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Improving Public Participation through Environmental Education for the Attainment of Sustainable and Resilient Rural Communities.

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Abstract

The paper aim to critically examine issues of environmental education and its significance to environmental sustainability, with key emphasis on identifying its critical importance in promoting public participation in environmental control regimes. Literature related to this topic was reviewed. The study was undertaken in seven (7) selected communities within the Diebu creek oilfield, Southern Ijaw Local Government Area of Bayelsa State. Primary data was collected through survey instrument; a questionnaire was retrieved from 220 respondents selected through the simple random sampling technique. Data were subjected to both descriptive and statistical analyses. The results of the descriptive analyses revealed low level of participation. 73% of respondents were unaware of extant environmental laws, and consequences of their harmful activities, while 24% were aware, but cited illiteracy, income level, and occupation as reasons for engaging in such harmful activities. Results also revealed that 81% of respondents indicated willingness to participate in environmental control programmes. Results of statistical analysis showed that F-ratio calculated 0.617 was greater than tabulated value of 0.381 at significant 0.005; suggesting that there was significant relationship between participation in environment control and level of education. Following the research findings, we suggest that Government at all levels should encourage public participation; enshrine environmental education into the primary and secondary schools curriculum, boast the non-formal environmental education sub-sector; organise awareness campaigns with aim to educate rural dwellers to actively participate and make valuable contribution to the efforts towards attaining sustainable and resilient communities.

Keywords: Environmental Education, Public Participation, Sustainability, Rural Resilience, and Communities.

1.0 INTRODUCTION.

Environmental education (EE) has become imperative in Nigeria, if we are serious about achieving environmental sustainability for self-reliance and sustainable development (Bosah, 2013). This is largely because our environment suffers severe consequences from man's anthropogenic activities that cause environmental degradation. Furthermore, the author noted that hence environmental problems have persisted for decades; government has been impelled to set up related policies and programmes to attain environmental sustainability.

Kwale (2011), noted that environmental sustainability is important to preserve resources

JOURNAL OF THE NIGERIAN INSTITUTE OF TOWN PLANNERS
VOL30, NO 4. JULY, 2025
https://nitpjournals.ng/index.php/jnitp/



like clean air, water and wildlife for future generations. Though, the term sustainability is broadly applied, but in the context of this paper it's used to refer to four distinct areas; human, social, economic and environment, which are known as the four pillars of sustainability, which are intended to ensure balanced growth that considers financial and environmental factors as well as social equity and cultural preservations. Abubakar (2010), posited that teaching the people about the environment and the problems bedeviling it; providing them with the tools they need and encouraging public participation (PP) to solve environmental problems as well as encouraging them to make responsible decisions are all goals of EE. Similarly, (Menyu, 2010; Hassenforder, Pittock, Barreteau, Daniel & Ferrand, 2016), concluded that EE will help to encourage public participation in decision making. Notwithstanding the Significance of EE in the attainment of sustainable and resilient communities, not much is being done to advance it frontiers in Bayelsa State. Consequently, this paper aim to examine the concept of EE and its significance in promoting public participation, with key objectives to highlighting the importance of EE, adoptable methods to advance the frontiers of EE and make valuable suggestions.

2.0 LITERATURE/CONCEPTUALREVIEW

2.1 The Concept of Environmental Education

Environmental education is the expansion of the study of ecology; a branch of biology dealing with the interrelationship of living organisms with one another and with their surrounding (Akintunde, 2008). Thomas (2005) was of the opinion that EE is the acquisition of knowledge aimed at behavioural and action modification and skewed to wise use of environmental resources at individual and group levels. Also, Choudhary and Tiwary (2019) submitted that EE is an opportunity to acquire skills, altitude and knowledge essential in ecological improvement. Nonetheless, Hassan, et.al (2016), defined EE as a process that enable individuals to explore environmental issues, participate in problem solving, and get citizens to progress the environment. The authors posited that EE is essential for promotion intergenerational equity; inculcating a long term views on environmental sustainability by educating the present generation on the impact of their dealings on future environmental conditions (Menyu, 2010). According to the author, the fundamental role of EE entails to give tangible awareness about the environmental and how to harness it for sustainable development.

