for treated (cleaned and packed) PET. This price is applied when wastebank-units sell their waste to wastebank-central. However, for wastebank-units, they can apply their own price in their area of operation. For example, in wastebank-unit Teratai, the price of untreated PET is IDR 2500 per kilogram, and IDR 6500 per kilogram for PET (Emma, personal communication, May 4, 2017). This price is applied to their customer. Hence, the wastebank-units will gain profits from the waste purchasing from the customer and selling to the wastebank-central. However, different from wastebank-units who benefit from waste trade with their customers, wastebank-central is not allowed to buy waste from the wastebank-units with price lower from the issued price (IDR 3000 in this case), and sell it to the waste vendor with the higher price. The wastebank-central is not profiting from the waste trade.

In the beginning, wastebank central was a cooperative owned by the city of Makassar. However, in 2015, the wastebank-central was reformed as UPTD or regional technical implementation unit under the Environmental Agency of Makassar (Mayor Statutes No. 63, 2014). Albeit the regional expansion in Makassar has led to revision of Mayor Statutes No. 63, (2014) to Mayor Statutes No. 126 (2016), the context of the regulation is more or less the same, including: a) providing infrastructures, facilities for wastebank-units creation; b) promoting coordination with other organization related to practice of waste reduce, reuse, recycle. The wastebank-central transition from a cooperative to a regional technical implementation unit under the Environmental Agency of Makassar, however, entails to a more supportive governmental action. Annually, the wastebank-central is budgeted IDR 3 billion from local government for waste purchasing from wastebank-units (Nasrun, personal communication, May 8, 2017). In total in 2016, the local government of Makassar provided IDR 10 billion for wastebank-central operational as well as waste purchasing (Agus, personal communication, May 15 2017). Wastebank-central employs 40 people, consists of temporary employees and civil servants.

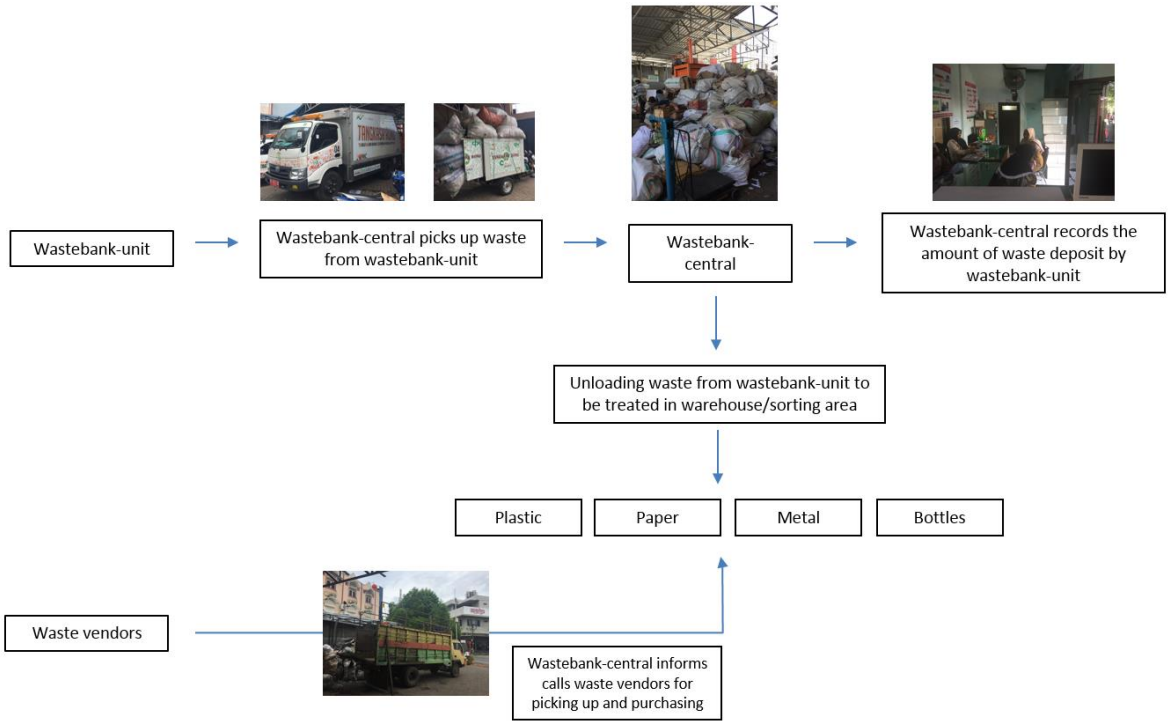

Figure 4.2 Wastebank-central way of work

Wastebank-central has different way of work from wastebank-units. The wastebank-central way of work is as illustrated in Figure 4.2. The waste from wastebank-units is picked up by wastebank-central. Wastebank-central has several type of vehicles for pick up activity, including three-wheeled motorcycle wagons and dump trucks. When the waste is arrived at wastebank-central, the waste is treated (cleaned, classified, and packed). Then, wastebank-central informs their waste-vendors partner to pick up the waste. There are more than 20 types of plastic, 10 types of metal, 8 types of paper, and 6 types of glass that are handled and traded in the wastebank-central. Currently, wastebank-central is in partnership with 5 waste vendors in Makassar, including plastic waste, paper waste, and glass vendors. The waste vendors are a private firm who buy the waste from the wastebank-central and re-sell it to Jakarta and Surabaya.

4.3 Conclusion

This section concludes two things. The first one is the solid waste management system in Makassar is decentralized, meaning that the responsibilities are handed over to every *kecamatan* and *kelurahan*. Every *kecamatan* has various programs to support the goal of cleaner Makassar. In the one hand, this promotes bottom-up approach of solid waste management system, but on the other hand, this might hamper the development of wastebanks if one *kecamatan* does not put wastebanks as their priority program. The second one is wastebanks in Makassar operate in two levels, as wastebank-units and

wastebank-central. Wastebank-central operates under the supervision of Environmental Agency of Makassar, which also governs the solid waste management system in Makassar.

Chapter 5 Niche Management Perspective on Wastebanks in Makassar

5.1 The Role of Wastebanks in Influencing Current Solid Waste Management Regime in Makassar

This chapter will attempt to answer the question on how wastebanks, as grassroots innovations, influence the regime of solid waste management in Makassar.

5.1.1 Niche Diffusion

When talking about grassroots innovations, small local projects may seem almost irrelevant at city or scale above. However, if a conducive niche leads to a large number of them, there is every reason to expect them to have proportionate impact (Church & Elster, 2002). Moreover, favourable key internal niche development processes and external conditions in the regime should make niches able to diffuse their innovative solutions into wider society, affecting, or even replacing the regime. Niches diffuse their innovations and practices along three routes (Seyfang & Haxeltine, 2012). The first one is scaling up, which sees individual projects recruiting more participants and develop in size, activity, and impact. Secondly, replication in a new location or context multiplying the number of participants and scale of innovative activity overall. Lastly, the translation of the whole or partial elements of niche ideas being transferred into mainstream context.

In the wastebanks niche in Makassar, the scaling up and replication process is indisputable. Starting in 2011, now the wastebanks have hundreds of units all across Makassar, “For now in Makassar, there are around 800 wastebank-units, including the one that operates in school and any other governmental offices” (Agus, personal communication, May 15, 2017). Similarly in every unit, the number of participants also increases from time to time. This resulted from the persistence of the board member of wastebank-units, the local NGO (YPN) as well as the municipal government to convene training or meeting which presumably become a platform for recruiting. For instance, in one wastebank unit called Pelita Bangsa which was first established in 2011, “Here, in my wastebank-unit, when I first started I had 7 customers (participants). Thankfully, they keep adding from month to month. Now I have 240 (participants)” (Ros, personal communication, April 13, 2017). Another wastebank unit Bimli, grew from 9 first customers in 2015, to 70 participants in 2017 (Irmawati, personal communication, May 31, 2017).

