

## Investigation of Market Women's Environmental Knowledge, Attitude and Behaviour in Nigerian City of Ibadan

Sunday A. Itasanmi<sup>1\*</sup>, Jegede Tosin E.<sup>2</sup>

<sup>1</sup>Department of Adult Education, University of Ibadan, Nigeria

<sup>2</sup>Ibadan Study Centre, National Open University of Nigeria, Nigeria

**Corresponding author:** Sunday A. Itasanmi, E-mail: Itasunny2000@gmail.com

### ARTICLE INFO

#### Article history

Received: July 11, 2019

Accepted: October 09, 2019

Published: October 31, 2019

Volume: 7 Issue: 4

Conflicts of interest: None

Funding: None

### ABSTRACT

This study assessed the environmental knowledge, attitude and behaviour among market women in the Nigerian city of Ibadan, Oyo State. A quantitative research design was adopted and 403 market women were randomly selected from different markets in Ibadan. Questionnaire items adapted from Fah and Sirisena (2014) and Abdullahi and Tuna (2014) were pilot-tested among female artisans in Ibadan. Data collected from the study were analyzed using frequency counts, simple percentages, ANOVA, and regression analysis. Results of the analysis revealed that market women have good knowledge about erosion, water pollution, amongst others but lack knowledge in the area of soil degradation. Market women also have pro-environmental attitude based on their responses and they exhibit environmentally responsible behaviours in the area of tree planting, refuse disposal etc. but display irresponsible environmental behaviour by not switching off electricity gadgets when not in use. The findings also showed that there is a significant effect of environmental knowledge on environmental attitude, environmental attitude on environmental behaviour and the joint effects of environmental knowledge and attitude on environmental behaviour among market women.

**Key words:** Environmental Knowledge, Environmental Attitude, Environmental Behaviour, Market Women, Ibadan, Nigeria.

### INTRODUCTION

The term environment is said to have been derived from the word "environ" which literally means "surrounding" and this includes biotic elements like human beings, animals, plants etc and abiotic factors like light, water, soil among others (Mozhi, 2010). The environment remains a complex factor amidst many variables that surround man and other living organisms. An environment consists of an attached whole system created by physical, chemical, biological and cultural elements which are interrelated individually and/or collectively in numerous ways and these elements have remained in constant change and such change are brought by human activities and vice versa. From the inception of mankind, the environment is not much affected by human activities as there were natural checks and balances between man and the environment. However, due to industrial revolution which brought about huge industrial installations, introduction of modern transport system, urbanization, population explosion, overexploitation of natural resources, poor waste management among many other human activities, have led to a large scale environmental pollution which has affected many people worldwide in the form of global warming, acidic rain, climate change, deforestation, food and water scarcity etc (Manzoor, 2017; Mozhi, 2010).

In Nigeria, the unwise use of natural environment as a result of ignorance, poverty, greed, lack of proper environmental education, overpopulation, overexploitation of natural resources, improper waste disposal among the populace has led to the degradation of the environment with its attendant consequences like erosion, flooding, water shortages, drought and desertification amongst others. Environmental degradation has resulted in the deterioration of Nigeria's rural and urban environmental quality and this has a significant effect on food security and cast doubt on the nation's ecological integrity (Isife, 2012). While several strategies have been made by the governments at different levels and development partners to reduce some of these environmental challenges through environmental legislation, environmental policies, environmental sensitization, weekly and monthly environmental sanitation exercise and creation of environmental sanitation task force, all the efforts made amount to scratching the problem on the surface as the root cause of the problems have not be solved and this has to do with knowledge, attitude and behaviour towards the environment. It has been established that the higher the environmental knowledge of the populace, the higher the chances of people having a positive attitude and behaviour towards the environment (Norris, 2016).

Ibadan is one of Nigeria's most populated cities and the largest by area with 3,565,108 inhabitants (Worldpopulation-review, 2019). It is worthy of note that the main problems the city is facing and which has been an obstinate issue are open and indiscriminate dumping of refuse, human and animal faeces, piles of decaying garbage which are considered domestic in nature are seen in key areas in the heart of the city. Also, the city lacks river/stream management policies in terms of river/stream channels maintenance coupled with the residents' dumping of refuse in rivers and drainage channels which impedes the free flow of water and this situation has persisted for years probably due to high illiteracy rate, ignorance, uncivil culture of indiscriminate waste disposal among other factors. This environmental culture is obviously the source of air and water pollution, land contamination, health hazards, environmental degradation and most especially flooding which is a common occurrence in the city for years (Adeolu, Enesi, & Adeolu, 2014; Agbola, Ajayi, Taiwo & Wahab, 2012).