JOURNAL OF THE NIGERIAN INSTITUTE OF TOWN PLANNERS
VOL30, NO 4. JULY, 2025
https://nitpjournals.ng/index.php/jnitp/



The Rio De Janeiro Earth Summit that promulgated the Agenda 21 emphasized the role of education in environmental sustainability (Boeve-de-pauw, Gericke, Oisson & Berglurd, 2015); and the campaign by UNESCO aimed at reshaping the curriculum to enshrine EE into school system were significant efforts that underscored EE in the attainment of sustainable development (Grosseck, Tiru, & Bran, 2019). The authors noted that EE for sustainable development remains a valuable subject of contemporary society, which is characterized with environmental issues such as climate change, pollution, loss of biodiversity and resources degradation. Furthermore, they pointed out that recent research focus on EE promotes environmental sustainability.

One cannot overstate the importance of EE on environmental sustainability. The United Nations World Commission on Environmental and Development defined environmental sustainability as the process of living within the limits of available physical, natural and social resources such that the living systems allowed thriving in time without end (Menyu, 2010; Boca & Saracli, 2019). The author posited that it underscore meeting the needs of the present generation without jeopardizing the chances of future generations to meet their own needs. Sustainability is often viewed through the principles of three interconnected pillars; *environmental sustainability*- protecting and conserving natural resources and ecosystem; *social sustainability*- ensuring fair and equitable social conditions, promoting human well-being and addressing social inequalities, and *economic sustainability*- fostering economic growth and development in an environmental and socially responsible manner, and that can be sustained overtime through EE delivery.

Abubakar (2010) highlighted the objectives of EE as captured in the Belgrade Charter (1975) as follows; *Awareness:* to help social groups and individuals acquire on awareness and sensibility to the total environment and its allied problems and or issues; *Sensitivity:* to help social groups and individual gain a variety of experience in, and acquire basic understanding of the environment and its associated problems and or issues; *Attitude:* to help social groups and individuals to acquire a set of values and feelings of concern for the environmental and motivation for active participation in environmental improvement and protection; *Skills:* to help social groups and individuals acquire skills for identifying and solving environmental problems and or issues; *Participation:* to provide social groups and individuals with an opportunity to be actively

JOURNAL OF THE NIGERIAN INSTITUTE OF TOWN PLANNERS
VOL30, NO 4. JULY, 2025
https://nitpjournals.ng/index.php/jnitp/



involved in working towards resolution of environmental problems and or issues.

The delivery of EE is encumbered with many challenges. Boca and Saracli (2019) stated that the delivery of EE is challenged by deficiency in teachers with requisite knowledge and interest, unavailability of elaborate curriculum and school communication programmes on EE for students as well as absence of organizations to create environmental awareness, to mention a few, targeted at achieving sustainable development.

2.2 Importance of Environmental Education

The importance of EE cannot be overstated. It has potentials to cause changes in individuals and environment (Boca & Saracli, 2019). The authors summarized the importance of EE as:

1. The knowledge of EE will enable worldwide public awareness of environmental problems and issues as well as support for environmental protection.
2. The knowledge of EE will promote responsible environmental behavior among the citizens. Responsible environmental behaviours mean actions taken by individuals or group of individuals to do what is right to protect the environment.
3. Environmental education promotes critical thinking and reflection on natural utilization.
4. The study of EE will engender sustainable development, which is very relevant to the survival of humanity and the environment or planet earth.
5. EE will help to promote dialogue and negotiation in decision making.

2.3 Approaches to Environmental Education

Patel and Bhatt (2007) posited that furtherance to meeting the objectives of EE in the Belgrade Charter of 1975, various approaches were adopted. They stated that some school may adapt an interdisciplinary approach such that environmental studies are drawn from various disciplines such as Geology, Economics, Biology, Geography etc.

According to the authors the objectives of EE could be achieved through formal, non-formal and informal learning approaches; *Formal EE:* This occurs commonly in schools or certified environmental education centers with specific guidelines and curriculum. It is targeted at specific student – teacher relationships found in classrooms, characterized by fairly homogenous groups assembled for the purpose of learning; *Non-formal EE:* This is an organized educational activity outside the established formal system. It occurs in specific places such

JOURNAL OF THE NIGERIAN INSTITUTE OF TOWN PLANNERS
VOL30, NO 4. JULY, 2025
https://nitpjournals.ng/index.php/jnitp/



as environmental education institutions, camps, non-profit environmental organizations, museums, parties, natural sites, zoos and other environmental groups aimed at educating the public on environmental issues to engender public participation; *Informal EE:* This is the lifelong process whereby every individual acquires attitude, value, skills and knowledge from daily experiences and the education influences and resources in his/her environment. It could be through the mass media, parents, friends and personal experiences.