As the wastebanks in Makassar has shown some evidence of scaling up and replication, its translation into current regime also needs to be examined. As mentioned above, translation can be seen if there is a whole or partial elements of ideas being transferred into mainstream context. In the wastebanks case, the effort to transfer the value can be seen in the attempt of the municipal government of Makassar to develop a new concept of TPS3R. The plan is to implement wastebank's way of work in TPS3R. Except, TPS3R is for organic waste. TPS3R or *Tempat Pengolahan Sampah* (Waste Processing Site) Reduce – Reuse - Recycle is a national program from The Ministry of Public Works of Indonesia aiming at waste reduction, waste treatment, as well as waste recycling. This program is implemented all over Indonesia, however, it is autonomous as the local government has the freedom to govern it. Hence, this focuses on regional scale and the role of the citizen and local government to manage this in the area. In Makassar, there are six TPS3Rs. However, five of them are inactive (Iskandar, personal communication, May 15, 2017). From the interview conducted with TPS3R Daarul Aman, the only TPS3R that is active, a major problem faced by the management is the absence of support from the government and marketplace for fertilizers which are generated from the organic waste composter. "I have to use IDR 5 million extra from my own money every month to cover the operational costs, including the worker's pay check" (Ismail, personal communication, May 20, 2017).

Seeing the difficulties dealt by many TPS3R on the one hand, and the fast growth of wastebanks on the other hand, the Environmental Agency of Makassar will adopt wastebanks' way of work into TPS3R practice. In return, the Environmental Agency of Makassar hopes that TPS3R will have a marketplace to trade the compost by having the government as the main buyer of the compost. "We want the organic waste to be bought by the government, at least, we help them with the marketing by connecting them to potential buyer organization, namely agricultural department. We want to adopt the wastebanks model" (Agus, personal communication, May 15, 2017).

5.1.2 Influencing

Besides an attempt to transfer partial elements of wastebanks to TPS3R, the presence of wastebanks also influences the society in some other ways. The first one is how some people who are involved in wastebanks perceive the economic value of the solid waste. To begin with, the economic motive behind the wastebanks practice is one of the three benefits promoted by the local NGO, together with environmental benefit as the main motive as well as social motive (Ridwan, personal communication May 19, 2017). These motives seem easily caught and understood by most of the wastebanks board of member, as they are the ones who initiate wastebanks in their communities, "Picking up waste from the street does not mean I am crazy. I clean my environment. In fact, what I pick is not waste, it is money." (Intang, personal communication, April 16, 2017). The challenge is, however, how to spread

this at to the rest of the community so that more people will understand the economic value of solid waste. At first, people's first impressions are sceptical. Sulaiman, for example, who told a story about

Figure 5.1 (left) Three buckets to accommodate waste separation system: blue for paper, yellow for inorganic waste, and green for organic waste in Maccini elementary school and (right) A concrete bin to contain dry leaves

when he first introduced a wastebank in his community, "When I was about to organize a meeting related to wastebanks, no one would come. They think it is stupid. They feel like working as waste picker." Yet, continuous efforts were made by different actors, especially wastebank-central and wastebank-units to give understanding to the citizen. "I usually told my customers to, at least, collect the waste and get money from it. Next, for them whose waste is separated and in good condition, I will buy it with higher price. So that they will understand, waste is as traded as any other goods, you get higher price for a better quality goods" (Intang, personal communication, April 16, 2017). In result of that, now, people who are involved in the wastebanks perceived waste as something that has economic value, "In my community, *kecamatan* of Manggala, there is a lot of waste, it is everywhere because it is not recycled. This is money, you know. Why would people step on it?" (Skrening, personal communication, May 19, 2017). However, the consequence is felt by wider community: a cleaner environment for everyone, as told by one of the citizens, "if only I have photographs before all this (referring to the wastebanks). Waste has no value, nobody thinks about that. Now, here, people would get angry if you take someone's garbage out from their yard" (Sulaiman, personal communication, May 31, 2017).

The second way the waste bank is influencing society can be observed in as behavioural and social shifts. One example is the Maccini elementary school (Figure 5.1 (a) and (b)). Musdalifah, as wastebank coordinator as well as a teacher, said that the presence of the wastebank in the school has changed several policies in the school related to the environment "Now the school has multiple-types trash bins, this will help the separation process. Now everyone (in the school) separates their waste". All trash bins in the school have replaced by organic and non-organic bins, which allow all of teachers and

students to participate. From my observation, the students and teachers are also able to distinguish the waste type, hence the waste separation is effective. This can be caused by the education effort conducted by the school related to environment, including waste separation and waste recycling (Musdalifah, personal communication, May 31, 2017).

A shift in how people treating their waste is not only happening in Maccini elementary school, but also in other wastebank-units. For instance in wastebank-unit Bimli, many houses are provided with multiple trash bins in order to separate their waste. “In the community around my wastebank-unit, if you visit the home, they now have at least two types of waste bins. I think that goes the same with any area which has a wastebank in it” (Irmawati, personal communication, May 31, 2017). Even though the multiple trash bins cannot be found in all houses in the vicinity of wastebank-unit Bimli yet, however, for wastebanks’ customers, the bins can be easily found in their residence. Besides a change in how people treating their waste, there is also perception of shift in social aspects as the result of wastebanks influence. “There used to be a lot of housewives and they have no activities. Now, they join us for many trainings such as recycling or just gathering and having fun.” (Ros, personal communication, April 13, 2017). It can be seen that wastebanks activities can be considered as a capacity building for those who live around them and it might bring a lot of benefit for self-development, especially for low income housewives. Moreover, many wastebanks, namely wastebank-unit *Lae-lae, Pelita Bangsa, Pelita Harapan, Bimli, Rempong, and Masagena*, also use some of the profit for the betterment of their community by donating money for several use, such as charity, events or infrastructure repair. Head of *kecamatan* Rapoccini admits, “People here usually stay inside their home at night. That is the culture here. But now, since the street is cleaner, they like to go out, just to sit in front of their house talking with their neighbour”.

Lastly, wastebanks promote inclusiveness and participation in solid waste management in Makassar. (Quick & Feldman, 2011) distinguish inclusion and participation. According to the author, inclusion constantly generate a community involved in defining and addressing public issues, whereas participation focuses on public input on the content of programs and policies. In wastebanks in Makassar, we can find both inclusion and participation. It is clear that participation of the citizen in the solid waste management is the foundation of wastebanks innovation. Solid waste management is no longer a hierarchical system, proceeding commands from the Environmental Agency of Makassar to the street sweepers in the street. The participation is expressed in several ways. One of them is through distribution of resources, which will be elaborated further in this chapter, as well as through active participation in giving suggestions to the ongoing system, especially related to their surrounding area. By joining wastebanks, it gives the citizen more understanding to their environment. An example is shown in one of wastebank-unit, “I suggest my head of *Kelurahan* to place a trash bin in every three

houses" (Fatima, personal communication, May 30, 2017). This exhibits that they who are participate in the wastebanks put more concern on their environment which allow them to address suggestions or critics to the authority. By joining wastebanks, the critics or concerns presentation to the authority can be done easily through several wastebanks forum, which will stimulate public participation even more.

Beside participation, inclusion is also observed. During the development of the wastebanks in Makassar, there was some conflict related to waste competition with the waste picker in some wastebank-units. A waste picker is a person who goes in certain surroundings picking waste to be sold and they consider this as a job. They usually do not belong to any organization hence work individually (Figure 5.2). When wastebank-units started to mushroom in several areas, they felt that their income decreased because of waste competition.

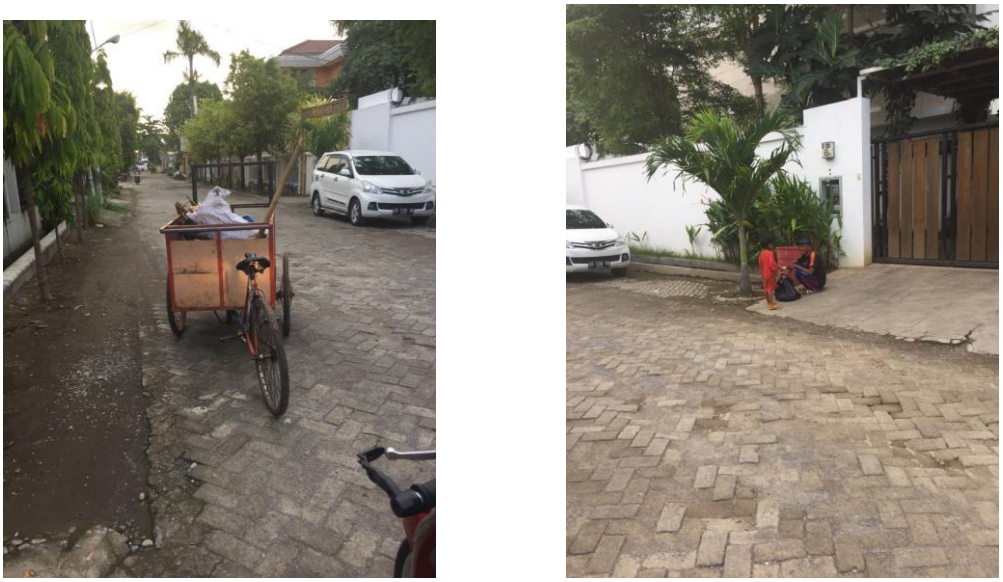

Figure 5.2 (Left) Wagon used by the waste picker to transport the waste and (right) A waste picker seems taking some rests

In order to solve this issue, the Environmental Agency of Makassar sat together with waste-pickers and see an opportunity of joint operation between waste pickers and wastebanks.