While women have been identified as a critical stakeholder in environmental management as a result of the roles they play at family and community levels and the fact that they are mostly affected by environmental degradation, engaging them in protecting the environment would thereby help to increase people's sense of responsibility required to sustain a good balance between human and natural resources as women are often dependent on available natural resources for food and shelter and this makes them vulnerable to environmental changes. Women's workload is centred on managing natural resources, biodiversity and ecosystems, therefore, their environmental knowledge, attitude and experience are essential to the sustainable development of the environment (Bureau of International Information Programs, & United States Department of State., 2012). However, gender biases in education provision may mean that women may be less equipped to understanding the dynamics involved in environmental management and this may be a contributing factor to the unfriendly environmental culture in the city most especially market women whose activities directly or indirectly affect the environment as they constitute major producers of waste. Hence, this study aims at understanding the knowledge, attitude and behaviour of market women towards the environment and how these factors are interrelated in order to have a safe environment for better living in the city.

This study attempts to answer the following questions

1. What is environmental knowledge among market women?
2. What is the environmental attitude among market women?
3. What is environmental behaviour among market women?
4. What are the sources of environmental information to market women?

Four null hypotheses to be tested in this study are:

1. There is no significant effect of environmental knowledge on environmental attitude among market women
2. There is no significant effect of environmental attitude on environmental behaviour among market women

3. There is no joint effect of environmental knowledge and attitude on the environmental behaviour of market women
4. There is no relative contribution effect of environmental knowledge and attitude on environmental behaviour among market women

## METHODOLOGY

This study adopted a descriptive survey design. The population of the study comprises of all women who were engaged in buying and selling in all the markets in Ibadan. A sample of four hundred and three (403) was drawn with the use of the simple random technique. A structured questionnaire adapted from Fah and Sirisena (2014) and Abdullahi and Tuna (2014) was subjected to content validity by experts in the Adult Education department in the University of Ibadan. The instrument was pilot tested among female artisans in Ibadan and 794 Cronbach's Alpha coefficient was obtained for the whole instrument while environmental knowledge, attitude and behaviour components of the questionnaire has .947, .70 and .766 coefficient respectively. The questionnaire was administered to the market women with the help of four trained research assistants. Data generated from the study were analyzed using descriptive statistics of frequency counts and simple percentages for the research questions while Analysis of variance (ANOVA) and regression analysis was used for the hypotheses.

## Research Findings

Research Question 1: What is environmental knowledge among market women?

Table 1 reveals the environmental Knowledge of market women. It can be inferred from the table that market women knows a lot about erosion, water pollution, air pollution, natural resources, sewage treatment, and greenhouse gases with 72.2%, 66.5%, 64.3%, 53.3%, 31.3% and 53.8% respectively while they have some knowledge about deforestation (39.5%), recycling (31.8%) and waste management (45.4%). However, market women never heard the word soil degradation (37.2%).

Research Question 2: What is the environmental attitude among market women?

Table 2 reveals the environmental attitude of market women. It can be inferred from the table that 53.5% of market women agreed that Sewage and wastewater should be properly controlled to prevent water pollution and 63.0% of them stated that they are concerned about environmental health hazards such as those caused by air or water pollution. Also, 47.4% of the market women believed that cutting down of trees affect our environment negatively and 46.7% strongly agreed that they can contribute to the solution of environmental issues through their actions. 43.2% of the respondents disagree with the statement saying recycling doesn't worth all the troubles it takes and the majority of the market women (49.6%) also disagreed with the statement of not being interested in knowing about the environment. While most of the market women (50.1%) believed that most of the concern about environmental problems have been exaggerated, they, however, agreed that it is not good to dump

