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Does Education Shape Urban Women's Climate Change Knowledge and Perception? Evidence From Lagos State, Nigeria

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Abstract

Women's involvement is crucial for addressing the impact of climate change and their contribution can significantly enhance effectiveness of climate actions. Thus, this study assessed the role of formal education on urban women's perception and knowledge of climate change in Lagos State, Southwestern Nigeria. The study was carried out among women in Ikeja, 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. A total of 242 questionnaires were retrieved and the 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 revealed that the respondents' perception of climate change ($\beta = 0.303$, Wald $\chi^2 = 4.888$, $p<0.05$) and knowledge of climate change ($\beta = 0.535$, Wald $\chi^2 = 8.283$; $p<0.05$) were influenced by their education. The study also showed that 80.2% of the respondents knew that climate change is happening, while 29.6% of the respondents only have in-depth understanding of climate change (causes and effects). The study concludes that policymakers should make substantial investments in women's formal education as a strategic pathway for improving climate change awareness, strengthening women's adaptive capacity, and enhancing their effective participation in climate action.

Keywords: Climate Change, Women's vulnerability, Perception Logistics regression, Education Adaptation and Sustainability

INTRODUCTION

Climate change is a gendered issue that disproportionately affects women (Dube & Sekhwela, 2017). Women's specific roles and responsibilities as primary caregivers, their economic dependence on natural resources, and restrictions on mobility often limit their access to resources, climate information, and decision-making opportunities. These factors are particularly pronounced in developing countries with limited resources, thereby worsening women's vulnerability to climate change. As increase in the amount of greenhouse gases in the atmosphere are now higher than ever before in the last decades due to both natural and human activities that cause the earth's average temperature to rise, Intergovernmental Panel on Climate Change (IPCC) observed severity in the impact as the aftermath resulted in global warming that induced climate change. This impact man and the entire environment negatively (Intergovernmental Panel on Climate Change, 2001b; Intergovernmental Panel on Climate Change, 2007). The consequent impacts are felt by regions, generations, income groups, age and gender differently, thereby putting women in 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 (Shrivastav & Dabla, 2025)

Yavinsky (2012) and Juan *et al.* (2023) revealed that women are more vulnerable to the impacts of climate change due to their different and unequal social roles and status. Similarly, Mohajan (2022) asserted also 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 such as restricted access to resources and to education, which women face in many regions of the world.

According to Office of the High Commissioner for Human Rights (2022) report, globally, about eighty (80) percent of the people displaced by climate change are females with the study indicating women and girls as the most vulnerable of 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) posits 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. Furthermore, women and girls suffered health crisis such as hunger and malnutrition due to food shortage caused by climate change. They eat less and last to ensure their families are well taken care of. In addition, because of economic hardship caused by climate change, many girls were forced into child marriage 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).

Food and Agricultural Organization (2025) shows 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, United Nations Framework Convention on Climate Change (2022) observes the extent of women and girls' vulnerability to climate change in some African countries. The study reveals men 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 event. The report further shows the case of women and girls in Mali being at risk of experiencing gender-based violence due to climate change impacts, environmental degradation and conflict. Similarly, a peer-reviewed studies on climate change impact in Ethiopia and Kenya reveals child marriage, an act of gender-based violence which 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 and flooding.

In Nigeria, Ogundepo (2023) shows that everyone is being affected by the events of climate change, and reputable institutional document the event of

flooding in some parts of the country in the year 2022 and 2023 where many people lost their homes and farmlands. Children could not attend school and women had to stay at home to take care of them. Concurrently, some women farmers could not return to work because of flooding in the field, which affected their income negatively. Also, Oxford for Committee for Famine Relief, OXFAM (2024) reports, various ways Nigerian women for instance in Delta State are vulnerable to the impacts of climate change. Women who were agricultural workers work harder to secure income and resources for their families due to negative impacts of climate change on their agricultural production. Many women were forced to seek alternative livelihood where they faced exploitation and precarious working conditions, options due to disruption in agricultural activities in informal sector. However, impact of climate change on women's health because of poor air quality, heat, extreme weather events and meteorological changes that alter vector-borne disease, reduced water quality, food insecurity was reported.