"I do not have the heart to see the condition of waste pickers in the landfill. Totally different with wastebanks. We actually hope that those waste pickers can work with the wastebank-units. Several times Environmental Agency had a forum with the waste pickers, sharing about price or goods they trade. However, most of them do not open themselves. In fact, if Environmental Agency knows such information we can help them looking for solution, at least help them about how to treat their waste so that they can get a higher price." (Iskandar, personal communication, May 15, 2017).

Yet, not all waste pickers refrain from participation in waste Banks. For example, waste picker in Lae-lae Island, who turned into a wastebank after being approached by head of *kelurahan,* "I think it was in 2016 when head of *kelurahan* came to me and introduced me to wastebank. My husband is also fisherman, so he usually picked up waste from the ocean. It is better now because all is facilitated" (Rabasiah, personal communication, April 16, 2017). It can be seen that engagement with the waste pickers is still a challenge. Not only because the number of waste pickers to be approached in Makassar is abundant, but also, I perceived, the effort given by the government to approach them is not optimal. The motivation to engage the waste pickers should not be solely to promote the development of wastebank, but also to prevent the waste pickers from losing their primary income. If involving the waste picker is used as a mean to gain more wastebanks clientele, in my opinion, that cannot lead to sustainable transformation. Instead, the wastebanks can be used to promote the waste picker to earn sustainably.

Beside waste pickers, there are also waste vendors involved in waste handling (Figure 5.3). Vendors are the ones who buy solid waste from waste pickers and sell them to Jakarta or Surabaya after certain treatments in their

Figure 5.3 Waste vendor activity while preparing solid waste before shipment

workshop. In fact, the waste that is already in wastebank-central is in equal condition as the waste in waste vendor's workshop. The waste is cleaned, classified, dismantled, and packed, or to put it in another word, it is ready to be directly shipped to Jakarta or Surabaya. It means that it is possible to surpass the vendor and directly sell the waste to Jakarta or Surabaya. However, the wastebank-central together with Environmental Agency committed to not weaken waste vendors, but empower them

instead. Consequently, with the presence of wastebanks, some informal actors of solid waste management, such as waste pickers and waste vendors, who are sometimes overlooked, are now engaged.

5.2 Niche Management Perspective on Wastebanks in Makassar

This chapter will attempt to answer the question on how wastebanks, as grassroots innovations, thrive and make its way to the incumbent regime of solid waste management in Makassar. In order to answer the question, I will assume that the wastebanks are the niche. Then, I apply the concept that has been developed in Chapter 2, niche management perspective, which comprises network building, learning process, actors' expectation, as well as protection given. Consequently, the analysis will be able to indicate how the niche thrives.

5.2.1 Network

Many agree that network building is considered to be important for a niche to grow ((Seyfang & Haxeltine, 2012), (Hatzl, Seebauer, Fleiß, & Posch, 2016), (Schot & Geels, 2008), (Caniëls & Romijn, 2008)). As mentioned before, Schot and Geels (2008) have conditioned a network to be wide and cohesive, meaning it has to engage various voices and views as well as be able to induce resources within the network, in order to facilitate a niche to improve. The result shows that the size of the network of wastebanks niche in Makassar is broad. It manages to gather a large variety of civil society (YPN, the local NGO and motivators), municipal authorities (*RT*, *RW*, *Kelurahan*, *Kecamatan*, Environmental Agency of Makassar), private sector (Unilever Foundation Indonesia, *Bank Rakyat Indonesia* or People's Bank of Indoensia, and *Pegadaian*), solid waste value chain actors (waste pickers, waste handlers, recyclers, TPS3R or waste processing site coordinator) as well as niche actors (wastebank-unit and wastebank-central). It is observed that the network is not limited to waste related actors, rather the network expands reaching out several private actors. In order to attain the impression of the cohesiveness of this network, I will try to examine the interaction of the actor as well as willingness to mobilise resources.

The Interaction of actors

Having a wide variety of actors, yet still working separately, might impede the potential that the network actually have. One way to strengthen the bond among actors is by having platform for the actors to meet. This platform can be a place to learn or sharing experience or even moving resources. In wastebanks niche in Makassar, the interaction among those actors is facilitated. Some routine meetings among actors in different levels are present with various agendas, depending on the goal of

the host. In the smallest level, wastebank-units for instance, many wastebank-units directors have initiated independent meeting to recruit new member, announce new program, or educate the community about wastebanks, waste separation, or waste recycling (Anca, personal communication, May 18, 2017 . The actors that are usually engaged in this level are wastebank-units clientele, wastebanks board members, *RT*, *RW* and *YPN*. Based on observation in the field, the meetings that are held or initiated by the wastebank-units differentiate in two ways. The first one is held and coordinated by the member of the wastebank-unit itself, namely meeting for announcing new

Figure 5.4 (Left) Mr. Anca from YPN is presenting types of waste and (right) A meeting participant is asking question

program, where they independently prepare the material and gather the participants through verbal invitation. The second one is held by the wastebank-units, still, but have the local NGO provided the speaker. This type of meeting is arranged usually when a wastebank-unit needs to recruit new members or having a training. For example, in one learning forum held by wastebank-unit Sapabulo as seen in Figure 5.4. In Figure 5.4 shown a speaker from the local NGO giving lesson about waste separation. The interaction during the meeting was not only one way, or from the local NGO to the participant, but also happened two ways, meaning that there were also feedbacks and suggestions from the participants. Accordingly, that might allow the local NGO to have insight of what happened in the field. Most of these meetings have irregular frequency, depending on the necessity and the initiative of the wastebank-units' board members.

In the bigger scope, *kecamatan* for example, the interaction is managed organizationally. It means that, unlike the meeting that is arranged independently by wastebank-units, forum that is arranged by *kecamatan*, as an authorized organization, has special budget given by the city government annually (Haris, personal communication, June 5, 2017). Every *kecamatan* has the authority, given by

Figure 5.5Training arranged by kecamatan but hosted by the local NGO

Environmental Agency of Makassar, to construct their own learning material. For instance, in *kecamatan* Rappocini they develop several topics for the meeting; the importance of wastebanks, recycling methods, or other government program related to cleanliness. However, the role of *kecamatan* seems to be solely facilitating the meeting, by providing venue, consumption, and proposing the topic. The topic then developed by the local NGO (YPN) until a presentation is generated and addressed to meeting participants. Having said that, it indicates that YPN plays a role as the knowledge resource. Standing next to YPN in the speaker panel is usually speaker from Environmental Agency of Makassar and wastebank-central giving lecture to the participant as shown in Figure 5.5. The participants of this kind of meeting are, however, limited. There can only be one person representative for each *RT*. Consequently, the distribution of knowledge is uneven or even stopped at some point because it really depends on the sense of responsibility of the representatives to deliver the knowledge to their community (Ros, personal communication, April 13, 2017). Beside knowledge distribution issue, actors' interaction platform provided by *kecamatan* is considered unequal among *kecamatan* by several wastebank activists. Wastebank seems not to be the priority for all *kecamatan*, hence it halts the learning process of wastebanks in that *kecamatan*.

Resources Mobilisation by Actors

The development of wastebanks in Makassar is driven by effort and expense invested by the key actors. The first is YPN as local NGO. The main goal of YPN is to bridge the needs of the citizen and the interest of the municipal government. “YPN is in the middle (between citizen and the authorities). YPN has to keep the spirit of the people, as well as connecting what people need to the interest of the government.” (Ridwan, personal communication, April 12, 2017). Many other actors consider YPN as the key actor in development of wastebank in Makassar (Ros, Haryati, Intang, Irmawati, Hafiz, Hukma, Iskandar, Agus, personal communication, May 2017). As described in the previous section, in many wastebank meetings, YPN always becomes the speaker delivering the material. YPN actively offers its resources to be distributed inside the niche, which most of them are in the form of problem solving, knowledge sharing, guidance, and bridging.

