World Academy of Science, Engineering and Technology
International Journal of Psychological and Behavioral Sciences
Vol:9, No:8, 2015

Recycling Motivations and Barriers in Kota Kinabalu, Malaysia

Jasmine Adela Mutang, Rosnah Ismail, Chua Bee Seok, Ferlis Bahari, Lailawati Madlan, Walton Wider, Rickless Das

Open Science Index, Psychological and Behavioral Sciences Vol:9, No:8, 2015 publications.waset.org/10002698/pdf

***Abstract*—**Public participation in recycling domestic waste is still very low in Malaysia. Only 10.5% of solid waste was recycled up to now which is far below than of in developed countries. Therefore, understanding public motivations towards recycling domestic waste are important to improve current recycling rate. Thus, this study attempts to identify what are the possible motivations and hindrances for the public to recycle. Open-ended questions format were administered to 484 people in Kota Kinabalu, Sabah, Malaysia. Two specific questions we asked to explore their general determinants and barriers in practicing recycling: "What motivates you to recycle?" and "What are the barriers you encountered in doing recycling activities?" Thematic was conducted on the open-ended questions in which themes were created with the raw comments. It was found that the underlying recycling motivations are (i) awareness' towards the environment; (ii) benefits to the society and individual; and (iii) social influence. Non participations are influence by (i) attitudes; (ii) commitment; (iii) facilities; (iv) knowledge; (v) inconvenience; and (vi) enforcement.

***Keywords*—**Recycling motivation, recycling barrier, sustainable, household waste.

I. Introduction

ENVIRONMENTAL sustainability is a major issue all over the world. Climate change, deforestation, depleting of natural resources, and other environmental issues has become the major concerns of every nation. Numerous studies have been done on issues related to environmental conservation behavior including recycling behavior. Many research suggested that the most sustainable environmental-friendly-alternative to waste management is recycling which includes reusing, reducing and recycling recyclable waste. The Malaysian government has targeted to achieve 22% of recycling rate by the year 2020. However, with another 5 more years to go, it is vital to explore what are the possible steps to be taken to encourage recycling activities. In addition to that, beginning September 2015, the Malaysian government will introduce a mandatory waste separation and the implementation methods were drawn by the National Solid Waste Management Department (JPSPN). Therefore, the minister of The Urban Well-being, Housing and Local Government will ensure all facilities regarding recycling are improved. However, the success of this effort will depend on the readiness and active participation of the citizens [2]. There are various reasons why a person engages in recycling activities. A study in Pulau Pinang, Malaysia reported that recycling participation was generally motivated by personal concerns for the environment and the promotion of good health [3]. The findings is consistent with a study done in Palestine [4] which revealed that recycling participation was also related to concerns on keeping the environment clean and promoting good health, followed by conserving resources for future generation, saving space in landfills, and creates jobs in the community. Another study in the United Kingdom [5] found that the major influencing factor to recycling is attitudes towards recycling but must be complimented by providing appropriate facilities, opportunities, knowledge how to go about recycling and eliminating situational barriers such as time, space and inconvenience.

Several studies recognize that recycling behavior is motivated by both intrinsic and extrinsic motivation. Extrinsic motivation is often associated with recycling for financial reward, social pressures, punishment, the enforcement of law and regulations, and other external rewards [6]-[8]. On the other hand, engagement in recycling activities are also influenced by intrinsic motivations [9]-[11] such as values related to the environment, social duty, frugality in consumption, self-satisfaction and for the sake of future generation. Involvement in recycling behavior is also associated with perceived behavioral control, situational factors and consequences of recycling. Under those circumstances includes social costs, time required to recycle, transportation, transport frequency and container proximity, knowledge, awareness, commitment, poor image and ignorance to perform the behavior are also associated with the willingness to perform recycling behavior [7], [12], [13].

Internal factors were reported to be stronger predictor for recycling behavior as opposed to external factors. External factors such as monetary rewards and incentives cannot sustain a particular behavior in a long run for if the reward is taken away the behavior will eventually stop. For this reason, internal factors are better determinant to ensure the behavior is done voluntarily without relying on external factors for long-lived effect. Thus, [9] suggested that the relevant authorities should ensure that the general public or households should have better awareness and knowledgeable recycling, providing conducive environment and sufficient facilities to recycling behavior, eliminate major barriers to recycling, and are convince that participation in recycling is beneficial.

