



ISSN: 2278 – 0211 (Online)

Are Demographic Variables Determinants Of Recycling Behaviour In Ghana?

Adu-Tutu Felix

General And Liberal Studies Department, Sunyani, Polytechnic, Ghana, West Africa

Samuel Yeboah Asuamah

Marketing Department, Sunyani Polytechnic, Ghana, West Africa

Boamah Darkwa

General And Liberal Studies Department, Sunyani, Polytechnic, Ghana, West Africa

Abstract:

The paper contribute to the knowledge that exist in the area of solid waste management by examining the linear correlation between demographic variables and recycling behaviour in a survey study of 139 marketing students of Sunyani Polytechnic, selected through convenient sampling method. The study is based on quantitative, descriptive and a cross-sectional study. Primary data was collected using self-designed questionnaire administered during lecture periods. Data was analysed using frequencies, percentage and chi-square using cross-tabulation. There are mixed findings of the relationship between demographics and recycling behaviour. Age has no significant relation with recycling behaviour. Policy makers should take into account the findings of the paper in planning to increase recycling behaviour. Longitudinal studies should be used in future studies to examine causal effects of demographics on recycling behaviour.

Key words: Recycled items; strategies to increase recycling; sources of information on recycling; gender; willingness to recycle

1.Introduction

The issue of recycling has attracted attention in developed and developing economies including Ghana. This attention results from the problem of waste management. Researchers (Omran et al., 2009) in various fields (public health, environmental health, environmental economics, and environmental scientist) and policy makers are of the view that recycling of waste is one of the methods to solve waste management problem in any economy. Recycling is believed to have numerous benefits in an economy such as creation of jobs; saving money; reduction in harmful emissions (pollution); reduction in disposal cost; saving of natural resources and saving of energy (Yeboah et al., 2012).

Studies (Apaak, 2010) have indicated that waste generation in economies has been on the increase with proper management of the waste generated. In the case of the use of recycling as waste management tool, researchers (Omran et al., 2009) have indicated that in most economies waste generated are not recycled leading to waste management problems in such economies.

Various variables have been identified as influencing recycling behaviour. One such variable that has attracted attention by way of research is demography of recyclers and non recyclers. Some researchers (Christine, 2001) are of the view that demographic variables play a significant role in waste generation and waste management in relation to recycling of waste.

Various empirical studies on determinants of recycling behaviour in relation to demographics are found in the literature. The findings in the literature have been inconclusive (Nixon & Saphores, 2009). In some studies demographic variables are significant determinants of recycling behaviour whereas in other studies the results have indicated that demographic variables do not play any significant role in recycling behaviour.

The main demographic variables investigated in the literature (Barr, 2007; Saphores et al., 2006) are age; gender, educational level; income levels; culture; personality type and household size. The findings on the link between demographic variables and recycling behaviour are found in the works of various researchers (Singhirunusorn et al., 2012; Swami, 2011; Ifegbesan, 2010; Momoh & Oladebeye, 2010; Sidiquea et al., 2010; Nixon & Saphores, 2009; Sidique, 2008; Barr, 2007; Saphores et al., 2006; Meneses & Palacio, 2005; Diamontopoulos et al., 2003; Christine, 2001; Ebreo & Vining, 2000; Eero et al., 2001; Raudsepp, 2001; Tikka, Kuitunen, & Tyns, 2000; Bradley et al. 1999; Chanda, 1999; Eagle & Demare, 1999; Fransson & Garling, 1999; Scott, 1999; Werner & Makela, 1998; Margai, 1997; McKenzie-Mohr et al., 1995; Sheppard, 1995; Gamba & Oskamp, 1994; Lyon & Breakwell, 1994; Petts, 1994; Scott & Willet, 1994; Arcury & Christianson, 1993; Gigliotti, 1992; Jones & Dunlap 1992) in the literature.

In some studies there is a significant relationship between some demographics and recycling behaviour (Momoh & Oladebeye, 2010). In other studies there is no significant link between some demographics and recycle behaviour in the literature (Momoh & Oladebeye, 2010).

The findings in the literature have been mixed and as such more empirical studies are worth doing to enrich the discussion. One reason provided for insignificant findings in the literature is the use of small sample size (Christine, 2001).