Thus, education is crucial in addressing the issues of climate. Formal education with integration of climate education will help individuals and communities to have better knowledge and understand of the causes and consequences of climate change, thereby develop people's skills for climate resilience, adaptation and mitigation strategies. Moreover, education will enhance participation of individuals, especially women and other vulnerable groups to participate in climate decision-making and action (Adejuwon & Tijani, 2017; Dube & Sekhwela, 2017; UNESCO, 2015). 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 the institution's research experience in Africa. CAMFED (2024) study further shows that educated women have the skills required to run and grow sustainable businesses such as climate smart agriculture. Moreover, the study asserted educated women's tendency to 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 attain these would eventually enhance reduction in carbon emission, improve 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.

According to the study by Hassan *et al.* (2022), there is high perception of climate change among residents in urban areas such as Lagos State with the outcome based on high literacy level in the state. Accordingly, CAMFED (2025) suggests investing in girls' education as a key to tackling climate change emergency, thereby establishing a foundation for women's equal participation in livelihoods, decision-making, policy making and green innovations.

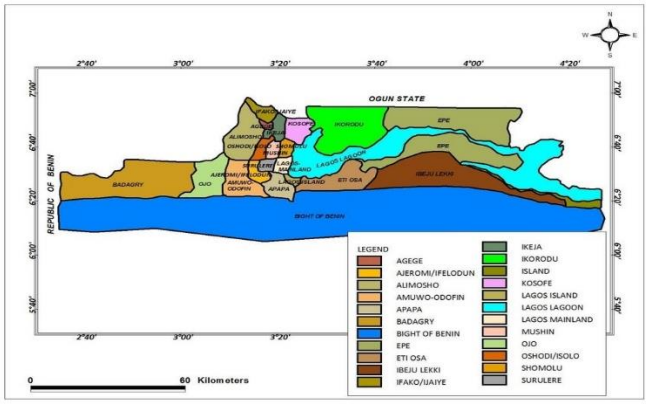
Although, several studies had been carried out on rural women's perception of climate change, knowledge of climate change, and various impacts of climate change on livelihood and adaptation of climate change (Otufale *et al.*, 2017; Suleiman *et al.*, 2018; Solomon *et al.*, 2020; Jemima *et al.*, 2022; 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 determining the factors influencing urban women's knowledge and perception of climate change. Opinion on women as the most vulnerable of climate change and areas of urban women's life under threat by climate change will be assessed too.

METHODOLOGY

Description of the Study Area

The study was conducted in Ikeja Lagos State, Nigeria. Lagos State is located between latitudes 6º 23'N and 6º 41'N: and longitudes 2º 42'E and 3º 42'E. It is bounded in the North and East by Ogun State, in the South by 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 (Fig 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 most 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 18ºC. Ikeja's typical temperature is 26.4 °C and the brief dry season has very little impact on the climate. 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 lasts 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.



Source: Lagos State Ministry of Physical Planning (2024)

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).

$$\frac{Z^2*(P\ (1-P/\ e^2)}{1 + (Z^2* (P(1-P)/e^2N}$$

Where:
Z = Confidence Level (1.65)
N = Population to be Sampled (110,387 women)
e = Margin error 5% (0.05)
P = Percentage probability of false rejecting the null hypothesis (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 a purposive sampling technique. The technique was found appropriate because the sample of the study (women) shared similar traits such as life experiences that the study was interested in.

Research Instrument and Data Analysis

Data were sourced from both primary (using questionnaire) and secondary sources. Two hundred and seventy-two (272) copies of the questionnaire were administered to women in the study area, out of which two hundred and forty-two (242) copies were retrieved and found useful for analysis. Descriptive (frequency, percentage and bar graph) and inferential (Logistic regression) statistics were used to analyze the data. In determining the independent variables influencing the dependent variable (urban women's perception and their knowledge of climate change), variables 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.

Study Variables and their Measurement

To ensure clarity and replicability, this study explicitly defines and operationalizes the key constructs examined, knowledge and perception of climate change and specifies how variables were coded for the regression analysis.

(a) Perception of Climate Change: Perception refers to respondents' level of understanding of the causes, effects, and mitigation/adaptation strategies of climate change. Respondents were asked to indicate their level of understanding of climate change, and their responses were recorded as "In-depth knowledge (adequate understanding)" = 1 or "Limited/no knowledge/unsure" = 0.

