SURVEY OF STUDENTS PERCEPTION ON ENVIRONMENT AND CHALLENGES IN DELTA STATE, NIGERIA

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Abstract
Students perception on environment and its challenges were examined. Students (225) from Senior Secondary (SS) schools were surveyed in Delta State using multi-stage sampling. Students knowledge of Environmental Challenges (ECs) and causes; attitude regarding ECs and Willingness To Participate (WTP) in solving ECs were obtained using structured questionnaire. Descriptive statistics, Spearman's correlation and binary logistic regression analysed data obtained. Female dominated (51.6%), 15-16 years (36.0%), in SS school 3 (62.7%), with absence of environmental group in school (68.4%). Pollution (Air=3.53±0.05, land=3.53±0.05); and people not interested in environment (X=3.63±0.05) and absence of environmental education to masses (X=3.59±0.05) ranked highest for students knowledge of ECs and causes respectively. Students have high knowledge about ECs (Ẋ=3.0±0.04) and causes (3.18±0.03). Students were highly disappointed that people are not interested in environment (3.57±0.05). Students awareness of ECs significantly (P<0.01) influenced their attitude regarding solving ECs (r=0.37). Mean of 3.23+0.03 affirms student WTP in solving ECs. Students strongly agreed that environmental responsibility is for everyone (3.55±0.05) and avoided wastage of resources (3.55±0.05). Gender, affection for environment and penalty for environmental abuse significantly (P<0.05) influenced WTP in environmental protection.
Keywords: Environment; Abuse; Protection; Students' attitude; Environmental education;

1. Introduction

Measuring and assessing environmental awareness is essential to monitor and improve environmental situation. Societal transition from rapid development through science and technology caused by man's taste for quality living has adversely affected the environment. Igwe (2003) observed that human seems too selfish in his role for daily bread, caring less for the source of all resources. As the environmental master of all biotic and abiotic factors, the way man treats it affects all living organisms, ecosystem and deteriorates man's living standard. Whiston (2001) opined that the environment is no issue, rather it is life itself. Life is the environment and vice versa (Indrani, 2010). The above assertion appears to be unquestionable as one's surrounding (environment) is part and parcel of him as a living being, and as such inseparable from it. However, man's survival only depends on his environment and how he interacts with it (Ikpoza *et al*., 2022). Consequently, all man's activity should be tailored regarding management of his environment to sustain his living. However, the realization of the friendly relationship with the environment depends on the people's understanding of environment which will determine their positive attitude regarding their environment.

Forest, a major environmental component is a reservoir of numerous products that is of significant importance to man by providing a variety of foods, flavorings, medicines and beverages (Ohwo *et al*., 2021). It also performs vast environmental services. However, forests are the major targets for urbanization and other related land based activities with heightened pressure on the forest (Dolor *et al*., 2022). Today, forests are facing bleak future as a result of depletion and mismanagement. Globally consequences of land degradation, deforestation, population explosion, desertification, water and air pollution amongst others have started manifesting in form of drought, temperature rise, flooding, low agricultural yield, drying up of water bodies, development of gully erosion, loss of lives and Nigeria is no exception. The forest has to be maintained and well managed to sustain its contribution to environmental sustainability (Ohwo *et al*., 2020). Environmental sustainability can only be achieved when the forest resources users are well educated to ensure continuity in the supply of products offered by the forest while preserving the intrinsic nature of our environment (Ohwo & Nzekwe-Ebonwu, 2021). Therefore, both developed and developing countries of the world tend to emphasize on the creation of environmentally literate society so as to sustain life on this planet (Fekede, 2005).

Where knowledge is absent, abuse is inevitable. Environmental abuse prompted climate change, pollutions and plastic and other waste disposal in water bodies with ripple effect on life and properties, health challenges, flooding, landslide, crisis and death. The earth is dying and needs mans' help. Managing and protecting the environment is the responsibility of all but everyone feels it is solely the duty of government and that is a big problem that needs timely intervention. Even in Nigerian schools, various clubs exists the likes of Lions Clubs International, Junior Engineer Technicians (JET), Junior Chamber International (JCI), Scripture Union, Debate, literary and drama club, Nigerian Red Cross Society but no attention is given to the establishment of club that targets the safety of our environment. Although, Forestry Association of Nigeria in an attempt to promote environmental awareness amongst students often time conduct a competitive essay writing whereby the winners gets reward handsomely, very few students partake in such competition. Thus, the state of environmental concern and education among students is low with damaging outcome on the earth. To curtail these environmental challenges, environment related contents are infused into most primary, secondary school and university curriculum. Even with the educational curriculum, students attitude regarding our environment is appalling.

