

PUBLIC PARTICIPATION IN WASTE RECYCLING IN MALAYSIA

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ABSTRACT

This paper presents the result of the quantitative method survey among the households in Malaysia regarding the household behavior and participation in solid waste management. The study argues that public participation in solid waste and environmental policy is important to deliver sustainability solid waste management in Malaysia. No programs or policies can be successful without the involvement of people and grass-root leaders (H. Huong, 1999). Ecological modernization theory also recognized that household behaviour and every day social practice could contribute to reduce the environmental problems (Spaargaren, 2000). Thus, this paper will examine the household behaviour and participation of solid waste and relevance of ecological modernization theory to deliver sustainability policy of solid waste management in Malaysia. The result from the survey among households in Malaysia shows less concern to contribute in recycling activities.

Keywords: *Solid Waste, Household, Behaviour, Recycling, Ecological Modernization Theory*

ABSTRAK

Kertas kerja ini membincangkan tentang hasil kajian di kalangan isi rumah di Malaysia mengenai penglibatan dan sikap isi rumah terhadap program kitar semula. Kajian ini menegaskan penglibatan awam dalam pengurusan sisa pepejal dan polisi alam sekitar adalah penting dalam mencapai kelestarian pengurusan sisa pepejal di Malaysia. Sesuatu program atau polisi yang dibuat tidak akan mencapai matlamatnya dengan jaya tanpa penglibatan pemimpin dan juga orang awam (H. Huong, 1999). Teori modenisasi ekologi juga mengenalpasti bahawa tingkah laku isirumah dan aktiviti harian mereka turut menyumbang ke arah mengurangkan masalah alam sekitar (Spaargaren, 2000). Justeru, kertas kerja ini menilai sikap dan penglibatan isi rumah di Malaysia terhadap pengurusan sisa pepejal dan relevannya dengan teori modenisasi ekologi untuk mencapai kelestarian dalam pengurusan sisa pepejal di Malaysia. Hasil kajian menunjukkan isi rumah di Malaysia mempunyai tahap kesedaran yang masih rendah dalam melibatkan diri dalam program kitar semula di tempat kediaman mereka.

Kata Kunci: *Sisa Pepejal, Isi Rumah, Tingkah Laku, Kitar Semula, Teori Modenisasi Ekologi*

INTRODUCTION

Solid waste is one of the greatest environmental challenges facing the most municipalities in Malaysia (MHLG, 2005). The amount of waste generated continues to increase in response to the rapid increased in population and accelerated urbanization and industrialization process. From a governance perspective, the management of municipal solid waste is an important and interesting case because it brings together a wider array of actors, including from all levels of government, local communities, householders and commercial service providers (Slater,R 2007). The household sector is the primary source of solid wastes in Malaysia, accounting for almost 60% the other important sources of solid wastes are industries, commercial establishments, markets, and institutions including schools and government offices. About 45% of Malaysia household wastes consist of food/kitchen wastes, 16% paper, 15% plastic and 9% glass and wood. Read. A (2000) argues that, household waste is an element of MSW which by nature is one of the hardest sources of waste to manage effectively, due to the diverse nature of its content, diverse sources of generation and Municipal Solid Waste (MSW) management by local government is a statutory obligation. Households were also key elements of successful of the national recycling policy (Read. A, 2000).

The ecological modernization theory considers the important the role of society behaviour in the context of production and consumption daily life to contribute in environmental crisis (Spaargaren et al. 1999). Spaargaren (1997, 1999) has emphasized the fact that the theory of ecological modernization should re-consider the role of citizen-consumers in the context of the production/ consumption cycles and the role of citizens, individuals or human agents in relation to institutional developments. Kit strange (2007) argues that the role of householder as consumer and producer, as tax-payer and customer, and as democratic decision-taker- is perhaps the single most important element in assisting or obstructing moves towards a more resource- efficient, waste avoiding and sustainable future. Thus, public awareness and public participation from household in solid waste management is important for analyzing sustainability of Solid Waste Management (SWM). Empirical studies have confirmed that an efficient SWM services derives from an appropriate participate of public, private agencies and community. (United Nation, 2003). On the other hand, strong involvement from government, private sectors and NGOs also crucial for sustainability policy of Solid Waste Management (SWM) (M. Joseph, 2007).