One of the example, as told by an interviewee from wastebank-unit Maccini elementary school, is: “We used to have difficulties to separate the plastic cup waste, because it is a lot and unorganized. Then we have discussion with YPN, and YPN came up with this (Figure 5.6) solution.” (Musdalifah, personal communicatin, May 31, 2017). YPN is responsive in answering questions or problems faced by wastebank-units and wastebank-central. The communication to YPN can be done in simple, fast and informal way, for instance through phone calls or messages. Furthermore, YPN also offers real-time solution or a visit. Guidance is also something that is offered by YPN. YPN has a program called motivator program. Through this motivator program, YPN ensures every *kecamatan* is handled by a motivator. This motivator is responsible for weekly visit, monthly reporting, as well as evaluation for every wastebank-unit in the assigned *kecamatan*.

Figure 5.6 Solution offered by YPN to tackle plastic cup storage issue

Second, resource to support wastebank niche in Makassar also issued by private sector. Support varies from financial assistance to capacity building. “We have accepted aid from BRI for 10 wastebank-units, IDR 10 million each. The allocation for the money is up to the board of members. Before the money is given, we surveyed the wastebank-units about their practice to guarantee that the money is used wisely.” (Patriani, personal communication, May 4, 2017). Unilever, on the other hand, does not facilitate the infrastructure of the wastebank. Rather, Unilever promotes capacity building through workshop, meetings or events. Likewise, Unilever also supports the best customer or the best wastebank-unit with Unilever products as a gift. “In my wastebank-unit, there are several programs. We partnered with Unilever so we have now a program called trash for ice cream.” (Ros, personal communication, April 13, 2017). In order to do all this, Unilever works closely with YPN as program implementer of Makassar Green and Clean (MGC). As a matter of fact, Unilever distributes all the resources via YPN. Therefore, Unilever provides YPN with annual operationalization cost. “Unilever encourages community participation and local government to develop wastebanks. As we know, there is no such thing like salary for all the wastebank practitioners, even they use their own resource to build one, hence we understand the need of a solid team and therefore facilitate capacity building.” (Muchtazar, personal communication, May 20, 2017).

Third, wastebank-units are the growth cell of wastebank development in Makassar. With this in mind, the succession of wastebank niche depends on the practice of the wastebank-units. Thus, resources mobilise in wastebank-units level are vital in the development process. One of the most common, yet essential resources given by wastebank-units are spaces. The places are necessary as a storage unit as well as the central for wastebank-unit activity, namely weighting and meeting. However, place is not something that is provided by YPN or Environmental Agency of Makassar. It has to be provided independently by every newly open wastebank-units as a requirement. To cope with this, all communities that have wastebank-unit organize their own space to open one. As an illustration, in wastebank-unit Sukses Abadi (Figure 5.8), just like any other wastebank-unit, they use the front part of one member’s house as the “office”. In other case, in wastebank-unit Teratai, where house “office” is not feasible, the community there utilizes an abandoned bus as the storage and central of its wastebank activity.

Figure 5.6 (left) The "office" of wastebank-unit Sukses Abadi and (right) wastebank-unit Teratai

In many spread areas, most wastebank-units provide a waste pick up service. This resulted from an impression that citizen is too lazy to bring the waste themselves to the weighting site. However, nobody provides the motorcycle for them. Consequently, they use their own vehicles and manage to obtain the fuel independently. Similarly, in wastebank-units that are located in the island, they utilize their own boats to transport the waste to the port. “I use my own boats to transport the waste to the port. Later, the vehicle from wastebank-central will pick my waste up. I also buy the fuel with my own money.” (Rabasiah, personal communication, April 16, 2017). Point often overlooked is that all of these supports from wastebank-units do not come from resourceful actors. They voluntarily offer their resource to the betterment of the development of the wastebanks. “I have an attached space to my home and I use it for my community wastebank-unit. I do not have money, I cannot help with my money, and this is all I can do.” (Ros, personal communication, April 13, 2017). Aside from wastebank-units, wastebank-central also offers resources, namely composters, waste scales, banners, and waste sacks.

5.2.2 Learning Process

The learning process is characterized as one of the constituents for building a thriving niche, both first order, and second order learning. In wastebank niche in Makassar, the learning process can be identified through these two elements, the distribution of knowledge which reflected first order learning, and iterative process of implementation and re implementation, which reflected second order learning.

Distribution of knowledge

Distribution of knowledge can be considered as first order learning. The network organizes learning through meetings and trainings, which often provided by actors, such as YPN and the city government as their form of supporting the niche. The meetings and trainings have become the primary platform for the actors to interact with each other. These trainings cover several topics, such as wastebanks operationalization, composting methods of organic waste, recycling plastics, as well as administration training for wastebanks board members. It focuses on sharing expertise and experience and facilitating learning. However, even though sharing experience and expertise is often incorporated in training materials, in the end of the training YPN always emphasizes that every wastebank-unit has to figure out what works in their specific environment. Besides knowledge spreading through institutionalized channel mentioned above, distribution of knowledge in wastebank niche in Makassar also takes place in the informal form; door-to-door audience. Several actors, mostly motivators or leader of wastebank-units, are committed to spare their time and go to the field to give understanding to their people in their community, or their potential customers. As illustrated in several quotes:

"Since the official decree from *kelurahan* issued about the formation of wastebank-unit in my community, I go door to door to introduce what is wastebank, how it works, and how to join. At the beginning, only few interested, but as the time goes by, I have plenty of customers now." (Ema, personal communication, May 4, 2017).

"I always go to the field and go door to door. Until now, I still am looking for wastebank-unit I have not visited yet." (Razak, personal communication, May 31, 2017).

"I, as a motivator, have to be eager to go to the field, providing guidance and understanding about wastebank." (Sulaiman, personal communication, My 31, 2017).

"There are usually meetings and trainings. But we (the member of wastebank-unit board) also go door to door with the citizen to teach them about waste separation or disseminating new informations regarding wastebank." Irwan, personal communication, April 13, 2017).

Iterative process of implementation and re-implementation

Learning is an experimental process, and failure is the best teacher in life. A success experimental process depends on willingness to learn from failure, because sometimes, fiasco is inevitable. Undergone in like manner by the practice of wastebanks in Makassar, failure is what make them learn.

I use a case from wastebank-unit Pelita Bangsa as an illustration. There, the member of the wastebank-unit does not clean and dismantle the solid waste at the beginning of their practice, hence their selling price in the wastebank-central is quite low. But after being told by the wastebank-central that they might have a higher price if they treat their solid waste beforehand, they now do it and manage to attain higher price as well as higher profit accordingly. “When my wastebank-unit was first established, I followed the practice of other unit. But then we realized that we have to take the good of everything, especially what YPN have said, we learnt, we implemented, and I think now we are the best.” (Ros, personal communication, April 13, 2017). To put it differently, in wastebank-unit Rempong, the learning process acquired from the solid waste weighting experience. At the beginning, the weighting activity is held in the leader of the wastebank-unit’s house. However, only few come bringing their waste. Consequently, their wastebank is almost inactive because the customer decreased day by day. They managed to learn from their mistakes. Now, they use their own motorcycle to pick up solid waste from their customer’s house if the distance is far. “… If the house is far, I come to their house with my motorcycle to pick their waste. Because there still some people who are ashamed when they have to bring trash bag while walking. Our clientele is growing now.” (Dewi, personal communication, May 4, 2017).

The iterative process experienced not only by wastebank-units, as the informal organization, but also by wastebank-central as an established organization. In the beginning, wastebank-central was established as a cooperative. However, this form is considered ill-suited. “When it first established, it was a cooperative. But, many things did not work really well. For example, there was a lot of spending for initial investment and regular investment for the members. Many considered it is so money oriented.” (Surasmi, personal communication, May 31, 2017). Later, the wastebank-central was reformed as UPTD or regional technical implementation unit under the environmental agency of Makassar. Clearly, with this new formation, wastebank-central is intervened by the local government. “I do not understand if there was a local government who does not want to intervene its wastebank innovations in their area. After all, the wastebank and the local government have the same interest, to reduce the solid waste volume.” (Ridwan, personal communication, May 19, 2017). Another example can be taken from wastebank-central is when wastebank-central once faced failure to sell their solid waste. They used to buy *damar* (plastic with category “others” including acrylic, polycarbonate, polyactic fibers, nylon and fiberglass) from wastebank-units. They bought that because waste handler also bought it from them. Unfortunately, waste handlers halted the purchasing of *damar* in short notice. On the other hand, supply of damar from wastebank-units was unstoppable

because the citizen had not got any information about that. Consequently, they are now facing hundreds kilograms of *damar* piling up in their office waiting to be destroyed. The money they used to buy the *damar* from the wastebank-unit cannot be returned. Now, as they learned from their mistake, they make regulation, signed by the department of environment of Makassar, about list of items they accepted as well as the price per kilograms.