Attitude of adolescent regarding environment is important as they contribute directly in giving knowledge-based solutions to present and potential environmental challenges (Evans *et al*., 1996). Environmental programmes in schools can also be directed to adults to influence their knowledge, attitude and behavior via intergenerational influence (Evans et al., 1996). Knowledge of environmental management will equip students and adults to better manage the environment properly. Environmental behavior is effective and useful behavior for nature protection (Erten, 2012). Frankovský (2012) defined the cognitive environmental factor to represents the thinking, analysis and information surfing on environmental issues, i.e., it includes information and knowledge about environmental issues, curiosity in the information and at the same time their availability and sufficiency. The emotional factor represents an emotional response to environmental issues. Specifically, how a person experiences the facts of it, what attitudes, experiences and emotions evoke environmental issues and how a person can or cannot process them. The behavioral factor represents an immediate behavioral response: how a persons' behavior reacts to Environmental challenges (ECs), whether he is willing to do something concrete or only monitors the issue passively. Thus, individual willingness to get involved in the solving ECs practically, and specifically, readiness to speak out in public or determination to join a group fighting for environmental protection are major behavioral factor.

Forestry and environmental awareness means to understand the delicate nature of our environment and why its protection is important (Indrani, 2010). Promoting environmental mindfulness amongst students is an easy way to become an environmental steward to get involved in creating a better environment for the future. An attitude could mean positive or negative evaluation of people, object, phenomenon, activities, ideas among others in one's environment. Many definitions of attitude abound, and according to Eagly & Chaiken (2005), for instance, defined an attitude as a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavor. Though, attitude is commonly define as affection regarding an object, affection (i.e discrete emotions or overall arousal) is usually understood to be distinct from attitude as a measure of favorability (Akinpelu, 2010).

To effectively curb the potential consequence of ECs, people especially school students need awareness of present ECs and nurture positive attitudes aim at reducing human induced causes of climate change, deforestation, flooding, pollution, population increase amongst others (Akinpelu, 2010). Hence, this need stresses the important of this study, which aims at assessing ECs awareness and attitude of student in Delta State regarding curtailing them. This study therefore examined knowledge of ECs and causes; determine students attitude regarding ECs and ascertain students Willingness To Participate (WTP) in solving ECs.

2. Materials and Methods

2.1 Study Design

This study was conducted in Delta State, Nigeria which lies between longitude 5°00' and 6°45' E and latitude 5°00' and 6°30'N. A multi-stage sampling procedure was used. The first stage was random selection of one Local Government Areas (LGA) each from Delta North, Delta Central and Delta South. The second stage involved the proportionate use of random sampling technique to select five secondary schools from each of the chosen LGA, then 15 science students from SS school were interviewed from each. The sum of 225 students was sampled.

2.2 Data Collection

Data was collected by questionnaire and consists of information on socio-economic characteristics of students, knowledge on ECs and causes and students attitude regarding ECs.

2.3 Data Analysis

Students knowledge on, causes and attitude regarding ECs was examined using a four points likert scale of 4 (high), 3 (moderate), 2 (weak) and 1 (very

weak). A mean value of 2.5 was adopted to categorise the listed causes of ECs as high (above 2.5) and weak (below 2.5).

Spearman's correlation analysis examined influence of awareness of ECs on students attitude regarding solving the problems using equation (1):

$$r_s = 1 - \frac{6\sum d^2}{n(n^2-1)} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where
d=difference between paired ranks
n=number of pairs

Students WTP in solving ECs was examined with 4-point likert scale (4-strongly agree, 3-agree, 2-disagree, 1-strongly disagree). Mean score of above 2.5 implies that the respondents agree to participate and vice versa. Binary logistic regression model in (2) tested the influence of some variables on WTP in environmental protection:

The model is given as:

$$\ln\left[\frac{p^i}{1-p^1}\right] = \beta_0 + \beta_1 X_1 + \cdots \ldots\ldots\ldots\ldots + \beta_{12} X_{12} + e \ldots (2)$$

Where,
B_1 to β_8 are the coefficients
X is a vector of variables reflecting respondents or other characteristics
X_1 = Age of respondent
X_2 = place of residence
X_3 = Awareness level of ECs of respondent
X_4 = Sex of respondent
X_5 = Affection for the environment
X_6 = Experience from terrible environmental hazard
X_7 = Penalty for environmental abuse
X_8 = Environmental responsibility is for all individual
X_9 = Environmental responsibility is for the government
X_{10} = Voluntary involvement in environmental protection activities
X_{11} = Speak about environmental protection publicly
X_{12} = Pick up nylons, plastic bottles and other debris from the floor at school and home
e = Error term

3. Results and Discussion

3.1 Students Socioeconomic Attributes

The result in Table 1 shows the socioeconomic characteristics of respondents. Feminine students were more (51.6%) than masculine students. Most students were between 15-16 years (36.0%) and were in SS School 3 (62.7%) who lives in small town (51.6%). The abundance of female students and students within the ages of 15-16 corresponds to reports of Chima & Sobere (2011), Sivamoorthy *et al*. (2013) and Tesfai et al. (2016). About seventy three percent (72.9%) of students stated that Forestry and Environmental related topics were in school curriculum, with 68.4% stating the absence of environmental group in school while 88.9% do not belong to any environmental NGOs. Malik *et al*. (2020) and Chima & Sobere (2011) observed that most students were Christian and students have knowledge of environment and Forestry as it was included in their school curriculum, respectively. Absence of environmental group in schools and students non membership in environmental NGOs shows students negligence regarding the environment. Sahin & Erkal (2017) stated that environmental sustainability education to students is important of in-order to prevent environmental challenges.

