

ANALYSING THE SUSTAINABILITY OF SOLID WASTE MANAGEMENT FROM THE PERSPECTIVE OF ADEQUATE LEGISLATION

Haidy Henry Dusim¹, Mohammad Tahir Mapa²

¹Universiti Teknologi MARA, Sabah, Locked Bag 71, 88997,
Kota Kinabalu Sabah, Malaysia.

²Universiti Malaysia Sabah, Jalan UMS, 88400,
Kota Kinabalu, Sabah, Malaysia.

*Corresponding author's email: haidy302@sabah.uitm.edu.my

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Abstract

This paper aims to analyse the sustainability of solid waste management from the perspective of policy. The previous studies have mainly focused on analysing the sustainability of solid waste management from the perspective of technology, however, little studies have focused on analysing the sustainability of solid waste management from the perspective of policy. In the context of this study, policy refers to adequate legislation. To conduct this study, Kota Kinabalu, Sabah is selected as a case study. Data are mainly collected from interviews, questionnaires and secondary data. Data collected from the interviews and secondary data are analysed through thematic analysis. Meanwhile, data collected from the questionnaires are analysed using the Statistical Package for the Social Sciences (SPSS). Based on the overall findings, the study found that the existing solid waste management in Kota Kinabalu still lack of adequate legislation, as it still lacks the element of the comprehensive legislation and specific legislation. Through conducting this study, it may help to shift the focus of analysing the sustainability of solid waste management purely from the perspective of technology to the perspective of policy. Besides, it may help to improve the sustainability of solid waste management system particularly from the perspective of policy.

Keywords: policy; adequate legislation; comprehensive legislation; specific legislation

1.0 INTRODUCTION

Solid waste management is basically defined as a process that involves managing the aspect of waste generation, storage, collection, transfer and transport, processing and disposal of solid waste (Tchobanoglous, Theisen, and Vigil, 1993). Managing solid waste is important, as it focuses on reducing the number of waste (Pitt & Smith, 2003). The task of managing the solid basically falls under the responsibility of the local government (Badgie, Samah, Manaf, & Muda, 2012). However, majority of local government around the globe are experiencing difficult task in managing their solid waste as the waste is continuously increasing due to the growing number of population. This indirectly reflected when the World Bank (1999), pointed out that solid waste management issues are considered as global issues. As a result, many countries around the globe pledge towards addressing this issues (Read, 1999).

Although there is a great interest towards addressing the issues of solid waste management, most countries especially the developing countries tend to focus on addressing the issues of solid waste mainly from the perspective of technology, this because they tend to believe that their solid waste issues are only involved technical. This indirectly demonstrated when they attempt to solve the problem mainly from the perspective of technology despite it is not the real cause of the problem. Therefore, in most of the developing countries they still unable to effectively resolve their solid waste issues (Klunder and Anschütz, 2001). According to the concept Integrated sustainable Solid Waste Management (ISWM), the issues of solid waste can be influenced by other aspects such as policy, environment, institutional, social and economy (Guerrero et al., 2013). This indirectly shows that the issues of solid waste management should not only be analysed mainly from the perspective of technology, but in other aspects too that need to be considered.

Therefore, this study attempts to analyse the sustainability of solid waste management from the perspective of policy. In the context of this study, the term policy refers to the aspect of the adequate legislation. Adequate legislation refers to solid waste management legislation that has the element of comprehensive legislation and specific legislation. A comprehensive legislation refers to solid waste management legislation that is able to cover comprehensively the entire aspect of solid waste management. Meanwhile, a specific legislation refers to solid waste management legislation that is specific or unambiguous.

Previous studies have shown that, the issues of sustainable solid waste management in developing countries tend to be associated with the aspect of policy, this indirectly reflected in the study conducted by Agamuthu and Fauziah (2011), where they pointed out that, majority of solid waste issues in the developing countries in Asian is commonly associated with the aspect of policy. As an example in Malaysia, it is difficult for the government to promote a sustainable solid waste management through the concept of 'reduce, reuse and recycle' (3Rs), as it still lacks of comprehensive laws relating to this concept. Although, recently under the Malaysian solid waste management legislation framework, known as Solid Waste Management and Public Cleansing Act 2007 (Act 672), Malaysia has introduced a Mandatory waste separation at source, where it required the household to mandatory separate their waste at source (Abas and Wee, 2013). However, studies have shown that this policy has yet to achieve its intended objective (Abas and Wee, 2014).