The current recycling trend in Malaysia is based more on the commercial value of the materials or market-based. This

Jasmine A. Mutang, Chua B. Seok, Ferlis Bahari, Lailawati Madlan, Walton Wider and Rickess Das are with the School of Psychology and Education, Universiti Malaysia Sabah, 88400 Kota Kinabalu, Sabah (e-mail: jasmine@ums.edu.my, chuabs@ums.edu.my, ferlis@ums.edu.my, lailawati@ums.edu.my, waltonwider@yahoo.com & quelast@gmail.com).

Rosnah Ismail is with Universiti Malaysia Perlis, Kampus Kubang Gajah, 02600 Arau Perlis, Malaysia (e-mail: rosmah@unimap.edu.my).

Open Science Index, Psychological and Behavioral Sciences Vol:9, No:8, 2015 publications.waset.org/10002698/pdf

means that only marketable waste is collected and currently the market for recyclable is still lacking [14]. Besides that, different municipality has different needs and differs in some ways. Therefore the 3R (Reuse, Reduce and Recycle) approach planned by the central government was found to be ineffective. Overview by [15]-[17] identified reasons why recycling is not common among Malaysians were space limitations, misconceptions, lack of time, inconvenience, inadequate facilities and burdensome. Other reasons reported by the Municipal Waste Management [18] are the lack of market for recyclable items, no standardized price for recyclable items, inconsistent and poor collection schedules, low public awareness, loose implementation policy and strategies, and loopholes in managing recyclable household waste among stakeholders.

The Ministry of Housing and Local Government (MHLG) noted that in order to increase recycling rates it is important to that household recycle voluntarily instead of putting the effort to recycle for monetary rewards. This is because not all recyclable items has good price in the current market in Malaysia. Clearly the general public are aware and have enough knowledge about environmental issues and the importance of recycling, however getting the knowledge translated into action needs to be tackled [19]. Therefore, it is vital to investigate further households' attitude and behavior towards recycling and identify what can be done to encourage recycling activities. It is important to understand public current recycling behaviors and attitudes towards recycling in order to develop relevant programs to increase the awareness and participation in recycling activities [20].

II. Methodology

A. Participants

A total of 600 randomly selected urban households in Kota Kinabalu participated in this study. However, only 485 data sets were viable for data analysis with a response rate of 80.7%. The average number of household is 5.34 (SD= 2.385). More than half of the participants were females (n=301) and the remaining are males (n=184) with the mean age of 30.79 (SD=9.24). Most participants were single (57.1%) and 42.9% were married the average household size is 5 person (SD= 2.36). Participants were asked whether there were recycling facilities around their neighborhoods. Nearly all reported that there were no recycling facilities available (81.4%). Table I summarizes the participants' profile.

B. Measures

Data were collected using open-ended questions concerning to their recycling activities. This method allowed respondents to express their answers freely. This paper will discuss their general their motivation to recycle and barriers they encounter in carrying out recycling activities by asking "What motivate you to recycle?" and "What are the barriers you encountered in doing recycling activities? Please list down." This approach sought to seek the integral components of qualitative research and to answer the research question.

TABLE I
Profile of Participants

Variables	n	%
Gender		
Male	184	37.94
Female	301	62.06
Marital Status		
Single	269	55.46
Married	208	42.89
Other Single	8	1.65
Recycling facilities availability at the residential area:		
Yes	90	18.56
No	395	81.44
	Mean	Std. Dev
Age	30.67	9.41
Household size	4.64	2.36

C. Data Analysis

Thematic analysis was conducted on the two open-ended [1] in which themes were created with the raw comments. Preliminary coding, categorization, axial coding and cross-tabulations were performed accordingly using indigenous psychological analysis approach.

III. Findings and Discussions

All statements were transferred into a database with all identifiers and demographic information removed. The statements were then grouped accordingly to similarity in terms of content. Unclassified statements were coded as "unknown" and therefore omitted from the descriptive analysis.