Table 1 Socioeconomic characteristic of respondents

Variables	Frequency	Percentage
Sex		
Masculine	109	48.4
Feminine	116	51.6
Aggregate	**225**	**100.0**
Age		
11-12 years	3	1.3
13-14 years	14	6.2
15-16 years	81	36.0
17-18 years	47	20.9
Above 18	80	35.6
Aggregate	**225**	**100.0**
Education		
SS1	51	22.7
SS2	33	14.7
SS3	141	62.7
Aggregate	**225**	**100.0**
Religion		
Christian	214	95.1

Islam	5	2.2
Traditional	6	2.7
Aggregate	**225**	**100.0**
Place of residence		
Village	23	10.2
Small town	116	51.6
City	86	38.2
Aggregate	**225**	**100.0**
Environmental and Forestry related topics in school curriculum		
Yes	164	72.9
No	61	27.1
Aggregate	**225**	**100.0**
Students environmental group in school		
Yes	71	31.6
No	154	68.4
Aggregate	225	100.0
Member of environmental related NGO		
Yes	25	11.1
No	200	88.9
Aggregate	**225**	**100.0**

Obtain: Computed data (2024)

3.2 Student knowledge of ECs and causes

Prior to students knowledge of ECs and causes, the need arouse to evaluate students familiarity with environment. About 84.0% of students defined environment while 64.0% of students listed the components of environment to include atmosphere (44.9%), lithosphere (42.7%) and others (Table 2). The students defined environment as our physical surrounding, were we live; where living and non living things live; totality of the atmosphere, stratosphere, lithosphere; a geographical area in which one is habituated and the elements surrounding a systems. Onoja (2014) defined the environment as life and vice-versa.

The students affirm that environmental challenges exist and rated the problems (Tables 3). Air pollution ranked the highest EP (3.54±0.05), followed by land pollution (3.53±0.05), water pollution (3.45±0.05), flooding (3.40±0.06), soil erosion (3.00±0.06) with acid rain the least EP (2.16±0.07). Malik *et al*. (2020) in his response (Not aware-1, slightly aware-2 and fully aware-3) ranked students knowledge of environmental terms as follows; environment first (X= 2.58), pollution second (X=2.53), soil erosion third (X=2.51), flooding fourth (X=2.45) with acid rain the least ranked with X=1.30. Yunus *et al*. (2019) reported that pollution is a serious environmental challenge.

Table 2. Respondents understanding of the environment

Variable	Frequency	Percentages
Definition of environment		
Defined	189	84.0
Not defined	36	16.0
Aggregate	**225**	**100.0**
Elements of the environment		
Listed	144	64.0
Not listed	81	36.0
Aggregate	**225**	**100.0**
Specific elements of the environment (multiple responses)		
Lithosphere	96	42.7
Biosphere	82	36.5
Stratosphere	52	23.1
Hydrosphere	70	31.1
Atmosphere	101	44.9
Troposphere	10	4.4
Aggregate	**225**	**100.0**

Obtain: Computed data (2024)

Table 3. Respondents rating of environmental challenges

S/N	Variable	Mean	Median	Mode	Standard error	Rank
1	Air pollution	3.54	4.00	4.00	0.05	1
2	Water pollution	3.45	4.00	4.00	0.05	3
3	Land pollution	3.53	4.00	4.00	0.05	2
4	Climate change	2.92	3.00	3.00	0.06	9
5	Global warming	2.79	3.00	3.00	0.07	10
6	Deforestation	3.01	3.00	4.00	0.06	7
7	Loss of biodiversity	2.44	2.00	2.00	0.07	13
8	Acid rain	2.16	2.00	1.00	0.07	14
9	Agricultural pollution	3.00	3.00	4.00	0.07	8
10	Littering and land fill	3.27	4.00	4.00	0.07	6
11	Flooding	3.40	4.00	4.00	0.06	4
12	Landslide	2.61	3.00	3.00	0.07	11
13	Soil erosion	3.29	3.00	4.00	0.06	5
14	Desertification	2.59	2.00	2.00	0.07	12
	Aggregate	**3.00**			**0.04**	

N.B.: High (4), moderate (3), weak (3), very weak (1)
Obtain: Computed data (2024)

Percentage response of ECs in Tables 4 shows land pollution (70.7%), air pollution (65.3%) and littering and land fill (60.9%) awareness of ECs were high, climate change (51.1%) and landslide (35.1%) awareness of ECs were moderate, desertification (38.2%) and landslide (28.4%) was weak, while acid rain (36.9%) and loss of biodiversity (20.0%) awareness were very weak. This also corroborates Malik *et al*. (2020). The high response of land and air pollution is due to oil exploration activities in Delta which prompted oil spillage polluting both land and water bodies, and soot pollution from gas flaring (Omisakin, 2022).