**Table 1.** Environmental knowledge among market women

S/N	Item description	Never heard	Heard but can not explain	Have some knowledge	Know a lot
1	Erosion	10 (2.5%)	28 (6.9%)	74 (18.4%)	291 (72.2%)
2	Water pollution	0 (0.0%)	36 (8.9%)	99 (24.6%)	268 (66.5%)
3	Air pollution	6 (1.5%)	33 (8.2%)	105 (26.1%)	259 (64.3%)
4	Natural resource	16 (4.0%)	39 (9.7%)	133 (33.0%)	215 (53.3%)
5	Deforestation	42 (10.4%)	74 (18.4%)	159 (39.5%)	128 (31.8%)
6	Sewage treatment	73 (18.1%)	104 (25.8%)	100 (24.8%)	126 (31.3%)
7	Soil degradation	150 (37.2%)	93 (23.1%)	98 (24.3%)	62 (15.4%)
8	Recycling	41 (10.2%)	143 (35.5%)	128 (31.8%)	91(22.6%)
9	Waste management	30 (7.4%)	76 (18.9%)	183 (45.4%)	114 (28.3%)
10	Greenhouse gases	67 (16.6%)	55 (13.6%)	64 (15.9%)	217 (53.8%)

**Table 2.** Environmental attitudes among market women

S/N	Item description	Strongly agree	Agree	Disagree	Strongly disagree
1	Sewage and wastewater should be properly controlled in order to prevent water pollution	180 (44.7%)	215 (53.3%)	0 (0.0%)	8 (2.0)
2	I am concerned about environmental health hazards such as those caused by air or water pollution.	138(34.2%)	254 (63.0%)	7 (1.7%)	4 (1.0%)
3	I believe that cutting down of trees affect our environment negatively	138 (34.2%)	191 (47.4%)	46 (11.4%)	28 (6.9%)
4	I believe that I can contribute to the solution of environmental issues by my actions.	187 (46.7%)	160 (39.7%)	49 (12.2%)	7 (1.7%)
5	I don't think that recycling is worth all the trouble it takes.	86 (21.3%)	82 (20.3%)	174 (43.2%)	61 (15.1%)
6	I'm not interested in knowing about the environment.	52 (12.9%)	31 (7.7%)	200 (49.6%)	120 (29.8%)
7	I think most of the concern about environmental problems have been exaggerated.	202 (50.1%)	99 (24.6%)	87 (21.6%)	15 (3.7%)
8	It is not good to dump refuse on the waterways	111 (27.5%)	235 (58.3%)	36 (8.9%)	21 (5.2%)
9	It is difficult to change my friends' minds about doing things to help the environment	62 (15.4%)	147 36.5%)	155 (38.5%)	39 (9.7%)
10	When I am outside, I usually don't notice the natural things around me like flowers, trees, and clouds.	67 (16.6%)	67 (16.6%)	195 (48.4%)	74 (18.4%)
11	There are already enough laws to protect the environment.	198 (49.1%)	107 (26.6%)	61 (15.1%)	37 (9.2%)
12	More controls should be placed on industry and agriculture to protect the quality of the environment, even if it means that thing I purchase will cost more.	182 (45.2%)	99 (24.6%)	41 (10.2%)	81 (20.1%)

refuse on the waterways. 38.5% of the respondent disagreed that it is difficult to change their friends' minds about doing things to help the environment and 48.4% also disagreed with the statement that they usually don't notice the natural things around them like flowers, trees, and clouds. However, majority of the market women strongly believed that there are already enough laws to protect the environment only that more controls should be placed on industry and agriculture to protect the quality of the environment, even if it means that things they purchase will cost more.

Research Question 3: What is environmental behaviour among market women?

Table 3 reveals the behaviours of market women towards the environment. It can be inferred from the table that 27% of market women frequently encourage the planting of trees

in their areas while 34.7% often discuss environmental change issues with friends and family. Majority of the market women (37.7%) rarely install rainwater tanks during the rainy season and most of them (49.1%) reported not to be in the habit of dumping refuse in the canal. However, 34.5% of market women reported that they don't switch off electricity gadgets when not in use. Also, it can be deduced from the table that 58.8% of the market women don't throw pure water sachet anywhere in the environment and 33.7% of the market women reported to have changed to environmentally friendly bulbs. Most of the respondents stated that they frequently vote for politicians that take the issue of the environment seriously and that they try as much as they can at home to recycle while 61.3% of market women stated that they report environmental crimes to the appropriate authority.

