

COMMUNITY AWARENESS IN SOLID WASTE GENERATION AT BANDAR BARU BANGI-SELANGOR DARUL EHSAN

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Abstract: Economic establishment and modernization has its share of disadvantages and one of the main aspects of concern is the pollution it is causing to the earth—be it land, air, and water. Due to the increase in the global population and the rising demand for food and other essentials, there has been a rise in the amount of waste being generated daily by each household. This waste is ultimately thrown into municipal waste collection centres from where it is collected by the area municipalities to be further thrown into the landfills and dumps. However, either due to resource crunch or inefficient infrastructure, not all of this waste gets collected and transported to the final dumpsites. If at this stage, the management and disposal is improperly done, it can cause serious impacts on health and problems to the surrounding environment. In order to avoid the problems caused by the increasing amount of solid waste generated everyday, the Government of Malaysia through the Ministry of Housing and Local Government launched the practice of integrated solid waste management program, where the first step is the source reduction or reduce the generation followed by the resources recovery through the recycling and disposal of the residuals safely to the sanitary landfills. The objective of this paper is to identify the awareness of the communities in solid waste generation at Bandar Baru Bangi town. In order to achieve the objective, a survey has been conducted over the communities in the study area. The results showed that most of the community members have awareness on the solid waste generation issue and almost 80% communities have awareness on the types of solid waste they generate. Most of the community members think before buy their household materials, which normally generate solid waste.

Keywords: Economic establishment, Solid waste generation, Recycling, Resources recovery, Disposal

INTRODUCTION

Mankind worked hard to achieve progress and excellence, which culminated into modern development through urbanization and industrialization. Urban areas can be regarded as living systems, which need resources to sustain them and for their continuous growth and evolution. However, growth is not only related to changes in form structure, but also within the environmental setting where growth is taking place [9]. Each form of urban growth is associated with different phases of development activities. These activities resulted in environmental pollution normally due to the disposal of solid wastes generated [5]. Technological sophistication through the usage of modern machineries further illustrated the complexities of waste management, which related closely with composition of waste generated [6].

The World Commission on Environment and Development, better known for its publication, the Brundtland Report or *Our Common Future* [11]. It provided the most well used definition of sustainable development, namely 'development that meets the needs of present generations without compromising the ability of future generations to meet their own needs.' Historically, the conservation and management of natural resources, and of development were considered mutually exclusive and as conflicting needs within society. The Brundtland definition provided a new choice by implying that it is possible and desirable to achieve a balance between these two entities. Sustainable development is about integrating social, political, economic and ecological concerns in decision-making (Figure 1). All are essential if sustainability is the goal.

The Brundtland Report also clearly spelled out that sustainable development would only be achieved if society in general, and industry in particular, learned to produce 'more with less', i.e., more goods and services with less use of the world's resources and less pollution and waste. In the era of green 'consumerism' [2], this concept 'more with less' has been taken up by industry which has, in turn, spawned a range of concentrated products, light-weight and refillable packaging and other innovations

[4]. All of these measures help to reduce the amount of solid waste produced. In essence, they are improvements in efficiency, whether in terms of materials or energy consumption.

In line with the concept of sustainable development, solid waste management may be defined as the discipline associated with the control of generation, storage, collection, transfer and transport, processing and disposal of the wastes in a manner that is in accord with the best principles of public health, economics, engineering, conservation, aesthetics, and other environmental considerations, and that is also responsive to public attitude [11]. The problems associated with the management of solid wastes in today's society are complex because of the quantity and diverse nature of the wastes, the development of urban sprawling areas, the funding limitations for public services, the impacts of technology, and the emerging limitations of both energy and raw materials. Rhyner et al. [8] grouped the activities associated with the management of solid wastes from the point of generation to final disposal into six functional elements: (i) waste generation, (ii) waste handling, storage, and processing at the source, (iii) collection, (iv) transformation, (v) transfer and transport, and (vi) disposal. However, these six functional elements can be regrouped into three elements to form an integrated solid waste management programme, which consists of (i) reduce the generation, (ii) reuse or resources recovery, and (iii) disposal of the residuals safely to the sanitary landfills.

It is clear from the above explanation that the source reduction is a strong functional element in an integrated solid waste management program where the community attitude plays an important role in a successive waste management program. Therefore, the objective of this paper is to present the awareness levels of the communities in solid waste generation at Bandar Baru Bangi town.

MATERIALS AND METHODS

This study has been conducted in Bandar Baru Bangi, which is a part of Kajang municipality area (MPKj) in the state of Selangor. Bandar Baru Bangi is one of the most developing towns in the country, being located in the midst of the affluent Klang Valley and in the vicinity of the country's futuristic Putrajaya and Cyber Jaya. Bandar Baru Bangi is recognized as a university town with an area of 5,086.15 acre, which is subdivided into 16 sections. The town is developed step-by-step starting from 1974 under the administration of Perbadanan Kemajuan Negeri Selangor (PKNS). The total population in Bandar Baru Bangi in the year 1998 was 41,726 and the estimated population in the year 2010 will be 90,000. Bandar Baru Bangi is recognized as an industrial area where the electrical and electronics industries, manufacturing industries, and plastic industries are most dominant. Generally, five types of houses are identified in this study area, i.e., flat, bungalow, single storey terrace, double storey terrace, and semi-detached.

A survey has been conducted over the communities in the study area where 300 questionnaires were distributed randomly to the households. The households are provided ample time to fill up the questionnaires and collected back after a certain period of time. However, only 75% (225) of the total questionnaires (300) were returned back by the households. The results of the survey have been analyzed statistically to present the community awareness in solid waste generation in the study area.