Table 4. Response of respondents on awareness of environmental challenges

S/N	Variables	High	Moderate	Weak	Very weak
1	Air pollution	147 (65.3)	61(27.1)	9(4.0)	8(3.6)
2	Water pollution	132 (58.7)	64 (28.4)	27 (12.0)	2 (0.9)
3	Land pollution	159 (70.7)	35 (15.6)	23 (10.2)	8 (3.6)
4	Climate change	62 (27.6)	115 (51.1)	17 (7.6)	31 (13.8)
5	Global warming	64 (28.4)	80 (35.6)	51 (22.7)	30 (13.3)
6	Deforestation	85 (37.8)	68 (30.2)	62 (27.6)	10 (4.4)
7	Loss of biodiversity	41(18.2)	63 (28.0)	76 (23.8)	45 (20.0)
8	Acid rain	33 (14.7)	53 (23.6)	56 (24.9)	83 (36.9)
9	Agricultural pollution	91(40.4)	62 (27.6)	52 (23.1)	20 (8.9)
10	Littering and land fill	137 (60.9)	32 (14.2)	35 (15.6)	21 (9.3)
11	Flooding	132 (58.7)	63 (28.0)	17 (7.6)	13 (5.8)
12	Landslide	47 (20.9)	79 (35.1)	64 (28.4)	35 (15.6)
13	Soil erosion	110 (49.3)	77 (34.2)	27 (12.0)	10 (4.4)
14	Desertification	56 (24.9)	52 (23.1)	86 (38.2)	31 (13.8)

N.B.: High (4), moderate (3), weak (3), very weak (1)
Obtain: Computed data (2024)

The major causes of ECs (Table 5) which ranked highest were - people do not care about the environment (X=3.63±0.05), lack of environmental education (X=3.59±0.05), poverty (X=3.47±0.06) and environment not considered during development (X=3.42±0.06). Care of environment is government duty was ranked the least cause of EC (X=2.64±0.06). However, the mean of the causes of ECs was above 2.5 hence the under listed variables are rated as high causes of ECs. Onoja (2014), Malik *et al*. (2020), Ancha *et al*. (2019), Novotny *et al*. (2021), Dolor *et al*. (2022) observed a high level of human activities as major causes of ECs. Human activities ranged from deforestation for urbanization, bush burning, war, poverty, illegal logging, filling-up of water bodies for

building, illegal and uncontrolled harvest of forest resources to agricultural use of chemical.

The response for causes of ECs in Table 6 shows that bulk of students highly understand the causes of ECs for - People do not care for the environment (78.2%), absence of environmental education to the masses (69.8%) and poverty (69.3%); alteration of forest land to other uses (44.0%), limited government project for environmental protection (38.2%) and limited time allocated to environmental information by media (36.0%) as moderate causes of ECs; care of environment is government duty (27.6%), crisis and war (24.0%), limited time allocated to environmental information by media (22.2%) as weak causes of ECs; while care for the environment is government duty (19.6%), crisis and war (14.2%) and absence of penalty for environmental abuse (13.3%) as very weak causes of ECs. Yunus *et al*. (2019) and Ohwo & Nzekwe-Ebonwu (2021) stated human actions such as alteration of forest into other uses and developmental activities as major causes of ECs.

Table 5. Respondents rating for causes of ECs

S/N	Variable	Mean	Median	Mode	Standard error	Rank
1	People do not care for the environment	3.63	4.00	4.00	0.05	1
2	Absence of environmental education to the masses	3.59	4.00	4.00	0.05	2
3	Environment not considered during development	3.42	4.00	4.00	0.06	4
4	Alteration of forest land to other uses	3.13	3.00	3.00	0.06	7
5	Care for the environment is government duty	2.64	3.00	4.00	0.07	13
6	Limited time allocated to environmental information by media	2.92	3.00	3.00	0.06	11
7	Reckless use of chemicals by farmers	3.32	4.00	4.00	0.06	5
8	Lack of penalty for environmental abuse	3.11	4.00	4.00	0.07	8
9	Lack of enforcement of environmental protection by all	3.04	3.00	4.00	0.07	10
10	Illegal logging	3.18	4.00	4.00	0.07	6
11	Filling up of water body for building purposes	3.11	3.00	4.00	0.06	8
12	Limited government project for environmental protection	3.10	3.00	4.00	0.06	9
13	Poverty	3.47	4.00	4.00	0.06	3
14	Crisis and war	2.85	3.00	4.00	0.07	12
	Aggregate	**3.18**			**0.03**	

N.B.: High (4), moderate (3), weak (3), very weak (1)
Obtain: Computed data (2024)

