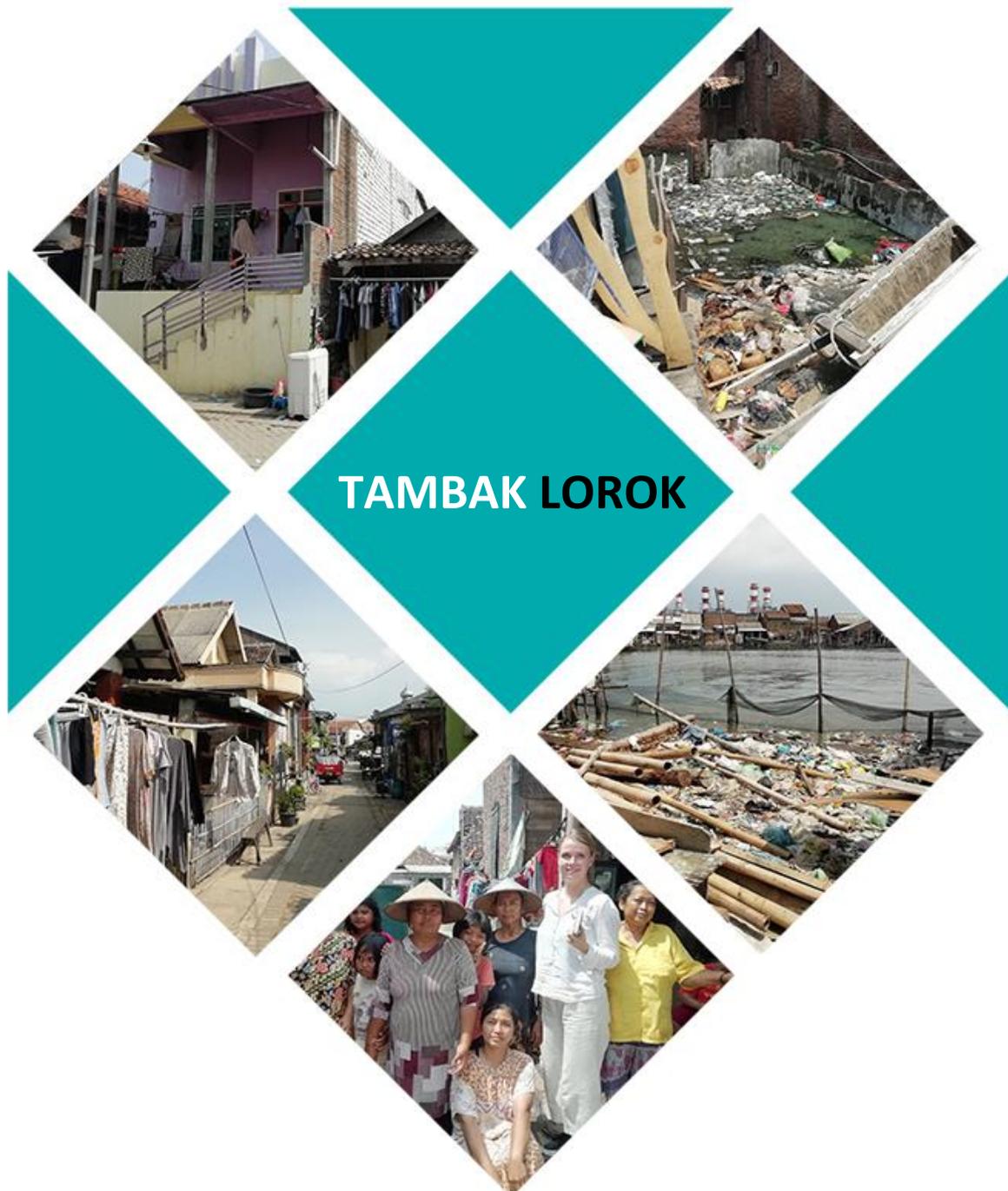


The Locals' Perceptions about Waste as related to the Local Practices of Waste Management.

'Case study: Tambak Lorok Community in Semarang, Central Java.'



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Bachelor Thesis Geography, Planning and Environment

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Preface

Hereby I present you my final version of my bachelor thesis about the locals' perceptions about waste management in Tambak Lorok, Semarang. The topic of this thesis came out of my personal interest in waste management and it sounded as an adventurous opportunity to explore this topic in another context and different culture in Indonesia. In a way, it felt somewhat uncomfortable to discuss waste management issues from a Western ideology with locals in a poorer community, but it was very interesting to get an insight their lives. Doing fieldwork in a local community Semarang has been an amazing experience for me. It was great to meet all these highly friendly people. I would like to thank them for their time and hospitality.

Furthermore, I would like to thank Ms. Sidabalok, Mr. Danardono and Mr. Puji for their enthusiastic support during our research in Semarang. They supported me and my fellow colleagues in the organization of the fieldwork and gave us a warm welcome in a foreign country.

Writing the report was definitely not easy for me. There, I would like to thank my supervisor Lothar Smith for his flexibility, patience and coaching. Futhermore, I would like to thank my roommates for support during my struggle of writing the report and some of my friends for checking my texts.

I would like to give special thanks to Dito, who was my translator during the fieldwork in Tambak Lorok. He and his friend Rena supported us when necessary and made us feel at home in a place so far away from it. Not only I would like to thank them for their unconditional support but especially for all the fun and interesting conversations about the differences in our cultures. Without Dito the journey would not have been the same and I am honoured to leave Indonesia and be able to call him my friend.

Last but not least, I would like to thank my fellow colleagues who joined me to this adventure in Indonesia. Not only for the supportive brainstorm sessions regarding the fieldwork, but especially for being a great company during our trip in Indonesia.

Thank you all for the great memories!

Summary

The local government of Semarang is facing difficulties with Municipal Solid Waste Management (MSWM). To improve MSWM there is a need for more facilities for waste collection and a better collaboration with local communities. However, the local government has only limited financial resources to invest in MSWM facilities. In addition, even if the government invests in such facilities it does not always result in better waste collection, due to lacking citizen participation.

Tambak Lorok, a community in Semarang, is an example of this situation. It is characterized as a poor, low-educated and dense urban area at the harbour. Despite the availability of waste management facilities Tambak Lorok, a major part of the waste is still not being collected properly but is illegally being disposed via dumping or burning waste. This has negative consequences for human health, the liveability of the area and causes environmental pollution.

Re-organizing local waste management in communities requires a certain degree of individual and collective involvement in the local waste management by residents of the community. Multiple factors seem to influence citizen participation in waste management. At first, the availability of physical resources and arrangements for a pick-up service influences the options locals have to dispose their waste. Second, locals' limited environmental awareness, due to low education, and limited know-how to dispose waste or arrange waste management in combination with locals' limited financial resources and social factors seems to influence their willingness to participate in Waste Management (WM). Therefore, citizen participation depends on the availability of local resources in the community and how locals' perceptions of their situation and their resources influences their attitude towards WM. From the local government's perspective, there appears to be too little capacity to facilitate all communities and increase environmental awareness through education. Besides, it appeared that local low-cost solutions are often more successful in poor livelihoods than plans designed from higher authority levels, since they enable to meet the local needs and suit the daily routines.

In order to increase citizen participation in local waste management in Tambak Lorok in Semarang, there is a need for a better local understanding of the situation and social complexity of local practices of waste management. This can be deduced from how locals perceive their situation. Therefore, the aim of this research is to contribute to the understanding of locals' perceptions about waste and waste management in order to identify opportunities and barriers for improvement.

To achieve this goal, the following central question is answered:

‘What are the locals’ perceptions about waste and waste management in the community Tambak Lorok in Semarang, and what are barriers and opportunities for improvement?’

Key concepts in exploring the influential factors of waste management via locals’ perception are: 1) Motivations for certain waste disposal behaviour 2) Attitude towards (changing) waste management 3) Degree of awareness about waste management and consequences of waste disposal behaviour.

Theoretical concepts have been used in order to analyse and explain the local practices of waste management. Starting with the Sustainable Livelihood Approach, which is a research framework for an integrated analysis of poor livelihood practices and strategies with the available local assets. Aspects of this framework completed with the structuration theory, which is about how societies develop about time and the role of perception. Regarding the social livelihood assets, the following two specific social concepts have been explained in more detail: ‘Sense of Ownership’ and the ‘Sense of Community’.

During the fieldwork, data has been gathered in order to find answers to the main question. Therefore, the local practices of waste management have been observed in Tambak Lorok and semi-structured interviewed have been conducted with locals in Tambak Lorok, including the head of the community. In order to put the locals’ perceptions in perspective, also two experts have been interviewed. In total fifteen interviews have been conducted. During the different stages of fieldwork and after the fieldwork, the interviews have been analysed on the basis of the Sustainable livelihood framework and other social concepts.

In Tambak Lorok, two areas RT1-5 and RT6-9 have been visited, of which only RT1-5 was facilitated with trash cans and a transport service. Part of the waste in RT1-5 appeared to be collected with these facilities. Still, the majority of respondents in this area explained to burn their waste, dump it in the ocean or, more often, dump their dry-waste on empty fields in the living area. Three main causes have been found for why locals practice this waste disposal behaviour, namely the shortage of facilities for locals to dispose their waste, the limited capabilities by the local government to collect the waste in local communities in general and because the dumping of waste is perceived as beneficial by locals in Tambak Lorok.

Locals’ positive attitude towards dumping of waste on empty fields can be explained by a combination of factors. Locals are forced to upraise their property to protect their homes against the floods which are caused by a rising sea level and land subsidence. Since locals have only limited financial resources, they rather perceive dry-waste as a valuable asset in their livelihood strategies instead of as a problem. The trade-off locals make seems to be influenced by their limited awareness

about the long-term consequences for human health and environment and due to their short-term focus in their livelihood strategies.

Still, a major part of the respondents explained to prefer to have better waste management facilities, since they are often visually disturbed by the trash as it gets spread across the streets in case of heavy weather or when it smells, which is often caused by wet-waste. Even though locals perceive the residents of the community themselves as responsible to organise better waste management. However, only little actions are taken due to a low Sense of Ownership due to their limited awareness and perceived other options based on their livelihood resources and a local vulnerability. These are the main barriers regarding the improvement of local waste management.

Even though not all respondents perceived a Sense of Urgency to improve local waste management, they tended to be willing to participate in and pay for waste management. This was explained by their strong Sense of Community. This increases their willingness to make personal sacrifices for something of which they would not find that important themselves.

However, even in case awareness would be increased by means of education, the availability of facilities for WM would be expanded and everyone in the community would be involved actively, locals in Tambak Lorok will still have the (financial) incentive to dump their waste on the empty fields. In case the local government prefers to collect all collect all the waste of Tambak Lorok, locals will also need an alternative for foundation material to upraise their property.

Since the expansion of facilities, organisation of education and alternatives for foundation material would require a lot of organisation, time and money, a local low-cost alternative solution is suggested in the recommendation. Namely, to investigate whether dry-waste could stay in the community and could keep being used as foundation material for their houses. Then however, in a way which is ensured to be a safe construction and guarantee that trash will not be spread over the whole area and in the sea in case of heavy weather. This would meet the local needs and could be a process based learning process to increase awareness about waste management, instead of organising education.

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1. Introduction

For a long time Semarang, as the capital city of the Central Java Province in Indonesia, is having a difficulty with managing solid waste in the municipality. Just like other developing countries, Semarang is coping with a strong population growth and a rapid urbanization pace (Hadi & Buchori, 2018). This growth, combined with the rising prosperity and domination of industrialization in the last couple of decades, has resulted in an increased pressure on the environment and the quality of life in and around the city (Supriyadi, Kriwoken & Birley, 2000).

Besides, with the advent of industrial developments not only the total volume of waste has drastically increased, the composition of the municipal waste has also changed (Supriyadi, Kriwoken & Birley, 2000). The major amount still is organic waste, but solid waste from households nowadays also consists of a highly increased amount of plastics and metals. These materials need to be processed properly, because they will not degrade naturally like organic material would (UNFCCC, 2010). The final disposal of waste by using landfills is still the most common method for processing waste in Indonesia (Supriyadi, Kriwoken & Birley, 2000). However, most landfills in Indonesia have reached its limits while waste keeps coming. Pollution in and around cities increases, since society and the waste management system are not used to cope with such increasing amounts of non-degradable solid waste.

Waste management (WM) is understood as the controlling and financing of disposing and processing of waste streams (Wilson, 2007). For many years, Indonesian municipalities have been trying to improve their Municipal Solid Waste Management (MSWM) system. Unfortunately, many of these attempts did not result in long-term success. According to Supriyadi, Kriwoken & Birley (2000) one of the reasons for this failure of MSWM reforms is that these new systems are often based on technologies of Western societies. Western incineration systems for processing waste by burning it, for example, are expensive systems compared to landfills.

Whereas Western countries impose taxes on household waste to finance their waste management programs, Indonesian programs rely heavily on subsidies from the government (Supriyadi, Kriwoken & Birley, 2000). Often, there is a payment like a tipping fee for the dump truck that collects waste. However, these payments are not always well-organised and are surely not enough to finance the entire system. Without continuous financial support from the government, it is difficult for local governments to maintain these expensive new waste systems.

The deficient organisational structures in waste management are the second cause for the failure of investments in waste management systems and facilities, like trash cans and dump trucks.

Such systems are often centrally organised and lack proper collaboration with local communities, which results in difficulties for the collection of waste. Communities in Indonesia are officially recognized sub-units within the municipality. Most of the time, they have their own way of functioning and their own responsibility for arranging the local practices of waste management (Mongkolnchaiarunya, 2005). This makes it difficult for the local government to control all the municipal solid waste and to dispose it properly.

1.1. Project Framework

1.1.1. Municipal Solid Waste management in Semarang

According to the Solid Waste Management Master Plan for the City of Semarang, a major part of municipal solid waste in the communities is collected, but only 65% is actually properly disposed at the landfill (Kristiansen & Skaaja, 2018). Only a small fraction is estimated to be recycled locally by, for example, handcrafting items. The remaining waste is either being dumped locally at a Temporary Disposal Site (TPS) or illegally disposed. A TPS is a registered temporary disposal site or transfer station, often arranged by the government with transport service. Illegal waste disposal can be either the burning of waste or uncontrolled dumping of trash in the city, forestry, ravines, drainage canals or waterways like rivers and the sea. As a result, litter is spread in and around the city and both legal TPS' (registered) and illegal TPS' (unregistered) arise.