RESULTS AND DISCUSSIONS

Types of solid wastes generated by the community members in Bandar Baru Bangi town are depicted in Figure 2 where most of the respondents (about 73%) answered that they normally generate food waste. The rest (about 27%) do not generate food waste because they are students or factory workers, who do not cook in their residences. This finding is also inline with the previous study done by the authors (Hendri Yani & Jamaluddin Md. Jahi 2003) in Kajang Municipality area, where the dominant component of the household waste is organic waste (82% weight). In Bandar Baru Bangi town, about 57% households generate paper waste, followed by plastic waste (about 56%), glass (about 48%), metal (about 38%), cardboard (about 11%) and bulky wastes (about 8%). Due to the high percentage of the respondents generate recycle-able wastes, this area can be considered for a potential area for recycling programme.

In order to analyze the results of the survey on community awareness, the answers of individual questions are coded by assigning a numerical value from 1 to 4. The number '1' means 'strongly aware', number '2' means 'aware', number '3' means 'less aware', and number '4' means 'not aware'. Statistical analysis of the results is shown in Table 1 where the mean value closer to 1 means strongly aware and closer to 4 means not aware.

Table 1: Survey Results on the Community Awareness about Solid Waste Generation Issue in Bandar Baru Bangi

Aspects of Awareness	Mean	Standard Deviation
Awareness in generation and management of solid waste	1.62	0.64
Awareness in solid waste generated by the community members	1.78	0.63
Awareness in buying waste generating product	1.95	0.73

The mean values for the three different aspects of awareness lie between 1 and 2, therefore generally the community members in this area have the awareness in solid waste generation. The survey results in solid waste generation issue are also depicted in Figure 3, where only a few numbers of the respondents do not have the awareness in solid waste generation issue.

Figure 4 shows the attitudes of community members in buying waste generating products. About 68% households think before buy a product which normally generates waste, followed by 26% households showed the opposite response, i.e., they do not think before buy a waste generating product. However, only 6% households do not have any comment regarding the buying waste generating products. This attitude is good in order to reduce the waste generation, which is the vital step in integrated solid waste management program [1].

The choice of packaging materials, either disposable or not, is not straightforward. Every day a huge amount of plastic waste is generated, where most of them come either in plastic bag form or in plastic container form. However, plastic material is not biodegradable and needs sophisticated technology and huge amount of money to dispose it. As an alternative, plastic packaging materials can be replaced by disposable or paper based packaging materials. Figure 5 shows the agreements of Bandar Baru Bangi town community members regarding the replacement of plastic packaging materials where possible to disposable paper based packaging materials. The response is very enthusiastic, where 72% respondents agree if the plastic packaging materials are replaced by disposable paper based packaging materials. However, more study is required to convince this idea because packaging is used for multiple purposes (Rattary 1990) including (i) protection of products; (ii) prevention of food spoilage; (iii) display of consumer information; (iv) compliance with government regulations; (v) consumer convenience; and (vi) attractive presentation of the products to the consumer.

CONCLUSION

The main objective of this study was to identify the community awareness in solid waste generation issue to be incorporated for improved solid waste management services in the study area. Most of the community members in the study area have awareness in solid waste they generate every day where 46.22% community members strongly aware on this issue. However, only less than 1% community members do not aware on this issue. Community members in this study area also showed their strong willingness if the plastic packaging materials are changed to disposable paper packaging materials. However, the usage of packaging materials depends on the government regulations. Therefore, further research is required to finalise this issue.

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REFERENCES

1. Agamuthu, P., Lingesveeramani, M. and Bregnhøj, H. 2003. Socio-economic influence on solid waste generation in Petaling Jaya. *Proceedings of the International Conference on Environmental Management and Technology*. Putrajaya, Malaysia, 4-6 August, pp. 419-426
2. Elkington, J. and Hailes, J. 1988. *The Green Consumer Guide*. Victor Gollzncz.
3. Fincham, R., Lawrence, R. and Oelofse, C. 2002. Sustainable development: contested territory. *Focus Interactive*. 13(2): 19-21
4. Hendri, Y. and Jamaluddin, M.J. 2003. Analisis sampah sarap domestik di sumber penajaan. *Prosiding Seminar Kebangsaan Pengurusan Persekitaran*. Bangi, 8^{hb}-9^{hb} Julai. pp. 694-701
5. Hindle, P., White, P. R. and Minion, K. 1993. Achieving real environmental improvement using value: impact assessment. *Long Range Planning*. 26(3): 587-597
6. Karim, A.T.A. and Othman, F. 1992. The effect of living standard and culture on refuse generation in Johor Bahru Housing Areas. *International Conference and Exhibition on Environmental Protection and Control Technology*. Kuala Lumpur.
7. Lohani, B.N. 1986. Management and utilization of solid waste in Asia. *Keynote Address of National Seminar on Management and Utilization of Solid Wastes*. Universiti Pertanian Malaysia, Serdang.
8. Rattary, T. 1990. Source reduction-An endangered species? *Resource Recycling*. 9(11): 64-65
9. Rhyner, C.R., Schwartz, L.J., Wenger, R.B. and Kohrell, M.G. 1995. *Waste Management and Resource Recovery*. New York: CRC Press, Inc.
10. Salleh, K.O. and Gaffar, F.A. 2003. Urban environmental quality and its impact on urban dwellers: a model for the Klang Valley basin. *Proceedings of the International Conference on Environmental Management and Technology*. Putrajaya, Malaysia, 4-6 August, pp. 419-426
11. Tchobanoglous, G., Theisen, H. and Vigil, S. A. 1993. *Integrated Solid Waste Management-Engineering Principles and Management Issues*. Singapore: McGraw-Hill.
12. WCED. 1987. *Our Common Future*. World Commission on Environment and Development. Oxford University Press, Oxford.