METHODOLOGY

A questionnaire survey among households in Malaysia was conducted in the study to gather information regarding perception and attitude towards waste management. Respondents were given a list of questions ranging from personal and social background information to level of education. 250 questionnaires were distributed in selected areas in Malaysia. From the 250 questionnaires distributed, 188 useable

questionnaires were received and analysed. The questionnaire was divided into 3 sections which are a) Household socio-economic characteristics, b) Household level of environmental awareness and attitude towards solid- waste recycling, c) Solid-Waste collection service.

Pre- test study was conducted in March 2013. The pre- test aimed to obtain basic responses from the prospective respondents and to gather more information from the study side and from the households. On pre-test study a sample of 30 responses were obtained, coded, and analysed. Questions that were not providing useful data were discarded, and the final revisions of the questionnaire were made. The pre-test can be used to measure how much time it takes to complete each questionnaire. The quantitative data from the household survey was analysed using SPSS (Statistical Package for Social Sciences).

Research problem statement

Malaysia, with an area of 329 750 sq Km, had a population of approximately 24.8 million in 2007, with a per-capita GDP of \$ 14 400. Malaysia is facing serious environmental challenges in terms of managing solid, hazardous, and toxic waste, water pollution, and air pollution. The World Bank (2000) reported that solid waste management was considered as a one of the major problems in developing countries and particularly in Malaysia. The daily generation of waste in Malaysia escalated from 13 000 tonnes in 1996 to 19 100 tonnes in 2006. Generation of municipal solid waste (MSW) in Malaysia has increased more than 91% over the past 10 years, due in particular, to the rapid development of urban areas, rural-urban migration, increase in per-capita income, and the change in consumption patterns brought about by development. The urban population, which constitutes more than 65% of the total population, is the main generator.

The changes in lifestyle in Malaysia, particularly in the urban areas, have led to more acute waste problems. Packaging of convenient household goods is free flowing, and carefree or rather couldn't careless attitude of the affluence society result in huge quantities of waste, as indicated by discarded wrappers from supermarkets and mushrooming fast food outlets. Plastics, which are not degradable constitutes the higher proportion of modern day wastes (Zalina, 2000). On the composition of solid waste, the 9th Malaysia Plan (2005-2010) estimated about 47% of the waste is made up of food waste, 24% of plastic, 7% is paper, 6% of iron and glass and others made of the rest (Figure 1). It seems that Malaysian are approaching unsustainable consumption pattern by buying more food that we need and unnecessarily generate more waste than we are supposed to have (Nadzri yahya, 2007).

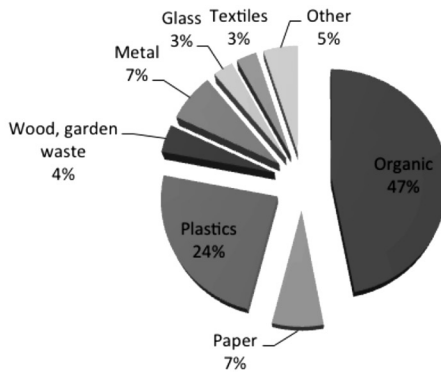


Figure 1: General Composition of Waste in Malaysia

Source: National Waste Recycling Program, Ministry of Housing and Local Government 2007

The theory of ecological modernization emphasizes the importance of consumers actively demanding green product and technologies as a main driver for more sustainable everyday life in households (Mol, 2000). Change in consumer behaviour in Malaysia resulting in reduction in waste generation.(MHLG, 2003) However it must be remembered that the choices for the consumer product industries and consumer behaviour may be the most critical factor in tackling solid waste management. This is because treating solid waste after being generated will only partially solve the problem, especially when solid waste generation keeps on increasing due to packaging and consumer behaviour. This result in solid waste being treated but still does not solve the problem of solid waste generation or the need for society to make changes in its behaviour.