Table 6. Percentage response for Causes of ECs

S/N	Causes of ECs	High	Moderate	Weak	Very weak
1	People do not care for the environment	176 (78.2)	29 (12.9)	6 (2.7)	14 (6.2)
2	Lack of environmental education to the masses	157 (69.8)	52 (23.1)	8 (3.6)	8 (3.6)
3	Environment not considered during development	144 (64.0)	46 (20.4)	21 (9.3)	14 (6.2)
4	Alteration of forest land to other uses	87 (38.7)	99 (44.0)	21 (9.3)	18 (8.0)
5	Care for the environment is government duty	69 (30.7)	50 (22.2)	62 (27.6)	44 (19.6)
6	Limited time allocated to environmental information by media	73 (32.4)	81 (36.0)	50 (22.2)	21 (9.3)
7	Reckless use of chemicals by farmers	125 (55.6)	60 (26.7)	28 (12.4)	12 (5.3)
8	Lack of penalty for environmental abuse	115 (51.1)	45 (20.0)	33 (14.7)	30 (13.3)
9	Lack of enforcement of environmental protection by all	91 (40.4)	73 (32.4)	41 (18.2)	20 (8.9)
10	Illegal logging	113 (50.2)	58 (25.8)	30 (13.3)	24 (10.7)
11	Filling up of water body for building purposes	94 (41.7)	70 (31.1)	49 (21.8)	12 (5.3)
12	Limited government project for environmental protection	90 (40.0)	86 (38.2)	31 (13.8)	18 (8.0)
13	Poverty	156 (69.3)	32 (14.2)	23 (10.2)	14 (6.2)
14	Crisis and war	81 (36.0)	58 (25.8)	54 (24.0)	32 (14.2)

N.B.: High (4), moderate (3), weak (3), very weak (1)
Obtain: Computed data (2024)

3.3 Students attitudes regarding ECs

Students attitude regarding ECs shows their high disappointed regarding the neglect of the environment with a general mean of 3.08±0.03 (Table 7). According to students ranked response on their displeasure regarding environmental abuse, their disappointment that people are not interested in the environment (3.57±0.05), People who pollute the environment gets them angry with concerned that dangerous chemicals are used in food production (3.44±0.06), their worried about the future of the environment (3.40±0.03), angry when they think about the damage to plants and animals caused by pollution, and annoyed that the government is not doing more to help control environmental pollution (3.36±0.03) rated 1st, 2nd, 3rd and 4th respectively while the least ranked displeasure regarding environmental abuse was their feeling that the environment takes care of itself (2.40±0.07). This shows that students have knowledge of mans' role regarding environmental protection as observed by the least rated value that the environment takes care of itself. Ancha *et al*. (2019), Malik *et al*. (2020) and Novotny *et al*. (2021) reported high sensitivity of students to environmental abuse.

Response of students attitude regarding environmental abuse presented shows that most (65.3%, 62.2%, 63.6% and 67.1%) expressed high rate of disappointment that people are not interested in the environment, people who pollute the environment make me angry, concerned that dangerous chemicals are used in food production and the government is not doing more to help control environmental pollution respectively (Tables 8). Respondents were moderately affirmed that Measures to protect environment give me more joy than measures to ensure economic development (41.8%), problem of environmental pollution has never bothered me too much, because I feel it is overrated (30.7) and they feel the environment takes care of itself (27.6%). There was very weak response to annoyance at the activities of organizations fighting to protect the environment (30.7%). The above observation supports Novotny *et al*. (2021).

The correlation between students awareness of ECs and attitude regarding solving ECs was significant ($P < 0.01$) with r = 0.368, that students awareness of ECs positively influences attitude regarding solving ECs (Table 9). Sivamoorthy *et al*. (2013) supports this report while Aminrad *et al*. (2012) opined that knowledge about environmental protection is independent of attitude the environment.

Table 7 Rated response of students attitude regarding environmental abuse

S/N	Variable	Mean	Median	Mode	Standard error	Rank
1	I am disappointed that people are not interested in the environment.	3.57	4.00	4.00	0.05	1
2	I am worried about the future of the environment.	3.40	4.00	4.00	0.05	3
3	I think I am very sensitive about environmental issues	3.17	3.00	4.00	0.06	7
4	Visiting natural recreational areas outside the city makes me happy	3.22	3.00	4.00	0.06	6
5	People who pollute the environment make me angry	3.44	4.00	4.00	0.06	2
6	I am angry at the activities of organizations fighting to protect the environment.	2.45	2.00	1.00	0.08	11
7	I am angry when I think about the damage to plants and animals caused by pollution.	3.36	4.00	4.00	0.06	4
8	I am frustrated when I think about how industries cause environmental pollution.	3.34	4.00	4.00	0.06	5
9	I am concerned that dangerous chemicals are used in food production.	3.44	4.00	4.00	0.06	2
10	I am annoyed at the idea that the government is not doing more to help control environmental pollution.	3.36	4.00	4.00	0.07	4
11	I feel the environment takes care of itself	2.40	2.00	3.00	0.07	12
12	The problem of environmental pollution has never bothered me too much, because I feel that it is overrated.	2.47	3.00	3.00	0.07	10
13	Measures to protect the environment give me more joy than measures to ensure economic development.	2.90	3.00	3.00	0.06	8
14	I feel my life is tied to the environment	2.56	3.00	4.00	0.08	9
	Aggregate	**3.08**			**0.03**	