The uncontrolled dumping and burning of waste in this research is defined as undesired waste disposal behaviour, since they have major consequences for human health, the natural ecosystems and biodiversity (Kristiansen & Skaaja, 2018). Waste in the city becomes a source of disease vectors, causes air pollution and leads to an unpleasant smell (Parameswari et al. 2014). In a literature review about the health effects in relation to residence near waste sites, Vrijheid (2000) concluded that it is difficult to measure direct exposure effects. However, she did find "an increased prevalence of self-reported health symptoms such as fatigue, sleepiness and headaches among residents near waste sites" (Vrijheid, 2000). Frequent exposure to the smoke of burning waste can even result in chronic heart and lung diseases and premature deaths (Lal, 2008). Often, poor or minority areas as community or powerless areas within communities are more frequently exposed to such effects (Vrijheid, 2000; Gerrard, 1993). Such undesired waste practices are often driven towards more vulnerable groups who are not empowered enough to resist against (Not-In-My-Back-Yard-effect) the raise of such dumping sites near their residential areas (Gerrard, 1993). Therefore, deficient waste management systems are likely to lead to socio-environmental injustice.

1.1.2. Community Participation

To make MSWM in Semarang more successful, the local government aims to process as much waste as possible in a responsible manner and to limit the consequences for people and environment (Kristiansen & Skaaja, 2018). Therefore, they invest in the expansion of the MSWM-system, but they do not have sufficient technological and financial resources to adequately facilitate all communities (Kristiansen & Skaaja, 2018). In addition, it appears that investments by the government in waste management facilities like trash cans and dump trucks, not always result in success due to the lack of citizen participation (Supriyadi, Kriwoken & Birley, 2000). However, according to Sekito et al. (2013), communities will need to organize themselves better in order to maintain the liveability of their environment.

According to Sudarmadi (2001), re-organizing local waste management in communities requires a certain degree of individual and collective involvement in local waste management by residents of the community. Therefore, there is a need for readiness to change behaviour. It is possible that people unintentionally show undesired waste disposal behaviour or do not know how to change their waste practices. In that case, they do not have the right tools and information to adjust their waste disposal behaviour. Another option is that people consciously choose not to participate in local WM (Sudarmadi, 2001).

Research to waste disposal behaviour in communities in Semarang concluded that the willingness by residents to participate in local WM depends on attitudes people have towards WM. Attitudes in turn are influenced by awareness (Sekito, 2012; Sudarmadi, 2001). Awareness is the degree of knowledge about and attention, concern and sensitivity of the people towards environmental problems (McHenry, 1992; Soukhanov, 1992). According to Sudarmadi et al. (2001), residents of poor communities in Indonesia often seem to be not fully aware about the situation of their living environment and consequences of their actions. Awareness can be either a result of education or by social experiences (Sekito, 2013; Sudarmadi, 2001; Mongkolnchaiarunya, 2005).

According to philosopher Merleau-Ponty (1962), people make sense of their world by interpreting their situation based on their knowledge and experiences they have inherited from the past. This interpretation is defined as a perception. Perceptions differ from person to person. It can be the case that one does perceive a certain waste practices as problematic, while another does not, due to their differences in earlier experiences. Based on their perceptions, people will make choices for certain waste disposal behaviour and will form a certain attitude towards waste and participation in waste management (Bear & Brown, 2012; Sekito, 2012; Sudarmadi, 2001). To explain the lack of participation, it is necessary to understand the choices locals make based on their perception. Therefore, this research focuses on the locals' perceptions about waste and waste management.

Based on these perceptions, it can be explained why local practices of WM proceed as they do and what the barriers or opportunities are for making local WM more successful.

1.2. Research Location

The research area is the community called 'Tambak Lorok' in Tanjungmas as sub-district of Semarang in Central Java, Indonesia. It is located close to the coastline and nearby the Banger River. Because of this economic geographical location, it is a typical fishing-town. The vast majority of the employed population is fisherman, fish processor or fish trader. The area has about 10.000 inhabitants spread over 46,8 hectares. The population density near the harbour is around 750 inhabitants per hectare (HVR PC, 2016). Mr. Puji was our local contact during the fieldwork. He works for LUPBTN, an organisation that supports farmers and fisherman, and is therefore well-known in Tambak Lorok. He explained that most of the people are quite poor and overall education level is low (Puji, personal communication, April 20, 2018). He explained that this area partly is provided with a pick-up service for waste, but even the areas with this pick-up service are having problems with waste management. Still waste is being burned on the streets or dumped in the ocean empty fields near houses. It is not clear what the main problem is regarding the waste management facilities or why local residents of Tambak Lorok in Semarang do not show the desired waste disposal behaviour.



Figure 1: Location of research Area Tambak Lorok in Semarang, Indonesia. Source: Google Maps.

1.3. Research Relevance

1.3.1. Scientific Relevance

Research conducted in Semarang (Sekito et al., 2013) and Jakarta (Sudarmadi et al., 2001) in Indonesia, both found a correlation between level of education and the willingness to cooperate in waste disposal actions like source separation. In areas with higher educated people, attitudes towards waste management are more positive and show a higher willingness to participate in, for example, waste separation (Sekito, 2013). However, according to Sudarmadi (2001), factors like social experiences, public attitudes and mass media also play a major role in attitudes towards waste management.

Both studies used quantitative methods to investigate the factors that influence local waste management and participation of local residents in communities. It is possible to quantify relevant resources that influence waste management in the community. For example, by measuring education, the degree of awareness, average wages, the amount of trash cans, the frequency of the pick-up service and social aspects like monthly gatherings etcetera. Research often uses these quantitative methods to investigate significance of relationships between those kinds of factors. Such approaches, however, fail to address how residents in poor communities specifically motivate their waste disposal behaviour or how locals explain their perceptions regarding the local practices of waste management.

According to a case study about Community Based Waste Management in Thailand, precisely this understanding of the local situation is needed to be able to increase citizen participation and to find local solutions (Mongkolnchaiarunya, 2005). Therefore, this study aims to gain a broad understanding about the different factors that play a role in local practices of waste management, specifically in Tambak Lorok. This is done by means of an in-depth analysis of the locals' perceptions about waste and waste management in the community Tambak Lorok. This qualitative in-depth analysis of locals' perceptions will contribute to the, so far mainly quantitative, existing knowledge about the perception of local waste management by residents of a poor community.

1.3.2. Social Relevance

According to Mongkolnchaiarunya (2005), local solutions are often more successful than plans as designed from higher authority levels, since this is more likely to meet the local needs fit in the local routines. In addition, local solutions can be highly effective and sometimes even cost saving. The community in the Thailand Case by Mongkolnchaiarunya (2005) (Appendix 1), for example, managed

to organize a low-cost trading mechanism locally regarding the collection of valuable waste. He argues that solid waste management projects in poor areas are more likely to be successful when they require as little financial resources as possible. Furthermore, during the project they gradually succeeded in improving residents' awareness about and attitudes towards waste management, despite their low level of education. In addition, it ensured community empowerment through self-reliance, and less dependence between the government and the community on waste management. This is exactly what Semarang and its communities like Tambak Lorok seem to need.

The results of this research can be useful for the different actors like the local government of Semarang, community leaders, organizations or other individuals who are committed to waste management and environmental education. However, the findings of this research are specifically bounded to the situation and local practices of Tambak Lorok. Thereby, the concrete results of this research will particularly be relevant for improving waste management in Tambak Lorok or could only be generalized to comparable situations. This research is primarily intended as an exploratory study as a stepping stone for follow-up research, that would investigate concrete solutions for Tambak Lorok. However, especially the approach of this research can be very useful for other research and local governments who are aim to improve MSWM and the active involvement of local communities.

1.3. Research Objective

Thus far, I outlined the issues regarding MSWM and community participation in Semarang. This shows that the government currently does not have the capacity to provide all communities with proper waste management. In addition, even when the government does invest in facilities for local waste management, it does not guarantee success. This also appears to be the case in Tambak Lorok.

To be able to improve local waste management at the community level in Tambak Lorok in Semarang, there is a need for a better local understanding of the situation and social complexity of local practices of waste management. This can be deduced from the perception of local residents. Therefore, the main objective of this research is as follows:

To contribute to the understanding of locals' perceptions about waste and waste management in order to identify opportunities and barriers for improvement.

To achieve this goal, the following central question is answered:

'What are locals' perceptions about waste and waste management in the community Tambak Lorok in Semarang, and what are barriers and opportunities for improvement?'

The central question is divided into the following sub-questions:

1. What are the local practices of waste management in the community Tambak Lorok in Semarang?
2. What are locals' perceptions about waste and waste management in the community Tambak Lorok in Semarang?
3. What are barriers and opportunities for changing local practices of waste management in Tambak Lorok, Semarang?

Key concepts in measuring locals' perceptions are: 1) Motivations for certain waste disposal behaviour. 2) Attitude towards (changing) waste management. 3) Degree of awareness about waste management and consequences of waste disposal behaviour.

By answering these sub-questions, this research provides a broad view of the local practices of waste management in Tambak Lorok in Semarang and explains how certain factors play a role in waste disposal behaviour.

1.5. Research Framework

In examining the research questions, this research will be carried out in multiple stages that guide this research. In the first phase of this research, existing literature has been explored about changing social practices and the factors that influence livelihoods strategies in poor communities. This forms the theoretical basis for this research. Based on that, the research methods have been designed. The second phase was to go into the field for observations and conducting the semi-structured interviews. After the first phase of fieldwork, the first results have been analysed and compared with the literature. Based on that, methods for the following phases of fieldwork have been refined. The third phase was to extensively analyse results from the fieldwork. Therefore, the interviews have been transcribed and analysed by using codes. Codes have been determined by the theoretical framework and have developed further during the analysis. During the analysis, theories have been refined in order to be able to explain the results. The last phase was to formulate the main findings and final conclusions in order to answer the main question. This is illustrated by figure 2.

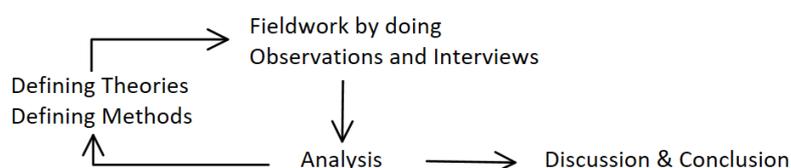


Figure 2: The four phases of research.

2. Theoretical Framework

The Sustainable Livelihood Approach (SLA) is a research framework which is useful for getting a broad understanding of a local phenomenon like waste management (Serrat, 2010). It is an integrated approach for analysing poor livelihoods within a clear framework and consists of multiple layers of analysis. Instead of highlighting the poor living conditions, the SLA focuses on the empowerment of local capabilities. Thus, how residents in poor communities could improve their livelihood practices and strategies with the available local assets instead of increasing the dependency on other actors like the government. The different levels of analysis in the SLA are shown in figure 3.

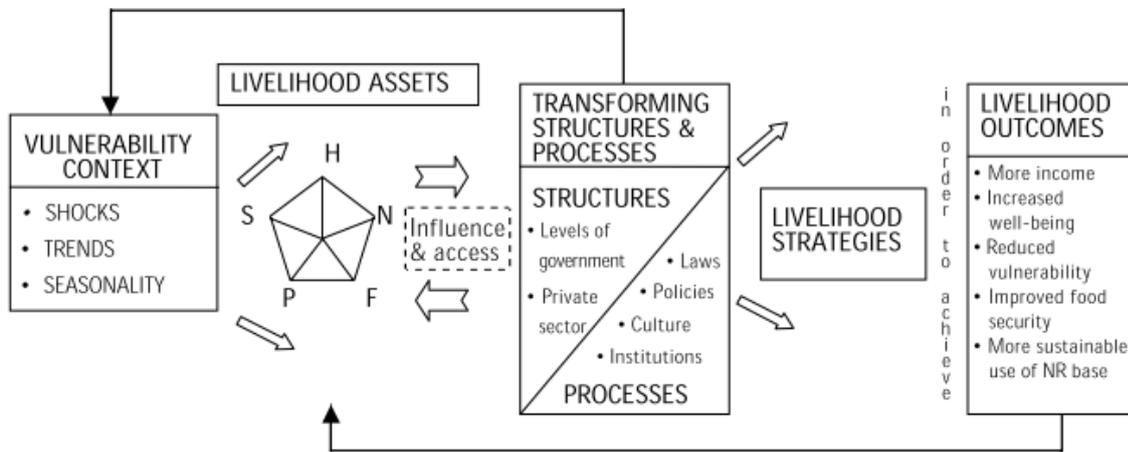


Figure 3: Sustainable Livelihoods Framework. Source: Dall (2017).

This chapter describes the steps of the SLA as explained by Serrat (2010). In addition, each part is completed with theories of social theorists Giddens [b. 1938] and Bourdieu [1930-2002]. Their theories about explaining societies are closely related to the approach of the SLA and thus give more content to the framework.

The first section below describes the analysis of structures and processes in a livelihood phenomenon like local waste management. This is completed with the structuration theory about how societies develop about time from Giddens [b. 1938] and Bourdieu [1930-2002] as described by Inglis & Thorpe (2012). The paragraph that follows, explains the central role of livelihood assets in the SLA. These livelihood assets overlap with the capitals as described by Bourdieu and are therefore combined.

2.1. Transforming Structures and Processes

In applying the Sustainable Livelihood Approach, the local practices of a phenomenon will be analysed based on structures and processes that influence livelihood strategies (Serrat, 2010). Starting with structures created by private, public or governmental organizations that influence local practices and affects local livelihoods. These structures can be functions like delivering services or setting and implementing policies. Processes are social norms, un-official agreements and official laws that determine the way of functioning of structures. These processes either stimulate or restrict people in choice they make. The last element of the framework is about vulnerabilities a community is facing. These can be seasonal insecurities, societal trends or shocks like diseases, floods or droughts (Serrat, 2010).