2.4 The Concept of Public Participation (PP)

Public participation (PP) is the course of action where individuals and groups actively connect with government and other actors to influence decisions, policies, programmes and legislation about their governance and the environment (Quick & Bryson, 2016). The authors also stated that there are countless reasons for PP; fulfilling legal requirements, embodying the ideals of democratic participation and inclusion; advancing social justice informing the public; enhancing understanding of public problems and exploring and generating potential solutions as well as producing policies, plans and projects of higher quality in terms of their content (Bryson, Quick, Carrissa & Barbara, 2013). According to Quick and Feldman (2016) PP requires resources, such as skill, time and money; also it can spawn advantages. Renn, Thomas, Horst, Peter and Branden (1993) posited that PP contributes to decision-making through providing new information, seeing issues differently and enthusiasm to address problems. PP can also support a more equitable distributor of limited public resources (Abers, 2000); it can create resources for future problem-solving and implementation to address new public issues by enhancing trust and legitimacy, building relationship and generating knowledge and interest about policy issues and processes (Ansell, 2011). The author further posited that whether PP actually produces these benefits for environmental sustainability attainment depends on some factors including extent of EE.

PP encompass as a variety of approaches (Krishnaswamy, 2012). However, participatory approaches in public decision-making are classified a continuum, ranging from nominal participation (information exchange) to full participation (co management) as illustrated:

JOURNAL OF THE NIGERIAN INSTITUTE OF TOWN PLANNERS
VOL30, NO 4. JULY, 2025
https://nitpjournals.ng/index.php/jnitp/



Table 1: Continuum of Public Participation

	Information exchange	**Consultation**	**Collaboration**	**Co management control**
Description	Information is communicated primarily in one direction, with limited opportunity for dialogue	Public opinions are sought and considered in expert or managerial decision-making, information flows in two directions, but decision-makers not obliged to integrate comments received	Preparations of the public are actively involved in developing solutions and directly influencing decision-makers. This usually involves interactive activities, dialogue and in-depth working relationship with more focus in joint responsibilities	Decision-making and sometimes responsibility for organizing public participation is partly or wholly delegated directly to the public or their representatives
Examples	Discussion paper, comment sheets	Public learning survey, open house	Roundtables, workshops, public advisory committee	Community forest board

Source: Krishnaswamy, 2012.

The table showed that between the two ends of the continuum is opportunity for consultation and collaboration amongst stakeholders. However, determining the approach and anticipated level of PP is correlated to the objectives and purpose for the engagement of stakeholders.

2.5 Methods of Teaching Environment Education

According to Abubakar (2010) the method that could be employed in teaching EE include lecture, discussion, practical field studies or excursion, project, seminar, symposium, quiz, debate etc. However, the author stated that the teaching of EE could achieve its objectives through following methods; *Reconnaissance Survey:* All environmental problems to be tackled need a well-planned reconnaissance survey. To embark on such surveys, the equipment to be used on field as well as the topographical maps should be provided as they guide the movement and work of the researcher on the field; *Measurement of Environmental Attitudes:* These include those on vegetation parameters, soil and its colour, shape, elevators depth water table etc. As much as possible the students should be made to measure them with the supervision of the teacher.

JOURNAL OF THE NIGERIAN INSTITUTE OF TOWN PLANNERS
VOL30, NO 4. JULY, 2025
https://nitpjournals.ng/index.php/jnitp/



Others methods include; *Laboratory Analysis:* Environmental problems such as pollution and soil erosion requires laboratory analysis of soil samples collected from the field, the teacher of EE should encourage their students to carry out the analysis for reliable results because mistakes made during analysis reflects in the final result, and *Collection of Data and Statistical Analysis:* Data collected from the field and laboratory should be made in an orderly manner to ease computation and statistical analysis. Here, it's important that the teacher gives good attention to the learner, because most of them find it difficult to collect, analyse and compute simple data.