N.B.: High (4), moderate (3), weak (3), very weak (1)

Obtain: Computed data (2024)

Table 8. Response of students attitude regarding environmental abuse

S/N	Attitude regarding environmental abuse	High	Moderate	Weak	Very weak
1	I feel sad that people are not interested in the environment.	147 (65.3)	64 (28.4)	9 (4.0)	5 (2.2)
2	I am worried about the future of the environment.	131 (58.2)	57 (25.3)	32 (14.2)	5 (2.2)
3	I am very sensitive about environmental issues	101 (44.9)	72 (32.0)	42 (18.7)	10 (4.4)
4	Visiting natural recreational areas within or outside the city gives me joy	109 (48.4)	70 (31.1)	33 (14.7)	13 (5.8)
5	People who pollute the environment make me angry	140 (62.2)	53 (23.6)	24 (10.7)	8 (3.6)
6	I am angry at the activities of organizations fighting to protect the environment.	58 (25.8)	54 (24.0)	44 (19.6)	69 (30.7)
7	I am angry when I think about the damage to plants and animals caused by pollution.	132(58.7)	53 (23.6)	29 (12.9)	11 (4.9)
8	I am frustrated about how industries cause environmental pollution.	124 (55.1)	60 (26.7)	34 (15.1)	7 (3.1)
9	I am concerned that dangerous chemicals are used in food production.	143 (63.6)	50 (22.2)	19 (8.4)	13 (5.8)
10	I am annoyed that the government is not putting much effort in environmental pollution control.	151 (67.1)	26 (11.6)	25 (11.1)	23 (10.2)
11	I feel the environment takes care of itself	44 (19.6)	62 (27.6)	58 (25.8)	61 (27.1)
12	The problem of environmental pollution has never bothered me too much, because it is overrated.	47 (20.9)	69 (30.7)	52 (23.1)	57 (25.3)
13	Measures to protect the environment give me more joy than measures to ensure economic development.	63 (28.0)	94 (41.8)	51 (22.7)	17 (7.7)
14	I feel my life is tied to the environment	63 (28.0)	58 (25.8)	46 (20.4)	58 (25.8)

Obtain: Computed data (2024)

Table 9 Influence of students awareness of ECs on attitude regarding solving the problems

		Aggregate Rank	Positive
Aggregate rank	Spearman correlation	1.000	0.368**
	Sig. (2-tailed)	.	0.000
	N	225	225
Positive	Spearman correlation	0.368**	1.000
	Sig. (2-tailed)	0.000	.
	N	225	225

****Significant at the 0.01 level (2-tailed).**
Obtain: Computed data (2024)

3.4 Willingness to participate in solving ECs

Students WTP in solving ECs show that 60.0% were WTP in solving ECs (Table 10). Yunus *et al*. (2019) observed that 90.0% of students agreed that environmental protection is the responsibility of everyone. Factors influencing students WTP in solving ECs shows a general mean of 3.23+0.03 (Tables 11) which indicates that students agree to participate in solving ECs. The students strongly agreed that everyone is responsible for the environment (3.55±0.05), prevent wasteful usage of resources (3.55±0.05) and love the environment (3.46±0.05). The respondents agreed that punishment for environmental abuse (3.44±0.05) and benefit derived from the environment (3.37±0.05) were factors that influenced WTP in environmental protection. Yunus *et al*. (2019), Malik *et al*. (2020) and Novotny *et al*. (2021) affirm the above findings.

Table 10 Response of students WTP in solving ECs

Variables	Frequency	Percentages
Willing to participate in solving ECs		
Yes	135	60.0
No	90	40.0
Aggregate	**225**	**100.0**

Obtain: Computed data (2024)

Table 11 Rated response of factors influencing WTP in environmental protection

S/N	Variable	Mean	Median	Mode	Standard error	Rank
1	Love for the environment	3.46	4.00	4.00	0.05	2
2	Experience from terrible environmental event	3.20	3.00	4.00	0.06	7
3	Punishment for environmental abuse	3.44	4.00	4.00	0.05	3
4	Benefit obtained from the environment	3.37	4.00	4.00	0.05	4
5	Environmental responsibility is for all	3.55	4.00	4.00	0.05	1
6	Environmental responsibility is for the government	2.46	2.00	2.00	0.06	9
7	Speak publicly about the environment	3.23	3.00	4.00	0.06	6
8	Voluntary participation in tree planting	3.20	3.00	4.00	0.05	7
9	Pick up nylon, plastic bottles and litters from the floor at school and home	3.29	3.00	4.00	0.05	5
10	Prevent wastage of resources such as light, water, food	3.55	4.00	4.00	0.05	1
11	I reuse packaging bags until they are weak	2.73	3.00	3.00	0.07	8
	Aggregate	**3.23**			**0.03**	