Another key point is that an adaptive learning process is present in the case of wastebanks in Makassar. That is to say that all leader of wastebank that I have interviewed realized the importance of taking into account cognition in the implementation of wastebank-units. Being said that, many wastebank-units have different complementary program. For instance, in wastebank-unit Harapan Bangsa, they make use of their location –near a kindergarten, hence they make a program so that parents can pay the kindergarten fee by deposit their solid waste. Likewise, in wastebank-unit Lae-lae in the island of Lae-lae, where the gas supply is limited, the wastebank-unit make a program called "trash to gas" which allow the customer to exchange their solid waste with gas to cook. The adaptive learning process can also be happened collectively. The most compelling evidence to this is that the emergence of wastebank-sectoral in *kecamatan* Tallo and *kecamatan* Rappocini, the only two *kecamatan* that have wastebankk-sectoral. The wastebank-units in the proximity of those *kecamatan* gather resource and establish wastebank-sectoral to solve waiting issue. The underlying reason is that it takes a long time – maximum five days to wait for wastebank-central to pick up their waste. On the other hand, they space is full with continuously incoming waste from their customer.

Additionally, unlike what (Smith & Raven, 2012) explained in his research, in this case, funding constraint does not impede experimentation. In fact, many actors move their own resource to solve the problem. Furthermore, the act of resources withdrawal as a consequence of failure does not occur. This might be caused by the support given is continuous by different parties, coupled with continuous monitoring and evaluation done by YPN. Furthermore, (Verheul & Vergragt, 1995) in Hegger et al., (2007) introduced "social experiments" to classify bottom-up experiments by citizen groups and/or NGOs which are conducting practices outside the institutional structures of firm and government. Hence, the experiments in this niche are not enabled by governmental actors and not evaluated by them either. Moreover, independence is also seen as one factor that contribute to the succession of one's experimentation. The actors that are facing difficulties seems to solve the problem independently, not waiting for resource or help to come. They, in fact, does not hesitate to use their own resource.

5.2.3 Expectation

Expectation management relates to how niches present themselves to external audience, and whether they live up the vision they addressed (Seyfang & Haxeltine, 2012). It is known that for a niche to be able to improve, actor's expectation need to be shared (Hatzl et al., 2016) as well as expressed (Schot & Geels, 2008).

Shared expectation

Actor's expectation in this case is generally divided into two clusters, environment and/or economic motives. In the level of wastebank-units, there are some head of wastebank-units who claim to be in this because of environment reason, "I love my environment more that I love myself. If I love myself more, I will not care with my environment, I will not open this for my community" (Skrening, personal communication, May 19, 2017). Likewise, there is also motive that is based on respect to the government, "…I want to help the government for a cleaner environment, through wastebanks. Wastebanks are the best program. I am in it now because it is my calling, I want Makassar to be clean. Sincere, from my heart. I am only happy if I see the street is clean." (Razak, personal communication, May 31, 2017), as well as religious reason, "… I am old now, I need to do good deeds. In Islam, cleanliness is half the faith they said, this is how I practice it." (Luran, personal communication, April 13, 2017). However, there are also perception of economic motives as the underlying reason, albeit not as the main reason --still attached to an environment background. "When I first heard about wastebanks, I think I should make one for the betterment of my community, for a cleaner environment as well as the economic value of the waste itself."(Intang, personal communication, April 16, 2017), or to illustrate more, "my wastebank-unit failed once. I biked along the alley to collect the waste myself, people said I am crazy. But I have a noble purpose, a least I can reduce the waste and I can benefit from its economic value." (Irmawati, personal communication, May 31, 2017). In wastebank-central, the vision resemblances a two-face coin. In one hand, wastebank-central is committed to reduce the solid waste by accommodating the waste from wastebank-unit through purchasing with the budget given by environment agency of Makassar. However, wastebank-central allows if there is a wastebank-unit who choose to sell their solid waste to waste-picker for certain reason, albeit it means that no income for wastebank-central. Having said that, their ultimate goal perceived as environmental-wise goal. But on the other hand, wastebank-central has to contribute to the regional budget, meaning that they obliged to, at least, return the budget given to them through waste selling. For the governmental actors, environment seems to be the only expectation, since cleanliness becomes one of few priorities in Makassar. On the other hand, for waste value chain actor the expectation based on pure economic motives. Lastly, for private sector, Unilever for instance, the

expectation is sustainability as an act of corporate social responsibility. Economic gain is not pursued for the benefit of the initiative itself, but as a way of contributing to the common good. However, (Kemp et al., 1998), on the other hand, explained that network will be conducive to success when actor's motivations to participate are not centred on short term financial gains.

Expression of Expectation

The expression of expectation are essential as they might provide direction to learning process as well as attract the attention of actors or potential actors (Schot & Geels, 2008). In this case, such expectation are explicitly expressed, both actively and passively. For most of the time, they articulate their ideas through networking activities, namely meetings or training. Sometimes, those meetings can be a platform to introduce expectation or recruit new member. This platform varies from national level, gathering all wastebanks from all over Indonesia, to the level of wastebank-units with door to door audience to introduce their expectation, "I used to be a waste-picker. In 2016, head of my *kelurahan* came and introduced me about wastebank. And here I am now." (Rabasiah, personal communication, April 16, 2017). However, unlike any other organization in this digital era, wastebank's key actor in Makassar does not possess their own website. In fact, website might expand their expectation articulation to a broader world.

Awarding and setting examples can also be considered as the act of passive expression of expectation. Through awarding mechanisms, the key actor, YPN for instance, sets such standard that suits their expectation that the participants, in this case are the wastebank-unita, voluntarily follow. Through this, wastebank-units adjust their expectation to YPN's expectation. Additionally, setting examples silently screams expectation, "I respect my head of lurah. He, with his own hand, picks garbage from the sea. If he has to work during the day, he will clean the street at night. If I do not want to open a wastebank-unit, then it is his failure, I respect him, I do not want that." (Intang, personal communication, April 16, 2017).

5.2.4 Protection

In transition literature, a niche is considered as a protected space where the innovations can develop (Seyfang & Haxeltine, 2012). In this sub chapter, I attempt to explain several protection schemes in wastebanks niche in Makassar.

The first is that the emergence of program that might enable further growth. The aim of this program is to protect the niche, both actively and passively. One example is a regulation made by the major of

Makassar stated that every civil servant in Makassar is recommended to have a wastebank account. This account will be evaluated annually, especially when a civil servant wants to earn a promotion. This regulation specified that every person has to acquire at least 2.5 kilograms solid waste deposited every month. Through this regulation, the government help to encourage more people to be wastebank customer. Another example given is the regulation to incorporate the existence of wastebank in an *RW* as one of key performance indicator. Hence, for an *RW* which has wastebanks, it is possible to get more incentive. Consequently, every head of *RT* will endorse the development of wastebanks in their area. One big step undertaken by the government of Makassar is when the wastebank-central is established. Before that, all wastebank-units sell their solid waste directly to waste pickers, or waste handlers. Consequently, they often feel cheated because sometimes, the pricing and the weighting is not fair, "It is good that now we have wastebank-central. It really helps the development of wastebanks. Before this, a lot of wastebank-units were dead because they cheated by waste picker." (Hamri, personal communication, June 5, 2017). The establishment of wastebank-central has become turning point in the development of wastebank in Makassar, notably with the new pricing regulation. The Environmental Agency of Makassar together with wastebank-central sat together with waste pickers and waste handlers discussing the reasonable price of inorganic waste in the market. Hence, all actors in solid waste value chain have the same understanding and being transparent about the pricing. Being said that, it is seen that there are efforts from the government to allow wastebanks in Makassar to develop further, by allocating their power to recruiting more participants as well as the establishment of wastebank-central that leads to further entrance and learning.

