

## URBAN WOMEN'S PERCEPTION OF CLIMATE CHANGE IN NIGERIA: THE ROLE OF EDUCATION

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### Abstract

*This study assesses the role of education on urban women's perception of climate change in Southwestern Nigeria. This was with a view to validating the significance of women's education for effective participation in climate change action towards mitigating and adapting to climate change impacts. The study was carried out among women in Ikeja Local Government Area, Lagos State. A structured questionnaire was designed and administered to 272 respondents selected in the study area using purposive sampling techniques. Data collected were analyzed using frequency counts, percentages, bar graphs, and logistic regression models. The logistic regression model was used to show the impact of women's education on their perception and knowledge of climate change. The results of the logistic regression model reveals that the respondents' perception of climate change ( $\beta = -0.540$ ,  $\chi^2 = 8.451$ ;  $p < 0.05$ ) and knowledge of climate change ( $\beta = -0.310$ ,  $\chi^2 = 5.198$ ;  $p < 0.05$ ) were influenced by their education. The study also shows that 83.8% of the respondents were aware that climate change is happening, while 29.6% of the respondents only have in-depth knowledge of climate change (causes and effects). The study concludes that a considerable investment in women's education should be adopted by policymakers as a technique towards enlightening women on climate change issues, which will further enable them to cope with the aftermath of climate change and enhance their effective participation in climate change action.*

**Keywords:** Climate Change, Women's vulnerability, Perception, Education, Adaptation and Sustainability.

### 1.0 Introduction

The impact of climate change confronting the entire globe has become the most challenging issue of this century. This calls for in-depth knowledge on the causes, effects, mitigation and adaptation measures especially for the most vulnerable. Increases in the amount of greenhouse gases in the atmosphere caused by climate change are now higher than ever before in the last decades. This is due to both natural and human activities that caused the earth's average temperature to rise. The impacts are severe as the aftermath effects resulted in global warming which impacts humans and the entire environment negatively (Intergovernmental Panel on Climate Change, 2001b; Intergovernmental Panel on Climate Change, 2007). Consequently, the impacts are felt by regions, generations, income groups, age and gender differently, thereby putting women in the most vulnerable state more than men (Yavinsky, 2012; Espada, 2022). Women and girls especially

in developing countries with little or no mitigation measures put in place to curtail the impacts are mostly affected by climate change (Business Solution to Poverty, 2024).

Yavinsky (2012) and Juan *et al.* (2023) reported that women are more vulnerable to the impacts of climate change due to their different and unequal social roles and status. Mohajan (2022) similarly observed that climate change disproportionately affects the most vulnerable social groups including women and girls in particular due to the roles and tasks they are assigned such as taking care of the land, fetching of water, caring for children and the family as well as discrimination (e.g. restricted access to resources and to education) they face in many regions of the world. The Office of the High Commissioner for Human Rights (2022) revealed that about 80 percent of the people displaced by climate change are females. The report indicates that women and girls are the most vulnerable to climate change. This is an emerging significant burden for the feminine gender (both elderly and young) with the most unique repercussions and impacts being felt more on household responsibilities, food (agriculture), women's social and political lives.

Shawn (2021) further reports that in the event of natural disaster, risk of death is 14 times higher among women and children living below poverty line. Likewise, women abandon school and jobs to help their families in securing food, water or taking care of family members during outbreak of diseases and disasters. More women and girls suffer health crises such as hunger and malnutrition due to food shortage caused by climate change. They eat less than required to ensure their families are well taken care of. In addition, as a result of economic hardship caused by climate change, many girls have been forced into child marriage in order for their families to cope with the economic crisis. Moreover, migration from one location to another for survival put women and girls at the risk of sexual violence, physical abuse, unintended pregnancy and maternal death (United Nations Framework Convention on Climate Change, 2022; World Economic Forum, 2024).