1.1.Statement Of Problem/Justification/Significance

There are serious waste management issues in Ghana. Given the increasing population waste generation is on the increase yet few communities have proper waste disposal systems to deal with the increased waste generation. Majority of the communities rely on crude way of dumping waste (all types) with its associated health and environmental implications.

According to UN report (2010) 80% of generated waste in Africa and Ghana are organic waste, 10% are plastic, metal, and glass waste with few been paper waste (less than 12%) Apaak (2010). Most are poorly collected and improperly disposed off. Recycling of waste is not the normal behaviour in relation to waste disposal. In view of these the paper examined empirically the role of demographic variables in recycling behaviour.

In the very knowledge of the researchers very few empirical works exist in the literature on the study area. The findings in the literature have also been mixed (Nixon & Saphores, 2009). The paper fills in the literature gap. The paper extends the work of Yeboah et al. (2012) by examining the correlation between demographic variables (gender, age, programme of study and religion) and recycling behaviour of respondents in the survey using cross-tabulations and chi-square analysis.

The findings of the survey provide further understanding of theories underlying the study by providing answers to research questions asked in the study. The findings also provide policy guide to policy makers in planning for waste management programmes. Future studies will also find the findings of the study useful. The findings will also generate interest in future research on the topic under discussion.

1.2.General Objectives/Specific Objectives

The paper contributes to the body of knowledge in the area of waste management by examining the link between demographic variables and recycling behaviour. The paper specifically examines

- The association between demographics and recycle behaviour; attitude towards recycling; reasons for recycling; sources of information on recycling; items recycled and strategies to increase recycling of solid waste.

1.3.Research Questions And Assumptions

The main research question is:

- What demographic variables are related to recycling behaviour in relation to attitude, reasons of recycling, items of recycling and policies to increase recycling?

The paper is based on the assumption that demographic variables significantly affect willingness to recycle; reasons for recycling and policies to increase recycling.

1.4.Limitations And Scope Of The Paper

The interpretations of the findings of the paper are limited to the use of self-reported responses of respondents in the survey data. Some respondents might have given biased responses which might not be known to the researchers.

The findings might lack external validity since the sample is based on convenience sampling method. The paper does not examine the effect of income, educational level, personality type and household type on recycling behaviour. Data collection is limited to only the Marketing Department of the school.

2.Research Methodology

The research design of the paper is quantitative, descriptive and cross-sectional survey. The sample consists of 139 respondents of marketing students of Sunyani Polytechnic, selected through convenience sampling method.

Primary data for the study was collected using self-designed questionnaire which were administered during lectures. Data collected was analysed using frequencies, percentages for descriptive results and Chi-square for the inferential statistics. Results on demographics were presented in a table form.

3.Results And Discussions

The results are presented and discussed in this section of the paper.

3.1.Sample Characteristics

Majorities of the respondents in the survey are males 85(61.2%) and the age distribution indicates that majority 84(60.4%) of respondents fall in the age group of 22-25. Most 109(78.4%) of the respondents are in level 100 where as majority 122(87.8%) are Christians. The rest of the results are shown in Table 1.

Demographic variables	Frequencies	Percentages
Gender		
Male	85	61.2
Female	51	36.7
Missing responses	3	2.2
Total	139	100.0
Age		
18-21	40	28.8
22-25	84	60.4
26-29	14	10.1
Missing response	1	0.7
Total	139	100.0
Programme of study		
HND	109	78.4
LCM	28	20.1
Missing response	2	1.4
Total	139	100.0
Religious groups		
Christian	122	87.8
Muslim	14	10.1
No religion	2	1.4
Missing response	1	0.7
Total	139	100.0

*Table 1: Demographics
(Source: Researchers' Field Survey, 2012)*

3.2. Demographic Effects On Sources Of Knowledge On Recycling

3.2.1. Gender

There is significant relationship between gender and magazines/newsletters as sources of information on recycling of waste (chi-square=11.584; p=0.021). More male respondents (41.2%) than female respondents (36%) are informed by magazines/newsletters.