3.0 THE STUDY AREA

The study was carried out in seven (7) communities; Diebu, Akama-ama, Peremabiri, Ikainbiri, Olugbobiri, Ekowe and Nangiama, all in Southern Ijaw local government area of Bayelsa state. The communities were selected randomly. The geology of the area, from top to bottom consists of Benin, Agbase and Akata formations (SPDC, 1998); and lie in the wet equatorial climate region of the Niger Delta. The area experiences both dry and wet seasons, with temperature ranging between 23 and 32^{o}c with little monthly variations. The major economic activities of the study area including fishing, farming, forestry, lumbering, hunting, gathering of wild forest products and tapping of palm wine and brewing of local gin (Allison-Oguru, Zuofa & Berepubo, 1999). However, the area is rich in natural resources which include oil and gas, with oil wells in all communities and pipelines transversing the area. Suffice it to say, these Anthropogenic activities have contributed immensely to the incidences of environmental pollution in the study area; thereby necessitating the need for environmental education.

4.0 MATERIAL AND METHODS

The research used mainly primary data, which involved the utilization of a structures questionnaire which measured environmental education and public participation, to illicit relevant data and direct physical observation. As earlier stated, the research involved seven (7) oil and gas bearing communities in Southern Ijaw local government area (SILGA) of Bayelsa State. Given the total population of the study area, the sample size of 230 was determined using the Taro Yamene formula for determination of sample size (Kpolovie, 2011). The multi-stage sampling technique was adopted for the study. A set of 230 structured questionnaires which sought to extract vital information related to knowledge of environmental laws, participation in environmental control programmes as well as

JOURNAL OF THE NIGERIAN INSTITUTE OF TOWN PLANNERS
VOL30, NO 4. JULY, 2025
https://nitpjournals.ng/index.php/jnitp/



educational background, etc, were administered to respondents; male and female household heads. The data obtained from the administration of questionnaires were analyzed descriptively (percentages, means and graphical illustrations), and the Students T-test was adopted to test the hypothesis of the study within 0.05% allowable degree of freedom.

5.0 RESULTS AND DISCUSSION

Results and discussion of finding of the research which aim to achieve set objective are presented in this section. As stated earlier, a total of 220 questionnaires were retrieved and subjected to statistical analysis.

Table 2: Awareness of Environmental laws/regulations

S/N	Option	No of Respondent	Percentage
1	Yes	53	24.1%
	No	160	72.7%
	Undecided	7	3.2%
Total		**220**	**100%**

Source: Researcher fieldwork, 2025

The table showed that 53 respondents representing about 24.0% indicated been aware of the existing environmental regulations, 160 respondents, representing about 73% said they were unaware of environmental laws meant to engender sustainable development. The table also showed that only 7 respondents representing about 3% declined supply any information.

Table 3: Reasons for Non-Participation in Environmental Laws/Regulations

S/N	Option	No of Respondents	Percentages
1	Poor implementation of environmental law	37	16.8%
2	Lack of public awareness	39	17.7%
3	Nature of occupation	28	12.7%
4	Illiteracy or low education	61	27.7%
5	Low income (poverty)	45	20.6%
6	Unemployment	10	4.5%
	Total	**220**	**100**

Source: Researcher fieldwork, 2025

Table 3 shows that about 16.7% of respondents identified poor implementation of environmental laws/regulations as reason for non-participation in environmental control programmes, 18% identified lack of public awareness, while about 13% identified nature of the occupation. The table also showed that about 28% of respondents ticked illiteracy or low educational level as major reasons for non-participation, while about 21% ticked low income (poverty) as reason for non-participation in environmental control reason. Finally 10 respondents, representing about 5% indicated unemployment as major reason for

JOURNAL OF THE NIGERIAN INSTITUTE OF TOWN PLANNERS
VOL30, NO 4. JULY, 2025
https://nitpjournals.ng/index.php/jnitp/



non-participation in government's environmental control programmes.