Second, there are attempts to integrate wastebanks with other government's program. BULO, for instance, is a program arranged by the government of Makassar aiming at ensuring food security in a community (Figure 5.9). There is a wastebank-unit, in this case is wastebank-unit Bimli, which put efforts to incorporate both program. It can be seen that by integrating BULO and wastebank, it creates demand for fertilize in one hand, while at the same time supplying the fertilizer from the organic composter in the wastebanks.

Figure 5.7 The practice of BULO in wastebank-unit Bimli. On the pictures are seen the products of the farming (left) chili pepper (right) eggplant

Lastly, there is an attempt from the government to remove some protection scheme of wastebanks, as a result of an improvement in the performance. The department of environment of Makassar plans to shift the status of wastebank-central as regional technical implementation unit to regional public service unit. What does this change entail? As a regional technical implementation unit, wastebank-central is supported by annual budget from the ministry of environment for operationalization. However, if the status change to regional public unit, it means that wastebank-central will only receive budget one time at the beginning as an investment and required to manage it independently for the forthcoming time. However, this is still a proposition. There will be no execution before the latest evaluation of wastebanks performance in Makassar (Agus, personal communication, May 15, 2017). Whether the wastebank-central is ready, that is an intriguing question. Removing protection from the niche can be an act of empowerment, yet if it was miscalculated, it might impede the niche development.

Policy actors also have an important role in the niche development. In Makassar, resources dispensed by governmental actors vary in different level. From the lowest level namely *RT*, *RW* and *kelurahan*, aids often come in the form of administrative support. However, this level is vital because this is where most of the new wastebank-units emerged, “When I first initiated wastebank-unit in my community, RT and RW helped me a lot. They helped me with the completion of wastebank-unit requirements, such as members, organization as well as decree from *kelurahan*.” (Haryati, personal communication, April 15, 2017). Move to the next level, most of the resources distributed by *kecamatan* are divided into two types, namely tools and knowledge. Wastebank-units Lae-lae, Pelita Harapan, and Bimli accepted wagon three wheels motorcycle aids from *kecamatan* in order to ease the transportation of solid waste. In addition, wastebank-unit in Bontomakkio also accepted a leaves grinder to help with

the composting process. However, it is worth noting that all of those resources given are not specifically assigned for wastebank practices, but also coupled with other government program such as composting. Not only tools, *kecamatan* also provided resources in form of exchanging knowledge, like meetings or forum, "Non-financial support provided by *kecamatan* is meetings for every *kelurahan*, we invite wastebank cadre and present about wastebank." (Abdullah, personal communication, June 5, 2017). Nevertheless, these supports are not present in some other *kecamatan*. In *kecamatan* Makasar and Ujung Tanah, motivators agree that wastebank is not considered as priority program, hence it is neglected and undeveloped compare to other *kecamatan*. "I admit it that in *kecamatan* Makasar, support given by the government is lacking. They put other program like Longgar (Green Alley) or BULO (urban farming) before everything else. When I came visit the *kecamatan* office, I present to them the challenge and opportunities of wastebanks in this *kecamatan*, but their response was just an empty promise." (Razak, personal communication, May 31, 2017). In the municipality level, resource given by the Environmental Agency of Makassar in the form of financial assistance. The city of Makassar budgeted IDR 10 billion to buy the solid waste from wastebank-units via wastebank-central. In total, Makassar allocate IDR 10 billion in 2016, and IDR 7 billion in 2017 (Agus, personal communication, May 15, 2017). "As the president of Indonesia's Wastebank Association, I do not find any other region in Indonesia that use their regional development budget to buy solid waste from the citizen, except Makassar." (Ridwan, personal communication, 4 May, 2017).

5.3 Conclusion

In brief, this chapter answers two main questions, on how wastebanks, as grassroots innovations, influence the incumbent regime of solid waste management in Makassar. First, the wastebanks niche in Makassar affect the current regime of solid waste management through two ways. The first one is by transferring its partial elements (way of work) into the regime (TPS3R as national program to reducing waste). The second one is through some shifts in the social and behavioural aspects, and how the community perceives economic value of the waste, which is presumably caused by the wastebanks. While wastebanks might not be necessarily claim credit for all of these shifts, it could certainly capitalize on such mainstream trends by echoing the success marketing associated with them, to reach wider participants

Second, wastebanks in Makassar thrive through a built network whose actors are willing to mobilise their resources into the niche as well as there are platforms for the actors to meet and interact. The network is heterogeneous, engaging various actors from inside and outside the wastebanks niche. However, most of the actors seem to depend on YPN as the local NGO. Besides, first and second order

learning also appears in the niche. The former can be seen in the form of knowledge distribution among wastebanks actors, and the latter can be identified through several experiments took place. Expectation is also important, in this case, the expectations are shared and expressed. Though the motivations are varied (environment and economic), however the actors are in the same vision. There are still some rooms for improvement to express the expectation of wastebanks actors. One of them is through maximize the use of internet. Lastly, protection given to the niche through regulations.

Chapter 6 Conclusion and Discussion

This research has addressed the influence given by wastebanks, as citizen movement, to municipal solid waste management in Makassar. Having presented the result and theoretical framework in previous chapters, Chapter 6 will discuss and conclude the findings based on the theoretical framework. This chapter will be opened by concluding section in 6.1, showing the theoretical and empirical findings. Section 6.2 will discuss my observation regarding the empirical results and reflect on several related theories. And finally, this chapter will be closed by policy recommendation in 6.3 and recommendation for future research in 6.4.

6.1 Answering the Research Questions

6.1.1 Transition Theories to Explain the Development of Wastebanks in Makassar

In order to know the relevant concepts, in chapter 3 of this thesis, an attempt is made to develop the theoretical frameworks to examine the influence of wastebanks, as grassroots innovations, to solid waste management in Makassar. The development is done by building on existing literatures on transition management: the multi-level perspective and niche management. This thesis started with one curiosity: *can wastebanks affect the solid waste management in Indonesia*? As a citizen movement, as well as new initiative whose performance is not yet known, wastebanks need to be protected in order to survive, if not thrive. Such protection can be provided by the niche, or in this research known as wastebanks niche. Four arrangements are identified to be relevant to this context: network, expectation, learning process, and protection. This arrangement is a result of integrating three different headings of niche-based approaches; conceptual niche management, niche policy advocacy, and strategic niche management. The integration of three concepts will, hopefully, perfect critics following each concept. Consequently, a framework to inspect whether the wastebanks niche in Makassar performs the function of social embedding innovation, not only as a protection but also political sphere is elaborated.

Having perceived wastebanks as the niche, this thesis, too, examines wastebanks transition on account of sustainability. Albeit, in the beginning, transition theory is used to explain the transition that is undertaken in the context of technological innovation. Transitions toward sustainability possess several attributes that distinguish them from many transitions, namely this kind of transition is purposive, do not offer financial benefit, and the absence of firm to help pioneering initiative and accelerate breakthrough. The transition is allowed when there are pressures given by the external 'landscape' upon the reigning regime to allow access to 'windows of opportunity' that might be replenished by ground-breaking, sometimes radical innovations, developed in niche spaces. The niche

can link up with the tension in the existing regime, in this case, growing awareness in participatory solid waste management, might provide a chance for the wastebank niche to give alternative and thus assist niche improvement. Although this transition theory offers admissible insights to transition management, it also has some faults. One of the weaknesses is that it has less recognition to the diffusion process. Thus, three elements are built to elaborate how wastebanks, as grassroots innovations, diffuse into the mainstream regime of solid waste management in Makassar through three routes, scaling up, replication, and translation.

6.1.2 Adopted Value of Wastebanks in the Solid Waste Management in Makassar

Wastebanks affect the current solid waste management regime in Makassar along three routes, scaling up, replication, and translation. Wastebank scaling up can be seen from its number of the establishments. Since it first established in 2009, now there are around 800 wastebank-units in Makassar. Moreover, in every wastebank-unit, the number of participants as well as type of programs also increase, which reflect to the process of replication. Translation can also be seen as wastebanks transfer its way of work elements to TPS3R or Waste Processing Site by Reduce Reuse Recycle, a national program held by the Ministry of Public Work. The government of Makassar argues that by implementing the concept of wastebanks, it might solve many problems faced by TPS3R. Besides an attempt to transfer partial elements of wastebank to TPS3R, the presence of wastebank influences the society in several ways, namely economic, behaviour, and social changes. The perception of people, especially who are engaged in wastebanks activity, towards economic value of the solid waste has shifted. People who are not the participant of wastebanks tend to be sceptical with the activity of waste picking. However, once they are introduced to what wastebanks are about and become participant, they perceive solid waste as goods that have economic value. Then, wastebanks are believed to be able to change the behaviour of the participants, mostly are about the possession of multiple types of waste bin for separation. Lastly, the changes in social aspect are also felt by some of the participants, for instance, capacity building for woman or additional income for the community. Lastly, wastebanks promote inclusiveness and participation in solid waste management regime in Makassar, by active participation in giving suggestion about their surrounding area and by engaging waste-pickers to open for joint operation.