3.2.2. Programme Of Study

There is a significant link between programme of study and sources of information on recycling of waste. The sources are 'television' (chi-square=15.623; p=0.048); 'radio' (chi-square=14.076; p=0.080); 'magazines/newsletters' (chi-square=13.581; p=0.09) and 'buses/stations' (chi-square=28.201; p=0.002).

Respondents (88.5%) offering London Centre of Marketing programme (LCM) more are informed by television than respondents offering Higher National Diploma (HND) (64.2%). With respondents offering HND (82.2%) more are informed by radio than respondents offering LCM (73.1%). With respondents offering LCM (42.3%) more are informed by magazines/newsletters than HND respondents (39.1%). LCM respondents (52%) are more informed in bus or at stations than HND respondents (23.8%).

3.2.3. Religion

Religion of respondents has significant relation with sources of information in relation to magazines/newsletters (chi-square=14.068; p=0.080). Respondents (100%) who indicate that they do not attend any church more are informed by magazines/newsletters than those who are Christians (38.5%) and Muslim (38.5%).

3.3. Demographic Effects On Attitude Towards Recycling

3.3.1. Gender

There is significant statistical relationship between gender and whether respondents recycle or not (chi-square=4.442; p=0.035). Female respondents (94.1%) more than male respondents (81.2%) recycle waste. Age has no significant link with whether respondents recycle or not.

3.3.2. Programme Of Study

There is a significant statistical relationship between programme of study and whether respondents recycle or not (chi-square=10.060; p=0.007). Respondents offering HND (90.8%) more than LCM (67.9%) students recycle waste.

3.4. Demographic Effects On Reasons Why Respondents Recycle

3.4.1. Religion

Religion is linked statistically with reasons why respondents recycle. The reasons are 'to save dustbin space' (chi-square=15.007; p=0.059) and 'my own awareness about the importance of recycling/duty' (chi-square=17.782; p=0.023). Christians (51%) recycle

more to save dustbin space than Muslim respondents (18.2%). Muslim respondents (80%) recycle more because of their own awareness about importance of recycling than Christian (79.3%) and those who do not attend any church (0%).

3.5. Demographic Effects On Reasons Why People Recycle

3.5.1. Gender

There is significant statistical relation between gender and reasons why people recycle waste (chi-square=12.102; p=0.017). Many male respondents (33.3%) than female respondents (19.6%) think people recycle if any profit made from the recycle reward scheme was donated to local charities.

3.5.2. Age

There is a significant statistical relationship between age and reasons why people recycle waste. The reasons are 'saving costs of disposal' (chi-square=15.637; p=0.048); 'conserve for future generation/save landfill space' (chi-square=19.005; p=0.015); 'if the recycling is made mandatory' (chi-square=16.145; p=0.04); 'if a private company operated the scheme' (chi-square=18.630; p=0.017) and 'if collection is more frequent' (chi-square=20.331; p=0.009).

Respondents (90%) in the age group 18-21years are more of the view than those between 22-25years (70.2%) and 26-29years (78.6%) that people recycle to save costs of waste disposal. Respondents (90%) in the age group 18-21years are more of the view than those between 22-25years (75%) and 26-29years (64.3%) that people recycle to conserve for future generation/save landfill space.

Respondents (64.3%) in the age group 26-29years are more of the view than those between 22-25years (24.4%) and 18-21years (25%) that people recycle if the recycling is made mandatory. Respondents (78.6%) in the age group 26-29years are more of the view than those between 22-25years (31.7%) and 18-21years (27.5%) that people recycle if private company operated the scheme. Respondents (100%) in the age group 26-29years are more of the view than those between 22-25years (60.2%) and 18-21years (62.5%) that people recycle if collection is more frequent.

3.5.3. Programme of study

There is significant statistical relationship between programme of study and reasons why people recycle waste. The reasons are 'saving costs of disposal' (chi-square=19.857; p=0.011); 'conserve resources for future generation/save landfill space' (chi-square=13.713; p=0.090); 'if the recycling is made mandatory' (chi-square=22.959; p=0.003); 'if profit from the recycle scheme is donated to the local community' (chi-square=17.569; p=0.025).