4-Strongly agree, 3- Agree, 2- Disagree, 1-Strongly disagree
Obtain: Computed data (2024)

The response of students WTP in solving environmental challenges (Table 12) shows that 69.8%, 66.7%, 60.0% and 57.8% strongly agreed that prevention resource wastage (light, water, food); every is responsible for the environment; love for the environment and punishment for environmental abuse respectively, influence their decision to participate in solving ECs. Novotny et al. (2021) had similar reports. Variables such as speak publicly about the environment (42.7%), gain from the environment (40.4%) and pick up nylon, plastic bottles and litters from the floor at school and home (40.4%) were agreed as factors impacting their decision to solve ECs. About 37.3% and 19.1% of students disagree and strongly disagree that environmental responsibility is for the government and reuse packaging bags until they are weak, respectively. Aminrad *et al*. (2012), Yunus *et al*. (2019) and Malik *et al*. (2020) had similar observations.

The relationship between students WTP in environmental protection and some variables affecting their participation shows sex, affection for the environment and punishment for environmental abuse significantly ($P < 0.05$) influenced WTP in environmental protection (Tables 13) as reported by Tesfai *et al*. (2016) for sex. Sanction is a tool for moderation of human behavior and proved to be effective in all nations of the world.

Table 12 Factors influencing WTP in solving ECs

S/N	Attitude regarding environmental abuse	Strongly agree	Agree	Disagree	Strongly disagree
1	Love for the environment	135 (60.0)	69 (30.7)	11 (4.9)	10 (4.4)
2	Experience from terrible environmental event	96 (42.7)	85 (37.8)	36 (16.0)	8 (3.6)
3	Punishment for environmental abuse	130 (57.8)	70 (31.1)	20 (8.9)	5 (2.2)
4	Benefit obtained from the environment	114 (50.7)	91 (40.4)	10 (4.4)	10 (4.4)
5	Environmental responsibility is for all	150 (66.7)	52 (23.1)	20 (8.9)	3 (1.3)
6	Environmental responsibility is for the government	37 (16.4)	67 (29.8)	84 (37.3)	37 (16.4)
7	Speak publicly about the environment	97 (43.1)	96 (42.7)	18 (8.0)	14 (6.2)

8	Voluntary participation in tree planting	92 (40.9)	89 (39.6)	41 (18.2)	3 (1.3)
9	Pick up nylon, plastic bottles and litters from the floor at school and home	104 (46.2)	91 (40.4)	22 (9.8)	8 (3.6)
10	I avoid wastage of resources such as light, water, food	157 (69.8)	40 (17.8)	22 (9.8)	6 (2.7)
11	I reuse packaging bags until they are weak	62 (27.6)	83 (36.9)	37 (16.4)	43 (19.1)

4-Strongly agree, 3- Agree, 2- Disagree, 1-Strongly disagree
Obtain: Computed data (2024)

Table 13 Binary Logistic Regression for students WTP in solving ECs

Factors	B	S.E.	Wald	DF	Sig	Exp(B)
Age	0.13	0.16	0.67	1	0.41	1.14
Place of residence	-0.09	0.25	0.14	1	0.71	0.91
Sex	-0.70	0.31	5.12	1	0.02	0.50
Awareness level of environmental challenges	-0.22	0.37	0.35	1	0.55	0.80
Affection for the environment	0.67	0.23	8.53	1	0.00	1.96
Experience from terrible environmental events	-0.31	0.25	1.53	1	0.22	0.73
Punishment for environmental abuse	0.72	0.24	8.83	1	0.00	2.06
Environmental responsibility is for all	-0.16	0.24	0.42	1	0.52	0.86
Environmental responsibility is for government	-0.07	0.17	0.16	1	0.69	0.93
Voluntary participation in tree planting	-0.23	0.22	1.05	1	0.30	0.80
Speak publicly about the environment	0.16	0.22	0.55	1	0.46	1.17
Pick up nylon, plastic bottles and litters from the floor at school and home	0.29	0.22	1.66	1	0.20	1.33
Constant	-2.68	1.52	3.12	1	0.08	0.07

Obtain: Computed data (2024)

4. Conclusion

Students in Delta State understand the environment and its problems. The major cause of environmental challenges was that most people are not concern about the environment and absence of environmental education to the masses. Students were disappointed regarding the neglect of the environment and their knowledge of environmental challenges positively influenced their attitude regarding solving these problems. Environmental education to the masses and mans' awareness that he is responsible for the environment in which he lives will enhance mans' attitude regarding the environment positively.

Suggestions for further Research

Studies on peoples' knowledge of the environment should be conducted to create green guardians and responsible environmental citizenry for environmental protection.

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References

Akinpelu, D. (2010). Stakeholders Canvass more awareness of the climate change in Lagos. Punch, Monday 12th April 2010.

Aminrad, Z. Zakaria., Hadi, S. & Hadi, S. (2012). Relationship between awareness, knowledge and attitudes regarding environmental education among secondary school students in Malaysia. *World Applied Sciences Journal,* 22(9): 1326-1333.