Participants were first asked whether they have ever done any garbage separation for recycling purposes at home. Slightly more than half (59.9%) did not separate their garbage and was asked "What are the barriers you encountered in doing recycling activities? Please list down". Those who did not separate their garbage was considered and coded as non-recycler by the researcher. Meanwhile the remaining 40.1% reported that they separated their garbage for recycling purposes was coded as recycler and they was asked further as to what motivate them to recycle.

A. Recycling Motivation

Table II showed that the thematic analysis revealed recycling motivation is composed of three main themes: (i) Awareness' towards the preserving the environment: awareness towards the importance of environment, environmental cleanliness pollution reduction, cost reduction, maintaining the Earth in the long run, and; (ii) Benefits to the society and individual: Additional Income, Ease of Management, Leisure Activities, Benefits for Future Generations, and Responsible towards Well-being and Health; and (iii) Social influence: Individuals, and media.

Based on the main themes count, awareness towards preserving the environment was most frequently listed by participants (cited 136 times). This finding is similar to the [17], [21], [19]. The second reason is labelled as benefits to individual and society (cited 57 times). Their responses indicated that by carrying out recycling, the get monetary

Open Science Index, Psychological and Behavioral Sciences Vol:9, No:8, 2015 publications.waset.org/10002698/pdf

benefits by selling the recyclable materials. Besides that, other parties such as the future generations and the local authority were perceived to benefit from their engagement in recycling. The third motivator is driven by social influence (cited 19 times). This is also similar to other studies [22], [23], [13] Examples of common responses are:

"…to keep my environment clean and safe…"

"I can make money out of it by selling old newspaper, paper, aluminum, cans and etc."

"because by separating our waste, we make things easy for the municipal workers. I think if we separate our garbage, we do a big favor for them'

"…for our children and future generations, we need to save the environment by going green so the importance of recycling is getting vital if not a necessity now."

"Family and friends showed me the importance of recycling"

TABLE II
MAIN THEMES AND SUB-THEMES BASED ON NUMBER OF RESPONSES ON "WHAT MOTIVATE YOU TO RECYCLE?"

No.	Main Themes	Sub-Themes	n	(%)
1.	Awareness towards Preserving the Environment	Awareness towards the Importance of Environment Environmental Cleanliness Pollution Reduction	136	(64.15)
2.	Benefits to Individual and Society	Cost Reduction Additional Income Ease of Management Leisure Activities Responsible towards Well-being and Health Benefits for Future Generations	57	(26.89)
3.	Social Influence	Individual – Employer/Government, neighbour, Friends, Family, Teacher, Lecturer Mass Media	19	(8.96)

Note: Percentages shown are calculated using total number of responses rather than total number of respondents.

B. Recycling Barriers

Non recyclers were asked what barriers they encountered in doing recycling activities are. The thematic analysis revealed six main themes (i) Facility; (ii) Attitude: lack of awareness, lack of cooperation, not interested, do not care; (iii) Knowledge: Lack of information; (iv) Commitment: busy working, and no time; (v) Inconvenience: dirty, and difficult; and (vi) Enforcement.

It is found that situational barrier such as lack of adequate facilities is the most common responses given by the non-recyclers (cited 77 times) as the main reason for not recycling. This finding is consistent with other studies done in other states in Malaysia [24], [25]. The second factor 'attitude' (cited 59 times) is related to the individual lack of awareness on the importance of recycling, lack of cooperation and involvement of others (spouse, family members, neighbors) and simply not bother about doing recycling.

The third common response is 'knowledge" which is consistent with other [26], [27] which means lack of information on what to recycle, where and how to recycle. In term of commitment (cited 19 times), participants were not keen to recycle because they have no time to do so and some indicate that they were busy with work. These are common responses in other studies regarding barriers of recycling in other part of the world. Somehow this indicates that they know the importance of recycling but are not willing to spend time doing it and not adapting it as a lifestyle. The findings also suggest that recycling is perceived as a nuisance and this finding is consistent with other studies which reported that those who perceive recycling as inconvenience will less likely to recycle [28], [29]. This finding showed that respondents perceived recycling activities as inconvenience, no time or never really thought about it. Since recycling requires effort to separate waste, some were reluctant to do so and thus report that recycling is inconvenience. That being the case, this explained that having greater perceived behavioral control (knowledge, provision of facilities, time, and space) will determine participation in recycling activities.