In Malaysia, the current level of waste generation and existing waste management practices are wasting valuable resources, failing to take advantage of economics of scale and technologies advances, causing harm to the environment and threatening human health (National strategic Plan 2005).It is unfortunately true that increasing wealth results in an increase in the demand for consumer goods and that these goods come wrapped in ever greater amounts of packaging to appeal to the senses of the consumer. Increase in personal wealth is demonstrated to others through acquisition of goods and the frequented replacement of existing goods with the latest model. In such a society, there is stigma attached to the re-use of products as demonstrating an inability to afford better. Consumers have also developed wasteful food habits, with much unwanted food thrown away. Thus, there is a growing use of materials and resources in “status” products and packaging, which are quickly discarded. This is not sustainable. Cultural changes are needed to protect precious natural resources and the environment. A structured plan is required for the country in order to achieve a common standard and economics of scale. Solid waste must be properly managed to avoid the potential for harm to human health.

Waste recycling in Malaysia

This section discusses public attitudes to waste behavior including recycling, sorting of waste at the source and waste disposal habits among households in Malaysia. Overall the public are aware of problems dealing with solid waste, however, their attitude is still low with regards to the practice of recycling etc. Environmental awareness and behavioral knowledge has been found to play a significant part in shaping waste management behavior. (S.Barr et al. 2007). In this study, recycling is seen as one of the most sensible solutions both economically and ecologically for managing and analysing sustainability of solid waste management in Malaysia. On the other hand, recycling programme also a key dimension address in ecological modernization process.(A.Scheinberg, 2008).

The survey showed that the majority (99%) of respondents claimed that they are aware of a recycling programme in their area, however only less than 30 percent of them were participating in the programme. By far the most common sources of information about recycling programmes for all respondents collectively are television (92%) and Local authority (6%), followed by newspaper and friends (1%). However, integrated use of all media can increase public participation (Abdelnaser et al., 2006), whereas traditional methods of promotion (including media campaigns, leaflet drops, newsletters, etc) can only achieve a limited level of success in shifting public perception, behavior and attitude (Grodzinska-Jurczak et al., 2006). Figure 2 illustrates the results of various sources through which households obtained information about recycling.

Figure 2 : Source of Information Regarding Recycling Programme

Source of information	Frequency	percentage
Local Authority	12	6.4
Newspaper	2	1.1
Friend	2	1.1
TV/mass communication	172	92

Source; Survey 2013

An education campaign will need to be conducted in order to encourage participation in the scheme by householders from a life cycle perspective and to motivate positive recycling and waste minimization behaviour in the community. Results from the questionnaire show that changing the attitude of residents towards protection of the environment, which has been shown to be one of the main drivers of recycling and waste minimization behaviour (Tonglet et al 2004), will need to be the thrust of the educational campaign. Read. A (1998) proved that the success of a recycling scheme depends largely on the public's participation. Increasing household participation must be carried out using all available media, such as television and radio networks, as well as newspapers, to increase public awareness. Without appropriate information and rising of public awareness, new

plans will fail to be implemented and new systems not effectively utilized (Read, A, 1999). Additionally, the study by Evison and Read (2001) stated that using a regular leafleting campaign to help to maintain public awareness, interest and understanding was vital for maintaining good responses.