(b) Knowledge of Climate Change: Knowledge refers to respondents' certainty and facts as regards occurrence and reality of climate change in consort with the respondents' recognition of the gravity of the impacts. Here, respondents were interviewed about reality of climate change, and their responses were recorded as "Certainty of climate change

reality (Yes)" = 1 or "Does not certain of climate change reality (No/Not sure)" = 0.

(c) Education: Education of the responded were captured using multinominal scale variables were "No formal education" = 1, "Primary education" = 2, "Secondary education" = 3, and "Tertiary education (ND/NCE/B.Sc./M.Sc./PhD)" = 4.

(d) Age: Age of respondents were captured on an ordinal variable based on age groups: 18–24, 25–31, 32–38, 39–44, 45–51, 52–58, and 59–67.

(e) Income: Respondents' level of income was measured on a scale of Less than ₦50,000, ₦50,000–₦99,000, ₦100,000–₦199,000, ₦200,000 and above

(f) Marital Status: The marital status of respondents was captured on a multinominal scale (single, married, and widowed)

(g) Occupation: Respondents were asked to indicate their occupation, and this was captured using a multinominal scale (unemployed/others, civil servant, private sector, trader, entrepreneur, and apprentice).

RESULTS

Socio-economic Characteristics of Urban Women in Ikeja

Table 1 shows the socio-economic characteristics of the urban women. This finding shows that more than one-third of the urban women were within the age range of 18 and 58 years, while the majority (53.3%) of the urban women interviewed are single. On the level of formal 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

Table 1: Breakdown of Socio-economic Characteristics of Urban Women, Ikeja, Lagos State

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	Single	129	53.3
	Married	111	45.9
	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 and above	7	2.9

Source: Authors' Fieldwork (2024)

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. The occupation of urban women interviewed at Ikeja reveals that 12.9% of the urban women are Civil servants, 9.1% are private organization employees, 17.0% are traders, 22.4% were entrepreneurial who owned

their businesses, 19.9% are apprentices, 18.7% accounted for those engaged in other activities such as urban agriculture, residential aids to earn a living. Nevertheless, the study on the income of the urban women reveals that majority of the respondents (62.2%) earn below N50,000:00.

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 using Table 2. The result shows that 86.0% of urban women understand climate change, while 16.2% of the respondents have no understanding on the issue. 80.2% percent of the urban women in the study area reveals their knowledge on reality of climate change occurrence, 5.4% of the urban women had a negative notion as regards the reality of climate change occurrence, while 14.5% of the respondents are ambivalent about their knowledge of climate change reality.

Table 2: Distribution of Respondents on Climate Change Perception

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

In addition, Figure 2 is used in presenting the breakdown of urban women's level of perception of climate change. The result reveals that 25% of urban women have had about climate change but have no understanding about it. 40.4% of the urban women have had about climate change but have limited understanding on the issue. Also, 29.6% of urban women have heard about climate change and have in-depth understanding on the issue (causes, effects, mitigation measures), while 5.0% have no understanding of climate change.

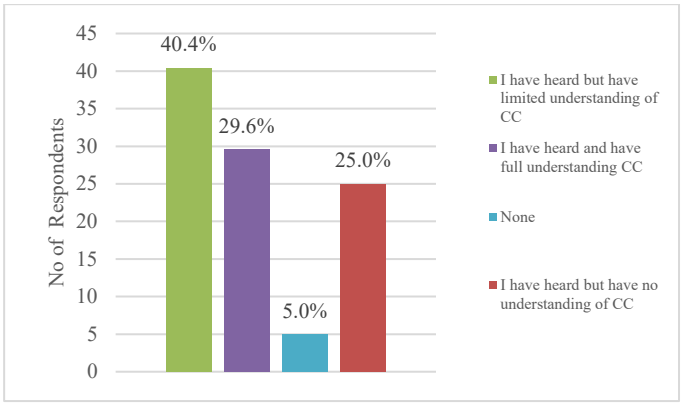


Figure 2: Urban Women's Level of Perception of Climate Change
Source: Author's Fieldwork (2024)

To examine the determinants of urban women's perception and knowledge of Climate Change, data analysis binary logistic regression was used. Two separate models were estimated: one with perception of climate change as the dependent variable and one with knowledge of climate change as the dependent variable. Both outcomes were coded as binary variables, where Positive perception / Adequate knowledge = 1 and Negative perception / Inadequate knowledge = 0. For categorical predictors, the first category served as the reference group: Low income for income level, Single for marital status, and Unemployed for occupation. Education was treated as an ordinal variable representing increasing levels of formal schooling, while age was included as a continuous variable measured in years. Statistical significance was assessed at $\alpha = 0.05$, and 95% confidence intervals were reported for all odds ratios to indicate the precision of estimates.