In addition, due to the unique administration of local government in Malaysia, this act is only applicable in West Malaysia and not in East Malaysia (Sabah and Sarawak), since they have their own separate local government laws (MHLG, 2006). It is important to note that based on the 1961 Local Government Ordinance, the solid waste management in Sabah is under the responsibility of each city/municipal/district councils where they are responsible to manage the collection, treatment, and disposal of solid waste (Alias, Latifah, Onn and Abdullah, 2014). Abas and Wee (2014) in their paper "The Issues of Policy Implementation on Solid Waste Management" found that it is important to analyse the sustainability of solid waste management in Malaysia from the perspective of policy as although there are many policies introduced by the government, they still fail to achieve their objectives.

Therefore, as mentioned earlier this study attempts to analyse the sustainability of solid waste management from the perspective of policy, focusing on the aspect of adequate legislation. To conduct this study, the city of Kota Kinabalu is selected as a case study. According to the Sabah Ministry of Housing and local government (2007), Sabah still experiencing solid waste issues despite has more legislation that can directly addresses their solid waste issues. Some of the specific questions that the study seeks to explore are: (1) Does the existing solid waste management in Kota Kinabalu have comprehensive legislation? (2) Does the existing solid waste management in Kota Kinabalu have specific legislation?. Through conducting this study, it may help to shift the focus of analysing the issues of solid waste purely from the perspective of technology to the perspective of policy, particularly from the aspect

of the adequate legislation. Besides, it may help to improve the sustainability of solid waste management particularly from the perspective of policy.

2.0 LITERATURE REVIEW

According to Guerrero et al. (2013), adequate legislation plays important role towards the sustainability of solid waste management. Previous literature has shown that the majority of the developed countries like Japan, Germany, United Kingdom (U.K) and United States (U.S), have continued focus on developing adequate solid waste management legislation towards a sustainable solid waste management (Wu, 2011), this indirectly reflected when they have focused on developing a comprehensive solid waste management legislation and specific legislation. However, similar experience does not happen in most developing countries.

According to Asase, Yanful, Mensah, Stanford, and Amponsah (2009), they pointed out that, the main reason why the cities in most developing countries usually experience unsustainable solid waste management is due to the lack of adequate legislation in their solid waste management system, hence it negatively affects their overall solid waste system. Coffey and Coad (2010), agreed that lack of the aspect of adequate legislation in the solid waste management system will pose many negative impacts towards the overall system. They pointed that due to lack of comprehensive solid waste legislation specifying the responsibilities of the most local government in the developing city, it has affected the effectiveness of the local government in delivering their tasks.

Furthermore, the lack of adequate solid waste legislation in Pakistan and Nepal has affected its government to sustainably manage its issues of solid waste management (Apo, 2007; Umair, Björklund, & Petersen, 2015). Hence, without regulation, it becomes a challenge to manage waste at the general level (Gertsakis & Lewis, 2003). Policies and regulation are important instruments to ensure a sustainable solid waste management system (Wilson, 2007).

According to Ngoc & Schnitzer (2009), majority of Asian countries still lack of comprehensive laws to cover the whole area in waste management even though they have a variety of law that relevant to waste management. Besides, due to the lack of adequate solid waste legislation, the waste management authorities have an unclear institutional framework and ambiguous descriptions of their functions. In fact, according to Apo (2007), they found that the Asian countries still lack of comprehensive solid waste management legislation. This is supported by the study conducted by Periathamby Agamuthu, Fauziah, & Noorazamiah Aiza (2007), where they claimed that inefficiency of the government in developing countries is frequent particularly in Asian countries. As an example, in Malaysia, disputes have been going on for years pertaining to issues of solid waste management and comprehensive laws of solid waste management.