In order to increase household participation, the message of recycling and other forms of appropriate waste management need to be adequately communicated to the public, so that residents' habits, behavior and traditions can be changed for the better, enabling local authorities to achieve government goals of recycling and recovery (Robinson & Read, 2005). In contrast, adverts in the local press intended to raise awareness of a scheme in Glasgow, Scotland, appear to have made little impression on the public and the visual impact of the sites themselves seemed to have been the best advert. A similar conclusion was reached by Belton et al, (1994) concerning the futility of newspaper adverts for a 'bring' scheme in Glasgow, where 84% of users had learnt of the bring sites existence simply by seeing sites.

When housing conditions and other socio-economic matters are taken into account differences in attitude to recycling are seen. Most clearly in the case of rural areas, where they did not know of a recycling programme or how to participate in recycling activities. On the other hand, a less educated background and low income also influence their attitude to involvement in recycling. For example, the survey found that respondents who lived in rural area show less concern and willing to be involved in recycling programmes. However, in urban areas the public shows a good effort to contribute in recycling activities. This survey also shows that men in general and people without a college education normally are less- likely to recycle. Respondents were asked to give the best description of why they recycled. The survey provided six possibilities in the questionnaire to describe their views of recycling (see figure 3 below). From the survey only 38% claimed that they recycled to save landfill spaces, whereas 20% of households indicated that they recycled for the future environment/generations, respectively.

Figure 3: Description of Reasons for Recycling of Solid Wastes among household in Malaysia

Reason for recycling of solid waste		Frequency (%)
1.	Good facilities provided	15% (28)
2.	For the future environment/ generations	20 % (38)
3.	Saves landfill space	38% (71)
4.	Incentives/monetary/reward	12% (23)
5.	Saves dustbin space	10% (19)
6.	My own awareness about the importance recycling/ duty	5% (9)

Source; Survey 2013

The study found that 60% of households did not participate in a recycling activity. Amongst the non-participants, 25% indicated inconvenience or lack of time as the reason for their non-participation. Additionally, 32% of respondents agreed that the recycling facilities were too far away or inadequate. It is also interesting to note that a smaller percentage of the non-participating respondents (1%) indicated that they believed that recycling was only wasting their time. Figure 4 below presents in detail the respondents' reasons for not participating in recycling. Support was found for the following hypotheses: Recyclers are significantly more strongly motivated to recycle by intrinsic than extrinsic factors; and recyclers are significantly more strongly motivated to recycle by social than personal reason.

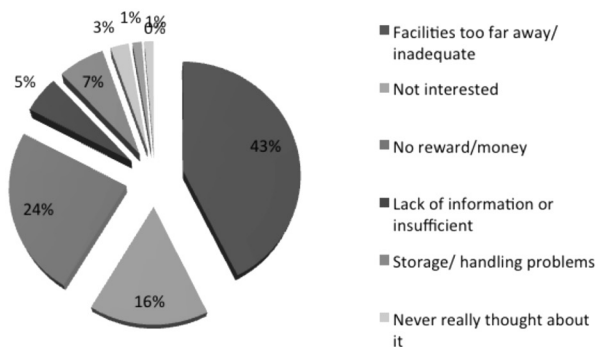


Figure 4: Description of Reasons For Non-Recycling of Solid Wastes among Household in Malaysia

Source; Survey 2013

When asked whether they knew the location of the nearest collection point for their area, only 40% indicated that they knew the location. However 32% of households complained that the collection point could not be easily located. In terms of distance, only 33.7% indicated that it was within one kilometer from their house, 6.4% said it was within the radius of 2-3 kilometers, 7.5% indicated that it was more than 4-5 kilometers radius while 25.5% indicated that they had no idea how far these facilities were from their houses. Without doubt, the farther the location of the collection point, the more discouraged will the householders be. Robinson and Read (2005) found that a contributing factor for those who were not recycling was a high lack of a awareness of the location of the nearest facility. While Gonzalez- Torre and Adenso- Diaz (2005) commented that when citizens who are environmentally concerned have bins near to their home, they appear to be willing to recycle more fractions than when they have to walk for a longer time to drop off the waste, due to the inconvenience of carrying the large volumes that this type of waste usually occupies. Limitations and conditions of the physical environment have also been shown to be a critical factor in recycling behavior. In a study in Sheffield, UK, a main reason for non-participation in recycling was given by survey respondents as lack of space for the recycling bin (McDonald and Oates, 2003). There can be many

physical barriers to recycling, making it inconvenient or unpleasant to recycle. It was concluded that short distances and ready access to the bins were obviously incentives to recycling.