2.1.1. Theory of Structuration

During the twentieth century many explanations have been given about how societies are made and remade over time. Two main contrasting theories are the Objectivists and Subjectivists point of view. Objectivists' in social theory, for example, mainly focus on how individual actions and interactions with others are being guided by the social system in which they function (Inglis & Thorpe, 2012). From the objectivist' point of view, social forces, institutions and structures enforce a certain behaviour and people continue acting and thinking the way they did before. Therefore, the social system keeps reproducing itself. On the contrary, Subjectivists' emphasize that people change the way they act and think and, therefore, are able to change the social system. Hereby, they over-privilege the power of individual action and transformation above the influence of broader social influences and social reproduction (Inglis & Thorpe, 2012). From the structuralism perspective, it is argued that a combination of both viewpoints is necessary in order to get an overall understanding of local practices. Therefore, this theory stresses the importance of acknowledging the mutual influence between societal structures and individual actions with their interactions with others (Schatzki, 1997). Therefore, structuration theory is about:

“How people both create and are created by social order, and how the interacting activities of individuals leads to both social reproduction and transformation” (Inglis & Thorpe, 2012 p. 209).

Anthony Giddens [b. 1938] and Pierre Bourdieu [1930-2002] are considered as the best-known theorists, who both avoided dividing 'structures' and 'actions'. They preferred to focus on 'practices' as routinized daily activities. This research focuses on 'practices', since this term encompasses the whole of both, social structures in society and individual actions (Inglis & Thorpe, 2012). From the structuralism perspective, the organization of waste management can be seen as a structure which is

shaped by the people who designed it and make use of it. The other way around, this structure again shapes the behaviour of people who use the system and the way people think about waste management in general.

2.1.2. Structure and Agency

According to Giddens (1984), changing structures like waste management depends on the individuals in these structures. He sees individuals as '*agents of change*'. He describes human beings as 'knowledgeable agents' who are able to reflect on and respond to situations in social practices. In most situations people act on the basis of '*taken-for-granted-knowledge*' where they know the rules how to behave, like in daily routines. Still, agents are able to make choices and influence the situation they are in by intervening, even without being fully aware (Inglis & Thorpe, 2012). Furthermore, Giddens (1984) explains that humans both create and recreate social structures over time. At the same time their actions are influenced by previous and existing structures. This continuous process of mutual influence between agents and structures in social interaction is called: '*The duality of structure*' (Giddens, 1984).

This research aims to get a broad understanding of these 'practices' by analysing the structures and processes in local waste management and how local residents in Tambak Lorok motivate decisions they make in their waste disposal behaviour. This understanding enables this research to search for how certain routines might be changed in order to improve local waste management.

2.2. Livelihood Assets

According to Giddens (1983) agents in social practices not only build on what they have learned in earlier practices, but also upon resources and materials inherited from the past. Bourdieu (1983) describes these resources as capitals that can either empower or limit agents in getting things done. These capitals overlap with the livelihood assets of the Sustainable Livelihood Approach (SLA).

In his structuration theory, Bourdieu distinguishes three types of capital: economic, cultural and social. In the SLA-framework, a convenient distinction is made by splitting economic capital into physical- and financial capital (Serrat, 2010). It is not only about the availability of resources, but also about how people deal with these resources. According to the interpretation of Bourdieu, physical possessions can have both, a cultural or economic value. Therefore, physical resources and economic capital are strongly related, since financial resources can be exchanged for physical resources. However, it is assumed that people deal differently with physical resources with an economic value than with actual money. Therefore, it is chosen to analyse them separately and explain the relation

between the two afterwards. Furthermore, natural capital in the SLA-framework is described as the environmental state and services like resources as land, water, forestry and wildlife (Serrat, 2010). The analysis of these factors appeared to be sufficiently covered in the description of the local practices and the vulnerability. Therefore, it is decided to focus on analysing four capitals with the following definitions:

- **Physical Capital** refers to *'infrastructure (transport, roads, vehicles, secure shelter and buildings, water supply and sanitation, energy, communications), tools and technology (tools and equipment for production, seed, fertilizer, pesticides, traditional technology)'* (Serrat, 2010).
- **Financial Capital** are directly related to the possessions and flows of monetary resources like *'savings, credit and debt (formal, informal), remittances, pensions, wages'* (Serrat, 2010).
- **Human Capital** corresponds to Bourdieu's description of Cultural Capital and refers to *"the amount of socially recognized prestige attached to a person's various practices"* (Bourdieu, 1983). This refers to knowledge, education, mastery of language and accents or to the physical state regarding health, skills and capacity to work (embodied state). Furthermore, it can be about official qualifications like education and career status (institutionalized state) or material possessions that have a cultural value, like clothing (objectified state) (Inglis & Thorpe, 2012).
- **Social Capital** refers to the social connections an individual has with others in social network. How many people you know and specifically who you know influences an individual's power in the field (Inglis & Thorpe, 2012). The social connections can be in the form of *'patronage, neighbourhoods, kinship, relations of trust and mutual understanding and support, formal and informal groups, shared values and behaviours, common rules and sanctions, collective representation, mechanisms for participation in decision making, leadership'* (Serrat, 2010).

The different capitals are strongly interrelated and determines the power position of an individual in the 'field'. Especially financial capital is strongly interrelated with the other two types of capital, since high economic capital can contribute to the development of human and social capital. The capitals as livelihood assets influence behaviour and choices that people make in their daily life (Inglis & Thorpe, 2012).

2.2.1. Locals' Perceptions of Assets in the Local Practices of Waste Management.

The way individuals deal with their livelihood resources depends on how they interpret their situation, their resources and how they decide to use their resources. In Merleau-Ponty's (1962) theory about understanding the world, he emphasizes the importance of perception in local

practices. Just like Giddens (1984) and Bourdieu (1983), he argues that behaviour and thinking patterns of people depends on that specific situation and previous experiences of that person. Relevant for this research about Merleau-Ponty's (1962) theory is his description about that interpretations of a situation differs from person to person.

Individuals' perceptions about waste management and their motivation for certain waste disposal behaviour gives an impression how locals evaluate their local set of resources. This will generate a broader understanding of the local practices of waste management. Analysing these different factors via perception, therefore, helps to get an understanding of trade-off decisions local people make in their daily livelihood strategies (Serrat, 2010).

The multilevel approach for analysing livelihoods helps to get an understanding of the complexity of features and structures that influence livelihood practices (Serrat, 2010). The combination of macro- and micro perspective, instead of a narrow focus on a specific location, enables this research to grasp the content of the overall context of the phenomenon. Furthermore, the multilevel approach of the Sustainable Livelihood Approach makes it possible to develop a broader view, than solely focusing on one specific or several sector(s). In addition, it goes beyond quantitatively measuring resources with analysis of why people deal the way with resources as they do. This broad understanding with qualitative data makes it possible to identify the constraining and enhancing factors for livelihood developments like waste management and to search for local solutions that actually fit in society and result in success. Therefore, this framework and the supporting literature about social concepts are used for the analysis of local practices of waste management as phenomenon in the community Tambak Lorok in Semarang.

2.3. The Sense of Ownership

Before operationalizing the features of the Sustainable Livelihood Approach, some concepts regarding social capital require some further explanation. Therefore, this chapter describes the social concepts 'Sense of Ownership' and 'Sense of Community'.

According to Bear and Brown (2012) the Sense of Ownership is about the extent to which individuals think they have or would like to have control over a certain situation. Whether or not they will take actions depends on an individuals' perceived Sense of Urgency and Sense of Responsibility. The degree of knowledge and awareness about a phenomenon influences how people perceive a situation. Based on that, people do or do not see a need for change and, therefore, perceive a low Sense of Urgency. The Sense of Responsibility is about whether individuals see themselves as responsible to control the situation and feel empowered enough to take action (Zorpas & Lasaridi, 2013).

It can be the case, that one does perceive a high Sense of Urgency for change, but does not feel empowered enough to take action, due to their limited resources or knowledge how to use their resources. If someone considers one selves as responsible and able to take action, the absence of actions can again be explained by the lack of awareness that causes a low Sense of Urgency due to their unawareness about their situation and its risks (Bear & Brown, 2012). Therefore, they do not perceive their situation as problematic as others could. This low Sense of Urgency often results in a low willing to make personal sacrifices or will have a low Sense of Responsibility. The steps as explained below illustrate the considerations that an individual can ask one selves. Considerations answered by 'Yes' are likely to lead to the following consideration. A final no 'No' is likely to result in no actions.

Based upon my knowledge and experiences, do I perceive this phenomenon as a problem?

- Do I perceive it as urgent enough to change the situation of this phenomenon? Yes or no?
- Do I feel responsible and empowered enough to take action myself? Yes or No?
 - Am I willing to make personal sacrifices to take action, Yes or No?
 - Am I willing to participate or change my behaviour if another takes control, Yes or no?

The sense of responsibility is not necessarily a result of awareness. It can also be influenced by social factors, for example, out of a sense of satisfaction, obligation, guilt or embarrassment. In that case, decisions for behaviour depends on behaviour of others in the social network and social norms (Bear & Brown, 2012). This influence is in line with the social concept 'Sense of Community', which is about whether individuals have the feeling of being part of a social group and whether they do or do not feel strongly connector with this group. As defined by Rovai (2002):

“a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together.”

Even if an individual perceives no Sense of Urgency for a certain change, they are still likely to be willing to make personal sacrifices for the common interest, in case they feel strongly connected to the group.

In short, the Sense of Ownership and Sense of Community influences whether individuals will take actions, whether they will be willing to participate in or organise better waste management.

2.4. Operationalization

This paragraph will operationalize the explained theoretical concepts into the perspective of waste management in local communities. Starting with the structures and processes, which refer to the role of the government community in local waste management. Such roles can be described by the strategies, agreements and routinized practices regarding final disposal, transportation and the local collection or disposal of waste in the community.

- **Physical Capital** refers to the available physical resources to dispose their waste like trash cans, containers, dump trucks or local dumping sites. A shortage of facilities gives locals few other options than illegal disposal.
- **Financial Capital** can refer to the financial possibilities and locals' willingness to pay for waste management services and physical facilities. The amount of financial capital can enable or disable people to invest in better waste management facilities and education. Another aspect that plays a role in Financial Capital are financial incentives that stimulate certain waste disposal behaviour.
- **Human Capital** in waste management is most often about the degree of environmental awareness and knowledge about how to organise waste management or dispose waste. This can either be obtained by education or social experiences. Furthermore, it can refer to the physical ability of individuals to transport trash.
- **Social Capital** is about social institutions and networks that influence waste disposal behaviour of individuals and organisations that are related to waste management. This can refer to different aspects. For example, whether the topic of waste management is accessible for discussion among residents and between resident and the community leader. Another option is whether individuals dare to correct someone else's waste disposal behaviour. More important, will a discussion have impact? At last, the social network can also influence the equality of the distribution of other resources.

The described capitals form the set resources in a livelihood. How locals' perceive a situation depends on how they perceive their resources. This influences whether they perceive a sense of urgency for improving waste management, and whether they feel empowered enough and responsible to take action for it. These perceptions influences locals' attitude towards waste and waste management, thus, whether individuals are willing to participate in waste management or will attempt to improve local waste management. This willingness to participate is about whether people are willing to make personal sacrifices for waste management. For example, to change their

behaviour or to pay for waste management services and facilities. These influences are illustrated by figure 4.

In particular, the degree of awareness influences the perception of the impact and risks of locals' waste disposal behaviour and whether they perceive a Sense of Urgency to change their practices of waste management. Furthermore, the relations among members in the social network of a community influences their Sense of community which can increase locals' willingness to participate in waste management for the common good.

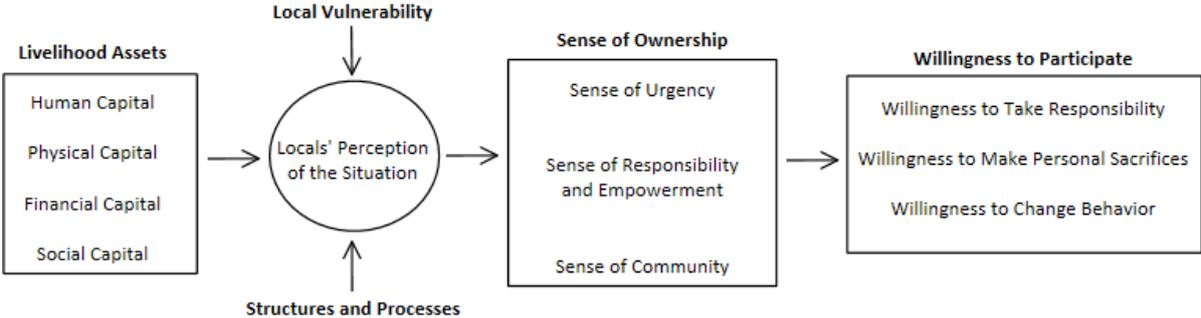


Figure 4: Operationalisation scheme regarding locals' perception of the situation and their willingness to participate.

3. Methodology

This chapter describes the applied strategy of this research strategy and used methods for data collection and analysis. First, the research strategy illustrates the type of research there has been used and why. The strategy for data collection defines what type of data there has been gathered and how. The research material goes into detail about the research questions and what has been done in order to find answers on research questions. Then. The last section will describe the practical the methods are described for how data has been processed.

3.1. Research Strategy

The goal of this research is to gain an in-depth understanding of social practices in local waste management in the community Tambak Lorok, which is located in Semarang, Indonesia. To understand these social practices, this research will explore the perception of waste management by local residents in Tambak Lorok. This research has a qualitative approach, because this method is most suitable for reconstructing the meanings that people assign to reality in order to understand their actions and thus social practices (Wester, 1991;1995). Using a quantitative approach would make it difficult to get this subjective perspective of motivations for behaviour, which is necessary in order to find answers on the research questions.

A case study is chosen as research strategy, because it makes it possible to analyse different influencing factors on a specific phenomenon into more detail. Four other research strategies as described by Verschuren & Doorewaard (2007) are; survey, experiment, grounded theory and desktop research. The aim of this research is not to develop a new theory, as how it would in using grounded theory (Cresswell, 2007), but to gain more in-depth knowledge about that what has been investigated in other research. The different factors that play a role in local waste practices could have been tested with a survey. However, a case study is more appropriate for getting this in-depth understanding of processes. Especially for discovering why processes occur as they do. In contrast to experiments and desktop research, a case study is more suitable for exploring real-life situations (Vennix, 2016).