Ancha, P. U., Ikyaagba, E. T. & Nongov, T. T. (2019). Undergraduate Students Willingness to Pay for Social Services of Trees at the Federal University of Agriculture Makurdi, Benue State, Nigeria, *International Journal of Environment and Climate Change,* 9(5): 273-286

Chima, U.D. & Sobore, S. M. (2011). School students perception of forestry and wildlife management in Rivers State, Nigeria, *Journal of Agriculture and Social Research,* 11(1): 26-35

Dickens E. Dolor, Abigail O. Ohwo, Chiamaka C. Chukwumaeze & Anselm E. Egwunatum (2022). The impact of socioeconomic variables of fringe forest dwellers on forest resources conservation on Egbema Forest Reserve in Imo State, Nigeria. *Journal of Biodiversity and Environmental Sciences (JBES),* 21(6): 1-10

Eagly, O. & Chaiken, V. (2005). Attitude Formation. Cape Town: Queens Books Press.

Erten, S. (2012). Environmental Consciousness among Turkish and Azeri Candidate. *Teachers Education and Science*, 37(166): 88-100

Evans, S. M., Gill, M. E. & Marchant, J. (1996). School Children as Educators: The indirect influence of environmental education in schools on parents' attitude regarding the environment. *Journal of Environmental Education,* 30(4): 28-33

Fekede, T. I. (2005). Practicum Experience in Teachers Education. *Ethiopian Journal of Education and Sciences*, 5(1):107-116.

Frankovský, M. (2012). Možnosti zisťovania environmentálneho povedomia. *Journal of Management and Business: Research and Practice*, 4(1): 7-14.

Igwe, I. O. (2003). Impact of climate change on environment. London Cambridge University Press.

Ikpoza, E.A., Nwachukwu N. C. & Ohwo, O.A. (2022). Climate change adoption strategies by aerable crop farmers in Ethiope East Local Government Area of Delta State, Nigeria: A multivariate probit approach. *Tropical and Subtropical Agroecosystems*, 25: 53-60

Indrani, R. H. (2010). Does awareness to climate change lead to behavioural change? *International Journal on climate change, strategies and management,* 2 (1): 6-22

Malik, N.A., Yahaya, O.Y. & Ogunleye, E.F. (2020). Assessment of awareness level and practice of environmental management among students in Ilorin, Kwara State, Nigeria. *FUDMA International Journal of Social Sciences (FUDIJOSS)*, 2(2): 108-117

Novotný, R., Huttmanová, E. & Valentiny, T. (2021). Evaluation of environmental awareness of University students; the case of the university of Presov, Slovakia. *European Journal of Sustainable Development,* 10(2): 59-72

Ohwo, O. A. & Nzekwe-Ebonwu, N. F. (2021). Impacts of rural community on the forest estate in Ugbolu, Oshimili North Local Government Area, Delta State, Nigeria. *Journal of Forest*, 8(1): 45-60

Ohwo, O. A., Gbigbi, T. M. & Daje, O. G. (2021). Marketing of selected non wood forest products in Asaba, Delta State, *Kastamonu University Journal of Forestry Faculty*, 21 (1): 74-89.

Ohwo, O.A., Onakpoma, I. & Okoromaraye E. (2020). Evaluation of properties of graded density fibreboard produced from wood residues (sawdust and corrugated paper). *Baltic Forestry*, 26 (2) article id 494 1-9 pp

Omisakin F.A. (2022). Soot pollution in Port Harcourt Nigeria: A grand Societal Challenges. A degree of Masters of Arts with a major in leadrership and organization Spring semester 2022 Malamo University Pp1-53

Onoja, P. A. (2014). Environmental awareness and attitude of senior secondary school students in Ankpa education zone of Kogi State, A project submitted for the award of Master degree in Science education (geography and environmental education), University of Nigeria virtual library pp 1-132

Şahin, H. & Erkal, S. (2017). An Investigation of University Students Attitudes toward Environmental Sustainability, *European Journal of Sustainable Development*, 6(4): 147-154.

Sivamoorthy, M., Nalinia, R. & Kumar, C. S. (2013). Environmental Awareness and Practices among College Students, *International Journal of Humanities and Social Science Invention,* 2(2): 11-15

Tesfaia, M. U., Nagothua, S. & Šimekb, J. **(**2016**).** Perceptions of Secondary School Students Regarding Environmental Services: A Case Study from Czechia, *International Journal of Environmental & Science Education*, 11(12): 5533-5553

Whiston, T. (2001). Concept of Environmental education. Retrieved from *http:en,Wikipedia.org/wiki/concept/environment+education.html.*

Yunus, W. A. S. W., Kamarudin, M. K. A. & M. K. M. (2019). Environmentalism among Primary's Students Based on Awareness, Knowledge, and Attitude Study. *International Journal of Academic Research in Business and Social Sciences*, 9 (12): 1–12.