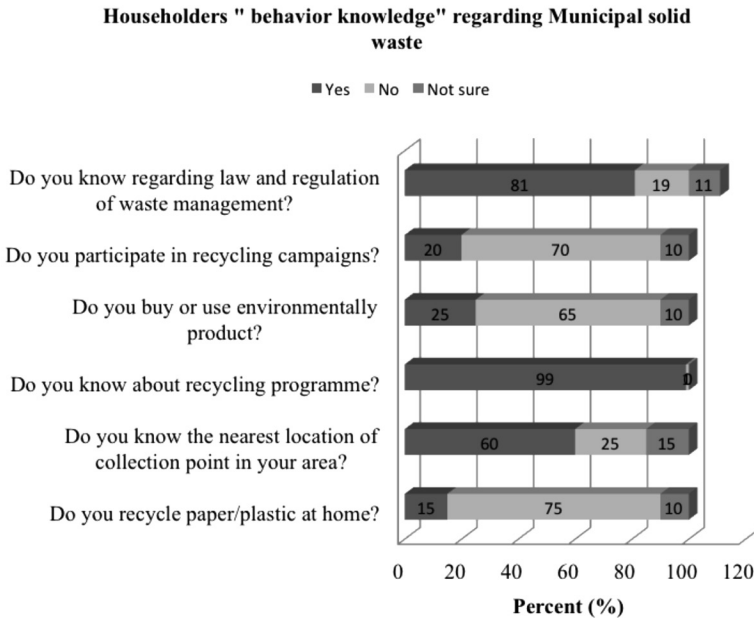


Figure 5: Householders “ behavior knowledge’ regarding Municipal solid waste

Source; Survey 2013

This survey found that there is a significant relation between area and recycling activities. The survey found that respondents from rural areas show less concern and effort to contribute in recycling activities. Some of the respondent (about 1%) did not know of are recycling programe in their area (figure 5). It is one thing to be asked to express one’s attitude to recycling and another to be involved in a recycling project having to sort one’s waste. Asked what the households did with their newspapers and magazines they answered that nearly half of them were collected for recycling.

The respondents were also asked for their views on how the situation could be improved. The majority of respondents suggested, “More facilities be provided”. There should be “local collection centers”, which are within easy reach for each community or housing areas. Community or group recycling should be encouraged and more effort is needed to educate the people of the need and importance of recycling. Monetary incentives may also be considered, for example by improving the community facilities in an area as a reward, based on the quality of recyclables

collected. In this regard, it is observed that the high rate of newspaper recycling might be due to the ready market for it. When asked whether they will recycle in the future, if all facilities are provided, 98% of respondents said that they would participate

The study also suggested more than a few strategies for the government to achieve sustained success in its recycling campaign. As Price (2001, P, 334) says the role of the Local authority and actions of the householders are paramount to the success of sustainable waste policies. Firstly, to improve the operational aspects of recycling facilities by improving convenience by placing recycling bins in more accessible and visible location particularly in small cities and rural areas. Local authorities also need to make their recycling service reliable, convenient and easy to use because the conventional dustbin, a convenient and reliable single point of disposal, is seen by many householders as a better option than recycling (Martin et al., 2006). Peurin and Barton (2001) note that the key link in increasing recycling rates is the householders. Belton et al. (1994) point out that not only is public participation in recycling essential but that there must also be a market for recyclables; some understanding of the public's attitude towards buying products made from recycled materials is therefore necessary. Secondly, local authorities need to work closely with private sector companies and NGOs to design a range of waste containers that are suitable for given locality. In this case, clear instructions should be provided as to how the schemes operate and they must communicate the benefits of recycling, and emphasize that recycling does not have to be inconvenient, or take up too much time or space in the home (Read, 1999; Thomas, 2001). Thirdly, awareness of recycling and concern for the environment should be inculcated from an early age. Unfortunately, there is no formal subject dedicated to achieving this purpose in the present education system at primary and secondary level in Malaysia. The survey also found that the involvement from local authorities, private sectors, and NGOs in promoting recycling programme show a weak commitment. Ecological Modernization is a systems based approach that looks to the interconnections between policy formation, the economy and the natural environment. Cooperation and the building of social capital between stakeholders are crucial to the ecological modernization platform (Dryzek, 1997; Lulofs, 2003).