TABLE III
MAIN THEMES AND SUB-THEMES BASED ON NUMBER OF RESPONSES "WHAT ARE THE BARRIERS YOU ENCOUNTERED IN DOING RECYCLING ACTIVITIES?"

No.	Main Themes	Sub-Themes	n	(%)
1.	Facility	Lack of Recycling Facilities	77	(37.20)
2.	Attitude	Lack Awareness Lack Cooperation Not Interested Do Not Care	59	(28.50)
3.	Knowledge	Lack of Information	32	(15.46)
4.	Commitment	No Time Busy Working	19	(9.18)
5.	Inconvenience	Dirty Difficult Process	15	(7.25)
6.	Enforcement	No Enforcement	5	(2.42)

Note: Percentages shown are calculated using total number of responses rather than total number of respondents.

A vast literature has discussed regarding barriers of recycling, and inconvenience and lack of knowledge is among one of the greatest barriers [30], [31], [29]. When people were asked about why they recycle, many responded they are too lazy or no time to participate, plus lack of information/knowledge is one of the reasons for not participating. A small number of responses (n=5) reported that they were not compelled to recycle because of no enforcement on recycling. Recycling is not made compulsory in Kota Kinabalu, so it is not an everyday routine among most household. Their response suggests that reward or punishment might 'pushed' households to engage in recycling behavior. An example of a successful recycling policy using external motivation method is in Boulder, Colorado. A policy name pay-as-you-throw was implemented and successfully yielded a growing recycling rate among the residents [32]. However, the disadvantage of this is it has a short term effects because once the reward (incentives, punishment, etc.) is taken away; the behavior stops.

Examples of responses pertaining to the barriers to recycle are:

"not enough recycle bins - every 'taman' or housing area should have bins ready. Housing developers should

Open Science Index, Psychological and Behavioral Sciences Vol:9, No:8, 2015 publications.waset.org/10002698/pdf

contribute bins and not solely on municipal councils. Infrequent collections result in in people dumping around recycling bins"

"…lack of collectors coming to housing areas; far distance to send to collection centers"

"inconvenient to drop off collection center; lack of recycle bins at public areas"

"like it's okay if I don't recycle, some other people will and my amount of recyclable items is just too little it won't make a difference'.

"no desire to do so"

"the barriers I encountered would be that people around me does not recycle, not enough awareness of importance of recycling from my family members"

"Recycling is troublesome. Not convenient unless it is placed nearby each residence area"

IV. Conclusion

In conclusion, households' recycling motivations in Kota Kinabalu, Malaysia appear to be formed by three main factors. The underlying factors are (i) awareness' towards the environment; (ii) benefits to the society and individual; and (iii) social influence. The findings of the present study were able to provide an insight of households' motivations to recycling, which showed general environmental concerns as the main component. The findings showed that recyclers are willing to engage in recycling activities even though inadequate facilities are provided. The primary motivator is driven by their awareness towards the environment. Perhaps specific awareness with regards to recycling could be directed towards the public especially the non-recyclers by the media, education institutions, NGO's, and relevant authorities to further promote awareness.

Non-recyclers reasons for not recycling are (i) attitudes; (ii) commitment; (iii) facilities; (iv) knowledge; (v) inconvenience; and (vi) enforcement. Ideally, these results will be able to give some important insight to the relevant authorities and taking considerations to improve the recycling participation of the public. The challenge is to 'convert' the non-recyclers to carry out recycling voluntarily because recycling activities will not be able to sustain itself without the influence of altruistic or intrinsic motivation. Recycling should be part of a lifestyle and should not only be practiced for economic reason, enforcement of law and other extrinsic motivators.

It is hoped that by knowing people's motivations and hindrances to carry out recycling would help to overcome waste management problems in the country hence the success of waste management project in the future. This study was conducted among household at urban area of Kota Kinabalu, therefore it could not be generalized to other population. This study needs to be replicated for future research targeted household at rural area or larger volume of data needs to be gathered in order to represent a general population. It is also suggested that combining multi strategies by taking into account several research findings to encourage and instill permanent recycling engagement among residents. Before the mandatory waste separation is introduce starting September 2015, it is vital for the government to provide easily accessible recycling facilities such as adequate bins, systematic collection system, good management of drop off centers and the recyclable collection centers. Most importantly is the implementation and the overall system must be convenient and practical implementation to both the public and waste management parties involved. Additionally, the government can set a standardize market values for recyclable items to encourage participation.