In addition, Food and Agriculture Organisation (FAO, 2025) showed that women particularly those in rural areas are vulnerable to the impacts of climate change as extreme temperature increases unpaid workload for women in poor households and worsens child labour. However, the United Nations Framework Convention on Climate Change (2022) revealed the extent of women and girls' vulnerability to climate change in some African countries. It was shown that men are migrating from rural to urban areas in search of employment leaving women behind in charge of land and household, a trend caused by extreme weather events. The report revealed further that women and girls in Mali are at risk of experiencing gender-based violence due to climate change impacts, environmental degradation and conflict. Similarly, in Ethiopia and Kenya, child marriage, an act of gender-based violence has become a means through which funds, assets and recovery of losses experienced are secured in the event of climate-related disasters, such as drought flooding.

In Nigeria, Ogundepo (2023) reports that everyone is being affected by the events of climate change. The event of flooding in some parts of the country in the year 2022 and 2023 was recorded. Many people lost their homes and farmlands, while children could not attend school and women had to stay at home to take care of them. Some women farmers could not return to work because of flooding in the field, which affected their income negatively.

Moreover, Oxford Committee for Famine Relief (OXFAM, 2024) documented various ways Nigerian women especially in Delta State are vulnerable to the impacts of climate change. Women who were agricultural workers worked harder to secure income and resources for their families due to negative impacts of climate change on their agricultural production. For example,

many women were forced to seek alternative livelihood options due to disruption in agricultural activities in the informal sector, where they faced exploitation and precarious working conditions. Impact of climate change on women's health due to poor air quality, heat, extreme weather events and meteorological changes that alter vector-borne disease, reduced water quality, and decreased food security were reported.

Nevertheless, Campaign for Female Education (CAMFED, 2024) reveals the significance of women and girls' education for better perception of climate change based on more than twenty-five years of her research experience in Africa. The research revealed that educated women have the skills required to run and grow sustainable businesses such as climate smart agriculture. They could inspire community action for climate resilience, innovate to adopt green technologies and lead on local and global policy that changes the status quo. The ability of educated women to achieve these, thereby reducing carbon emission, improving women's adaptation, increase prosperity and resilience to the effects of climate change which are felt in most of the marginalized communities of the world.

Likewise, Otufale (2017) in his study reveals the positive impact education had on rural women's knowledge and perception of the consequences of climate change hazards on rural women's agricultural activities. The Campaign for Female Education (CAMFED, 2025) documented that investing in girls' education is key to tackling the climate change emergency as it established a foundation for women's equal participation in livelihoods, decision-making, policy making and green innovations.

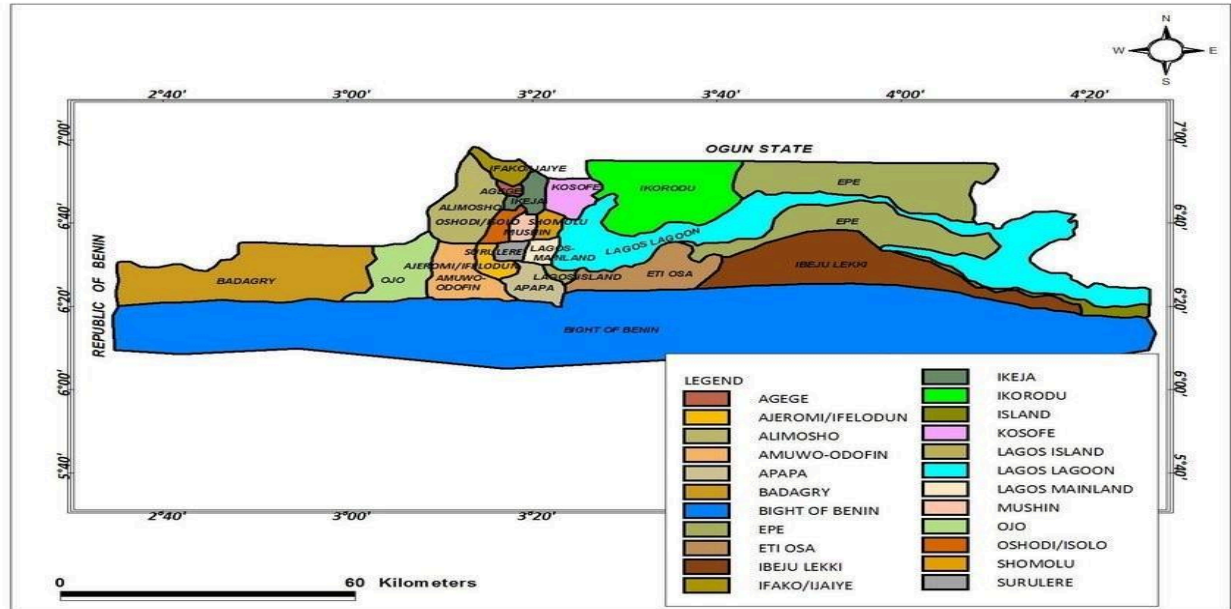
Although, several studies had been carried out on rural women's perception of climate change, knowledge of climate change, and various impacts of climate change on livelihood and adaptation of climate change (Otufale *et al.*, 2017; Suleiman *et al.*, 2018; Solomon *et al.*, 2020; Jemima *et al.*, 2022; Masoumeh *et al.*, 2023; Ifeanyi-Obi, 2023; FAO, 2024; Ojeleye, 2024)), but very little has been documented on urban women's perception of climate change. Therefore, this study will be filling this gap in the literature by assessing urban women's perception of climate change and the role of education. Furthermore, the study will assess urban women's knowledge of climate change and areas of life under threat by climate change.