Attitude to sorting at source

Respondent also were asked regarding their activities sorting at source. The result shows that only 6% of respondents always sorted their waste at home, 50% of respondents said sometimes and 44% of respondent responses never sorting their waste at home (figure 6). The survey also found that almost 80% of respondent said sorting at source is difficult to practice and only 10% of respondents said the sorting system was easy to practice at home. Almost half of the respondents do not know of any information regarding sorting at source and only 15% of respondent were satisfied with the information given about sorting systems.

Attitude sorting at source among household in Malaysia

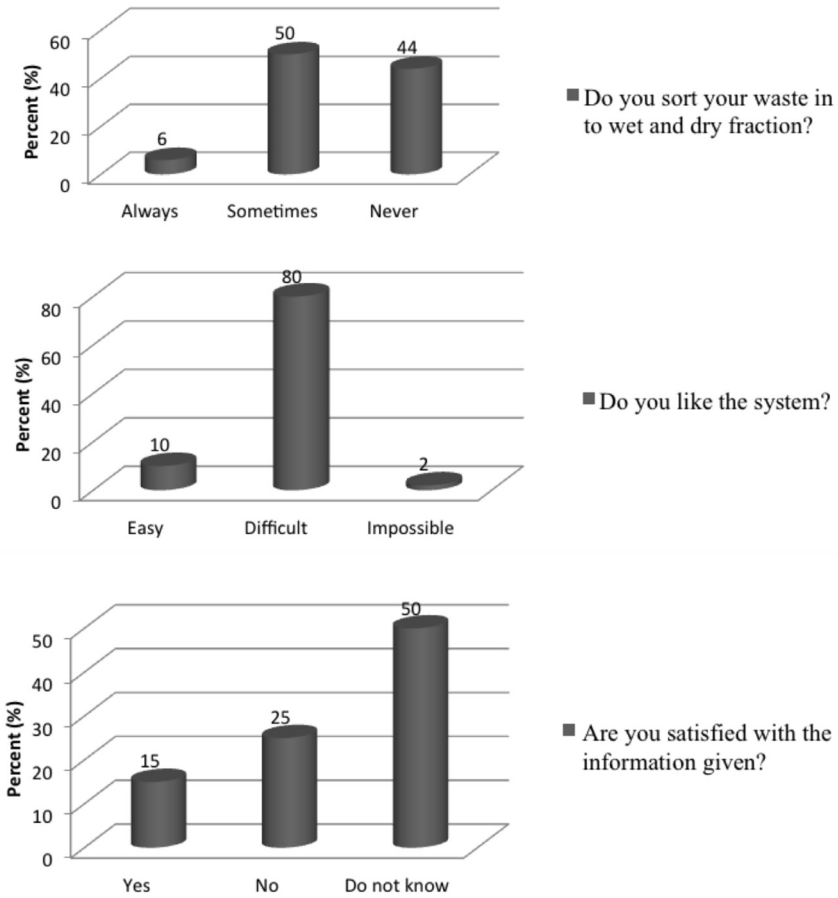


Figure 6: Attitude sorting at source among household in Malaysia

Source; Survey 2013

Furthermore, the households in Malaysia were asked to comment on an extension of the sorting that would include batteries, problem waste, and waste food. 44 per cent are willing to participate in a collection of batteries, and 51 per cent are interested in a collection of problem waste, while only 15 percent want to contribute to a separate collection of waste food.