Research Question 4: What is the source of environmental information to market women?

Table 4 reveals sources of environmental information to market women. It can be deduced from the table that 42.9% of market women often get information on the environment through the internet while 40.7% occasionally get environmental information through television. Majority of the respondents (71.5%) reported that they often get environmental information through books while 52.4% stated that they get it through the newspaper. 41.9% of market women occasionally get environmental information through the radio while 37.5% often get it through social media like Facebook, WhatsApp etc. 39.5% of market women reported that they get environmental information through friends and families.

### Test of Null Hypotheses

**Null Hypothesis 1:** There is no significant effect of environmental knowledge on environmental attitude among market women

Table 5 revealed that there is a significant effect of environmental knowledge on environmental attitude among market women. The result indicated that F-calculated value (6.74) than F-critical value (1.73) at 0.05 level of significance. (F value (24/402) = 6.74, Pro=0.000 < 0.05). Thus, the hypothesis was rejected

**Null Hypothesis 2:** There is no significant effect of environmental attitude on environmental behaviour among market women

Table 6 showed that there is a significant effect of environmental attitude on environmental behaviour among market women. The result indicated that F-calculated value (12.65) than F-critical value (1.88) at 0.05 level of significance. (F value (19/402) = 12.65, Pro=0.000 < 0.05). Thus the hypothesis was rejected.

**Null Hypothesis 3:** There is no joint effect of environmental knowledge and attitude on environmental behavior of market women

As indicated in Table 7, it was found that the linear combination of the joint prediction of environmental knowledge

**Table 3.** Environmental behaviour among market women

S/N	Item description	Very frequently	Frequently	Rarely	Not at all
1	I encourage the planting of trees in my surrounding	96 (23.8%)	109 (27.0%)	94 (23.3%)	104 (25.8%)
2	I do discuss the issue of climate change with my friends and family	140 (34.7%)	125 (31.0%)	82 (20.3%)	56 (13.9%)
3	I install rainwater tanks in my house in time of rain	59 (14.6%)	48 (11.9%)	152 (37.7%)	144 (35.7%)
4	I do dump refuse in the canal	46 (11.4%)	84 (20.8%)	75 (18.6%)	198 (49.1%)
5	I do switch off electricity gadgets when they are not in use	32 (7.9%)	92 (22.8%)	140 (34.7%)	139 (34.5%)
6	I throw pure water sachet anywhere in the environment	46 (11.4%)	63 (15.6%)	57 (14.1%)	237 (58.8%)
7	I have changed to environmentally friendly bulbs	136 (33.7%)	86 (21.3%)	103 (25.6%)	78 (19.4%)
8	I vote for politicians that take the issue of the environment seriously	49 (12.2%)	137 (34.0%)	135 (33.5%)	82 (20.3%)
9	At home, I try to recycle as much as I can	116 (28.8%)	105 (26.1%)	86 (21.3%)	96 (23.8%)
10	I report environmental crimes to the appropriate authority	247 (61.3%)	84 (20.8%)	40 (9.9%)	32 (7.9%)

**Table 4.** Sources of environmental information to market women

S/N	Item Description	Often	Occasionally	Very Often	Never
1	Internet i.e. Google or search engine	173 (42.9%)	107 (26.6%)	69 (17.1%)	54 (13.4%)
2	Television	50 (12.4%)	164 (40.7%)	58 (14.4%)	131 (32.5%)
3	Books	228 (71.5%)	33 (8.2%)	60 (14.9%)	22 (5.5%)
4	Newspaper	211 (52.4%)	39 (9.7%)	89 (22.1%)	64 (15.9%)
5	Radio	42 (10.4%)	169 (41.9%)	66 (16.4%)	126 (31.3%)
6	Social media like Facebook, WhatsApp etc	151 (37.5%)	84 (20.8%)	121 (30.0%)	47 (11.7%)
7	Friends and family	19 (4.7%)	159 (39.5%)	135 (33.5%)	90 (22.3%)