Acknowledgment

Part of this research was funded by the Fundamental Research Grant Scheme (FRGS) under the Ministry of Education Malaysia (FRG0330-SS-1/2013).

References

[1] V. Braun, and V. Clarke "Using thematic analysis in psychology." *Qualitative Research in Psychology*, vol. 3, no.2, pp. 77-101, 2006.

[2] Govt to gradually introduce mandatory waste separation from Sept 2015 (2014, November 15). Retrieved from http://www.thestar.com.my/News/Nation/2014/11/15/waste-sorting-mandatory-sept-2015/

[3] O. Abdelnaser, A. Mahmood, and A. Read "A study of the motivation factors and de-motivations factors influencing the participation of people of Pulau Pinang in recycling of solid wastes." *The Journal of Solid Waste Technology and Management,* vol. 37, no 2, May 2011, pp. 91-101.

[4] O. Abdelnaser, A.K. Sarsour, and A.H.K. Pakir "An Investigation Into The Factors Influencing The Participation Of Households In Recycling Of Solid Waste In Palestine." *International Journal of Health Economics,* no.2, 2012, pp. 4-19.

[5] M. Tonglet, P.S. Phillips, and A.D. Read "Using the Theory of Planned Behaviour to investigate the determinants of recycling behaviour: a case study from Brixworth, UK." *Resources, Conservation and Recycling*, vol.41. no.3, June 2004, pp.191-214.

[6] R.D. Young "Exploring the difference between recyclers and non-recyclers: the role of information." *Journal of Environmental Systems,* vol. 8, no.4, 1989, pp. 341-351.

[7] J. Hornik, J. Cherian, M. Michelle, and C. Narayana, C, "Determinants of recycling behaviour: A synthesis of research results." *Journal of Socio-Economiy,* Spring 1995, vol. 4, no.1, pp. 105-127.

[8] G. Cecere, S. Mancinelli, and M. Mazzanti, "Waste prevention and social preferences: the role of intrinsic and extrinsic motivations." *Ecological Economics,* vol. 107, Nov. 2014, pp.163-176.

[9] D. Smeesters, L. Warlop, G. Cornelissen, and P. V. Abeele, "Consumer motivation to recycle when recycling is mandatory: two explanatory studies." *Journal of Economy and Management,* vol.48, no. 3, 2003, pp. 451–468.

[10] R. DeYoung, and S. Kaplan, "Conservation behavior and the structure of satisfactions." *Journal of Environmental Systems,* vol.15, no.3, Jan. 1985, pp.233-242.

[11] S. Oskamp, M.J. Harrington, T.C. Edwards, T.C., D.L Sherwood, S.M. Okuda, and D.C. Swanson, "Factors influencing household recycling behaviour." *Environment and Behaviour,* vol. 23, no.4, July 1991, pp. 494 - 519.

[12] J. Boldero, "The prediction of household recycling of newspapers; The role of attitudes, intentions and situational factors." *Journal of Applied Social Psychology,* vol. 25, no.5, March 1995, pp. 440-462.

[13] J. Davies, G.R. Foxall, and J. Pallister, "Beyond the intention-behavior mythology: An integrated model of recycling." *Marketing Theory*, vol. 2 no. 1, March 2002, pp. 29-113.

[14] Tan Cheng Li. (12 April 2005). Trying to get Malaysians to recycle. The Star Online. http://www.thestar.com.my/story/?file=%2F2005%2F4%2F12%2Ffeatures%2F10479400&sec=features

[15] C.M. Yiing, and A.M. Latifah, "Overview of household solid waste recycling policy status and challenges in Malaysia." *Resources, Conservation and Recycling,* vol. 82, Jan. 2014, pp. 50– 61.