Local practices of waste management are a phenomenon in which different kinds of features play a role. According to Scholz (2011) an embedded case study is most appropriate to describe and, thereafter, analyse these different features and processes. By analysing sub-units within a case it is possible to get a broad understanding of the overall context of a human and environmental system as phenomenon. Therefore, it is chosen to analyse different subunits. Not only local residents, but

also the head of the community and locals who are active in finding more environmental friendly uses of trash. The main focus is to get an in-depth understanding of local practices of waste management in Tambak Lorok as specific situation, while keeping in mind that local practices are influenced by external factors and processes. Therefore, this analysis mainly focuses on the perception of local practices from the perspective of local residents in Tambak Lorok, but also includes some outer-perspectives from an environmental scientist and a governmental actor. In this way this research attempts to provide an overall understanding of influencing factors of local practices of waste management in the community Tambak Lorok.

3.2. Strategy for Collecting Data

The first part of data collection is mainly about gathering background information about the phenomenon of waste management and local practices in Indonesia. Therefore, literature research has been done in order to identify difficulties Indonesia is facing and has experienced before regarding waste management. Furthermore, it is used to explore the factors that play a role in local practices of waste management. This first data analysis forms the theoretical basis of this research which has been used to determine the focus and methods that have been used to find answers on the research question. Little accurate information was available online about local waste management in communities in Semarang. For that reason, I have already contacted our local contact person who is also expert in the field of waste management. She helped us with refining methods and finding a suitable location for doing the actual fieldwork.

The second and biggest part of data collection is gathered in the field by doing observations and interviews. I have chosen to do semi-structured interviews where just several main-questions have been prepared in advance. This helps to stay close to the topic, more than with unstructured interviews. At the same time it gives much more flexibility in the conversation than with structured interviews, leaving room for the respondent to tell his story and without sending us too much to a certain answer. After the first observations and interviews results have been quickly analysed. Before going back into the field, there has been reflected upon what has been done in order to refine the approach for getting proper results. Not only during the fieldwork, but also during the following phases of analysis this constant process of reflection has been repeated. This interim reflection and repetition is called an iterative process (Vennix, 2016) and is of great importance for a nuanced qualitative research.

During the iterations of different phases of data collection and analysis the empirical results have been compared with some theoretical concepts to be able to explain certain results (Vennix, 2016).

This comparison of empirical results with theoretical concepts during the process of doing research gives this research an inductive-iterative character (Bryman, 2008). Furthermore, triangulation has been applied by using of data from different sources like Literature review, observations, individual interviews and group interviews. When both empirical and theoretical results from different sources have a similar argumentation, this increases the validity of the research.

Due to lack of time for the fieldwork and research as a whole, the applied method is not suitable for generalizing results to the entire population in Tambak Lorok, as is explained the limitations, in chapter 8. Yet, it is used as an indication for the total population and the situation in Tambak Lorok, with the advice for a more extensive follow-up research before practically anything is done with the research in the community.

3.3. Research Methods

This paragraph describes the motivation for the research questions and methods that are used to answer them. It explains what data that has been used, which research objects have been approached and what questions have been asked. The interview guide that has been used during the interviews can be found in Appendix 2. This interview guide provided the basis structure of the interviews. However, the literally asked questions are improvised on the basis of answers provided by respondents and what seemed to be relevant for further explanation.

What are the local practices of waste management in the community Tambak Lorok in Semarang?

The answer to this question provides background information about the current structures and processes of waste management in Tambak Lorok. It is rather descriptive in order to get a view of the community system and waste practices. This has been explored by doing observations in the area and by asking community to describe their daily routines of waste disposal. They have been asked about the organisational structures or social agreements regarding local waste management. In addition, a governmental actor and environmental scientists as experts in the field of waste management have been asked about the current strategy of MSWN by the local Government of Semarang and how they currently collaborate with local communities.

What are the perceptions of waste and waste management by residents of the community Tambak Lorok in Semarang?

This question provides a detailed insight into the locals' perceptions of waste and waste management. The results regarding this question will be a description of how locals' explain their local practices of waste management. Therefore, residents were asked to motivate their waste disposal behaviour compared to any other options they have. Their attitude has been measured by asking them to motivate their opinion about the current practices and its organisation. Furthermore, they have been asked to motivate attitude towards changing these practices and who they perceive to be responsible for this. Based on these on these arguments in their motivations and based on what them is asked directly about it, a description is given about their awareness regarding waste management and it the consequences of their disposal behaviour. In de conclusion, local's perceptions of waste and waste management are analysed and explained by interpretation and comparison with the literature. This explanation from literature will bring this research to a higher level and more abstract level of scientific research and enables this research provide a better understanding of this perception.

What are barriers and opportunities for changing local practices of waste management in Tambak Lorok, Semarang?

This question provides an insight in the barriers and opportunities for changing local practices of waste management in Tambak Lorok. Based on the analysis of the perceptions, it will be determined what the most influential factors are of local practices of waste management, how these factors interrelate and, finally, how these factors form a barrier or possible opportunity for changing local practices of waste management. To put locals' perceptions in perspective, also experts have been asked about their perception of MSWM, local waste management in communities and how they think this could be improved.

Conclusions as derived from the last two sub-questions will give answer to the central question:

What are the perceptions of waste and waste management of residents in the community Tambak Lorok in Semarang, and what are barriers and opportunities for improvement?

3.4. Applied Methods During the Fieldwork

The research area for this research is the community Tambak Lorok in Tanjungmas as sub-district of Semarang in Central Java, Indonesia. As explained in paragraph 1.2, Tambak Lorok is a typical poor community with a dense population where is attempted to introduce waste management, but is still facing difficulties with waste management. This area has been chosen with the help of Ms. Sidabalok as expert in the field of waste management and our contact person from UNIKA, which is the local university in Semarang. She was familiar with the situation of waste management in this area and helped us with finding local contacts. In advance, Ms. Sidabalok has send some pictures about the area where it is visible that trash is getting dumped on empty fields close to residential areas (figure 5) and that even the cattle is grazing in between the trash (figure 6).



Figure 5: Trash dumped on an empty field near the residential area (Source: Ms. Sidabalok).



Figure 6: Grazing goats in-between the trash in Tambak Lorok (Source: Ms. Sidabalok).

The next step to actually go into the field for observations and doing interviews together with Dito our translator from UNIKA. Ms. Sidabalok arranged that Dito, a student from UNIKA, joined us during the fieldwork for doing the translation during the interviews with local residents. Most of the respondents in Tambak Lorok only speak Javanese or Indonesian, therefore translation was required.

3.4.1. Day 1 in Tambak Lorok

The first respondent was arranged in advance via Ms. Sidabalok. She was living in Tambak Lorok, but we have met her in another district where she is active in group of woman who collect waste. The goal was to learn more about the local context of waste management, difficulties communities are facing and what terms locals use when they talk about waste management. Straight after that we went to Tambak Lorok and started with doing the observations and interviews. The translator explained that every 20 houses in an alley is called an Rukun Tetangga administrative area, or RT for short. Every RT is marked with a number, so there is RT1, RT2 and so on. The area that has been

visited is the harbour part of Tambak Lorok and can be divided into two sub-areas: RT1-5 with a pick-up service for waste and RT6-9 without any form of waste management.

RT1-5 has been chosen on the advice of our local contact person Mr. Puji and Ms. Sidabalok as expert in the field of waste management. Finding respondents by using the judgement of an expert is called purposive sampling (Ishak, 2014). This helped us with finding respondents in a population that would be hard for us to reach. We had decided to walk through this area and address one person or group of people at their home in each street. After three interviews in this area it was chosen to stop interviewing more residents but to reflect on these interviews first. These interviews namely were rather short on the advice of the translator and we had our doubts whether the content of these first interviews were detailed enough to be able to draw conclusions on. We did decide to interview the head of the community before going home in order to get his perspective on the situation of local waste management. After some revision at home we decided to change some questions and to inform the translator about the necessity of longer interviews and that repetition in answers from respondents actually is useful for translation.

3.4.2. Day 2 in Tambak Lorok

During the next part of fieldwork we had planned to do all the interviews in RT1-5. After three interviews, we came to the conclusion we kept getting similar answers from respondents. Thereupon, we concluded we had reached the saturation point of new data for this area. For that reason we have chosen to expand the research area to RT6-9 where there was no waste management in that area, to find some new perspectives. The intention was to have roughly the same number of respondents per area, in order to be able to make statements about possible differences and similarities between the areas. Except for one respondent who reused coffee packaging in handcrafted bags, there were surprisingly many similarities between RT1-5 and RT6-9. Therefore, we decided to have enough data because the saturation point of sampling was achieved. The list of respondents can be found in Appendix 3.

The last part of the fieldwork consists of doing interviews with experts. In advance there already has been contact with Ms. Sidabalok which gave us some insights. However, doing the actual interview with Ms. Sidabalok gave us the opportunity to get new perspectives and verify results from the fieldwork at the same time. In a follow-up research we would prefer to do an expert interview in-between the two moments fieldwork in Tambak Lorok in order to verify the first results and reflect on it together with an expert. Unfortunately, it did not succeed to plan it like this. Furthermore, Ms. Sidabalok did give us the opportunity to plan an interview with Mr. Saptigori from the Environmental

Protection of Semarang. Therefore, we managed to get the perspective from both: a governmental actor and environmental scientists as experts in the field of waste management.

The fieldwork has been executed in the period between the 2nd of April and the 9th of May.

3.5. Method for Processing Data

This paragraph will the steps in what way the data has been processed. At first, observations have been done by viewing the area via Google maps, taking pictures in the field and by watching while walking through the area. People in pictures always gave permission for making photos. The interviews have been recorded by phone. In advance, every respondent has been asked permission for recording. In-between the days of fieldwork data has been roughly analysed by reading the written notes during the interviews and the listening back the voice records. Eventually all voice records have been transcribed in Microsoft office word. The transcripts are somewhat difficult to read because of the multiple language barriers between the respondents, the translator and interviewer. Therefore, I have chosen to summarize every transcript to make it a coherent argumentation. The process from reading transcripts and adjusting the summaries has been repeated a couple times to prevent losing valuable information and to exclude interpretation as good as possible.

After transcribing and coding the analysis could start. ATLAS.ti 8 has been used in order to code the transcripts and organize argumentation from respondents. Not the transcripts but the summaries have been coded, since this was a more clear text. During coding the transcripts have been used in order to check argumentations and to collect the most important quotes to refer to in the written results. Before the coding I executed a quick analysis of arguments in word in order to define proper code names and categories as how it would fit in the research framework of the Sustainable Livelihood Approach. After that, I coded the full document of summarized of transcripts document and started writing the analysis. During the analysis some codes have been adjusted, deleted or added several times. Therefore, it is characterized as an iterative process. Quotes from respondents are shown in this report to ground the interpretations that have been made.

4. Empirical Results: Exploring the Local Practices of Waste Management in Tambak Lorok

This chapter describes the results of the fieldwork which has been conducted in the community Tambak Lorok in Semarang. The results are based on local observations and 15 interviews with locals which includes the head of the community and two experts in the field of waste management. The results are described and explained in the steps as how they are explained in the Sustainable Livelihood Approach in the theoretical framework.

The first two paragraphs describe the current structures and processes or the local practices of waste management. The governance structures are divided in two domains: the governmental and the communal domain. These paragraphs are rather descriptive in order to get a view on the situation. Then, a local vulnerability is introduced and explained how this influences the livelihood strategies regarding the local practices of waste management. The chapter that follows will give a detailed description of how locals explain their practices and how they perceive waste and waste management. It explains why local practices of waste management proceed as they do, based on how they motivate their routinized waste practices and how they use their livelihood assets.

4.1. Exploring Municipal Solid Waste Management Strategies of Semarang

This paragraph describes the role of the governmental in Municipal Solid Waste Management (MSWM) and the strategy that currently is being used by the municipality of Semarang. According to Mrs. Sidabalok (personal communication, April 20, 2018) as expert in the field of waste management, most of the time local governments are responsible for arranging logistics like dump trucks and the final disposal site. Communities themselves are expected to arrange the local collection. The overall strategy for waste management in Indonesia is still mainly focused on the treatment of waste at the end of the cycle by using for example landfills or incinerators.

Mr. Saptogiri (personal communication, April 26, 2018) as chief of Environmental Protection of Semarang, explained that in Semarang 80% of all waste is going to the landfill. Furthermore, he explained that their main concern with these landfills is that it is reaching its limits, while the amount

of incoming waste keeps growing. It is difficult for local governments to new locations for such new landfills, because of a growing NIMBY-effect. People do not want such dumping sites close to their living environment. Therefore, the local government of Semarang has been searching for alternative methods for waste treatment. Since a couple of years they are experimenting with some new techniques and strategies to Reduce, Reuse and Recycle (3R) waste. For example, on a small scale they are producing fertilizers and energy with organic waste from the landfill. Therefore, the local government of Semarang and the Australian government are now working together to build an incinerator in Semarang to process municipal solid waste and to transform it into local energy. All these implementations are again focussed on the treatment of waste at the end of the cycle.

Furthermore, Mr. Saptigori (personal communication, April 26, 2018) and Ms. Sidabalok (personal communication, April 20, 2018) as experts in the field of waste management told us about the concept of a waste bank with which some communities in Semarang are experimenting with. Residents in the community can bring their valuable items like paper boxes, newspapers, plastic bottles and metal to the waste bank. The community gets money in return which can be used for collective purposes. It was unclear whether the government or, for example, the recycling companies would be perceived as responsible for this financial compensation or how this exchange should go in more detail. In this way, they hope to stimulate local reuse and recycling of waste which could release the pressure on governmental facilities. Furthermore, they aim to improve the collaboration between the communities and the municipal its services for solid waste management. According to Mr. Saptigori, the Environmental Protection of Semarang is planning expand the amount of and collaboration with such waste banks.

4.2. Exploring Local Practices of Communal Waste Management in Tambak Lorok

This paragraph explains more about the community domain and the local practices of waste management in Tambak Lorok. It describes the community system, arrangements and the main local practices of waste management in Tambak Lorok.

The translator explained that community systems in Indonesia can be divided in different geographical levels. Starting at the street level: Every 20 houses in an alley and is called an Rukun Tetangga administrative area, or RT for short. Every RT is marked with a number, so there is RT1, RT2 and so on. Several RT together form a sub-area within the community which are called Rukun Warga administrative area, and is abbreviated as RW. If something needs to be organised for an RW, the head of this district will talk to the head of the community. In Tambak Lorok this is Slamet Riyantu.