For instance, although the issues of recycling and waste recovery need serious attention, its existing piece of legislation including the Local Government Act 1976, Drainage and Building Act 1974 and Environmental Quality Act 1974 are not established to specifically address the issues. As a matter of fact, there is lack of comprehensive legislation that covers the entire aspects of solid waste management at the State or Federal level particularly in the aspect of recycling. Issues of inadequate focus and capacity in the solid waste management system at the entire levels still exists, though it is administered by the Federal, State and Local government. In general, a specific legislation for solid waste management at the federal level is missing except for legislation pertaining to environmental protection and management (Ministry of Housing and Local Government, 2006). Moreover, specific regulation to manage the municipal waste activity such as waste collection, disposal, and treatment is also unavailable at the federal level (Environmental Conservation Department & Solid, 2002).

In addition, based on previous literature, inadequate legislation in developing countries like Cameroon made the government unable to address the issues of waste handling and disposal effectively because they have incomprehensive waste management legislation. Hence, establishing a comprehensive legislation framework has been proposed to improve its waste management (Manga, Forton, & Read, 2008). Likewise, according to Ezeah & Roberts (2012), the capital city of Nigeria, Abuja has weak legal framework to support its waste management thus, it is proposed that a comprehensive analysis towards the entire aspect of legislation related to municipal solid waste management need to be conducted so it can complement and support the Integrated Waste Management (IWM) Model and Waste Hierarchy objectives. Singapore strongly believes that solid waste management will be more effective when it is accompanied by comprehensive laws (Foo, 1996).

Apart from comprehensive legislation, clear or specific legislation is also important. For example, although there are many recycling programs which have been introduced by the Malaysian government to encourage recycling, the absence of clear guidance on how to recycle affects the recycling program in Malaysia (Lau, 2004). Therefore, it is imperative to formulate sustainable regulations, policies, and programmes at the national, state and local authority level (Mohd Nasir Hassan, Rakmi Abdul Rahman, Theng Lee Chong, Zakaria, & Awang, 2000). Promoting recycling among the stakeholders will be difficult if there are no law that compels the stakeholders to recycle, hence introducing compulsory law regarding recycling is important to motivate the people to recycle (Ministry of Housing and Local Government, 2006). For example, local government in Sabah does not have the power to force the public to segregate its waste due to lack of regulation or mandatory regulation and official guidelines on how to properly separate municipal solid waste (Fatma Sabariah, Manaf, & Mariani, 2013). Interestingly, according to the study conducted by Nguyen, Zhu and Le (2015), introducing specific regulation on household waste separation will enhance public trust and may potentially lead to public participation. Hence, the Malaysian government has introduced a new legislation framework known as Solid Waste and Public Cleansing Act (Act 672), where it has the elements of clarity in term of its legislation particularly in waste separation (Yiing & Latifah, 2014).

Other elements which need to unambiguous are clear procedures on how to perform inspection and enforcement at the national, provincial and local levels as these will improve the performance of solid waste management policy (Abas & Wee, 2015). Meanwhile, ambiguous laws affect the effectiveness of solid waste management system, this is experienced by developing countries like Malaysia and Philippines hence specific law is important (Hezri, 2010). For example, although by-laws of local government in Malaysia generally compels the waste generator to store its waste in an appropriate container so that waste collection will be more efficient, many local governments do not set any specific regulations on the garbage bin standard such as in term of its size, material, and color. Hence, it is common to see the residents to use garbage bins from different sizes and forms. Besides, there is also no specific guideline or standard towards what sizes of plastic bags to store the waste (Apo, 2007). Hence, specific legislation is crucial.

The element of specific legislation is vital. Abuja, the capital city of Nigeria, has an inadequate legal framework to promote its municipal solid waste management. Its existing legislation that is relevant to solid waste management has a broad environmental legislation functions and it is not distinct to municipal solid waste management. Hence, the element of specificity its legislation is absent, which it is necessary for the legislative machinery in executing its daily operation. Furthermore, the ambiguous strategies demonstrated in achieving the general objectives of its municipal solid waste management make the matter even worse with the existing situation of inadequate legislation (Adama, 2007; Imam, Mohammed, Wilson, & Cheeseman, 2008). Moreover, in Brazil specific regulation is crucial in order to maintain its port solid waste management. Its government has come up with several specific rules on its port solid waste management focusing on the port operations, cargoes, and ships. However, although the Brazilian

government has a specific rule on its port solid waste management, Jaccoud & Magrini (2014) recommend that the specific rules on solid waste management should be revised in order to ensure its effectiveness. Hence, this shows that the element of specific legislation is crucial in attaining adequate legislation.

