

Issues on a Solid Waste Management System in Cameron Highlands, Malaysia

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Introduction

Naturally, human daily activities will be the cause of waste generation. This is one of the unavoidable reasons in daily life and the resulting waste needs to be managed. Most residents from various backgrounds face the problem of efficient waste management [1,2]. Among other causes or reasons are such as population growth which makes waste management more challenging, more people in certain locations resulting in higher levels of waste generation. The rapid growth in the construction industry as a result of the development of subsistence standards, demands of infrastructure projects, changes in habits, as well as population growth have been major contributors to waste generation [3,4].

Inefficient waste management results in negative impacts on the environment such as environmental hazards. The inability of the population to manage waste generation effectively results in increased impact stress on the environment [5,6]. Moreover, among developing countries, sustainability is centered on the principle that future generations do not accept the negative impact of actions on the environment that occur today.

Today, developing countries are actively pursuing efficient waste management but the opposite is happening among developing countries that do not have strong allocations, weak institutional frameworks, lack of access to technology, lack of expert manpower, the existence of less friendly products. Nature, instability of consumer trends and so on [7,2] This resulting in the disruption of efficient sustainability processes in the solid waste sector.

The bulk of the urbanization allocation is allocation for solid waste management in developing countries. The allocation provided by the government is often insufficient to enable efficient and satisfactory service [8, 9]. In addition, solid waste management faces the challenges of non-strategic waste disposal locations, the introduction of external technologies as well as management systems that are not suitable for the implementation area due to design differences and requirements under which the system is designed (Coffey and Coad 2010). Disposal of solid waste other than spe-

cial locations such as landfills is a practice in some developing countries. The solid waste management scenario that has been discussed in most developing countries is similar including Malaysia [10, 11]. The solid waste management scenario in most developing countries is similar, including Malaysia.

Background Study

The unsustainable culture of production and consumption among the world community today, especially in Malaysia, has led to the rate of solid waste generation that is increasing drastically from year to year [12]. As a result, there is an increase in the number of landfills which will have a negative impact on environmental, social and economic well-being. The average landfill in Malaysia can only accommodate the generation of solid waste for 2 years. This situation is different from landfills in the west because their landfills can last for 5 to 10 years [13,14].

Sustainability-related issues have received global and local attention and one of the issues that received attention was the issue of efficient solid waste management. This issue has become a critical problem faced by central governments, local authorities, and communities at the local and global levels today [7,15].

As in Cameron Highlands, Malaysia, it is a well-developed tourist area. The area is developed rapidly since the focus is on development in the surrounding area. Apart from that, Cameron Highlands is also a tourist hotspot especially during the school holidays and public holidays where almost 600,000 tourists have traveled to this area in 2014 [16].

In views of solid waste generation, it is increased due to the increase in population and tourists as well as the development of Cameron Highlands. The intended development includes the Prima house project in four different locations, namely in Pekan Brinchang and three in Pekan Tanah Rata [17,16]. Population and tourist density in the Cameron Highlands area will be one of the main reasons for the increase in solid waste generation.

Due to the increasing number of residents and tourists, the generation of solid waste is becoming increasing and uncontrolled. Therefore, this study was conducted to see the challenges faced and need to be improved towards a more sustainable and effective solid waste management and does not have a negative impact on the environment [18].

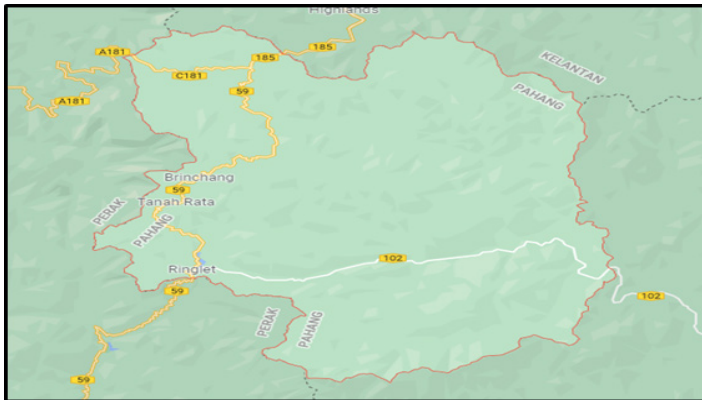
OBJECTIVES

Two main objectives of the study were formed

1. To study the solid waste management system in landfills.
2. To identify the challenges that contribute to waste management problems in landfills.