6.1.3 The Requirements to be the Thriving Niche

In order to see if wastebanks, as the niche, are able to thrive, four arrangements were examined. The first was its network building. Actors involve in wastebank network are as follows: civil society (YPN and motivators), municipal authorities (RT, RW, *Kelurahan*, *Kecamatan*, DLH, and other SKPDs), private sector (YUI, BRI and Pegadaian), solid waste value chain actors (waste pickers, waste handlers,

recyclers, TPS3R coordinator) as well as niche actors (wastebank-unit and wastebank-central). One way to strengthen the bond among actors is by having a platform for the actors to meet. In wastebanks niche in Makassar, the interaction among those actors is facilitated, with various agenda such as recruiting new member, announcing new program, or educating the community about wastebank, waste separation, or recycling. The meeting can be held in two level, community and municipality, depending on the initiator of the meeting. However, wastebanks seem not to be the priority for all *kecamatans*, hence it halts the learning process of wastebanks in that *kecamatan*. In both type of meeting arrangements (community and municipality) the local NGO (YPN) appears to be the main actor who organizes as well as prepare the material to be presented. Hence, this gives wastebanks the notion of such a high level of dependence on the local NGO.

The network eases resources mobilization by actors. Many actors agree that the local NGO (YPN) is the main player in the wastebanks niche in Makassar. YPN offers problem solving, knowledge sharing, guidance, as well as bridging actors to actors to be distributed inside the niche. Other actors, private sectors for instance, offers financial aids as well as capacity building. The wastebank-central supports the wastebank-units in the form of utilization such as composter, scale, and banner. However, in resources distributed by private actors and wastebank-central, YPN still plays a role; determining which wastebank-unit accepts what, depends on their evaluation. Under this circumstance, it emphasizes that the position of YPN is dominant in wastebank niche in Makassar.

The second, learning process that is undergone by the niche is identified in both first and second order learning through distribution of knowledge, iterative process of implementation and re-implementation and adaptive learning process. The network organizes learning through meetings and training, which often provided by actors, such as YPN and government as their form of supporting the niche. Besides knowledge spreading through institutionalized channels mentioned above, distribution of knowledge in wastebanks niche in Makassar also takes place in the informal form; door-to-door audience. The iterative process of implementation and re-implementation in every level of the actors, from wastebank-units to wastebank-central, proof that they are evolving. An adaptive learning process is also shown in the wastebanks niche. Furthermore, it seems like widely understood by wastebank actors that cognition in the implementation of wastebank-unit is important. However, funding constraint does not impede experimentation. In fact, many actors utilise their own resource to solve the problem. Furthermore, the act of resources withdrawal as a consequence of failure does not occur. This might be caused by the support is given continuously by different parties, coupled with continuous monitoring and evaluation done by YPN.

The third, actors' expectation is shared and expressed. For the governmental actors, environment seems to be the only expectation, since cleanliness becomes one of few priority in Makassar. On the other hand, for waste value chain actors, the expectation based on pure economic motive. Lastly, for private sector, Unilever for instance, the expectation is sustainability as an act of corporate social responsibility. The actors articulate their ideas through networking activities, namely meetings or training in various level, from national to wastebank-units. Those meetings can be a platform to introduce expectation or recruit new member. Awarding and setting examples can also be considered as the act of passive expression of expectation. However, economic gain is not pursued the benefit of the initiative itself, but as a way of contributing to the common good.

Lastly, four protection schemes are identified in Makassar, resource mobilizes by policy actors, the emergence of programs that enable further growth of the niche, attempts to integrate wastebanks with different government's programs, as well as an attempt by the government to remove protection. However, removing protection from the niche can be an act of empowerment, yet if it is miscalculated, it might impede the niche development.

6.1.4 The Interlinkage of Niche Elements

The shared and expressed expectation by wastebanks niche actors attract the attention of actors or potential actors. As the the local NGO and the government often involve other actors outside the niche (private sector, solid waste value chain actors) in many of the meetings, forum, and trainings, they start to live up each other expectation hence their relationship is getting more cohesive. The actors are getting more engaged to the point where the local NGO is able to roust interest of another actors (the government, private sector) to mobilise resource for further development of the wastebanks innovation as well as wastebank-units actors who are willing to put time and money into nurturing and developing the innovations. This kind of network makes a conducive learning environment. The meetings, forum, and trainings as the learning process cost money and requires effort. However, the government are willing to support these learning activities and experimentation because they have high expectation of the future. Likewise, inside the wastebanks niche, it is proven that there is no such thing as the act of resources withdrawal by the Environmental Agency of Makassar as a consequence of failure. In return, positive learning experiences may strengthen the expectation, which in turn, attract more actors to support the niche and as the cycle continues, the actors give protection.

6.2 Discussion

6.2.1 A Dependent Network

Actors and network establish existence to each other mutually. Network consists of actor and an actor cannot take action without network. Actors and network continuously redefine each other, hence one is dependent on the other (Stalder, 1997). In wastebank network in Makassar, the network could be wide and have a lot of niche activities hence it is considered as cohesive. Consequently, the network appears stable and independent. However, I believe, this might be a misconception. As illustrated before in the previous chapter, the local NGO or YPN has a big role in the development of wastebanks in Makassar. It is worth noting that YPN was involved in wastebanks development since the very beginning. Nevertheless, from my observation it appears that the wastebanks network is not independent. Instead, the network is very much dependent on YPN. YPN disseminates knowledge inside the wastebanks niche in meetings or trainings. Albeit the government initiates the forum, YPN is still the one who prepare and present the material. YPN has become a place for every actor in wastebanks niche to ask question or asking problems. YPN is also responsible for distributing aids from other actors to wastebank-units. With so many actors inside and outside the niche rely on YPN, YPN burdens great responsibilities. According to Stalder (1997), the importance of an actor in one network can be acknowledged from the size of the network that can be commanded and the number of actors that can be integrated. Given this definition, it supports the importance of YPN in wastebanks niche in Makassar.

Even though, as mentioned before, dependency among actors is such a nature of a network, I argue that it might imperil the network itself if the responsibility is not distributed evenly. Moreover, if the knowledge is not distributed evenly among the wastebanks main players. Point often overlooked is that every actor inside the wastebanks niche can be replaced by another actor or, in worse case decided to walk out the network. This might be a risk since the relationship between YPN and Environmental Agency of Makassar is partnership. With such dependency to YPN, wastebanks niche development might be threatened if that ever happened. Another key point, the importance of YPN in wastebanks network is not equal to its power. As the greater authority in solid waste management in Makassar, coupled with its ability as policy generator, the agency of environment possesses the biggest power or the decision maker.

However, Stalder (1997) argues that there is no basic difference between a large structure (in this case Environmental Agency of Makassar) and a small actor (noting that YPN is a local NGO with less than ten people working) since an influencing actor depends on the number of other actors that they can influence. Although this may be true, nevertheless, Stalder's statement might not be able to explain a

structural change that will impact other actors inside the network. I will use the Makassar Mayor Election that will be held next year, in 2018, to illustrate. According to an online poll published by Makassar Today (http://makassartoday.com/2016/11/01/polling-pilwali-makassar-2018/), the current mayor of Makassar, is in the third position after two other candidates. Supposing Makassar has a new administration in 2018 while this administration might not support wastebanks, this might cause instability in the network. As elaborated before, I believe that a built network begins with shared and expressed expectation. However, it will be challenging if the expectation of the remaining actors of wastebanks niche does not align with the most powerful actor albeit YPN is able to employ more actors. It might impede the development of wastebanks niche in Makassar.