Table 4: Involvement in Decision-Making Processes of Environmental Control Programme

S/N	Option	No of Respondent	Percentage
1	Yes	6	2.7%
2	No	201	91.4%
3	Abstinence	13	5.9%
Total		**220**	**100%**

Source: Researchers Fieldwork, 2025

The table showed that only 13 respondents representing about 6% said they have been involved in the decision-making processes of environmental regulations. This is really antithetical to sustainable development efforts, because citizens can provide valuable insights into local environmental issues and potential solutions. Ostrom (1990) posited that environmental laws can be more effective with citizens participation in the decision making process.

Table 5: Willingness to Participate in Environmental Control Programmes.

S/N	Option	No of Respondent	Percentage
1	Yes	178	80.9%
2	No	34	15.5%
3	Abstinence	8	3.6%
Total		**220**	**100%**

Source: Researchers Fieldwork, 2025

As shown in the table, 178 respondents, representing about 81% expressed willingness to participate in environmental control programmes, while 34 respondents (16%) out rightly said no; they would not participate in environmental control programmes. Given the overwhelming willing of the people to participate, the issue therefore is how policy-makers would promote public participation to achieve environmental sustainability through EE. According to (Fox & Stoett, 2016), there can only be effective participation at the levels of partnership, delegated power and citizen control over such issues affecting their lives and environment, as noted in Arnstein (1969) ladder of citizens' participation. Arnstein defined citizens' participation in terms of the amount of actual control the citizens have over ranges of environmental policy decisions.

Hypothesis Testing

A single hypothesis was formulated; participation in environmental control has no significant relationship with respondents' educational attainment, was tested using the students T-test statistics at 0.05 degree of freedom.

JOURNAL OF THE NIGERIAN INSTITUTE OF TOWN PLANNERS
VOL30, NO 4. JULY, 2025
https://nitpjournals.ng/index.php/jnitp/



Substituting the values into the T-test formula yielded:

$$t = \frac{364 - 850}{\sqrt{\frac{234}{7} + \frac{18507}{3}}} = \frac{-486}{\sqrt{3343 + 6169}} = \frac{-486}{7876}$$

Calculated value = - 0.6171 which is the same as 0.617

To find the table value at 0.05% degree of freedom = (Row – 1) (Colum – 1)

= (7 – 1) (5 – 1) = 6 x 4 = 24

Table value at significant level of 0.05 = 0.381

Decision rule – since calculated value is greater than the table value; we reject the null hypothesis (H_o) and accept the alternate hypothesis (H_1).

This result of this study aligns with the views of Nassbaum (2020) who concluded that educational level influences participation in environmental management efforts; noting that it increases awareness about environmental issues and provide knowledge about sustainable practices leading to greater participation. However, it should be noted that the relationship between educational level and environmental participation is complex and impacted by various factors such as income status, cultural background and access to environmental information.

6.0 CONCLUSION AND RECOMMENDATION

The research revealed that majority of the citizens did not actively participate in environment control regimes implemented in their communities. However, illiteracy or low educational attainment and lack of awareness campaign programmmes were blamed for the lapse. Nevertheless, respondents showed reasonable level of willingness to participate in such programmes. An effective EE will most likely improve public awareness; promote eco-friendly attitudes, skills and strategies that shall minimized environmental degradation with far reaching consequences for human life. Likewise, a successful control of environment problems reasonably depends on the perception of people for their environment; given that the human mind drives human behavior. Suffice it to say, most environmental problems are primarily human engineered; therefore, a deliberate change of attitude and total transformation in the people's behave with respect to the use of natural resources is central or required in the attainment of sustainable and resilient communities.

JOURNAL OF THE NIGERIAN INSTITUTE OF TOWN PLANNERS
VOL30, NO 4. JULY, 2025
https://nitpjournals.ng/index.php/jnitp/



Sequel to the research findings, we recommend that an elaborate curriculum be designed on EE and be incorporated into the school curriculum at all levels of education, to raise a generation of environmental mindful citizens that would participation in environmental control programmes. Secondly, EE should involve strategies and learning experiences that are planned, focused, experimental and participatory etc. This can also be achieved by the establishment of adult literacy classes so that every member of the society can be trained and inculcated with the principles that promote sustainable development. Finally, Government at all levels should devote significant part of their budgets for environmental awareness creation as well as ensure that government decisions reflect more concern for environmental sustainability.

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JOURNAL OF THE NIGERIAN INSTITUTE OF TOWN PLANNERS
VOL30, NO 4. JULY, 2025
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