Determinants of Urban Women's Perception of Climate Change

Table 3 shows the result of the logistic regression model for urban women's perception of climate change. The results of the overall model demonstrated a modest -2 Log Likelihood value of 226.827 with values of Cox and Snell R^2 (4.1%), and Nagelkerke R^2 (6.6%), indicating that the predictors explained approximately 4–7% of the variance in perception. Educational attainment was the only statistically significant predictor ($\beta = 0.303$, Wald $\chi^2 = 4.888$, $p = 0.027$). The odds ratio shows that each one-unit increase in education level was associated with a 35.3% increase in the odds of holding a positive perception of climate change

(OR = 1.35, 95% CI: 1.04, 1.77), holding all other variables constant. However, age (β = 0.111, p = 0.383), income (β = 0.220, p = 0.351), marital status (β = 0.125, p = 0.708), and occupation (β = 0.079, p = 0.512) were not significantly associated with perception. The 95% confidence intervals for all four variables included 1.0, suggesting that the observed associations may be attributable to sampling variability.

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

Perception of Climate Change	Coefficients (β)	S.E.	Wald(χ^2)	DF	P value	Exp (β)	95% C.I. for EXP(B)	
							Lower	Upper
Intercept	-0.873	1.045	0.698	1	0.404	0.418		
Age	0.111	0.127	0.761	1	0.383	1.118	0.871	1.435
Education	0.303	0.137	4.888	1	0.027	1.353	1.035	1.770
Income	0.220	0.236	0.870	1	0.351	1.246	0.785	1.977
Marital status	0.125	0.335	0.140	1	0.708	1.134	0.588	2.186
Occupation	0.079	0.121	0.430	1	0.512	1.082	0.854	1.371
Model Fit	**-2 Loglikelihood**	***Cox and Snell R^2***	***Nagelkerke R^2***					
	226.827	0.041	*0.066*					

N = sample size (242). OR = Odds Ratio. CI = Confidence Interval. Significant predictor -Education

Having established the determinants of climate change perception, the analysis proceeds to identify the factors associated with adequate climate change knowledge among the same sample of urban women.

Determinants of Urban Women's Knowledge of Climate Change

Table 4 presents the logistic regression results for urban women's knowledge of climate change. The model fit was modest with -2 log-likelihood value of 179.482. The model explains about 6.5% and 11.6% of the variance (Cox and Snell R^2 = 0.065; Nagelkerke R^2 = 0.116), accounting for roughly 7–12% of the variance in adequate knowledge. As with perception, education was the sole significant predictor (β = 0.535, Wald χ^2 = 8.283, $p < 0.05$). The odds ratio indicates that a one-unit increase in education level was associated with a 71% increase in the odds of possessing adequate knowledge of climate change (OR = 1.71, 95% CI: 1.19, 2.46), holding all other variables constant. Age (β = 0.020, $p > 0.05$), income (β = 0.249, $p > 0.05$), marital status (β = 0.598, $p > 0.05$), and occupation (β = −0.141, $p > 0.05$) did not show statistically significant associations. Notably, marital status had the largest non-significant odds ratio (OR = 1.82), but its wide confidence interval (0.71, 4.67) reflects substantial uncertainty.

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

Perception of Climate Change	Coefficients (β)	S.E.	Wald(χ^2)	DF	P value	Exp (β)	95% C.I. for EXP(B)	
							Lower	Upper
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Age	0.111	0.127	0.761	1	0.383	1.118	0.871	1.435
Education	0.303	0.137	4.888	1	0.027	1.353	1.035	1.770
Income	0.220	0.236	0.870	1	0.351	1.246	0.785	1.977
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Model Fit	**-2 Loglikelihood**	***Cox and Snell R^2***	***Nagelkerke R^2***					
	226.827	0.041	*0.066*					

N = sample size (242). OR = Odds Ratio. CI = Confidence Interval. Significant predictor -Education

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.