## **2.0 Methodology**

### *2.1 Study Area*

The study was conducted in Ikeja Lagos State, Nigeria. Lagos State is located between latitudes 6° 23'N and 6° 41'N: and longitudes 2° 42'E and 3° 42'E. It is bounded in the North and East by Ogun State, in the South by the Atlantic Ocean/ Gulf of Guinea and in the west by the Republic of Benin. Lagos State comprises 20 Local Government Areas and 37 Local Council Development Areas (Figure 1). Ikeja Local Government Area where the state capital is located is the focal area of study for this research work. Ikeja has a tropical climate with the majority of the month in the year experiencing heavy rainfall of about 1645 mm (64.8 inches) each year. The Köppen-Geiger scale rate this climatic area Am. AM is a sub-classification under the A group which has warm temperatures with the warmest average above 18°C. Ikeja's typical temperature is 26.4 °C and the brief dry season has very little impact on the climate as a whole. Moreover, due to the proximity of the city to the equator, the hottest period in Ikeja is imprecise but usually experienced around January, July, August, September, October, November, and December in the year. The daily average temperature is above 32.2°C while the hot season lasts for 4.4 months, from December 12 to April 25. Ikeja experiences its warmest month of the year in March, with an average high of

32.7°C and low of 25.5°C. The daily average maximum temperature is below 28.8°C with the chilly season lasting 3.2 months, from June 23 to September 30. The month of August is the coldest month of the year in Ikeja, with an average low of 23.3°C and high of 27.7°C.



**Figure 1: Study Area**

**Source:** Lagos State Ministry of Physical Planning (2024)

## 2.2 Research Design, Population, Sample Size and Sampling Technique

The study used a survey design to obtain information from respondents who are women in the study area. A total population of 110,387 women in the study area was used to obtain a sample size of 272 using the formula for determining the sample size recommended by (Singh and Masuku, 2014; Jemima *et al.*, (2022).

$$Z^2 * (P(1-P) / e^2)$$

$$1 + (Z^2 * (P(1-P) / e^2)N$$

Where Z = Confidence Level (Z = 90% confidence level = 1.65).

N = Population to be Sampled (110, 387 women).

e = Margin error (e=5% (0.05).

P = Percentage probability of false rejecting the null hypothesis (e=50% (0.05).

$$= \frac{1.65^2 * (0.5(1 - 0.5/0.5))}{1 + (1.65^2 * 0.591 - 0.5) / 0.05^2 * 110,387}$$

$$= \frac{272}{1000}$$

For the survey, a total number of 272 questionnaires were administered to respondents using purposive sampling technique. The technique was found appropriate based on the fact that the sample of the study (women) shared similar traits such as life experiences that the study was interested in.