Waste Disposal Habits of Households

Waste disposal habits or behavior are determined by climate, cultural factors, housing conditions, expectations about the role of (local) governments and other factors (A.

Idris et al, 2004). Also, some characteristic of waste (for example, odour and the impact of flies and rodents) exhibit a distance decay function. When primary waste collection service is not reliable, people explore other options. When regulation is either absent or is followed in its breach rather than compliance by a majority, there are incentives to dump the wastes in open access spaces such as streets and public spaces. In hot and humid climates, there are disincentives for accumulation or storing of wastes and positive incentives for disposing of wastes as and when they arise waste management in any city in the developing world requires understanding and realigning these incentives in institutional arrangements.(Zalina, 2000)

The survey shows that the majority (80%) of respondents have a problem with waste storage in their area. The present situation with respect to on-site storage varies from one area to another. However, in most cases on-site storage is not satisfactory; storage is not secure, and does not allow for effective collection, resulting in health and environmental problems. Dustbins usually remain open, increasing the risk of epidemics from infectious diseases such as hepatitis, typhoid fever, anthrax in animals, tetanus, and pneumonia. Open bins allow for the easy transmission and spreading of infection pathogens such as Salmonella typhi, Salmonella paratyphi, Bacillus anthralis, Clostridium tetani, and Clostridium perfringens, many of which are present in health- care waste.(M.Nassir, 2002).

Residents with no proper waste storage facilities particularly in rural areas, often hang waste packed in plastic bags outside the house, on fences, trees, or left at the roadsides. Apart from the aesthetic problems, this contributes to the inefficiency of collection. Insufficient supply of communal trash cans results in the storage area becoming a dump site. Scavenging by rodents and stray animals eventually leaves the waste scattered all around the site, and this is unhygienic and can cause health problems to local residents.

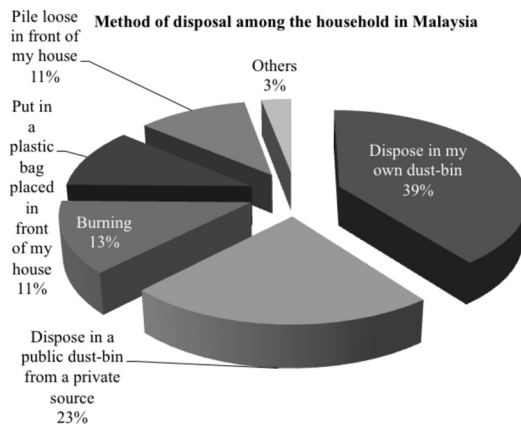


Figure 7: Method of disposal among the household in Malaysia

Source; survey 2013

The survey, found that there a few options households have to dispose of their waste (figure 7). Result shows that 43% of respondent, normally in urban areas throw their waste in the bin that is provided by local authorities, 34% of respondent used communal bins where only one bin is provided in every area and sometimes respondents found it difficult to throw their trash because the bin was always over loaded. This survey also found that 13% of respondents burn of their waste as a option to dispose their waste and it seems this happened in small villages in Malaysia. Other methods of disposal are; put in a plastic bag placed at curbside and pile waste loose at curbside (11%).

The survey showed that poor storage facilities and public attitude- wide variation of types and size used and haphazard storage collection by residents contribute to the inefficiency of collection. Financial and institutional constraints are the main reasons for inadequate waste disposal in Malaysia (Nadzri Yahya, 2007). Introduction of SWM user fees cover only the collection and transportation costs leaving practically no resources for safe disposal of the waste (MHLG, 2005). The government should reinforce the management aspects of SWM disposal by encouraging and promoting private sector participation either as individual units or as joint ventures for investment in waste recycling, marketing and utilization of SWM for environmental friendly projects. However, the management of such enterprises must be under the supervision of the government for monitoring their effectiveness.