Table 5: Women's Vulnerability to Climate Change

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

Differences in total responses across variables are due to item non-response

Source: Authors' Fieldwork (2024)

Also, Figure 3 further shows the areas of urban women's life under threat as a result of climate change. 46.2% indicates all areas of their lives being threatened by climate change, while 7.1% of urban women indicates their health. 10.9% of the urban women indicates food, while 15.1% indicates their livelihoods.

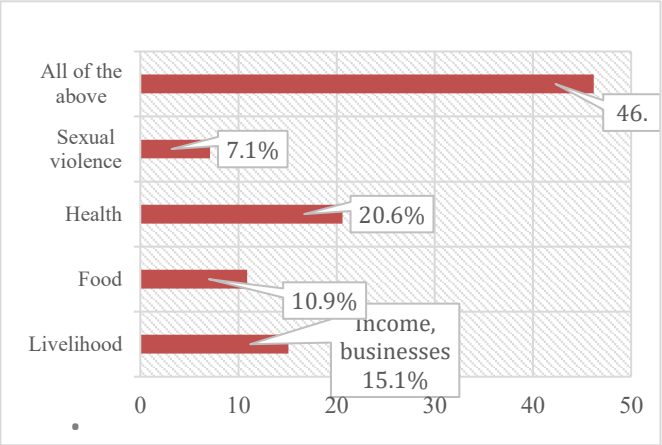

Figure 3: Areas of Urban Women's Life Under Threat of Climate Change

Source: Authors' Fieldwork (2024)

DISCUSSION OF FINDINGS

This study provides important empirical insights into the relationship between education and urban women's perception and knowledge of climate change in Ikeja, Lagos State. The findings reveal a complex interaction between socio-economic characteristics, knowledge and the role of education in shaping climate change perception among urban women.

First, the socio-economic profile of respondents shows that a large proportion of urban women fall within the economically active age group (18–58 years). This finding aligns with Dube Sekhwela, (2017), research outcome that women of this age category can play a significant role in adopting new innovation to address climate change. This is significant because individuals within this age bracket are generally more receptive to new information, innovations, and adaptive strategies. This suggests supports for this age group as regards education, climate-resilience livelihood, training and resources to empower women in this age category.

On marital status of the respondents, majority (53.3%) of the urban women sampled being single suggests single women having higher tendency to have more knowledge of climate change and may be more available to participate in climate education. Thus, specific needs and vulnerability of this group should be considered in developing climate change adaptation measures.

The educational distribution of the respondents reveals that the majority having at least secondary education and a considerable proportion holding tertiary qualifications. The educational advantage appears to play a pivotal role in shaping knowledge and perception. This finding supports Ojeleye *et al.* (2019; Hassan *et al.* (2022), where highest perception of climate change among urban people was based on their high literacy level. This suggests capacity building through formal and environmental education and training for women to enhance effective adaptability to climate change impacts.

The study on occupation of the urban women further reveals higher proportion (22.4%) of the urban women interviewed being an entrepreneur who own their businesses. This finding agrees with

the Campaign for Female Education (2024), based on twenty-five years of her research experience in Africa which shows educated women's ability to run and grow sustainable businesses such as climate-smart agriculture successfully. This suggests provision of finance, markets and training for urban women to enhance climate resilience and economic growth. However, in the context of this study as regards income, majority of the respondents earn below ₦50,000.00. This suggests prioritization of economic support for low-income urban women to reduce their vulnerability to climate hazards.

Hence, findings from Ikeja on knowledge and perception of climate change suggest that exposure to formal education enhances access to information channels such as media, academic content, and institutional campaigns on climate change. However, despite this high knowledge, only a small proportion (29.6%) demonstrated in-depth understanding of climate change issues. This gap between knowledge and deep understanding highlights a critical issue: education may facilitate exposure, but not necessarily comprehensive understanding. This finding suggests that general literacy does not automatically translate into climate literacy. Instead, there is a need for targeted environmental education that exceeds basic knowledge on reality of climate but should include in-depth perception of causes, impacts, and adaptation strategies. This supports Ayanlade *et al.*, 2023; that argue that climate education must be integrated into formal and informal learning systems to enhance meaningful engagement.