**Table 5.** Analysis of variance (anova) showing the effect of environmental knowledge on environmental attitude

Sources of variance	Sum of squares	df	Mean square	F-Cal	F-Crit	p	Remark
Between-group variance	1779.581	24	74.149	6.74		000	sig.
Within-group Variance	4158.379	378	11.001		1.73		
Total Variance	5937.96	402					

F=6.74, df 24/402; p=.000<.05

and attitude on environmental behaviour among market women ( $F_{(2,402)} = 105.713, p < 0.05$ ). The result yielded a coefficient of multiple regression of  $R=0.588$  and multiple R-square of 0.346. The result also revealed that Adjusted  $R^2=0.343$ ; indicating that about 34.4% of the variance was accounted for by the independent variables. This implied that there is a prediction of environmental knowledge and attitude on environmental behaviour among market women. Thus the hypothesis was rejected.

**Null Hypothesis 4:** There is no relative contribution effect of environmental knowledge and attitude on environmental behaviour among market women.

Table 8 showed personal factors, the unstandardized regression weight ( $\beta$ ), the standardized error of estimate (SE $\beta$ ), the standardized coefficient, the t-ratio and the level at which the t-ratio is significant. As indicated in the table, environmental attitude ( $\beta=0.527, t= 12.619, p<0.05$ ) was tested significant and predictor of environmental behaviour among market women also environmental knowledge ( $\beta=.161, t= 3.850, p<0.05$ ) was a predictor. This implied that environmental knowledge and attitude stand as a significant predictor of environmental behaviour among market women. Hence, the null hypothesis was rejected

## DISCUSSION

The study revealed that market women have a clear understanding and knowledge of environmental issues like erosion, water pollution, air pollution, natural resources, sewage

treatment, and greenhouse gasses and they equally have little knowledge about deforestation, recycling and waste management. However, market women lack clear understanding and knowledge of soil degradation and this is a serious environmental challenge because soil is a vital natural resource that serves as root for all earthly life with implications spanning a number of key policy area ranging from food security, climate change, flood control, famine, safe drinking water amongst others key areas that are critical to human survival (Young, Orsini & Fitzpatrick, 2015). Hence, there is need to intensify effort at providing sound environmental education on issues surrounding soil degradation among this women so as to limit some of their actions that contribute directly or indirectly to the menace in order to ensure a safe and sustainable environment for all.

The study also revealed that market women have pro-environmental attitude based on their responses as they agreed that sewage and wastewater should be properly controlled to prevent water pollution, they expressed their concern about environmental health issues and believed that cutting down of trees affect their environment negatively. The market women also agreed that it is not good to dump refuse on the waterways. These responses could be said to have been as a result of what they have experienced in terms of disasters caused by floods in the city with a monumental loss of lives and properties caused partly by dumping of refuse in rivers and drainage channels which impede the free flow of water. According to Agbola et al. (2012), the practice of dumping wastes in the waterways is a common phenomenon in the

**Table 6.** Analysis of variance (anova) showing the effect of environmental attitude on environmental behaviour among market women

Sources of variance	Sum of squares	df	Mean square	F-Cal	F-Crit	p	Remark
Between-group variance	4914.920	19	258.680	12.65		000	Sig.
Within-group Variance	7826.425	383	20.435		1.88		
Total Variance	12741.345	402					

$F=12.659, df 19/402, p=0.000<0.05$

**Table 7.** Summary of regression on joint prediction of environmental knowledge and attitude on environmental behaviour of market women

**R=0.588**

**R<sup>2</sup>=0.346**

**Adj. R<sup>2</sup>=0.343**

**Std. Error=4.56495**

Model	Sum of squares	df	Mean square	F	p	Remark
Regression	4405.838	2	2202.919			
Residual	8335.507	400	20.839	105.713	000	Sig.
Total	12741.345	402				

**Table 8.** Summary of regression on the relative contribution of environmental knowledge and attitude on environmental behaviour among market women

Variable	Unstandardized coefficients		Standardized coefficients			Remark
	B	Std. Error	Beta ( $\beta$ )	t	p	
(Constant)Knowledge	9.466	2.181	-	4.340	000	
Attitude	0.151	0.772	0.161	3.850	000	sig.
		0.061	0.527	12.619	000	sig.

city areas most especially where there are no provisions for waste management by the government and the people does not have the financial capacity to engage private refuse collector. They went further to state that the act of dumping refuse in the waterways is common during rainy seasons, unlike the dry seasons that they allow the wastes to dry and burnt in an open space. This seasonal variation in waste management used by the people in the city has serious implications for the severity of flooding they see. As a result of the floods, they are now more conscious of the causes and consequences of their environmental attitude.