More HND Respondents (80.7%) either than LCM respondents (64.3%) are more of the view that people recycle to save costs of disposal. More HND Respondents (82.6%) than LCM respondents (60.7%) are more of the view that people recycle to conserve resources for future generation/save landfill space. LCM respondents (57.1%) more than HND respondents (21.4%) are more of the view that people recycle if recycle is made mandatory.

More LCM respondents (53.5%) either than HND respondents (23.2%) are more of the view that people recycle if recycle if profit from the recycle scheme is donate to the local community.

3.6. Demographic Effects In Items Recycled

3.6.1. Gender

There is significant statistical relationship between gender and items respondents recycle. The items are 'tins' and 'cans' (chi-square=10.350; p=0.035); 'food waste' (chi-square=8.600; p=0.072); 'clothes' (chi-square=8.290; p=0.082). Female respondents (61.7%) more than male respondents (53.5%) recycle tins and cans. More Females (64.6%) either more than males (51.4%) recycle food waste. Female respondents (83.3%) more than male respondents (80.5%) recycle clothes.

3.6.2. Age

There is a significant statistical relationship between age and items respondents recycle in relation to the recycle of paper (chi-square=22.923; p=0.011). Respondents (86.5%) in age group 18-21years recycle more paper than those in the age groups of 22-25years (71.5%) and 26-29years (70%).

3.6.3. Programme Of Study

Programme of study is linked statistically with items recycled by respondents. The items are 'plastics' (chi-square=13.403; p=0.099); 'Garden waste' (chi-square=26.587; p=0.001) and 'clothes' (chi-square=21.437; p=0.006). More HND respondents (79%) recycled plastics than LCM respondents (57%). Less HND respondents (40.4%) recycled Garden waste than LCM respondents (55%). More HND respondents (88%) recycled clothes than LCM respondents (52.3%).

3.7. Demographic Effects Strategies To Increase Recycling Of Solid Waste

3.7.1. Programme Of Study

There is significant association between programme of study and strategy option to increase recycling. The strategy option is 'provision of more benefits to areas with better recycling' (chi-square=14.784; p=0.063). More LCM respondents (82.2%) either than HND respondents (72.5%) are more of the option that if more benefits are provided to areas with better recycling then more people will recycle.

3.7.2. Religion

Religion statistically is related to strategies to increase recycling. The strategies are 'provision of recycling bin in every residential area' (chi-square=24.832; p=0.006); 'launch of numerous campaigns in the media' (chi-square=15.332; p=0.018) and 'giving of incentives to individuals who practice recycling' (chi-square=17.240; p=0.028).

More Muslim respondents (92.9%) either than Christians (89.3%) and those who do not attend any church (0%) opt for provision of recycling bin in every residential area'. Christian respondents (95.1%) prefer launching of recycling campaign in the media than Muslims (92.8%) and those who do not attend church (50%). More Muslim (92.9%) prefer giving of more incentives to individuals who practice recycling than Christian (82.8%) and those who do not attend church (0%)

3.8. Demographic Variables That Have No Significant Effect

Some of the demographic variables have no statistical significant relation with sources of information; attitude towards recycle; items recycled; reasons people recycle; reasons why respondents recycle and strategies to increase recycling.

Age of respondents have no statistical significant relation with the sources of information on recycling. Age and religion have no significant relation with whether respondents recycle or not. Religion has no statistical link with items recycled. Age, gender and programme of study have no significant association with reasons why respondents recycle. Religion has no link with why people recycle waste. Age of respondents and gender have no significant statistical relationship with strategies to increase recycling in the survey.

3.9. Discussions

The results are mixed. Some demographic variables have significant relation with recycle behaviour whereas some do not have any significant relation with recycle behaviour. These support the findings of researchers such as Momoh and Oladebeye (2010). According to Momoh and Oladebeye (2010) age, gender, educational level, place of residence have no significant relation with willingness to recycle.

Household size and employment status have significant link with willingness to recycle. Some researchers (Do Valle et al., 2004; Domina & Koch, 2002; Werner & Makela, 1998; Gamba & Oskamp, 1994; Oskamp et al., 1991; Vining & Ebreo, 1990) indicate that gender is not a significant predictor of recycle behaviour. The findings of these researchers are not in support that the findings of the current study in which gender significantly affect willingness to recycle.