Moreover, across both models - the logistic regression analysis to determine urban women's perception and knowledge of climate change, education was the only consistent and statistically significant predictor of climate change perception (OR = 1.35), and knowledge (OR = 1.71) among urban women in Lagos State, with a stronger association observed for knowledge than for perception. This suggests that formal education primarily strengthens factual understanding of climate change, while perception may be shaped more by factors outside the scope of formal schooling, such as cultural norms, media exposure, or lived climate experiences. The relatively narrow confidence interval for education in the knowledge model further supports the robustness of this finding. This finding is also consistent with CAMFED (2014, 2025) Otufale (2017) which emphasize that education enhances women's perception, critical thinking, access to information, and the ability to interpret environmental changes. However, the low pseudo-R^2 values in both models indicate that most of the variance in climate change perception and knowledge remains unexplained. This suggests that unmeasured factors such as media exposure and experiences with climate events may also influence these outcomes among urban women sampled.

Interestingly, income was not found to be a significant determinant of climate change perception or knowledge. However, while income may not influence perception, it could still affect the ability to adopt adaptation measures, which often require financial resources. Similarly, the insignificance of age and marital status indicates that climate change perception cuts across different demographic categories among urban women. Findings from Ikeja suggests that climate change is a universally recognized phenomenon within the study area, regardless of personal or social status. This also implies that interventions should not be overly segmented by these variables but rather focus on inclusive strategies that target all women.

The findings from Ikeja on vulnerability further reinforced the gendered nature of climate change impacts. A majority of respondents acknowledged that women are the most vulnerable to climate change. This perception is consistent with the studies of Shawn (2021) and Mohajan (2022) which highlight women as the most vulnerable to climate change impacts due to their socio-economic roles, limited access to resources, and existing gender inequalities. The recognition of the vulnerability among respondents is significant because it may influence their decision to participate in climate action. This suggests women's participation in climate change initiatives.

Moreover, the identification of multiple areas of life—health, food, and livelihood—as being under threat indicates that urban women perceive climate change as a multidimensional issue affecting their overall well-being. The fact that nearly half of the respondents indicated that all aspects of their lives are threatened underscores the prevalent nature of climate change impacts. This aligns with Oxford for Committee for Famine Relief (2024); United

Nations Framework Convention on Climate Change (2022); United Nations Women (2025) research findings that climate change exacerbates socio-economic challenges, particularly in urban environments where population density and infrastructural pressures intensify vulnerabilities. This suggests ensuring urban women's access to resources, climate education and finance to address their specific needs and vulnerabilities.

Overall, the findings from Ikeja highlight the critical role of formal education as a driver of climate change perception and knowledge among urban women. However, they also reveal important gaps in depth of understanding and practical engagement. The study therefore emphasizes the need for a more holistic approach to climate education—one that integrates formal education, public awareness campaigns, and community-based learning to enhance both knowledge and action.

CONCLUSION

This study provides empirical evidence that education is a critical driver of climate change knowledge and perception among urban women in Ikeja, Lagos State, Nigeria. Although 80% of respondents were aware of climate change, the limited depth of understanding observed among many participants highlights the urgent need for targeted climate education that moves beyond awareness to practical knowledge, risk interpretation, and informed climate action. However, most of the urban women interviewed indicated women as the most vulnerable to climate change with every aspect of their lives being threatened. The outcome of this study reveals the positive impact of education on urban women's knowledge and understanding of climate change. This study concludes that education as a whole is crucial for developing an in-depth understanding of environmental issues like climate change. This will enable individuals and communities to engage in proactive decision-making towards addressing the issue to achieve a sustainable and functional environment.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are proposed:

(a) Incentives directed towards investing in urban women and girls' education should be highly prioritized to enhance climate resilience and economic empowerment.
(b) Climate focused training and resources should be provided for urban women to aid their climate literacy.
(c) Provision of economic support for low-income urban women to enhance climate resilience likelihood opportunities. This will enhance their capacity to cope with climate change impacts.
(d) Implementation of better accessibility to essential healthcare services and portable water is crucial and should be prioritized to reduce livelihood disruption and death.

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Conflict of Interest
The authors declared no conflicts of interest concerning the research, and authorship.

Authors' Contributions
The study conception, literature review and the field survey were carried out by the first author while the design of study, material preparation and data analysis were performed by the second author. The earlier versions of the manuscript were written by both authors.

Data Availability Statement
The datasets generated during and /or analysed during the current study are available from the corresponding author on reasonable request.

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