### *2.3 Research Instrument and Data Analysis*

Data were sourced from both primary (through the use of questionnaire) and secondary sources. Two hundred and seventy-two copies of the questionnaire were administered to women in the study area, out of which 242 copies were retrieved and found useful for analysis. Descriptive (frequency, percentage and bar graph) and inferential (Logistic regression) statistics were used to analyse the data. In determining factor(s) influencing urban women's perception and their knowledge of climate change, factors such as age, education, income, marital status, and occupation were considered and captured using a multinomial scale. On the other hand, women's perceptions of climate change and knowledge of climate change were measured using a nominal scale.

## **3.0 Results and Discussion**

### *3.1 Breakdown of Socio-economic Characteristics of Urban Women*

Table 1 shows the socio-economic characteristics of urban women. This finding shows that more than one-third of the urban women were within the age range of 18 and 58 years. This means that urban women are still within the age range at which they have the ability to learn and adopt new innovations that may be adopted to curtail the effect of climate change.

The majority (53.3%) of the urban women interviewed are single. This finding further explains the respondents' tendency to effectively engage in other activities that are valuable and could benefit the community.

On the level of education attainment by the respondents, 1.2 % had no formal education, 4.6% had primary education, 37.9% had secondary education, 34.9% had acquired B.Sc. 4.1% are M.Sc. certificate holders, 0.8% have Doctoral degree certificates, and 16.6% have degrees in National Diploma, National Certificate of Education, or its equivalent. This result indicates that the majority of the respondents had acquired secondary school education. This could have played a significant role in their perception of climate change. This finding supports Ojeleye *et al.* (2019), where more than average of the respondents interviewed were well educated to contribute to the discourse on climate change. Moreover, this finding corroborates further the outcome of Rapid Transition Alliance (2020) where educated women were found to be more productive in agricultural production as climate changes the balance of carbon and water cycles.

**Table 1: Breakdown of Socio-economic Characteristics of Urban Women**

Survey	Classification	Frequency	Percentage
Age	18-24	90	37.2
	25-31	29	12.0
	32-38	36	14.9
	39-44	41	16.9
	45-51	24	9.9
	52-58	16	6.6
	59-67	6	2.5
Marital	Married	111	45.9
	Single	129	53.3
	Widow	2	0.8
Education	No formal Education	3	1.2
	Primary Education	11	4.6
	Secondary Education	91	37.8
	B.Sc.	84	34.9
	M.Sc.	10	4.1
	Ph.D.	2	0.8
	Others	40	16.6
Occupation	Civil Servant	31	12.9
	Private Organisation's employee	22	9.1
	Trader	41	17.0
	Entrepreneur	54	22.4
	Apprentices	4	19.9

	Others	45	18.7
Income	Less than ₦50,000	162	67.2
	₦50,000 - ₦199,000	45	18.7
	₦100,000 - ₦199,00	22	9.1
	₦200,000 - ₦299,000	5	2.1
	₦300,000 - ₦399,000	7	2.9

**Source:** Authors' Fieldwork (2024)

As regards the occupation of urban women, the study reveals that 12.9% of the urban women were civil servants, 9.1% were private organization employees, 17.0% were traders, 22.4% were entrepreneurial who owned their businesses, 19.9% were apprentices, 18.7% accounted for those engaged in other activities such as urban agriculture, residential aids to earn a living. This finding agreed with the Campaign for Female Education (CAMFED, 2024), which was based on twenty-five years of research experience in Africa and showcased women's ability to run and grow sustainable businesses such as climate-smart agriculture successfully. This is a good indicator for women to be involved in climate change action. Nevertheless, the study revealed that the majority of the respondents (62.2%) earn below ₦50,000.00. This should be taken into As regards the occupation of urban women, the study reveals that 12.9% of the urban women were civil servants, 9.1% were private organization employees, 17.0% were traders, 22.4% were entrepreneurial who owned their businesses, 19.9% were apprentices, 18.7% accounted for those engaged in other activities such as urban agriculture, residential aids to earn a living. This finding agreed with the Campaign for Female Education (CAMFED, 2024), which was based on twenty-five years of research experience in Africa and showcased women's ability to run and grow sustainable businesses such as climate-smart agriculture successfully. This is a good indicator for women to be involved in climate change action. Nevertheless, the study revealed that the majority of the respondents (62.2%) earn below N50,000.00. This should be taken into consideration in any climate change action to be adopted. Mitigation and adaptation measures to curtail the effects of climate change should not be a burden on income for effective achievement.