The case in Ethiopia on its unavailability of specific legislation pertaining to its healthcare waste management (HCWM) is another example of the importance of the need to have specific legislation. The legal framework for managing the healthcare waste in Ethiopia can be established with the current legislation provision but the provision under the existing legislation is lack of the comprehensiveness and specificity element particularly in describing harmful healthcare waste and its group. Moreover, it also does not specify the healthcare facilities (HCFs) legal obligations in managing, transporting, disposing and treating healthcare waste, reporting and documentation safekeeping (Haylamicheal & Desalegne, 2012).

In short, the absence of specific legislation detailing how and what in the management of solid waste have affected the effectiveness of the management in these developing countries. Mrayyan & Hamdi (2006) believed that the specific legislation available in developed countries such as specific laws pertaining to how to manage industrial waste which basically cover all the waste system elements that include waste treatment, storage, final disposal and generation provide positive support towards its waste management system. Thus, there is a need to have comprehensive and specific legislation to ensure the success of the management of solid waste.

3.0 METHODOLOGY

To achieve the objectives of the study, this study employed both secondary and primary data. Information from the secondary data was collected through reviewing the past literature, regulations relating to solid waste management, documents (official legal and policy documents), published statistics like census data, statistical abstract, database, annual report (solid waste master plan), journals, as well as information from unpublished sources and other relevant sources to guide the research towards obtaining primary information. Meanwhile, information from the primary data is collected mainly from an in-depth interview through a semi-structured interview. The interview questions mainly focus on the aspect of the adequate legislation, where the questions are divided into two main themes, where the first theme represents the question regarding the element of the comprehensive legislation. While the second theme represents the question from the element of the specific legislation. The findings from the secondary data and primary (in-depth interview) will be analysed using the thematic analysis. About 9 respondents have been interviewed these respondents consist of officers from Kota Kinabalu City Hall (KKCH) and the Sabah Ministry of Local Government and Housing (MHLG). Apart from that, the research also used questionnaires, where a total of 267 questionnaires have been distributed among the respondents living in the area of Kota Kinabalu, namely Kota Kinabalu, Manggatal and Telipok. The findings from the questionnaires will be analysed using the Statistical Package for the Social Sciences (SPSS).

4.0 FINDINGS

Table 1: Level of Comprehensive legislation

	Mean		N	%
Comprehensive Legislation	1.53	Low	161	60.3
		Moderate	69	25.8
		High	37	13.9
N=267				

Table 1 indicates that the overall level of comprehensive policy in the existing solid waste management in Kota Kinabalu is still low (60.3%), with the mean score of 1.53 (of the highest 5).

Table 2: Level of specific Legislation

	Mean		N	%
Specific legislation	1.36	Low	192	71.9
		Moderate	52	19.5
		High	23	8.6
N=267				

Table 2 indicates that the overall level of specific legislation in the existing solid waste management in Kota Kinabalu is still low (71.9%), with the mean score of 1.36 (of the highest 5).

5.0 DISCUSSION OF FINDINGS

Based on the overall findings, this study found that the existing solid waste management in Kota Kinabalu still lack of adequate solid waste management legislation as it still lacks of the comprehensive legislation and specific legislation. In the context of this study, comprehensive legislation refers to solid waste legislation that is able to comprehensively cover the entire aspects that fall under the solid waste management, such as managing the waste generation, collection, storage, transfer and transport, treatment and recovery and waste disposal.