6.2.2 Protection

As agreed upon many niche scholars, niche acts as a protective space that nurtures innovation until it transforms into form that is competitive and able to influence the regime. In wastebanks niche, protection given by policy actors in several forms as mentioned previously. The purpose of the protection is to successfully introduce this new concept of participatory solid waste management. However, it is important to realize that niche is temporary. Eventually, the protection can be removed and developed competitiveness which enables widespread diffusion. After a period of time, niche protection exposes it to real-world conditions where it should be able to survive. It is worth noting that, once the protected space has performed its function, there needs to be a dismantling of the protecting factors in order that the new technology can be tested by real world conditions (Leromonachou, Potter, & Warren, 2004). There is an attempt by the government of Makassar to remove some protection scheme of wastebanks. The department of environment of Makassar plans to shift the status of wastebank-central as regional technical implementation unit to regional public service unit. Meaning that as a regional technical implementation unit, wastebank-central is supported by annual budget from the ministry of environment for operationalization. However, if the status changes to regional public unit, it means that wastebank-central will only receive budget one time at the beginning as an investment and required to manage it independently for the forthcoming time. I question, *is it ready?*

According to Leromonachou et al., (2004), a niche can be considered set if the protection removal does not permit adverse effect as well as allow the continuation of the niche development. Therefore, some alternative measures are required to find the best suited scenario post-removal with taking into account different areas, political settings, and users. Yet, the government of Makassar argues that there will be an evaluation regarding this matter first before subsequently, the wastebanks will be self-supported. I, too, agree that this evaluation needs to be done. However, I believe that several

alternatives need to be developed by wastebanks actors in such a way so that the niche is able to survive in selection environment.

According to (Smith & Raven, 2012) during the attempt of niche empowerment, it is possible that there will be some actors who are neither wished for more independent niche, nor empowering it. Instead, that niche actors seek to retain the benefit of the protection itself. Even though this phenomenon has not occurred yet, I argue that this phenomenon might happen and will result in halting the development of the niche.

6.2.3 Reflection on Conceptual Framework

Finally, my theoretical framework will be reflected in this part. To begin with, I employ several theories in this research. First, the multi-level perspective. The multi-level perspective, I perceived, is applicable to be implemented in this research. Even though the multi-level perspective is originally developed for a socio-technical innovation, it is still relevant to examine the transition of grassroots innovations, to explain the relationship between the regime and the niche as well as the diffusion of the niche into the regime. The niche based approaches that are used in this thesis are also applicable to be utilized as the niche theories are built on several existing frameworks. Network building, protection, learning process, and expectation are useful to examine the wastebanks niche as a citizen movement. However, (Verbong, Christiaens, Raven, & Balkema, 2010) did a research about strategic niche management in India. They argue that Indian settings are different form traditional geographical field of study for SNM. In my opinion, this situation can also be relevant to Indonesia where this research was undertaken. The authors claim that in original multi-level perspective and niche management theory, there should be a destabilization in regime so that the niche can crack it open and make a window of opportunity. However, in their case, a highly dynamic and unstable regime can also be a barrier for niche development. In Makassar, the regime also can be considered as unstable, especially with the upcoming politic circumstances. Even though it is not yet seen, however, a political destabilization in the regime can halt the wastebanks development. The next framework is the diffusion theory. I apply the diffusion routes of replicating, scaling up and translating developed by Seyfang and Haxeltine for grassroots innovation (2010). However, I find it difficult to translate the terms of “scaling up” and “replicating”. I question *“How many establishments or replications of an innovation so that it will be considered as a diffused niche?”* This framework can only explain grassroots innovation quantitatively. Rather, I believe that it is also necessary to see how many of those replications are truly active or well functioned. Thus, the establishments should not only evaluated through number, but also through its quality.

6.2.4 Policy Recommendations

In this section, I have formulated three policy recommendations that may help the development of wastebanks as participatory solid waste management in Makassar. The first is related to the wastebank network dependence to the local NGO (YPN). It is of great importance that the level of knowledge and understanding among key actors in wastebanks network is evenly distributed. This can be done by holding a training for trainer frequently, in parallel with the usual meeting or training presented by YPN to different community. Moreover, the commitment invested among actors inside the network also need to be levelled. The second one is the actors inside the wastebank network need to find a way so that the wastebanks will not be affected by the incoming mayor election of Makassar. This innovation has to be sustained, noting that its success in and long development. I would suggest that by requiring the establishment of the wastebank-central to be independent of the Environmental Agency of Makassar. In return, the political destabilization that might be caused by the mayor election could be prevented. Finally, I would suggest to develop several scenarios or alternatives to support the proposal of wastebanks empowering. For example by providing financial support, excluding from the initial investment, for the first two years after the protection of wastebank-central is removed. With this financial scheme, it is hoped that even if the wastebank-central could not attain any profit in the first year, it will not directly inactive or out of business. Rather, there is time to try another alternatives that may work.

6.2.5 Recommendations for Future Research

I believe that it will be interesting to see the development of wastebanks in different cities in Indonesia where the government support is absent. This will give a wider insight, to really know how this framework can be implemented in other settings, as well as to gain knowledge on the importance of government in stimulating the citizen initiatives. Finally, since this research has used qualitative approach of social-science to this research to examine the influence of wastebanks to behavioural shift, it will be interesting to see the real effect of wastebank in people's behaviour from a quantitative study with respect to how much waste is really separated.

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Annex

A. Interview List

Informants Cluster	Informant Name	Interview Date	Remarks
Waste Bank Unit	Ros	13-Apr-17	Head of Pelita Bangsa wastebank
	Asrifudin Luran	13-Apr-17	
	Haryati	15-Apr-17	Head of Sapabulo wastebank
	Rabasiah	16-Apr-17	Head of Lae-lae wastebank
	Daeng Intang	16-Apr-17	Head of Lae-lae 2 wastebank
	Dewi	04-May-17	Head of Rempong wastebank
	Emma	04-May-17	Head of Teratai wastebank
	Fatima	30-May-17	Head of Longgar wastebank
	Surasmi	31-May-17	Head of Pelita Harapan wastebank
	Irmawati	31-May-17	Head of Bimli wastebank
	Nia Mandaya	12-Apr-17	Head of Masagena wastebank
	Sulaiman	31-May-17	Head of Adipura wastebank
SKPD	Hj Andi Musdalifah	31-May-17	Teacher of SD Inpres Maccini
	Sinar Alam	20-Apr-17	Head of Pasar Traditional Maricaya
	Patriani dan Erik	04-May-17	Kecamatan Tallo Sectoral Wastebank
	Ali	25-Apr-17	Balai Kota Makassar
City Government	Irwan	13-Apr-17	Head of Kelurahan Bontomakkio
	M. Rizal Zain	18-Apr-17	Head of Cleanliness and Park Division of Kecamatan Mamajang
		04-May-17	Head of Kecamatan Tallo
	Ismail Abdullah	05-Jun-17	Secretary of Kecamatan Rapoccini

Informants Cluster	Informant Name	Interview Date	Remarks
	Haris	05-Jun-17	Head of Cleanliness and Park Division of Kecamatan Rapoccini
	Iskandar dan Agus	15-May-17	Head of Departement of Waste, Hazardous Waste, and Capacity Building and Secretary of DLH
	Hamri	05-Jun-17	Head of Kecamatan Rapoccini
NGO	Saharudin Ridwan	12-Apr-17	Director of Yayasan Peduli Negeri (YPN)
		04-May-17	
		19-May-17	
	Veana	12-Apr-17	Assistant of Environmental Manager of YPN
	Andi Nurdianza	18-May-17	Manager of Environment of YPN
		30-May-17	
Motivator	Abdul Razak	31-May-17	Motivator of Kecamatan Makassar
	Hukma	31-May-17	Motivator of Kecamatan Ujung Tanah
	Ros	31-May-17	Motivator of Kecamatan Rapoccini
	Sulaiman	31-May-17	Motivator of Kecamatan Panakukkang
	Patriani	04-May-17	Motivator of Kecamatan Tallo
Central Wastebank	Nasrun	08-May-17	Head of Central Wastebank of Makassar
	Hafiz	12-May-17	
Waste Vendor	Ade	30-May-17	Agung Paper Vendor
	Wahyu	30-May-17	HPG Plastic Vendor
	Masuri	08-May-17	Plastic Vendor
TPS3R	Ismail	20-May-17	TPS Darul Amam

Informants Cluster	Informant Name	Interview Date	Remarks
Private Sector	Muchtazar	20-May-17	Assistant Manager of Environmental Division Unilever
	Fitri	19-May-17	Pegadaian
Recycler	Skrening	19-May-17	Recycler
	Rosmah	30-May-17	Recycler