The results on age are consistent with previous research works (Werner & Makela, 1998; Gamba & Oskamp, 1994; Oskamp et al., 1991;) which reported no significant effect of age of respondents on recycle behaviour. The findings are also inconsistent with some studies (Ewing, 2001; Scott, 1999; Derksen & Gartrell, 1993; Vining & Ebreo, 1990) that report significant effect of age on willingness to recycle. These results indicate mixed findings of the relationship between demographics and recycling behaviour.

4. Conclusion And Policy Implications

The statistical link between demographics and solid waste recycling behaviour has been investigated. The findings have been mixed. Policy makers in waste management should incorporate these findings in the programmes to encourage recycling behaviour. Future studies should include other demographic variables such as income and household type which are reported in the literature to influence recycling behaviour. Larger sample size should be used in future studies to ensure more external validity. Longitudinal study should be used to examine causal effects of demographics on recycling behaviour.

5. References

1. Apaak, C. (2010). Keeping Ghana Clean by Profiting from our waste. GhanaWeb Website. Retrieved on 28/06/2012.
2. Arcury, T. A., & Christianson, E. H. (1993). Rural-Urban differences in environmental knowledge and actions. *Journal of Environmental Education*, 25(1), 19-25.
3. Barr, S. (2007). Factors influencing environmental attitudes and behaviors: A UK case study of household waste management. *Environment and Behavior*, 39, 435-473.
4. Chanda, R. (1999). Correlates and dimensions of environmental quality concern among residents of an African Subtropical City: Gaborone, Botswana. *Journal of Environmental Education*, 30(2), 31-39.
5. Christine, T. (2001). Public understanding and its effect on recycling performance in Hampshire and Milton Keynes. *Resources, Conservation and Recycling*, 32(3-4), 259-274.
6. Derksen, I., & Gartell, J. (1993). The social context of recycling. *American Sociological Review*, 58, 434-442.
7. Diamontopoulos, A., Schlegelmilch, B. B., Sinkovics, R. R., & Bohlen, G. M. (2003). Can socio-demographic still play a role in profiling green consumers? A review of the evidence and empirical investigation. *Journal of Business Research*, 56, 465-480.
8. Do Valle P., Reis E., Menezes J., & Rebelo E. (2004). Behavioral determinants of household recycling participation. *Environ Behav*, 36(4), 505-40.
9. Domina, T., & Koch, K. (2002). Convenience and frequency of recycling: Implications for including textiles in curbside recycling programs. *Environ Behav*, 34(2), 216-38.
10. Eagle, P. F. J., & Demare, R. (1999). Factors Influencing Children's Environmental Attitudes. *Journal of Environmental Education*, 30(4), 33-35.
11. Ebreo A., & Vining J, (1992). Predicting recycling behavior from global and specific environmental attitudes and changes in recycling opportunities. *J Appl Soc Psychol*, 22(20), 1580-607.