Based on the overall findings collected from the interviews, the study found that the existing solid waste management in Kota Kinabalu still lacks of the element of comprehensive solid waste management legislation. This indirectly reflected when from the interviews, the study found that the local government in Kota Kinabalu mainly refer to the Anti-Litter (2010) and Conservancy and Hygiene (1984) by-laws in managing their solid waste. However, according to MHLG (2006), in their report entitled "The Study on National Waste Minimisation in Malaysia" the existing by-law in Sabah is still unable to comprehensively cover the entire aspect of solid waste management system especially in the aspect of the waste collection, treatment, and disposal of solid waste. In fact, they also argued that the Local Government Ordinance (LGO) 1961 in Sabah is unable to comprehensively cover the entire aspect of the solid waste management system. The lack of comprehensive legislation is also supported by the findings collected from the questionnaires. This indirectly reflected in table 1, where it shows that majority of the respondents with 60.3% perceived the level of comprehensive legislation in Kota Kinabalu was low.

In fact, according to Moh and Manaf (2014), in Malaysia, there still inadequate comprehensive legislation that is able to comprehensively cover the entire aspect of solid waste management system even at the federal and states level, especially in the aspect of recycling. Furthermore, according to a report by MHLG (2005), they pointed out that Malaysia still lacks legal provision that requires the waste generator to reduce their waste. Hence, this indirectly supported that Kota Kinabalu is lacking of comprehensive

legislation that covers the solid waste management system. The absence of such comprehensive legislation affected the effectiveness of the solid waste management (Guerrero et al., 2013). Meanwhile, in most developed countries comprehensive legislation is seen as the key factor towards more sustainable solid waste management. For example, Japan, United Kingdom (UK) and Germany have comprehensive legislation relating to waste minimization which helps to contribute towards effective solid waste management. Hence, the lack of comprehensive legislation pertaining to solid waste management will significantly affect the effectiveness of solid waste management system and thus may not be sustainable in the long run.

The previous section has discussed the findings collected from the element of the comprehensive legislation. Meanwhile, in this section, it will attempt to discuss the findings regarding the element of the specific legislation. In the context of this study, specific legislation refers to solid waste legislation that is specific or unambiguous. Based on the overall findings collected from the interviews, it shows that the existing solid waste management in Kota Kinabalu still lacks the element of the specific legislation. From the interviews, the study found that Kota Kinabalu still lacks of specific legislation especially pertaining to the aspect of waste separation. In fact, according to Fatma Sabariah et al. (2013), the local government in Sabah is unable to force the public especially the household to separate their waste at source, since there is no specific legislation developed in Sabah pertaining to waste separation. The lack of specific legislation is also supported by the findings collected from the questionnaires. This indirectly reflected in table 2, where it shows that the majority of the respondents with 71.9% perceived the level of specific legislation in Kota Kinabalu was low.

These findings are also supported by the previous studies, according to MHLG (2006), the Local Government Ordinance 1961 (LGO), still has lack of specific provision describing the aspect of waste treatment, disposal, and waste collection. The only most relevant provision is under Section 49 (1) (39) where it is stated that the local government has the authority to “Keep clean streets, bridges, squares, playing fields and other open or closed public places in the (LA) area”. However, this section is still considered as unclear or not specific towards handling the issues of waste treatment, disposal, and waste collection. In comparison to Peninsular Malaysia, the new legislation is known as Solid Waste Management and Public Cleansing Act (Act 627) is more specific for example they have clearer legislation pertaining to waste segregation, where under the new legislation, it is mandatory for the household to segregate their waste.

Moreover, Malaysia overall still lack of specific legislation pertaining to its solid waste management, this indirectly reflected when the existing piece of Malaysian legislation namely Local Government Act 1976, Drainage and Building Act 1974 and Environmental Quality Act 1974 is not established to specifically address the issues of solid waste management particularly waste treatment and recycling (Yiing and Latifah, 2014). This also supported by the study conducted by MHLG (2006), where it was found out that Malaysia still does not have specific solid waste management legislation even at the Malaysian federal level except for legislation pertaining to environmental protection and management.