Scope of the Study

The study will be conducted in Cameron Highlands district. Cameron Highlands or Tanah Tinggi (Figure 1.0) Cameron is a famous highland resort in peninsular Malaysia. Cameron Highland is located in the southwest of Pahang, a state rich in natural forest treasures (Google maps, 2021)



The study is conducted by interviewing parties involved in solid waste management in the Cameron Highlands which are Alam Flora Sdn. Bhd and Cameron Highlands District Council. The findings obtained from the interviews are analyzed in more depth.

First Objective Achievement: To Study A Sustainable Solid Waste Management System In Landfills

The first objective of the study was achieved through the results of a literature review and data from semi-structured interviews that were conducted. Based on the literature review, the way towards sustainable waste management is through the 3R concept of waste reduction, reuse, recycling and using technology, facilities and equipment that provide comprehensive solid waste management services. This 3R concept requires the cooperation of various parties and not only the responsibility of the organizations involved such as Alam Flora Sdn. Bhd and the District Council.

Through research data from interviews with Alam Flora Sdn. Bhd. itself has compiled a systematic schedule to ensure that the management of solid waste generated every day is managed systematically and does not interfere with the daily activities of local residents. Due to the hilly terrain conditions in Cameron Highlands and having limited open space, traditional methods of waste disposal such as open methods and sanitary methods become less suitable for hilly and restricted areas such as Cameron Highlands.

Garbage collection in Cameron highlands is divided into two zones, namely zone A and B. Zone A covers the Tanah Rata area up to Bertam Valley. While zone B starts from Brinchang to Kampung Raja. Strategic systems have been put in place so that solid waste is collected systematically. Apart from that, other services such as collecting illegal garbage, cleaning drains and roads as well as cutting grass are also among the management managed by Alam Flora sdn. Bhd. Therefore, a proper and systematic system plays a very important role towards sustainable waste management and awareness of various parties including locals as well as tourists.

Second Objective Achievement: Identify the Challenges That Contribute to the Problem of Waste Management in Landfills

The second objective was also achieved based on the results of literature review and interview sessions conducted. Data from the literature review found that the problems faced towards sustainable waste management are lack of technology and facilities, recycling market deficit, lack of funds, legal laxity, and lack of awareness from various parties.

The first problem is the lack of facilities and technology where existing technologies such as landfills cannot cope with the increasing generation of solid waste every day. The second problem is the recycling market where there is a lack of efforts in developing the recycling market which has hampered the effectiveness of the implementation of the waste recycling process because the recycling market depends entirely on profitable recycling waste. Next is the problem where there is a lack of funds to manage solid waste. For example, the reluctance of the industry to reduce industrial waste has resulted in the techniques that need to be adopted for waste management to be very large and costly. Therefore, reasonable incentives should be given to stimulate waste reduction as one of the alternative waste management techniques.

The problem of legal relaxation can be avoided where the industry has to apply existing rules in their waste management methodologies. In addition, the problem stems from a lack of awareness. Although the government has established various policies, some parties are not aware of the importance of implementing solid waste management based on the hierarchy of management that emphasizes waste reduction through 3Rs, intermediate treatment and final disposal.

The results of the study indicate that there are several challenges faced in solid waste management in Cameron Highlands. Waste management in Cameron Highlands does not face problems with facilities and technology as well as finance because good technology has been provided for waste management and the government has provided sufficient funds. The results of the study show that the big challenge faced is the lack of awareness of locals and tourists. This has led to an increase in the generation of solid waste, especially during the school holidays and public holidays. Therefore, the researcher found that this second objective has some challenges faced by waste management and these challenges cause management to have to formulate other strategies to ensure solid waste management does not have a negative impact on local people, environment and health.

Conclusion

Overall, this study has succeeded in achieving the objectives as a result of the findings and information that have been analyzed from Alam Flora Sdn. Bhd. Cameron Highlands. They have kindly collaborated with feedback, knowledge and information provided related to the study conducted. In addition, the views of officials involved in waste management in Cameron Highlands who have over 15 years of experience are very helpful in achieving the objectives of this study. The findings also show the importance of sustainable waste management to ensure the environment is not polluted and also contribute to the quality life of local residents.

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