The results of the study further showed that market women have environmentally responsible behaviours in the area of tree planting, engaging friends and family on environmental change issue, not involving in the dumping of refuse in canals and not in the habit of throwing pure water sachet anywhere in the environment amongst many other areas. However, market women exhibit irresponsible environmental behaviour by rarely installing rainwater tanks during rainy seasons to conserve water and this is not considered to be environmentally friendly as it has been established that rainwater harvesting helps to manage stormwater runoff and thus prevent erosion, groundwater contamination, flooding and improve the quality of water in our lakes and streams. Again, water treatment and pumping take a high percentage of public energy consumption but rainwater systems reduce this energy usage (Drew, 2019). Also, market women don't switch off electricity gadgets when not in use and this increase energy usage. There is a direct connection between energy use and the environment. The lesser the energy consumption the less the amount of toxic fumes generated by power plants and this conserve the earth's natural resources and protect the ecosystems from destruction (SaveOnEnergy, n.d.). This, therefore, calls for a behavioural change among the market women to conserve energy by switching off electrical gadgets when not in use.

The study found out that there is a significant effect of environmental knowledge on environmental attitude; a significant effect of environmental attitude on environmental behaviour; a linear combination of the joint prediction of environmental knowledge and attitude on environmental behaviour and environmental knowledge and attitude as a significant predictor of environmental behaviour among market women. This result is consistent with previous research findings (Altinigne & Bilgin, 2015; Arcury, 1990; Heyl, Diaz, & Cifuentes, 2013; Li, 2018; Maleki & Karimzadeh, 2011; Pratiwi, Sulhaini & Rinuastuti, 2018; Zheng, Xu, Kong, Deng & Lin, 2018). For instance, Zheng et al. (2017), in their study titled "correlation between the environmental knowledge, environmental attitude and behavioral intention of tourists for ecotourism in China", the results of the study indicates that there is a positive correlation between the environmental knowledge and the environmental attitude and also, there is a positive correlation between the environmental attitude and environmental behaviour as well as a positive correlation between environmental knowledge and environmental attitude. However, these research findings contrast the findings of Kibert (2000) who found out in his study that environmental knowledge had an insignificant relationship with

behaviour as well as knowledge having a weak correlation with attitude.

## CONCLUSION

This study has assessed the environmental knowledge, attitude and behaviour among market women in Nigerian city of Ibadan and the findings of the study revealed that market women have substantial knowledge about environmental issues like erosion, water pollution, air pollution, natural resources, sewage treatment, and greenhouse gasses and have little knowledge about deforestation, recycling and waste management but lack knowledge in the area of soil degradation. Also, it was revealed that the market women have positive attitude to the environment and they exhibit environmentally responsible behaviours in the area of tree planting, engaging friends and family on environmental change issue, not involving in dumping of refuse in canals and not in the habit of throwing pure water sachet anywhere in the environment amongst many other areas. However, market women exhibit irresponsible environmental behaviour by rarely installing rainwater tanks during rainy seasons to conserve water and they don't switch off electricity gadgets when not in use. It was established in the study that there is a significant effect of environmental knowledge on environmental attitude; environmental attitude had a significant effect on environmental behaviour and environmental knowledge and attitude stand as a significant predictor of environmental behaviour among the market women.

Arising from the findings of the study, the following recommendations are proposed:

1. Solid environmental education efforts should be intensified among the market women as this will increase their knowledge base on environmental issues and in turn positively affect their attitude leading to pro-environmental behaviour among this women
2. Market women should be adequately sensitized on the need to install rainwater tanks to harvest rainwater and the inherent environmental hazards in their habit of not switching off electrical gadgets when not in use
3. Environmental information to market women must be routed through various means they identified as their source of information so as to get them along on environmental discourse in the city
4. Further study on environmental knowledge, attitude and behaviour among markets women should involve a larger number of participants across the geopolitical zones of the country so as to have a better generalization for the whole country.

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