We've spoken to him and he told us that, as the head of the community, he acts as a bridge between the people in the community and the government. He arranges gatherings with people from the community to discuss problems or developments in the community. If the community needs support from the government, the head of the community is expected to reach out to the government to address local issue and represent locals' voices. The other way around, if the government needs something from the community, they will reach out to him. Regarding waste management, the head of the community explained he did managed to facilitate RT 1-5 with a waste collection service. The other area RT 6-9 is still without waste management. The main practices that have been observed in Tambak Lorok are described in the following sub-paragraphs. Despite the differences between RT1-5 and RT6-9 in having or not having waste management, similar waste practices have been observed. Therefore, it is decided to not analyse together with differences indicated where relevant.

4.2.1. Collection of Waste via Trash Cans and a Pick-up Service

Two years ago, a waste collection service has been introduced to RT 1-5. People in this area have been provided with trash cans to collect their household waste. Often, one trash can is shared with a few households. A garbage collector picks up their waste and brings it to the central container at the registered Temporary Disposal Site (TDS), where all waste from the community is meant to be brought together. There is a company that replaces the container and brings all the waste to a final disposal site, like a landfill. The community is paying the truck driver for this service and therefore each household needs to gather an amount of 10.000 to 15.000 Indonesian Rupiah (€0,60 - €0,90) each month. This money is often collected in weekly payments. The pick-up service for the trash cans is meant to happen every single or two day(s), but in reality it can sometimes take 5 days. The container is promised to be replaced every three days, but also the frequency of this pick-up service is uncertain. Therefore, trash cans in the neighbourhood and the container at the temporary disposal site often get overloaded and people in RT 1-5 need to find another ways get rid of their trash.

4.2.2. Dumping on Empty Fields

A practice that appeared to be very common in Coastal areas like Tambak Lorok is the dumping of waste on empty fields. The overall street view looks quite clean and decent, as can be seen in figure 7. Even in RT6-9 where there are no facilities or services for waste management at all. However, the empty spaces in between a lot of houses did look like real dumping sites, as shown in figure 8. All kinds of materials, plastics and other kinds of trash where being dumped on these fields and people lived right next to these sites. Even chickens and goats which are meant for human nutrition, grazed around in between the trash on these dumping sites. And with heavy rainfall, trash off these fields will are sometimes being spread over the streets.



Figure 7: Decent street view in Tambak Lorok (one the left RT1-5, on the right RT6-9).



Figure 8: Empty fields as dumping sites in the residential area in Tambak Lorok (on the left RT1-5, on the right RT6-9).



Figure 9: Dumped trash in the ocean, with a separation between the dock and the fisherman's area.

4.2.3. Dumping in the Sea

Another way of waste disposal that often seemed to be practiced in Tambak Lorok is the illegal dumping of waste into the ocean. Especially this happens in RT 6-9, where they hardly have other options to dispose their solid waste. Previously, this was also a common practice in RT 1-5, but this decreased after the introduction of waste management, according to local residents. All forms of waste are getting dumped into the sea, varying from daily household waste to old mattresses or even dead animal cadavers. The trash is floating on the water surface right next to the houses at the dock, as shown in figure 9. This causes a strong and (for us) an unpleasant smell. One of the respondents explained that the trash in the ocean sometimes even flows right into their living area when the sea level is high and floods arise.

4.2.4. Burning Waste

Besides the illegal dumping of waste, a lot of people actually burn waste near their house. This practice was visible not only in Tambak Lorok, but throughout all of Semarang. When visiting other poor communities, there were often several small fires with burning plastics. When looking from higher ground, you could see many small plumes of smoke rising over the city or alongside the roads. This caused a thick stench and sometimes even smog. In our case, it even caused irritation to our eyes and lungs while breathing. Remarkably, fewer of these fires have been observed in Tambak Lorok relatively to other parts of Semarang. We did not observe such fires in Tambak Lorok ourselves. However, (without asking for it) a number of respondents in both areas did tell us they still burn plastic on a daily basis.

4.2.5. Separation of Waste

Regarding the sustainability aspect of waste management, several practices have been observed. In none of both areas visited Tambak Lorok, waste is actually being separated. One of the respondents in RT 1-5 told us that the head of the community once asked them whether or not they would be interested in separating and collecting materials like paper, plastic and other valuable materials in exchange for money. Now there is a scavenger that collects such valuable materials in RT1-5 and sells it to a company. One respondent explained this happens weekly, another said it only happens occasionally. Still, most respondents indicated that they never actually separate their waste or collect valuable items or exchange waste for money or groceries. Unfortunately, none of the respondents or experts could actually give us a name of one of these recycling companies. Nor could they tell us with certainty how materials were reused, recycled or processed in another way.

4.2.6. Local Actions for Reuse, Reuse and Recycling

Three respondents in RT1-5 considered to make compost out of their organic waste. One of the goals was to reduce the amount of wet-waste and process it locally in an efficient way. More important for the other respondent was that she could make fertilizers with it. Unfortunately, they needed to stop since the quality of compost from their organic waste was not good enough.

Besides making compost, this respondent was furthermore active in collecting and recycling plastic. A couple of years ago she just started with making souvenirs from sea shells. While collecting these shells she found a lot of trash in the coastal area. Later on she realized that the living areas as well were spread with trash and plastics. Therefore, she started asking kids to help her collect plastic in the coastal area. She would clean the plastic and then learn the kids how to process the plastic as stuffing for fluffy animals, which in turn they could sell as souvenirs. This way she tries to educate the kids in an entertaining way.

Another woman, living in RT 6-9, also started reusing plastic packaging herself. She has a small groceries shop in front of her house where she sells things like snacks and instant coffee. After selling it, she keeps the packaging until she has enough to handcraft it into a handbag, étuis or small basket. It is not her goal to sell them with profit. She just likes to do it when she has nothing else to do and she thinks it is important to prevent pollution of the living environment.

4.3. Local Vulnerabilities for Livelihood Strategies in Tambak Lorok

This paragraph explains the local vulnerability that influences the livelihood strategy regarding the local practices of waste management in Tambak Lorok. Due to the geographical location, Tambak Lorok has to deal with coastal flooding, accompanied with land subsidence, rising sea levels and a high tide due to tidal water movement cause tidal floods. As a result, roads and sometimes even houses are getting flooded. It damages houses and infrastructure, which again has consequences for the local economy and daily life. Many other districts in Semarang are also suffering from floods, mainly caused by heavy rainfall in combination with poor drainage systems blocked by trash. However, in the case of Tambak Lorok the flooding is coming from the ground due to these high ground water level and land subsidence. In some periods water rises above the grounds surface even on a daily basis, which forces people to leave their homes for a while.

Residents in Tambak Lorok need to protect their houses against these high water levels and therefore it is necessary to upraise the floor level of the area. One of the respondents explained that the appraisalment of road is executed and financed by the government, to make sure that all areas

stay accessible. The head of the community explained that in RT6-9 this not the case. He explained that accessibility to RT6-9 is still not good enough for services like dumpsters to pick-up waste in that area. According to him, this is one of the reasons why this area still has no waste management. He is still trying to convince the government that RT6-9 still needs help regarding infrastructure and waste management, because he does think it is very important for this area to have proper waste management.

Residents themselves are responsible for the appraisalment of the floor level of their property which results in a wide variation of heights of floor levels. Sometimes a house is built a meter above the ground while the neighbour's house is still at the street level, as shown in figure 10. In several cases the ground level even reached halfway the window frame or even to the ceiling. Figure 11 shows house of which the left still seems to be in use, and the one on the right is expected to be no longer in use.



Figure 10: This picture shows a house on the left which has an raised floor level. This was in contrast to the floor levels of other houses in the streets.



Figure 11: These picture shows two houses of which the ground level reaches halfway the window frame.

The rising seawater level, tidal flooding's and land subsidence thus seem to be a serious threat for daily life in Tambak Lorok which forces local residents into certain livelihood strategies. To keep their home liveable it is necessary for them to upraise the floor level of their property. Otherwise their houses will end up like the one on the right figure 7. Ms. Sidabalok explained the following about residents in Tambak Lorok:

“They are forced to raise the floor-level and the trash is seen as a cheap way to raise the floor level, before building a house on top of it.” (Sidabalok, personal communication, April 20, 2018)

Some do have the financial resources to buy good quality foundation material like the one in figure 6, others choose to use dry-waste as cheap option instead. Once the trash level is high enough they will put soil on top of it with a small layer of concrete, so they can start building their house. Respondents told us that this practice is already used for years and that a lot of houses in this area are built on top of trash. Landowners therefore approve that people in the neighbourhood dump their household waste on their land, as long as it is just dry-waste like plastics or other packaging. They prefer to avoid wet-waste like organic material and dead animals because it will lose its volume and give a bad smell during the process of degrading.

High water levels as vulnerability influences local waste management strategies as how it is being practiced by local residents. Using trash as foundation material is the way local residents in Tambak Lorok decided to deal with this vulnerability.

5. Empirical Results: Locals' Perceptions about Waste and Waste Management in Tambak Lorok.

This chapter gives a detailed description of the locals' perceptions of waste and waste management. It explains why local practices of waste management proceed as they do, based on how they explain their own daily routines how they use their livelihood assets. Each sub-paragraph covers a particular theme of the livelihood assets as described in the Sustainable Livelihood Approach. Two sections are added to this paragraph with the perception of (improving) local practices of waste management in Tambak Lorok by experts in the field of waste management.

Quotes of respondents have been used to ground my interpretations that are made. Regarding the residents in Tambak Lorok I have chosen to not process their names in the result. Therefore, in the results there has been referred to the respondents as follows: R refers to the number in the list of respondents as shown in Appendix 2. RT refers to the area in which the respondents live. This means R3 RT1-5 is respondent 3 who lives in RT1-5, the area with waste management. RT6-9 is the area without waste management.

5.1. Lack of Capacity and Physical Resources

A problem in local waste management which was directly pointed out by almost every respondent is 'the lack of capacity' in general, which is related to Physical Capital. Starting with the shortage of trash cans. While asking respondents for their opinion about local waste management, residents of RT1-5 where they have a waste service, often complained about the shortage or the size of the trash cans they have. According to them, one trash can for three houses is not enough to contain all their daily household waste. With a pick-up service every two or three days the trash cans are getting full quite easily. As how respondents explained: *"then it's a problem. Then it is getting dirty in the streets."* – R3 RT1-5. They would prefer their waste to be picked up on a daily basis or to have at least one trash can for each house, so it is enough to contain all of their household waste. Furthermore, they blamed the pick-up service for coming late most of the time. One of them explained that the workers don't pick up the trash because the central container at the TPS is often too full. Since the trash cans are unsealed, it causes a strong smell after a few days when the waste is not being collected in time by the pick-up service. This increases the risk of trash spreading around the area.

One respondent explained that with heavy weather and high water levels, trash cans sometimes roll over.

Regarding the overloaded trash cans and container, the community depends on a dump truck for transport, for which the local government is responsible. It has not been examined in this study why this pick-up service is so irregular. However, both experts stressed that the overloaded landfills and disposal sites are a recurring problem. The amount of municipal solid waste that needs to be disposed or processed seems to be way more than the current governmental system can handle. Furthermore, instead of going straight to the official landfill sometimes containers are getting transported to another unofficial disposal site. At those locations, some separation takes place by scavengers after which it gets burned in the open air. The respondent (R1 RT1-5) who was active as waste collector explained that also these waste sites not always have enough space to accept new batches of waste. As a result, the dump truck will stop collecting waste where after the trash will pile up in communities.

Moreover, residents in RT6-9 do not even have the option to dispose their trash in a proper way, since they have no trash cans or pick-up service. The limited or even complete lack of facilities gives the residents in Tambak Lorok few other options than dumping or burning their waste. Like how one respondent explained:

“She feels uncomfortable when there is a lot of plastic and waste on the streets. Because it has been five days that the workers doesn’t pick the trash up. She ends up burning it off.” – R7 RT1-5

One respondent in RT6-9 who reuses coffee packaging for handcrafted bags did explain that she takes her trash to the central container in RT1-5. Practically, other residents in RT6-9 have this same option to dispose their waste in a proper way. However, Mrs. Sidabalok (personal communication, April 20, 2018) explained that some parts of the community are quite far away from the disposal sites. Therefore, it is a relief for some people that they can just dump their waste on an empty field nearby in case there is no pick-up service.

As explained, some respondents in the community have experimented with composting but again the lack of capacity was a major problem. According to Mr. Saptigori (personal communication, April 26, 2018), Local composting could reduce the amount of solid waste that needs to be picked-up and could therefore lessen the pressure on capacity on the central container and full trash cans. Unfortunately, the process for local composting also requires quite some space, which is already scarce in Tambak Lorok.

The lack of capacity and facilities in different stages of waste management thus hampers an efficient outflow of waste from communities, which gives resident in Tambak Lorok few other options than the illegal disposal of waste. Regarding this outflow of waste, Tambak Lorok seems to be partly dependent on other (governmental) actors in the chain of waste management.

5.2. Financial Incentives for Undesired Waste Disposal Behaviour

Besides whether or not having proper physical facilities for waste management, some more factors seemed to play a role in local waste disposal behaviour in Tambak Lorok. This chapter explains the role of financial incentives that appear to stimulate waste disposal behaviour that previously has been described as 'undesired'. These financial incentives are related to Financial Capital.

As explained in paragraph 4.3, the dumping of waste on empty fields is not just a simple way for local residents to get rid of their trash, but landowners actually seem to perceive this practice as a beneficial method to upraise their property. This can be illustrated by the following translated quotation:

"She can saving more money to close the...

.... Yeah, the level of the ground. She says it's beneficial for the people". – R11 RT6-9

Buying and transporting foundation material costs money and effort, while the community has an abundance of dry-waste like plastics, which is also suitable for foundation material according to their experiences. This actually costs the community money and effort to get this out of the community.

Wet-waste like organic material is seen by locals as something they want to get rid of because of the smell and nuisance of vermin. In contrast, dry-waste rather seems to be perceived an asset than an actual problem. The use of dry-waste saves them from using their money or other financial resources for the appraisalment of their properties. Just like the fisherman explained to perceive the dumped trash in the ocean as beneficial, since attacks algae which again attack shells (R9 R6-9). The shells will stick into these plastics which makes it easier for him to catch the shells. Therefore, dry-waste is rather perceived as an asset in their livelihood strategy for the protection of their houses against the high water level as local vulnerability. In this case, trash is interpreted as substitute for money. Therefore, the dumping of waste seems to be stimulated by a financial incentive.