Furthermore, according to the study by Lim et al., (2002), entitled “Solid Waste Disposal in Sabah: Survey Report”, they found that there no specific regulation develop at the Malaysian federal level that specifically regulates the activity of municipal waste such as the activity of waste collection, disposal, and treatment. Hence, this may affect the implementation of waste separation in Sabah. However, with the new Malaysian Solid Waste and Public Cleansing Management Act 672 which introduced in 2007, it has indirectly paved the way for the Malaysian solid waste management to introduce more specific legislation particularly in the aspect of waste separation, thus enable mandatory household waste separation to be introduced (Yiing and Latifah, 2014).

6.0 CONCLUSION

Overall the city of Kota Kinabalu, Sabah still does not have adequate legislation in their existing solid waste management system. This is because the existing solid waste management in Kota Kinabalu still lacks of the element of the comprehensive legislation and specific legislation. The lack of comprehensive legislation indirectly reflected when, currently there is no legislation or by-laws in Kota Kinabalu that is able to comprehensively cover the entire aspect of solid waste management, even in the aspect of managing waste generation through waste minimisation. Apart from that, the lack of the element of specific legislation indirectly reflected when there is no specific legislation relating to the aspect of waste separation in Kota Kinabalu. Hence, the lack of the element of comprehensive legislation and specific legislation are the main contributing factors towards the issues of sustainability of solid waste management in Kota Kinabalu. Hence, to achieve a sustainable solid waste management particularly from the perspective of policy, it is important for the local government in Kota Kinabalu to develop a more comprehensive and specific solid waste legislation in their existing solid waste management system.

References

- Abas, M. A., & Wee, S. T. (2014a). Municipal Solid Waste Management in Malaysia: an Insight Towards Sustainability. *Journal of Chemical Information and Modeling*, 53(9), 1689–1699.
- Abas, M. A., & Wee, S. T. (2014b). The Issues of Policy Implementation on Solid Waste Management in Malaysia. *International Journal of Conceptions on Management and Social Sciences*, 2(3), 12–17.
- Agamuthu, P., & Fauziah, S. H. (2011). Challenges and issues in moving towards sustainable landfilling in a transitory country - Malaysia. *Waste Management & Research: The Journal of the International Solid Waste and Public Cleansing Association, ISWA*, 29(1), 13–19.
- Alias, F. S., Latifah, A. M., Onn, M. H. N., & Abdullah, S. J. H. (2014). Knowledge and Attitude of Water Villagers' Towards Solid Waste Management. *British Journal of Arts and Social Sciences*, 16(2), 88–100.
- Badgie, D., Samah, M. A. A., Manaf, L. A., & Muda, A. B. (2012). Assessment of Municipal solid waste composition in Malaysia: Management, practice, and challenges. *Polish Journal of Environmental Studies*, 21(3), 539–547.
- Fatma Sabariah, A., Manaf, L. A., & Mariani, H. N. (2013). Overview of municipal solid waste management in malaysia. *Borneo Science*, 33(9), 23–30.
- Guerrero, L. A., Maas, G., & Hogland, W. (2013). Solid waste management challenges for cities in developing countries. *Waste Management*, 33(1), 220–232.
- Klunder, A. V. D., & Anschütz, J. (2001). *Integrated Sustainable Waste Management - the Concept. Tools for Decision-makers. Experiences from the Urban Waste Expertise Programme (1995-2001)*.
- MHLG. (2006). The Study On National Waste Minimisation In Malaysia. Malaysia: Ministry of Housing and Local Government.
- Moh, Y. C., & Manaf, L. A. (2014). Overview of household solid waste recycling policy status and challenges in Malaysia. *Resources, Conservation and Recycling*, 82, 50–61.
- Pitt, M., & Smith, A. (2003). Waste management efficiency at UK airports. *Journal of Air Transport Management*, 9(2), 103–111.

- Read, A. D. (1999). Making waste work: Making UK national solid waste strategy work at the local scale. *Resources, Conservation and Recycling*, 26(3–4), 259–285.
- Tchobanoglous, G., Theisen, H., & Vigil, S. (1993). *Integrated solid waste management: engineering principles and management issues*. New York: McGraw-Hill, Inc.
- Wu, H.-H. (2011). Legal Development in Sustainable Solid Waste Management Law and Policy in Taiwan : Lessons from Comparative Analysis Between EU and U.S. *National Taiwan University Law Review*, 6(2), 461–494.