### *3.2 Respondents' Perception of Climate Change*

The results of urban women's perception of climate change and the knowledge of climate change occurrence in the study area are presented in Table 2. The results show that 86.0% of urban women are aware of climate change, while 16.2% were not aware. 80.2% percent of the urban women in the study area believed they have more understanding on issues around climate change reality, 5.4% of the urban women did not have any understanding about the reality of climate change, while 14.5% were not sure about climate change happening. These results suggest that though more respondents were aware of the climate change phenomenon, not all have in-depth knowledge of this challenge. This could be an avenue for sensitisation and training of women on issues of climate change.

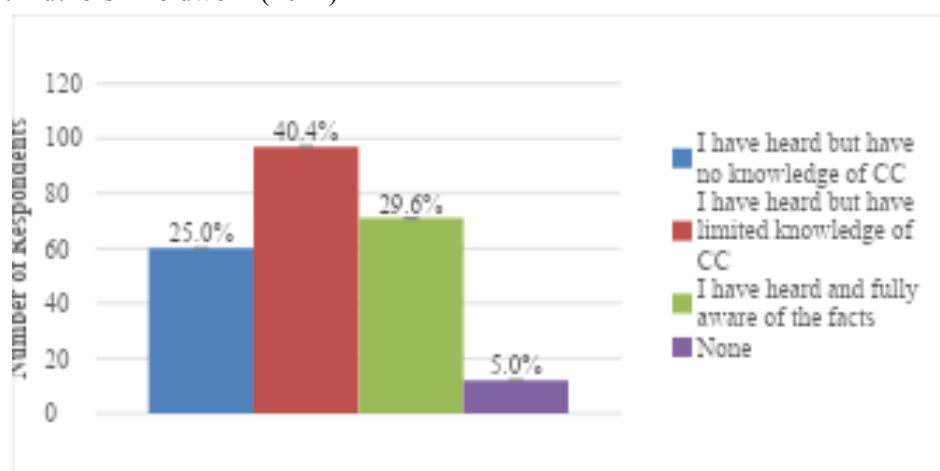
In addition, Figure 2 presents the breakdown of urban women's level of perception of climate change. The result reveals that 25% of urban women have heard about climate change, but have

no knowledge about it. 40.4% of the urban women have had about climate change but have limited knowledge on the issue. Also, 29.6% of urban women have heard about climate change and have in-depth knowledge of the issues (causes, effects, mitigation measures), while 5.0% have not heard of or had any knowledge of climate change. This reveals the need for effective sensitization and dissemination of information on the issue of climate change to women especially.

**Table 2: Distribution of Respondents Climate Change Perception**

Climate Change	Frequency	Percentage
<b>Perception of Climate Change</b>		
Yes	208	86.0
No	34	16.2
<b>Total</b>	<b>242</b>	<b>100</b>
<b>Knowledge of Climate Change Reality</b>		
Yes	194	80.2
No	13	5.4
Not Sure	35	14.5
<b>Total</b>	<b>242</b>	<b>100</b>

**Source:** Authors' Fieldwork (2024)



**Figure 2: Urban Women's Level of Perception of Climate Change; Source: Author's Fieldwork (2024).**



### 3.3 Determinants of Urban Women's Perception of Climate Change

Table 3 shows the result of the logistic regression model used to ascertain the impact of education on urban women's perception of climate change. The result shows that education is significant to the respondents' perception of climate change ( $\beta = -0.310$ ,  $\chi^2 = 5.198$ ;  $p < 0.05$ ). This suggests that respondents with education are 0.733 times more likely to perceive climate change. However, the result from the table shows that the respondents' level of income ( $\beta = -0.233$ ,  $\chi^2 = 0.983$ ;  $p > 0.05$ ); age ( $\beta = -0.103$ ,  $\chi^2 = 0.677$ ;  $p > 0.05$ ); marital status ( $\beta = -0.092$ ,  $\chi^2 = 0.080$ ;  $p > 0.05$ ) and occupation ( $\beta = -0.094$ ,  $\chi^2 = 0.636$ ;  $p > 0.05$ ) are not significant with climate change perception by urban women in the study area. In addition, the model explained about 69.0% (Nagelkerke  $R^2$ ) and 45.0% (McFadden  $R^2$ ) variations in the dependent variable (Urban Women's Perception of Climate Change).