In addition, in another part of Tambak Lorok, similar financial incentives seem to stimulate waste disposal behaviour which actually is perceived as undesirable by people in the neighbourhood.

According to Mrs. Sidabalok (personal communication, April 20, 2018), there is a larger unregistered dumping site, where a landowner is paid by hotels so that they can dump their waste there. The dumping of waste is literally used as a source of income and thus is part of a livelihood strategy. Mrs. Sidabalok (personal communication, April 20, 2018) told us that this land owner probably is aware of the nuisance that his dumping site causes for the neighbourhood. People in this area perceive this way of waste disposal as undesirable and tried to bargain with him to stop. Unfortunately, they were not able to overcome the financial incentives for the landowner to stop him.

As expert in the field of social justice in waste management practices, Mrs. Sidabalok (personal communication, April 20, 2018) defined this case as a clear example of a Not-In-My-Back-Yard issue, where the hotel as financial powerful actor dumps its waste in a less wealthy and powerful place. This issue is part of a broader conflict of socio-spatial justice which didn't come forward during the actual fieldwork in Tambak Lorok and therefore will not be discussed more detail. The main point of her argument in this example was as follows:

“There are incentives for people to keep unregistered dumping sites running.”

(Sidabalok, personal communication, April 20, 2019)

Just like with the dumping of waste on empty fields, people might not change their disposal behaviour as long as these financial incentives remain.

5.3. The Lack of Awareness

Another factor that appeared to play a big role in waste disposal behaviour is awareness, which is related to Human Capital. Many respondents do not seem to be aware of the consequences of their waste disposal behaviour and only worry about the effects that are directly experienced. Therefore, not all respondents tended to see a need for improving waste management. This can be illustrated by the following translated quotation:

“...people who live here, they don't really understand the concept of trash or waste. Most of them think: why we should pay 5.000RU every month while we can just throw it away?” - R1 RT1-5

Another respondent (R13 RT6-9) explained, that even if more facilities would come, people might start using the trash cans for other purposes again and keep on dumping waste, since they do not really understand the concept of waste management.

Respondents in Tambak Lorok did not seem to be disturbed by living next to fields filled with trash. When they were asked for their opinion about the trash on the empty fields, one of them for example answered: *“Most people here doesn't mind about. Because the trash is mainly not wet. He*

said that it doesn't smells" – R6 RT1-5. As explained in before, basically all respondents tend to perceive the dumping of waste on empty fields as functional and beneficial. They even encourage it, as long people just dump dry-waste like plastics which does not cause bad smell.

Respondents in RT1-5 generally stated that they were quite satisfied with the current local practices of waste management. Still, they preferred to have more trash cans. Half of the respondents in RT6-9 did not seem to be bothered by the current situation. Since waste can easily being disposed locally by burning or dumping, they did not really tend to worry about the lack of facilities or a pick-up service that is often late. However, the other half of respondents in RT6-9 were really hoping for better management facilities like in RT1-5. Their main motivation was because it would prevent the bad smell and visual disturbance caused by trash and would therefore improve the quality of their living environment.

One respondent at the dock in RT6-9, for example, did complain about people that dump things the wet-waste in the water surface near her house. She complained about people that throw away things like: *"...mostly dead animals or something. Anything smell. Because she is struggling with like headaches while sleeping, she cannot sleep like that – R10 RT6-9"*. In her argument she does relate her health complaints to the dumped trash, while at the same time she is not concerned about any other health risks of living in near waste sites like the empty fields. As can be illustrated by following translated answer:

"She said that she doesn't mind about the disease or the contamination, because she kind of already lives with that and kind of used to it. But she, again insist that if there's a proper waste management it would be better to make this environment less slump. – R10 RT6-9".

Another respondent (R11 RT6-9) who was also especially visually disturbed by the trash on the streets, explained to let her husband dump the trash in the ocean when he goes fishing. Just like respondent 10 in RT6-9 she explained that if water levels rise, trash flows back into their living area. She knows that it is inefficient, but she thinks that is a problem to solve for then, because sees no better way to dispose her waste. Therefore, she is really hoping for waste management facilities like in RT1-5.

Multiple respondents did seem to acknowledge that living near waste sites could have a negative effect on their health. Still, they did not seem to perceive it as an actual risk or they said to not care about it. In a previous example, it was explained that a woman who ended up burning her waste if the pick-up service was late, since it visually disturbed her. We asked her whether she has ever thought about that burning waste could affect her lungs. Thereupon, she answered the following:

“She know it is bad, but she thinks that it is okay because...

....she only burns it for 5 minutes and then it is gone - R7 RT1-5”.

It might be the case that they did not know about or never had thought about the health effects of their waste practice before I asked them about it. Still, while explaining different respondents that burning waste and living close to waste sites could have cause health effects, most of them explained to not really care about it or to be okay with it. Some of them said to not care about it since they perceived to have no other options. This can be illustrated by the following translated quotation:

“He doesn’t mind about the diseases, he considered that already.

He is not, he was not thinking that it is like.. affect him directly. - R6 RT6-9”

Their main argument is, that it is a long used practice and they have not experienced any direct problems with it. Another respondent even explained to be okay with her kids playing around in those dumping sites and that it strengthens their immune system (R8 RT6-9).

All examples of above, show how local residents in Tambak Lorok focus on short-term effects that are directly experienced. Long-term consequences did seem to be perceived as a problem for later.

5.4. Sense of Responsibility

This paragraph explains how locals’ perceive their responsibility regarding local waste management and what actions have been taken by them to change their practices. This section is related to Human Capital.

As explained in the previous section, not all residents of Tambak Lorok in Semarang seem to be worried about the local practices of waste management and the consequences of their waste disposal on the long-term. Furthermore, they do not really seem to be concerned with what happens with waste after their disposal and what consequences it has later or elsewhere. This can be illustrated by the following translated quotation:

“The RT head already told them if they are willing to collect and separate for maybe paper and water bottles and other plastics. They will get money. But all this people don’t just... don’t care about it and just throw it away.” - R4 RT1-5

This respondent indicated that she does not perceive it as locals’ responsibility to think about what happens next with waste after it is picked-up by the government. However, most respondents did tend to perceive arrangement of local waste management as the responsibility of the residents

themselves. Except for two, none expected any help from the government regarding the arrangement and funding of facilities. Two others pointed the head of the community as responsible for arranging such things. However, the rest stated it is the people themselves who should take action to improve local waste management.

As explained in paragraph 5.1 multiple respondents, especially in RT6-9, stressed the need for better waste management facilities. Just like other respondents, they argued that it is the responsibility of the residents of the community themselves to arrange such facilities. Therefore, all respondents have been asked for the reason why there still is a shortage of trash cans. Three respondents blamed the lack of money. Another thought the process for arranging such things would be too complex. However, the argument that was most often used is similar to the following translated statement:

“So they expect a proper waste management here.

But still nobody really arranges it for them.” - R10 RT6-9

Multiple times respondents in RT6-9 argued to hope for someone to arrange it for them. As long as nobody starts, little seems to be arranged. One respondent has done some arguing with people about trash they throw in the sea near her house. However, the talking did not help much. She explained, this is due to the fact that also those people have no other place to go with their waste. Two others explained to have talked or complained about waste management and the pick-up service with the community leader before. In their discussion they concluded that the pick-up service from the government is the problem. Two mothers said to have the intentions to talk about the arrangements of waste management with other mothers. The woman who works for the waste bank and has some experience with raising awareness regarding waste management among mothers, explained that people are often not really interested in waste management and just care about money. However, the topic of waste management does seem to be an accessible topic for discussion among members of the community and the community leader.

5.5. Locals' Willingness to Participate in Waste management

Based on the fieldwork in Tambak Lorok there does seem to be an actual willingness to participate in waste management systems among residents in Tambak Lorok. This Willingness to participate is partially related to Human Capital

This willingness to participate is proven by the amount of waste which is already being collected successfully in RT1-5 on a weekly basis and the low resistance against the payments for it. Except for one, none of the respondents in RT1-5 indicated to be concerned about the payment they

currently give for waste management. They explained to be *“satisfied enough”* with local waste management and to find the price of *“3000RU every week just affordable”* (R6 RT1-5). Even if they did not tend to care about waste management at all, they did not complain about monthly payment.

In RT6-9, where there is a complete lack of waste management facilities, the majority of respondents in RT6-9 explained to be willing to participate in and pay for waste management if a new system is getting introduced. Half of the respondents in RT6-9, were really hoping for better waste management. They said to be willing to pay for waste management and to find the price affordable. Others in RT6-9 did not tend to be bothered by the current situation and to not really care about waste management. Still, they explained to be willing to participate in waste management if a new system gets introduced, if everyone else would. This can be illustrated by the following example which is in line with answers of other respondents:

“She is sure that if the whole community taking part of it and willing to talk about it, she’s sure that everyone is willing to pay some amount of money to buy the trash bin.

But it’s not yet happened.” - R10 RT6-9

Therefore, there seems to be little resistance against the monthly payments for waste management. However, the purchasing of new trash cans itself seems to be a little more difficult for them. Three respondents who explained to be willing to give a monthly payment expected to get a free trash can, since they find it too difficult for themselves to invest in a trash can and there is not yet enough money in the community to buy them. One of them was not aware about the price of 90.000 Indonesian Rupiah (€5,40) for a trash can.

Even more, one respondent in RT1-5 explained that people would be willing to separate their waste as long as everyone participates. Even though they did not really tend to care about it themselves. According waste separation she for example explained:

“She think it is too much hassle... She just doesn’t care about it. She is just tired from work from selling the fish in the market... But she thinks that if it is in the scale of the community, if they do it all together, it will bring the awareness on the bigger scale.” R7 RT1-5

Again they indicated that their waste disposal behaviour and willingness to pay depends on the behaviour of others. Despite the desire for better waste management of some locals, they seemed to be quite hesitant in taking action. However, the topic of waste management did seem to be an accessible topic to discuss about. Others who are not really concerned about waste management indicate to be willing to participate if everyone else does.

5.6. Mobilizing for Change

This paragraph describes the perspective of two local experts in the field of waste management and of respondents how are active in mobilizing other residents to change their waste disposal behaviour. First, the need for education in order to increase awareness is stressed. Second, the role of financial incentives is put in another perspective and is described how the use of best practices could play a role in changing local practices of waste management.

5.6.1. Need for Education

Both interviewed experts stressed the need for education in order to raise environmental awareness and improve local waste practices. At first, Ms. Sidabalok blamed the government and the packaging industry about their lack of information they gave about how to dispose things like plastic packing in a proper way. Like how she stated: *“So, this is the one, the problem of awareness.... they don’t know how to.. uhm, to do the plastic”* (Sidabalok, personal communication, April 20, 2018). This is also one of the other reasons why the composting project of one of the respondents failed. Simply, because people lacked of the know-how about how to separate and dispose their waste. Therefore, the quality of collected organic waste was often not good enough for the digestion process.

Also the head of the community blamed the lack of awareness as main cause for why people do not care about waste management. We asked whether he would be interested in educating people in Tambak Lorok about waste management. Thereupon, he answered to think it is very hard to educate people and to change behaviour of residents in Tambak Lorok. Especially, he is concerned about older people that only finished elementary school, which is the majority of the population because they will probably face difficulties with adapting to new concepts. As he explained: *“they are used to a certain mind-set which they cannot grow out.”* Another respondent was making money from selling souvenirs in which she processed plastics. In her attempts to stimulate other mothers to do the same, she tried to educate them about the effects of good waste collection. Unfortunately, she failed to get their attention for the environmental part. She said it is easier to reach out to kids than to mothers, because adults only care about the money.

Mr. Saptigori (personal communication, April 26, 2018), chief of the governmental agency Environmental Protection of Semarang (EPS), acknowledges that it is difficult to change the behaviour of people. However, he thinks after a long process of education and socialization it will built awareness and opportunities for sustainable development on the long-term. In his explanation he refers to Japan where they managed to educate people how to separate waste in small communities after a long process of education. Mr. Saptigori (personal communication, April 26,

2018) explained the EPS is already taking action, by going into communities and educating them about waste management. Mostly, starting with kids from pre-schools. Furthermore, they invite people from the communities at their office to discuss waste management. After their attempt to raise awareness, they expect the communities to ask for their help in for example organizing waste banks. If communities are still not interested, they will not start taking actions. He thinks it will be a waste of time and investment.

According to Ms. Sidabalok (personal communication, April 20, 2018), also universities could play a bigger role in educating people about the dangers of plastics and forms of waste disposal in order to increase awareness. Therefore, UNIKA is planning to let students from the university give workshops and education about environmental awareness and waste management. However, both experts emphasized just education is not enough and people need a certain incentive in order to change their behaviour.

5.6.2. Incentivizing Desired Waste Disposal Behaviour

Both experts suggested the concept of using financial incentives in order to incentivize people for proper waste disposal behaviour. Ms. Sidabalok (personal communication, April 20, 2018) told us about other neighbourhoods which developed a successful system for waste management where the government rewarded them by dropping the charge on waste management. Mr. Saptigori (personal communication, April 26, 2018) explained his idea about the collaboration with local waste banks. Residents will still need to pay for their trash, but will get a refund as community after a longer period for the valuable items that have been separated properly. It was unclear whether the government or a recycling company would pay for this refund.

Another suggestion from Ms. Sidabalok (personal communication, April 20, 2018) was to use the promotion of best practices in communal waste management to inspire people in other communities. She explained that people in Indonesia are likely to follow a leader or inspiring person. If an action or event becomes popular, other people and even governmental actors are likely to follow. For example, she told us that people started cleaning the streets after an intervention of the army that started cleaning rivers. People started bringing their own plastics bags to the market after the media showed other cities put taxes on plastics bags. According to Ms. Sidabalok (personal communication, April 20, 2018), these examples show how best practices can be used as powerful instrument in order to spread information and mobilize people for change.