12. Ebreo A., & Vining J, (2000). Motives as Predictors of the Public's Attitudes Toward Solid Waste Issues. *Environmental Management*, 25(2),153–168
13. Eero, O., Grendstad, G., & Wollebak, D. (2001). Correlates of environmental behaviors: Bringing back social context. *Environment and Behavior* 33, 181-208.
14. Ewing G. (2001). Altruistic, egoistic, and normative effects on curbside recycling. *Environ Behav*, 33(6), 733–64.
15. Fransson, N., & Gärling, T. (1999). Environmental concern: Conceptual definitions, measurement methods, and research findings. *Journal of Environmental Psychology*, 19, 369-382.
16. Gamba, R. J., & Oskamp, S. (1994). Factors influencing community residents' participation in commingled curbside recycling programs. *Environment and Behavior*, 26, 587-612.
17. Gigliotti, L. M. (1992). Environmental attitudes: 20 years of change? *The Journal of Environmental Education*, 24(1), 15-26.
18. Ifegbesan, A. (2010). Exploring secondary school students' understanding and practices of waste management in Ogun State, Nigeria. *International Journal of Environmental & Science Education*, 5(2), 201-215
19. Jones, R. E., & Dunlap, R. E. (1992). The social bases of environmental concern. Have they changed over time? *Rural Sociology*, 57(1), 134-144.
20. Lyon, E., & Breakwell, G. H. (1994). Factors predicting environmental concerns and indifferences in 13-16yrs. *Environment and Behaviour*, 26(2), 223-238.
21. McKenzie-Mohr, D., Nemeroff, L.S., Beers, L., & Desamrais, S. (1995). Determinants of responsible environmental behavior. *Journal of Social Issues* 51, 139-156.
22. Meneses, G. D., & A. B. Palacio. (2005). "Recycling Behavior: A Multidimensional Approach." *Environment and Behavior* 37(6), 837-860.
23. Momoh, J. J., & Oladebeye, D. H. (2010). Assessment of awareness, attitude and willingness of people to participate in household solid waste recycling programme in Ado-Ekiti, Nigeria. *Journal of Applied Sciences in Environmental sanitation*, 5(1), 93-105.
24. Nixon, H., & Saphores, J. M. (2009). Information and the decision to recycle: results from a survey of US households. *J. Environ. Plann. Manage.* 52, 257–277.
25. Omran, A., Mahmood, A., Abdul Aziz, H., & Robinson, G. M. (2009). Investigating households attitude towards recycling of solid waste in Malaysia: A case Study. *International Journal of Environmental research*, 3(2), 275-288.
26. Oskamp, S., Harrington, M. J., Edwards, T. C., Sherwood, D. L, Okuda, S. M., & Swanson, D. C. (1991). Factors influencing household recycling behavior. *Environ Behav*, 23(4), 494–519.
27. Petts, J. (1994). Effective waste management: Understanding and dealing with public concerns. *Waste Management and Research*, 12(3), 207-222.
28. Raudsepp, M. (2001). Some socio-demographic and socio-psychological predictors of environmentalism. *TRAMES*, 5(4), 355-367.
29. Saphores, J. M., Nixon, H., Ogunseitan, O. A., & Shapiro, A. A. (2006). Household willingness to recycle electronic waste: An application to California. *Environment and Behavior*, 38, 183–208.
30. Scott, D. (1999). Equal opportunity, unequal results: determinants of household recycling intensity. *Environ Behav*, 31(2), 267–90.
31. Scott, D., & Willets, F. K. (1994). Environmental attitudes and behaviour. *Environment and Behaviour*, 26(2), 239-261.
32. Sheppard, J. A. C. (1995). The black-white environmental concern gap: An examination of environmental paradigms. *Journal of Environmental Education*, 26(2), 24-35.
33. Sidique, S. F. (2008). Analyses of recycling behavior, recycling demand, and effectiveness of policies promoting recycling. Unpublished PhD Thesis
34. Singhirunnusorn, W., Donlakorn, K., & Kaewhanin, W. (2012). Household Recycling Behaviours and Attitudes toward Waste Bank Project: Mahasarakham Municipality. *Journal of Asian Behavioural Studies*, 2(6), 35-47.
35. Swami, V., Chamorro-Premuzic, T., Snelgar, R., & Adrian Furnham, A. (2011). Personality, individual differences, and demographic antecedents of self-reported household waste management behaviours. *Journal of Environmental Psychology* 31, 21-26
36. Tikka, P. M., Kuitunen, M., & Tyns, S. M. (2000). Effects of educational background on students, attitudes, activity levels and knowledge concerning the environment. *Journal of Environmental Education*, 31(3), 12-19.
37. Vining, J., Ebreo, A. (1990). "What Makes a Recycler? A Comparison of Recyclers and Nonrecyclers." *Environment and Behavior* 22(1), 55-73.
38. Werner, C. M., & Makela, E. (1998). Motivations and behaviors that support recycling. *J Environ Psychol*, 18, 373–86.
39. Yeboah, A. S., Kumi, E., & Kwarteng, E. (2012). Attitude towards recycling and waste management: A survey of marketing students in Sunyani Polytechnic, Ghana. *Advances in Arts, Social Sciences and Education Research*, 2(5), 158-167.