The model fit parameters (loglikelihood, AIC, and BIC) of the estimated model show that the logistic regression model is appropriate for explaining the relationship between the dependent and the independent variables. This result is intandem with Campaign for Female Education (CAMFED), 2014; Campaign for Female Education (CAMFED), 2025) more than twenty-five years research outcome in Africa, which reveals the positive impact of education on women's perception and activities on climate change adaptability.

### 3.4 Determinants of Urban Women's Knowledge of Climate Change

Table 4 presents the logistic regression results of the factors that influenced urban women's knowledge of climate change. The result shows that the respondents' knowledge of climate change was influenced by their education ( $\beta = -0.540$ ,  $\chi^2 = 8.451$ ;  $p < 0.05$ ). The result indicates that urban women with education are 0.583 times more likely to be aware of climate change. On the other hand, age ( $\beta = -0.019$ ,  $\chi^2 = 0.015$ ;  $p > 0.05$ ); income ( $\beta = -0.238$ ,  $\chi^2 = 0.712$ ;  $p > 0.05$ ); marital status ( $\beta = -0.622$ ,  $\chi^2 = 1.658$ ;  $p > 0.05$ ); and occupation ( $\beta = -0.157$ ,  $\chi^2 = 1.189$ ;  $p > 0.05$ ) are not significant. This indicates that these factors are not important to urban women's awareness of climate change. This model explained about 11.8% (Nagelkerke  $R^2$ ) and 8.3% (McFadden  $R^2$ ) variations in the dependent variable (urban women's awareness/knowledge of Climate Change). The model fit parameters (loglikelihood, AIC, and BIC) of the estimated model show that the logistic regression model is appropriate for explaining the relationship between the dependent and the independent variables. This supports Otufale, 2017 *et.al* research outcome which reveals that education has a positive impact on rural women's knowledge and agricultural activities in the study area.

### 3.5 Urban Women's Vulnerability of Climate Change

Table 5 shows the descriptive analysis of urban women on women being the most vulnerable to climate change. 58.7% of the respondents indicated women as the most vulnerable. 12.1% did not agree with the notion, while 29.2% were not sure whether women are the most vulnerable to climate change or not. A larger percentage (58.7%) of the respondents agree that women are the most vulnerable to climate change. This supports the studies of Shawn, (2021) and Mohajan, (2022) on women as the most vulnerable to climate change impacts. This suggests that the effective participation of women in climate change action could be achieved as a result of their awareness of being the most vulnerable to climate change.