6. Discussion & Conclusion

The goal of this research is to provide an insight in locals' perceptions about waste and waste management (WM) in the community Tambak Lorok in Semarang, in order to identify barriers and opportunities for improvement. By exploring these perceptions, it enables this research to get a broad understanding of the local practices of WM in Tambak Lorok in Semarang and to explain how certain factors play a role in waste disposal behaviour. The previous chapter has described and explained the influential factors that play a role in local practices of WM, as perceived by residents of Tambak Lorok and two local experts in the field of WM.

This chapter discusses the principal findings of this research and formulates the answers on the sub-questions. The relevant factors that play a role in locals' perceptions about waste and waste management are analysed in the steps of the Sustainable Livelihood Approach framework and associated social theories, as described in the Theoretical Framework (Chapter 2). Altogether, this forms the answer to the main question. This chapter will end with a main conclusion that presents the principal findings of this research.

What are the local practices of waste management in the community Tambak Lorok in Semarang?

In Tambak Lorok, two areas RT1-5 and RT6-9 have been visited, of which only RT1-5 was facilitated with trash cans and a transportation service. Part of the waste in RT1-5 appeared to be collected with these facilities. Still, the majority of respondents in this area explained to dispose their waste in other ways. As expected from literature (Kristiansen & Skaaja, 2018), common practices of waste disposal appeared to be the burning of waste on the streets and the dumping of waste in the ocean. The amount of valuable waste that is being separated and reused is almost negligible. Furthermore, it was expected to find messy streets and a few illegal dumping sites, due to a deficient local waste management system (Parameswari et al. 2014). Therefore, the first thing that surprised us while entering the field, was the contrast between the decent clean streets and the large number of dumping sites in-between the houses. The clean streets and drainage canals showed a certain degree of 'good waste disposal behaviour'. Furthermore, it was expected from the Not-In-My-Back-Yard (NIMBY) effect, that especially the more vulnerable people would be forced to live next to such dumping sites which would have been a process of socio-environmental injustice (Gerrard, 1993). This created the impression those dumping sites would be perceived as undesired and that waste still was a complex problem in Tambak Lorok. However, the opposite turned out to be true.

It appeared that in Tambak Lorok, several practices of waste management existed parallel to each other. Although some expectations could be confirmed, others could not, showing that an understanding of locals' perceptions is very important.

What are locals' perceptions about waste and waste management by residents of the community Tambak Lorok in Semarang?

Locals' perceptions about waste and waste management are examined by use of the livelihood assets of the Sustainable Livelihood Approach and associated social concepts like Sense of Ownership and Sense of Community, as described in the theoretical framework.

At first, respondents have been asked to motivate their waste disposal behaviour. One of the main motivations of locals to dump or burn their waste is, because they do not see any other options to dispose their waste. In RT1-5 they complain about the shortage of trash cans and the pick-up service for being late. In RT6-9 there is complete lack of waste management facilities. This shortage of facilities appeared to be a major problem, not only for the community, but also for the local government.

It varied whether respondents were worried about this shortage of facilities and the current state of local waste management. The most striking result was that locals hardly seemed to perceive it as problematic to live in between the dumping sites. The dumping of waste not only appeared to be a convenient option for local residents to get rid of their trash. In fact, basically all respondents explained to see the dumping of waste on empty fields as beneficial. As explained in paragraph 4.2 and 5.2, residents in Tambak Lorok are forced to upraise their property in order to protect their homes against floods due to the increasing seawater level, tidal flooding's and land subsidence. Some do have the financial resources to buy good quality foundation material, others choose to use dry-waste as cheap option instead. This shows that dry-waste was perceived by locals as free alternative to proper foundation material, in which dry-waste is a substitute for financial resources.

At a previous stage of this research, waste in the community was explained as a problem and the dumping of waste on empty fields was indicated as 'undesired waste disposal behaviour'. However, the fieldwork showed that dry-waste is perceived as a valuable asset by locals in their livelihood strategy to protect their homes against flooding's, as a local vulnerability. Their positive attitude towards the dumping of waste on empty fields may then rather be a result of a sense of necessity, due to their circumstances of the local vulnerability and their limited financial resources.

As well as for dumping as for burning waste, it seemed that respondents hardly have serious concerns about the consequences on the long-term regarding their health, environmental pollution and the safety of the construction of their houses. Part of the results made it seem that respondents

are little aware about the consequences of the burning of waste and, therefore, underestimate the long-term risks and consequences. This results in respondents not being concerned about their local waste practices. Respondents tend to be more concerned about the effects that are directly experienced. For example, in case the trash smells or causes visual disturbance as it gets spread across the streets by heavy weather. Wet-waste like organic material is more likely to cause a bad smell, therefore, wet-waste is often perceived as problematic. To get rid of those disturbances, locals often choose to burn their waste near their house or dump it elsewhere. As long as they can easily get rid of the visual disturbance and bad smell of waste, which concerns them most, they seem to be quite satisfied with the local practices of waste management.

Due to locals’ limited awareness and lack of other resources, they are likely to prefer short-term benefits over long-term consequences or effects of which they are not uncertain. This domination of short-term livelihood strategies over long-term strategies appeared to be characteristic for poor livelihoods, according to Ingram et al. (2006) .

The above explanations shows that locals’ positive attitude towards dumping waste on empty fields is to be a result of multiple causes. Locals often do not perceive to have any other options due to the lack of physical facilities and financial resources. More importantly, locals rather perceive dry-waste as a valuable (financial) asset in their livelihood strategies to adapt to a local vulnerability, instead that it is perceived as a problem. The trade-off locals make seems to be influenced by their degree of awareness and short-term focus in their livelihood strategies. These multiple influences are illustrated by figure 7.

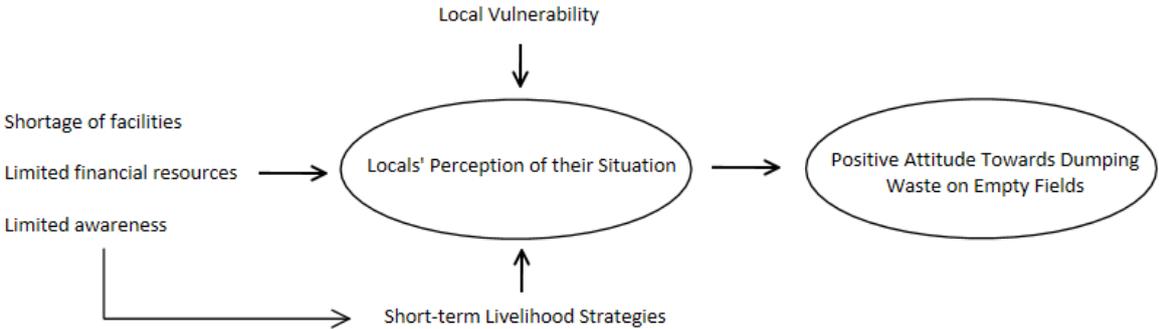


Figure 7: Illustration of the influential factors of locals' perception of their situation and their attitude towards the dumping of waste on empty fields.

Sense of Ownership

It was expected from literature that a low degree of awareness would result a low Sense of Urgency and low Sense of Ownership. This means residents would feel less responsibility take action (1) be less likely to make personal sacrifices (2) and would be less willing to participate (3).

A major part of the respondents explained to prefer to have more trash cans, since that would improve local waste management and the quality of their living environment. In general, respondents perceived themselves, as residents of the community, as responsible for arranging better facilities for waste management. Except for two, they did not expect any help or funds from the government. However, their indicated sense of responsibility and their desire for more trash cans seemed somewhat contradictory compared to the actions they take.

A reason for not taking action by the ones who suggested improvements for local waste management was, that it is too complex to arrange better facilities and community participation, and that they lack of the financial resources to invest in facilities. However, the argument that was most often given by respondents was, that no one arranges it for them. A probable explanation for them to not take action, as derived from the Sense of Ownership, is that they feel not empowered enough to control the situation due to their perception of the situation, their resources and, therefore, do not feel responsible to take action. Another option is that they do not perceive it as urgent enough to make personal sacrifices for it (Bear & Brown, 2012). Based on that, it was expected to find a low willingness to participate in waste management, to make personal sacrifices like payments for waste services or even resistance towards requests for changing waste disposal practices.

In turn, there appeared to be a remarkably high willingness among the respondents to pay a monthly amount for waste management facilities and services. Except for one, there was no resistance found towards a monthly payment for waste management. However, three respondents did tend to be worried about the investments in trash cans. This can again be explained by their lack of awareness about the prices of a trash can, but even more by their short-term livelihood strategies. Locals did not seem to be used to save money over a longer period. Most surprisingly, even those who did not indicate to care about waste management and felt no need for improvement said to be willing to participate in and pay for waste management, under the condition that everyone in the community would participate.

Locals' high willingness to participate despite their low Sense of Urgency can be explained by a strong Sense of Community (Rovai, 2002). According to this theory, one is more likely to make personal sacrifices for the common interest if one feels strongly connected to others in the

community. One of the experts confirmed this finding and explained that this strong influence of social factors on individuals behaviour is quite common in Indonesia.

Despite the fact that respondents would prefer to have more facilities to improve their living environment visually and regarding the smell, they did not seem to perceive it as urgent enough to make personal sacrifices for it regarding organization and purchase of facilities. They did not feel empowered enough to do so, due to their local circumstances and limited resources. However, the strong Sense of Community seems to increase locals' willingness to participate in waste management and to make personal sacrifices for it. As long as someone else arranges it for them and if all the others in the community also participate.

What are barriers and opportunities for changing local practices of waste management in Tambak Lorok, Semarang?

As discussed in the previous section, the shortage of trash cans seemed to be one of the main barriers regarding successful waste management. However, by solely expanding the amount of trash cans, the problem is not likely to be solved. For improving the actual outflow of waste and to overcome difficulties in the physical domain, the community seems to be dependent on transportation services and final disposal of the government. In addition, the local government seemed to be responsible to maintain the quality of the roads and accessibility of the area. However, the roads in RT6-9 are still not accessible for dump-trucks. More important seemed to be, that locals will still have the incentive to dump their dry-waste on the empty fields in order to upraise their property. This incentive is stimulated by their circumstances of how they are forced to deal with their local vulnerability with their limited financial resources. Besides more trash cans, locals will also need an alternative for the appraisalment of their property.

Locals' limited awareness about the long-term consequences of their waste disposal behaviour and their routinized short-term livelihood strategies contributes to the acceptance of their situation. Furthermore, the ones who would like to see better waste management are demotivated to take action due to the attitude of others in the community. For those respondents and the head of the community, it created the expectation that others would not be willing to participate in waste management and might use the trash cans for other purposes, due to their lack of awareness. However, as explained before, also among the respondents who did not tend to care about waste management (partly due to their awareness), there seemed to be a relative high willingness to participate, due to their strong Sense of Community. According to one of the experts, such social factors can be both, a major barrier or a powerful instrument to influence behaviour. Since people in Indonesia are likely to 'copy' behaviour of others, especially of inspiring persons and examples of

best practices. The lack of awareness therefore seems to be a major barrier, but the strong Sense of Community does sound like an opportunity, as will be discussed in the recommendation.

At first, it was feared that respondents have given us socially desirable answers. However, the local practices of waste management in RT1-5 proves a certain truth of these positive attitudes. Despite the fact that different forms of illegal disposal are still a common practice in RT1-5, part of the waste is successfully being collected and without any serious resistance against the monthly payments.

Furthermore, also the experts indicated that the lack of awareness is a major problem regarding the locals' willingness to participate in waste management. They think that education is most essential to increase awareness and to be able to increase the willingness to participate among in order to improve local waste management. As well as the experts, the head of the community as the respondents who were active in waste management, explained that education is most effective by kids. They find it, or think, that it is difficult to teach adults since they are used to a certain mind-set and routines. This shows that the current structures and routines practices can be a barrier for changing these structures, which corresponds with the structuration theory of Giddens (1984) and Bourdieu (1983).

Besides education, experts think locals would need a certain incentive in order to stimulate them to change their waste disposal behaviour. According to them, waste banks are a good instrument to incentivize locals to collect their valuable waste in exchange for a certain reward like money or groceries. The Environmental Protection of Semarang (EPS) would like to introduce more waste banks into communities. Therefore, they started with giving education in communities like Tambak Lorok. After that, they expect communities to take initiative and show their willingness to participate in waste management. If not, the government is not likely to start putting effort in improving local waste management, since it might end up in a lost investment. However, just like in Tambak Lorok it might be the case that the lack of awareness is not the only motive for their attitude towards their willingness to participate. Therefore, even if education increases environmental awareness, locals in Tambak Lorok will still have the (financial) incentive to dump their waste on the empty fields.

An award for valuable waste items can be either meant for community development or as a direct reward for residents who hand in valuable items. In the first case, this is not a direct profit resident who collect the valuable waste, while locals appeared to be sensitive especially for such direct short-term effects. In the second case, it is a direct profit which locals could use for the investment in safe foundation material. However, it is questionable whether this outweigh each other. Moreover, as stated earlier, locals appeared to find it difficult to save money for a long-term

investment, while the dumping has an impact which is directly visible. Precisely this also seemed to be the problem regarding the long-term investment in trash cans, while the monthly payments were not perceived as a problem.

'What are the locals' perceptions about waste and waste management in the community Tambak Lorok in Semarang, and what are barriers and opportunities for improvement?'

The above explained sub-conclusions together form the answer to the main question. Since the answer is a complex construction of factors, it is difficult to formulate one short answer the main question. Therefore, it is chosen to summarize the most important findings in this main conclusion.

Three main causes have been found which results in that locals still dispose their waste via undesired ways like dumping or burning. At first, the shortage of facilities for locals to dispose their waste. Second, the limited capabilities by the local government to collect the waste in local communities for final disposal in general. Third, because the dumping of waste is perceived as beneficial by locals in Tambak Lorok.

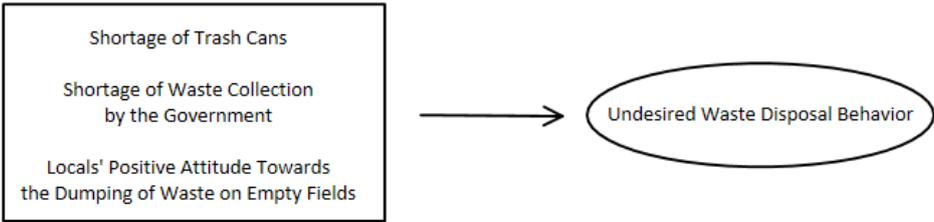


Figure 8: Main causes for why locals show the undesired waste disposal behaviour.