CONCLUSION

The result from the survey among households in Malaysia shows less concern to contribute in recycling activities. Education background, condition of house, established income were the main factors influencing people to contribute in recycling programe. Lack of facilitates provided by local authorities such as recycling bins and information related to recycling also influence peoples contribution to recycling. For example in small cities, respondents are mostly less concerned regarding recycling activities because of a lack of information given and good effort from local authorities to encourage people to participate in recycling programe. In some cases there is no recycling bins provided particularly in rural areas and so it is not possible for the public to participate in recycling activities. The survey also found that there are a few options how respondents can dispose of their waste. 23 % of respondents choose to burn their waste particularly in small cities. Lack of storage provided by local authorities was the reason given why respondents burn their waste as an option to dispose of their waste. Its seems that society in Malaysia is still not aware regarding waste problems and some of them are not interested to contribute in any activities that relate to solid waste management.

This study could indicate that there are other factors that hinder households' participation in recycling, such as absence of 'visible' recycling centres and lack of

incentives to do so. It is important to educate households on the possible benefits of recycling and create practical knowledge and experience in organizing a successful recycling campaign. This study also was successful in identifying some reasons for householders' attitudes towards recycling. More specifically, it was identified that a number of factors discouraged them from participating in recycling. It was clear that "lack of facilities" and "distance of facilities- being too far from homes" were the major factors.

A similar survey of recycling by Belton et al. (1994) identified the three main reasons for non-participation in the use of recycling centres in Glasgow, United Kingdom (UK) to be a perception that the centres were too far away, apathy and a lack of interest in recycling. In addition, these reasons were also clear proofs that most householders were not aware that they can do their bit for recycling by simply putting the recyclable and non-recyclable materials in separate bags and placing them in the ordinary rubbish bins available at the house which will then be collected by the council or appointed private company or agent. Barriers to assessing solutions, such as lack of facilities or poorly designed facilities (for example, no recycling bins), inconvenience or lack of knowledge (for example, does not know the location of the nearest point to recycle) were the most commonly mentioned barriers related to facilities of infrastructure. The location of the recycling station is very important and the public attitudes towards knowledge about source separation in general and recycling stations in particular are of interest for the performance of the whole system.

In sum, the whole system of solid waste management in Malaysia is still weak and fragmented. There are also problems in institutions arrangements and managerial aspect in solid waste management. Thus, national policy for solid waste management in Malaysia is an important to deliver sustainability of solid waste management. Awareness on the problems and impacts associated with solid waste generation, collection and transport, and disposal must be promoted through campaign and education. The government should become more open and flexible to take an initiative to improve the solid waste management system and create a sustainability system for solid waste management in Malaysia. The public and private participation also plays important aspects for the success of the government program in deliver positive impact towards sustainability solid waste management. Ecological modernization theorists contend that the recognition of environmental problems is starting to reshape the institutions and everyday social practices of modernity in fundamental ways.(Spaargaren, 2000). The active engagement of citizens making choices in their consumption that pushes the government and the economy along in their embrace of ecological rationality. Thus participation and household behaviour in solid waste management is crucial to deliver sustainability policy of solid waste management in Malaysia.

A key aspect of governance for sustainability is the capacity of individual citizens and organizations to develop an informed perspective on critical issues

relating to sustainability. Civic education is crucial to the development of new ways of creative solutions to intractable social and environmental problems.(Benn.S et al. 2005).Governments, private sectors and NGOs all have a role to play in contributing to civic education for sustainability solid waste management in Malaysia and assist in the development of an active public sphere. The relationship between decision makers and experts to inform and educate individuals to be involved in environmental self- governance is evident for ecological modernization.

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