**Table 3: Regression Results of the Determinants Urban Women's Perception of Climate**

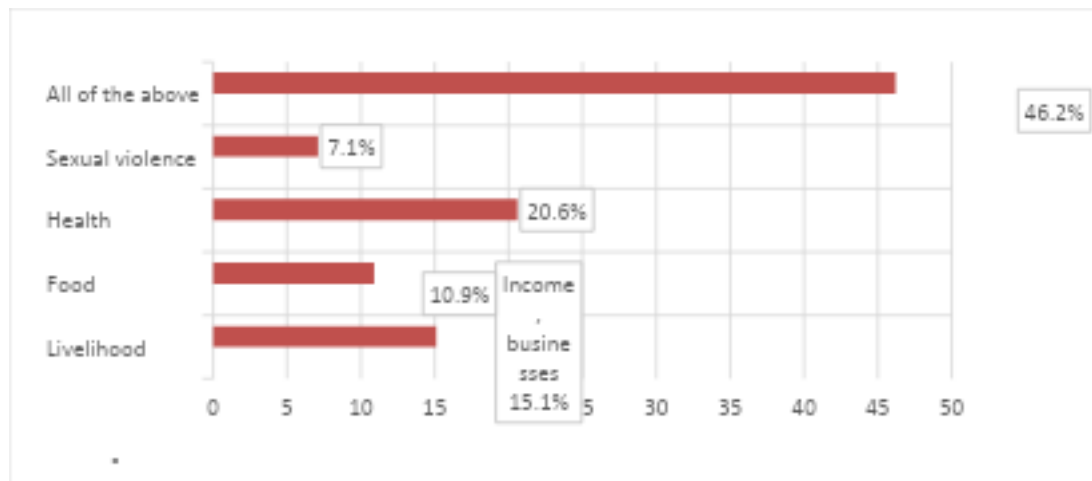
Perception of Climate Change	Coefficients (β)	SE	Wald(χ <sup>2</sup> )	P value	Exp (Coefficients) (β)
Intercept	0.909	1.022	0.790	0.374	2.481
Age	-0.103	0.125	0.677	0.411	0.902
Education	-0.310	0.136	5.198	0.023	0.733
Income	-0.233	0.235	0.983	0.322	0.792
Marital status	-0.092	0.324	0.080	0.777	0.912
Occupation	-0.094	0.118	0.636	0.425	0.911
Model Fit	Null Model	Estimated Model	Cox and Snell R <sup>2</sup>	Nagelkerke R <sup>2</sup>	McFadden R <sup>2</sup>
Loglikelihood	-120.541	-115.122			
Deviance	241.082	230.244			
AIC	243.082	242.244	0.044	0.069	0.045
BIC	246.571	263.178			
DF	241	236			

**Table 4: Regression Result of the Determinants of Urban Women's Knowledge of Climate**

Knowledge of Climate Change	Coefficients (β)	SE	Wald (χ <sup>2</sup> )	P value	Exp (Coefficients) (β)
Intercept	0.908	1.351	0.451	0.502	2.479
Age	-0.019	0.152	0.015	0.901	0.981
Education	-0.540	0.186	8.451	0.004	0.583
Income	-0.238	0.282	0.712	0.399	0.788
Marital status	-0.622	0.483	1.658	0.198	0.537
Occupation	0.157	0.144	1.189	0.276	1.170
Model Fit	<i>Null Model</i>	<i>Estimated Model</i>	<i>Cox and Snell R<sup>2</sup></i>	<i>Nagelkerke R<sup>2</sup></i>	<i>McFadden R<sup>2</sup></i>
Loglikelihood	-98.219	-90.035			
Deviance	196.438	180.071			
AIC	198.438	192.071	0.065	0.118	0.083
BIC	201.926	213.004			
DF	241	236			

**Table 5: Women's Vulnerability to Climate Change: Source: Authors' Fieldwork (2024)**

Options	Frequency	Percentage
Yes	141	58.7
No	29	12.1
Not sure	70	29.2
Total	240	100



**Figure 3:** Areas of Urban Women's Life Under Threat of Climate Change.

**Source:** Authors' Fieldwork (2024)

#### 4.0 Conclusion

This study analysed the role education played in urban women's perception of climate change. The study revealed that education has a significant impact on urban women's knowledge and perception of climate change. Most of the urban women in the study area have at least a secondary school education. More than eighty percent of urban women in the study area have an awareness of climate change, but few have in-depth knowledge of climate change. However, most of the respondents in the study area indicated women are the most vulnerable to climate change and that all aspects of urban women's lives are being threatened at the moment. This study supports the documentation of Otufale, (2017) where rural women's perception of climate change on their agricultural practices was enhanced by education. This signifies the need for women and girls' education both in rural and urban areas relative to issues of climate change.

#### 5.0 Recommendations

The study, therefore, recommends incentives to be directed towards investment in education for women and girls, especially in our communities (both urban and rural), and this should be a matter of priority. Efforts should be made further in the area of constant dissemination of information to people, especially women and girls, the most vulnerable to various environmental issues like climate change. Moreover, stakeholders, corporate organizations, NGOs, individuals, and communities should collaborate with the federal, state, and local governments on the issue of climate change, for the purpose of achieving immense sustainable environmental development in the nation. In addition, implementation of education as an approach towards sensitization of people on the issue of climate change will positively aid in achieving a sustainable and healthy environment capable of coping with the aftermath of climate change.

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