[16] A. Omran, A. Mahmood, H. Abdul Aziz, and G.M. Robinson, "Investigating Households Attitude Toward Recycling of Solid Waste in Malaysia: A Case Study." *International Journal of Environmental Research,*vol. 3, no. 2, Spring 2009, pp. 275-288.
[17] I.S. Zen, Z.Z. Noor, and R.O. Yusuf, "The Profiles of household solid waste recyclers and non-recyclers in Kuala Lumpur, Malaysia." Habitat International, vol. 42, April 2014, pp.1-7.
[18] Municipal Waste Management Report. *Status Quo and issues in southeast and East Asian Countries.* 2010. Retrieved from http://www.environmenthealth.asia/userfiles/file/Municipal%20Waste%20Report.pdf
[19] S.N.D. Mahmud SND, K. Osman, "The determinants of recycling intention behavior among the Malaysian school students: an application of theory of planned behavior." *Procedia Social and Behavior Sciences*, vol. 9, 2010, pp. 119–24.
[20] A.M. Jasmine, and A.H., Sharifah, "Factors predicting recycling behaviour among Malaysian." *Southeast Asia Psychology*, vol. 1, 2012, pp. 68-80.
[21] P. Jayasubramanian, S.M. Meenakshi, and M. Divya, "Perception of households towards waste management and its recycling in Coimbatore." *International Journal of Multidisciplinary Research and Development,* vol. 2, no. 1, 2015, pp. 510-515.
[22] J.R. Hopper, and J.M. Nielsen, "Recycling as altruistic behavior: Normative and behavioral strategies to expand participation in a community recycling program", *Environment and Behavior*, vol. 23, no. 1, March 1991, pp. 195-221.
[23] P.O. Valle, E. Reis, and E. Rebelo, "Behavioral determinants of household recycling participation: The Portuguese case." *Environment and Behavior*, vol. 36, no. 4, July 2004, pp. 505-540.
[24] A. Omran, and A.O. Gebril, "Study of household attitude toward recycling of solid waste: A case study." *Acta Technical Corviniencis*, IV. http://acta.fih.upt.ro/pdf/2011-1/ACTA-2011-1-12.pdf.
[25] S.A. Latif, Y.H. Bidin, and Z. Awang, "Towards the realization of Green cities: The moderating role of the residents' education level." *Procedia - Social and Behavioral Sciences,* vol. 85, Sept. 2013, pp. 646 – 652.
[26] S. Siwakoti, "Knowledge, attitides, and practices of women and men towards recycling in North St. James Town, Toronto." St. James Town Initiatives. Weslesslley Institute, 2009, pp 1-20.
[27] M. Banga, "Household knowledge, attitudes and practices in solid Waste segregation and recycling: The case of urban Kampala." *Zambia Social Science Journal,* vol. 2, no. 1, May 2011, pp. 27-39.
[28] J. Vining, N. Linn, and R.J. Burdge, "Why recycle? A comparison of recycling motivations in four communities." *Environmental Management,* vol. 16, no.6, 1992, pp. 785-797.
[29] O. Abdelnaser, and A.D. Read, "Waste not, want not. A study of household attitude towards recycling of solid wastes." *Environment Engineering and Management Journal*, vol.7, no.1, Jan/Feb 2008, pp. 1-8.
[30] C. Thomas, "Public understanding and its effect on recycling performance in Hampshire and Milton Keynes." *Resources, Conservation and Recycling,* vol. 32, no. 3-4, July 2001, pp. 259–274.
[31] L. Darby and L. Obara, "Household recycling behaviour and attitudes towards the disposal of small electrical and electronic equipment." *Resources, Conservation and Recycling,* vol. 44, no.1, April 2005, pp. 17-35.
[32] Zero Waste Singapore, "Singapore Waste Statistics 2012". 2013 Available from: http://www.zerowastesg.com/tag/recycling-rate/ (01.04.2013).

A. M. Jasmine was born in Sarawak, Malaysia on the 29th of July 1980. She received her college education at Universiti Putra Malaysia (UPM), Malaysia where she studied Human Development (BSc) and Consumer Science (MSc).

She is now attached at the Psychology and Social Health Research Unit under the School of Psychology and Social Work at UMS. She has been involved in a number of psychology related researches in the university. Her primary research interests are consumer psychology, positive psychology, environmental psychology, neuropsychology, and indigenous psychology.

Open Science Index, Psychological and Behavioral Sciences Vol:9, No:8, 2015 publications.waset.org/10002698/pdf