Locals' positive attitude towards the dumping of waste on empty fields can be explained by a combination of factors. Locals are forced to upraise their property in order to protect their homes against the floods, which are caused by a rising sea level and land subsidence. Since locals have only limited financial resources, they rather perceive dry-waste as a valuable asset in their livelihood strategies instead of as a problem. The trade-off locals make seems to be influenced by their limited awareness about the long-term consequences for human health and environment, and due to their short-term focus in their livelihood strategies.

Still, a major part of the respondents explained to prefer to have better waste management facilities, since they are often visually disturbed by the trash as it gets spread across the streets in case of heavy weather or when it smells. This bad smell is often caused by wet-waste like organic material and is , therefore, perceived as problematic by locals. Even though locals perceive themselves as residents as responsible to organise better waste management, only little actions are undertaken by them. This was explained by their low Sense of Ownership, which is characterized by a low Sense of Urgency and low Sense of Responsibility. Their limited awareness influences the Sense of Urgency

locals perceive for changing waste management. In addition, their limited physical and financial resources, in combination with a local vulnerability, influences their perception of waste and waste management in a way that locals do not feel empowered and responsible enough to take actions themselves to improve local waste management. Even though some locals stress a high urgency for better waste management. They rather hope for others in the community to organise it. These are the main barriers regarding the improvement of local waste management.

Even though not all respondents perceive a Sense of Urgency for the improvement of local waste management, they tended to be willing to participate in and pay for waste management. This was explained by their strong Sense of Community which increases their willingness to make personal sacrifices for something of which they would not find that important themselves. All the above mentioned relations are illustrated by figure 9.

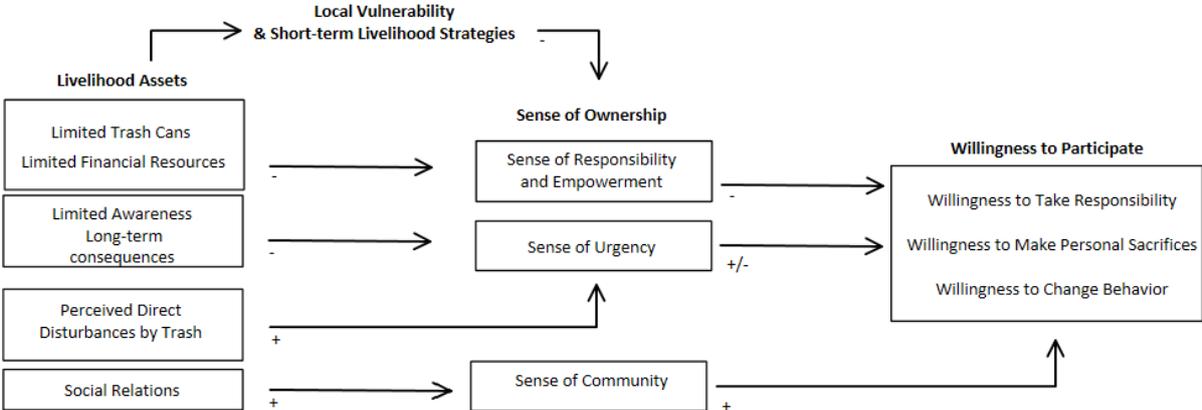


Figure 9: The influential factors regarding locals willingness to participate in waste management.

However, even in case awareness would be increased by means of education, the availability of facilities for WM would be expanded and everyone in the community would be involved actively, locals in Tambak Lorok will still have the (financial) incentive to dump their waste on the empty fields. In case the local government prefers to collect all the waste of Tambak Lorok, locals will also need an alternative for foundation material to upraise their property.

Since the expansion of facilities, organisation of education and alternatives for foundation material would require a lot of organisation, time and money, a local low-cost alternative solution is suggested in the recommendation.

7. Recommendations

That the government now strives to reduce the amount of waste at the household level with the expansion of waste banks in communities sounds like an efficient option to reduce the pressure on the facilities from the government. Furthermore, separation at the household level increases the opportunities for reuse and recycling to make municipal solid waste management more sustainable. However, the implementation of a waste bank requires a lot of organisation and behaviour change in order to let locals actually separate their waste. In addition, it requires education and the rewarding system requires money. It was unclear whether the government would pay for this reward or a recycling company. For further research in general, it could be relevant to investigate the efficiency in the collaboration between the communal waste banks, recycling companies and municipal solid waste systems. Either way, the government's budget is limited and recycling processes are often less likely to be profitable enough to buy waste.

It is a typical response of governments to buy an expensive technique and to organize an overarching system, while a local solution might be more efficient. Especially in the case of Tambak Lorok. What if we would perceive the dry-waste in the community as an asset instead of as a problem, just like the locals do. What if waste could stay in the community and could keep being used as foundation material for their houses. Then however, in a way which is ensured to be a safe construction and guarantee that trash will not be spread over the whole area and in the sea in case of heavy weather and high water levels. Maybe just like how the Indonesian organisation Sumpahsampah managed to make bricks out of local plastics for pavements and walls (Sumpahsampah, n.d.). Follow-up research should first investigate whether this is feasible. If so, it could release the pressure on governmental facilities and investments and it would suit better to the local needs and their short-term livelihood strategies. In this way, it could rather be a process-based and practical learning process for locals with a direct observable effect, instead of a forced organization of waste management and forced education in a way which locals do not perceive it as useful for them. Just like how the Thailand-Case (Appendix 1) managed to develop a low-cost local trading mechanism regarding valuable waste items and gradually succeeded in improving the attitudes of locals towards waste management.

In case dry-waste like plastics can be used as foundation material, still part of the household waste will need to be disposed in another way. Unfortunately, there seems to be not enough space to start local composting. As well as residual waste as organic waste will need to be transported out of the community. Therefore, especially RT6-9 would still require more trash cans. Despite that locals

perceive difficulties with long-term investments in trash cans, the high willingness for monthly payments in this case is an opportunity. By raising the monthly payments for they could collect money and purchase trash cans as a community instead of leaving this responsibility to individuals. Furthermore, the Environmental Protection of Semarang appeared to be prepared to assist local communities in case they are willing to improve their local waste management.

Furthermore, I recommend follow-up research to investigate how effective the current environmental education is. It might be relevant to investigate how the Sense of Community could play a role in the mobilization of people to change their behaviour instead of as a barrier. And how inspiring persons within the community and examples of best practices of other communities could be used in education strategies. As how it appeared from the results, these could be powerful instruments to mobilize adults instead of solely educating them about the environmental issues regarding waste management.

8. Limitations

The applied research strategy does involve some difficulties. Starting with recognizing the risks of interpretation and biases. The results of the research almost entirely consist of interpretations of answers of respondents. Interpretation creates a risk for misconceptions and influences from our personal biases from our Western culture and academic background. I have tried to stay as 'objective and blank' as much as possible, but it is difficult to fully elude misinterpretations in qualitative research. However, it is possible that the translator has interpreted my questions differently than intended or translated answers from respondents slightly different because of his personal bias and the additional language barrier. Valuable information can be lost in these translations. This language barrier therefore has been experienced as a serious barrier during the fieldwork.

Due to lack of time and resources it was difficult to get a good representative population for all Tambak Lorok. The method and time-frames of doing interviews made it difficult to get a good variation in the population. Mostly housewife's and just several man have been interviewed. During daytime most man where at work. For a follow-up research I would advise to have a bigger population and a higher variation concerning gender and age in order to increase generalizability. Another limitation about the respondents was the planning of the interviews with the experts. It was useful to go into the field without any biases from local experts and to discuss the first results from the fieldwork with them. However, I would have preferred to interview at least one of the expert in-between phases of fieldwork in Tambak Lorok. The expert interviews namely resulted in some new perspectives which could have been useful during the fieldwork.

Furthermore, the use of semi-structured interviews results in a low reliability of the results. It will be impossible to get exactly the same answers from respondents if the research will be repeated. However, the extensive report and appendixes of the applied fieldwork contributes to the reliability and ability to replicate this research. In addition, as explained, the semi-structured interviews and iterative processes do result in a better validity of the results. Still, this validity can be distorted by respondents who gave 'socially desirable answers'.

Another limitation of this research is that a large number of factors played a role in this research. Some aspects of this research could have been a research topic on its own. This makes it very difficult to sum up to one conclusion and to explain all observed phenomenon's with a theoretical basis. However, with this broad explorative approach this research did succeed in getting a better overall understanding of the locals perceptions and practices of waste management, with advices for further research.

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10. Appendices

10.1. Appendix 1: Thailand-Case

A community-based-solid-waste management case in Thailand managed to organize a low-cost trading mechanism locally (See Appendix 1) regarding the collection of valuable waste. Mongkolnchaiarunya (2005) argues that solid waste management projects in poor areas are more likely to be successful when they require as little financial resources as possible. They developed a community system where they have chickens which are fed by poultry food out of organic compost collected by the community. The eggs produced by these chickens are used as exchange resource for plastics and other valuable items to stimulate people in the community to separate their waste. In this way, it is a low cost and self-sufficient trading mechanism, because they don't need money to trade with and they are self-sufficient in the production of eggs. Furthermore, during the project they gradually succeeded in improving residents' awareness about and attitudes towards waste management, despite their low level of education. In addition, it ensured community empowerment through self-reliance, and less dependence between the government and the community on waste management.

Promoting a community-based solid-waste management initiative in local government: Yala municipality, Thailand (Mongkolnchaiarunya, 2005)

Abstract

“Yala is a city of some 80,000 people in southern Thailand, and is well known for tidiness and clean conditions. However, it has experienced problems in waste disposal and has sought ways of addressing these through alternative techniques, including recycling. A package of new practices was introduced, one of which (“Garbage for Eggs”) is described here. Residents were encouraged to bring recyclable material to exchange for eggs, at monthly exchanges in local communities, with emphasis on poorer communities. The project aimed not only at garbage reduction, but also at community empowerment through self-reliance, establishing new relationships of more equality and less dependence, between poor communities and the municipal administration. The project succeeded initially in promoting clearance of a backlog of discarded items, especially glass, thus improving the environment of the communities; but the quantities brought for exchange then reduced steadily over a year of monitoring, to much lower levels. Various factors accounting for this are discussed, and the impacts of the exchange practice on other poor groups, such as waste-buyers, are analysed.”

10.2. Appendix 2: Interview Guide for Local Residents

Personal background

- What is your name and age?
- For how long do you live here in Tambak Lorok?
- What is the latest education that you followed?
- What do you do for a living?

Local practices of waste management

- Can you shortly explain how a normal day in the week looks like for you?
- What kind of waste do you produce in daily practices?
- How do you deal with your household waste? Why.
 - o Do you know what happens next with your waste?
 - o Have you ever considered: Compost organic waste/separated plastic collection? Why

Awareness

- Despite waste collection, the sea and some areas are filled with trash.
 - How does that happen?
 - What do you think of that?
- Do you think the current waste management behaviour have any negative side effects?
 - o Dumping in the riving – Blockages in drainage, flooding.
 - o Dumping sites – Health: Disease vector, cancers, birth, fatigue, sleep headache
 - o Burning waste – Lung disease
- Do you think it's important to prevent this from happening? Why (not)?

Perception of responsibility

- In what way do you think the current local waste management should be improved?
- Who do you think is responsible for managing and improving local waste management? Why.
 - o What is the role of the government? Why?
 - o What is the role of the community? Why?
 - o Are these responsibilities being taken? Why (not)?
- Do you think you could play a role in improving local waste management? How and why?

Conditions for changes

- Under which of the following conditions would motivate you most to separate and collect your household waste? Why.
 - o If you could financially benefit from it. (Money, compost to reduce volume).
 - o If you could prevent blocked drainage canals and thus prevent floods.
 - o If you could prevent environmental pollution.
 - o If you could prevent negative health effects for you and your family.
 - o If you could prevent negative health effects for others.
- What would you need for improving local waste management or to change the way you deal with your own household waste?

10.3. Appendix 3: List of Respondents

Table 1: List of respondents in chronological order.

Nr.	Name	Age	Characteristic	Characterizing Description	Date	Duration
1.	Ms. Septina Dwiaryani	40	Waste collector Inhabitant TL. RT1-5	She is a active in a group of woman who collect waste and personally she makes creative souvenirs from recycled plastic for sale.	14-04-18	50 min
2.	Ms. Ngatmina	50	Inhabitant TL. RT1-5	Seller of Shrimps and fish.	14-04-18	8 min
3.	Ms. Ami	24	Inhabitant TL. RT1-5	Maker of Shrimps.	14-04-18	23 min
4.	Ms. Ruminah	53	Inhabitant TL. RT1-5	Shrimp Cracker.	14-04-18	9 min
5.	Mr. Slamet Riyantu	50	Head of the Community	He is seller of groceries the head of the community of Tambak Lorok.	14-04-18	1h 10min
6.	Mr. Asnawi	65	Inhabitant TL. RT1-5	Fisherman	18-04-18	39 min
7.	Ms. Igu Istigumah	56	Inhabitant TL. RT1-5	Trader of fish and seafood from both local fishermen and from Surabaya.	18-04-18	36 min
8.	Ms. Parni	55	Inhabitant TL. RT1-5	Housewife and seller of fish.	18-04-18	20 min

9.	Multiple	65	Inhabitant TL. RT6-9	Fisherman and shell crackers.	18-04-18	22 min
10.	Ms. Busemi	40	Inhabitant TL. RT6-9	Seller of groceries in front of her house. Her house is built above the water surface.	18-04-18	25 min
11.	Ms. Suminah	41	Inhabitant TL. RT6-9	She cooks dishes for sale.	18-04-18	20 min
12.	Ms. Sadiyah	60	Inhabitant TL. RT6-9	Dryer and seller of fish	18-04-18	19 min
13.	Ms. Supriyanti	53	Inhabitant TL. RT6-9	She is a seller of groceries she makes handbags and etuis from packaging.	18-04-18	39 min
14.	Hotmauli Sidabalok		Expert	Contact person from UNIKA and finishing PhD about Waste Management	20-04-18	54 min
15.	Gunawan Saptigori		Expert	Chief of Environmental Protection of Semarang.	26-04-18	1u 46min
Sum of duration:						9u