

IMPEDIMENTS TO AND OPTIMIZE STRATEGIES FOR IMPLEMENTING GREEN LIVING FOR SUSTAINABILITY IN NIGERIA: IMPLICATION FOR SCIENCE TEACHING

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DOI: <https://doi.org/10.5281/zenodo.10649211>

Published Date: 12-February-2024

Abstract: Green living is a standard of living which involves consciously reducing human activities that increases carbon trace. In Nigeria, sustainable green living forms a part of science teaching in the educational section. However, there lie some impediments towards achieving this education goal. Hence, this study sought to determine the impediment to and optimize strategies for implementing green living for sustainability. Descriptive research design was used for the study with a sample size of 77 science teachers in 10 Government owned secondary schools in Onitsha North local Government Area of Anambra State. There was no sampling since the population is manageable. Data collected were analyzed using mean and standard deviation. The findings of the study showed that that cost and socioeconomic status of individuals, lack of government support, ignorance of what green living is, complicated waste recycling and disposal system, transportation infrastructure, availability of green living infrastructures among others are impediments to green living. Moreover, the strategies the can facilitate the implementation of green living among others include the recycling of waste, production and use of eco-friendly materials, production and use of materials that can be recycled easily. Based on the findings, it was recommended among others that various sectors such as healthcare, agriculture and marketing should be encouraged to adopt green living in their professional practices to ensure that there is minimal or no harmful effect on the environment.

Keywords: Green living, Impediment, Implementing, Science Teaching, Strategies and Sustainability.

1. INTRODUCTION

The world's environment has been inflicted with toxins because the environment is saturated with various decays stemming from release of solid waste into the environment leading to various degrees of pollution. Pollution is seen to be one of the major factors that spur degradation and decay in environmental preservation and conservation. Globally, over 2 billion tons of solid wastes are generated in urban centres annually with most not emptied at all (Kaza et al, 2018). This situation is one out of many contributing to climate change triggering degeneration of healthy living, melt down in the economy among others. Extreme weather occasioned by climate change are far a more destructive force behind disasters measured by the toll of damages to lives, built environment, destruction of critical infrastructure, loss of properties and economic activities, irreversible contamination, forced population displacement including short and long term disease outbreaks (Funari, Manganello & Sinisi, 2012). Taking care of the environment becomes paramount for life sustainability.

Numerous scientific studies and reports offer evidence of climate change/global warming induced by natural and human activities and its potential harmful effects on our environment. Global warming often refers to warming that can occur due to increased green house gases (GHGs) emissions from human activities which trap heat that would if not escape from Earth (Environmental Protection Agency (EPA), 2012). Climate change presents various kinds of long term risk in which their impacts is experienced globally and in actual fact are irreversible. Predominantly, the growing accumulation of green house gases (GHGs) is changing the world's climate and weather patterns and disasters such as droughts, floods, extreme temperatures, posing serious worldwide problems which are growing more severe and frequent (Murugesan & Gangadharan, 2012). The Green living is an economic as well as environmental imperative such that as many green advocates attest that it is human social responsibility (Murugesan, 2007). Hence, green living becomes a prerogative for the achievement of sustainable development which cut across economic, environmental and social dimension of any society. This calls for the adoption of green living.

Green living is a lifestyle because it involves conscious daily practices aimed at reducing activities of individual that increases carbon trace. Ainoa, Kaskela, Latiti, Saarikoski, Sivunen, Storgards and Zhang (2009) described green living as a lifestyle that attempts to reduce an individual's or society's use of the earth's natural resources. "Going green" is the phrase referring to corporate and individual action consciously taken to curb the harmful effects on the environment through consumer habits and lifestyles (Capital, 2010). It is noteworthy that the building sector is one of the largest contributors to (green house gas) emissions, with commercial buildings contributing between 30%-40% of these emissions annually (Maharjan, 2019). The authors also added, that people's lifestyle is becoming massively dependent on technology which predominantly negates the necessity for going green.

Regrettably, Nigeria is not without several peculiar challenges which make a green agenda appear unachievable. Top of these include inefficiencies in the energy and transportation systems, as well as waste management and building industry (Capital, 2010). What appears to be lacking is a concise government agenda, translating into strategies, top of which are the policies and incentives required to encourage private sector participation. Regarding waste management in Nigeria little has been done by successive governments as well as relevant agencies with regards to environmentally sustainable waste disposal. Indiscriminate dumping of waste by individuals and government agencies is widespread. Ogwueleka (2009) observed that solid waste management in Nigeria is characterized by inefficient collection methods, in efficient coverage systems and transportation. This could have been different where people use eco-friendly material especially those that could be recycled, to curb indiscriminate disposal of wastes posing threats on the environment.

Green living provides healthier environment to live in with less or no threat of diseases and healthier food. Some of the health issues such as asthma, chronic obstructive pulmonary diseases and cardiovascular diseases, among others people are constantly confronted with arise from unhealthy environment (Schipper, 2022). Schipper affirmed that, first opting for locally produced food and seasonal food that are environmentally friendly whenever possible is part of green (sustainable) living. Secondly, this reduces the carbon footprint and preserves food sources for future generation. Thirdly, such food sources also reduce reliance on pesticides that have been proven to be harmful to the environment.

The green living movement encourages people to live in a more environmentally friendly way (Lake, 2018). Lake further noted several advantages of green living that contribute to cleaner water and air, preserve natural resources and reduce the impact of global warming. They are; reduced pollution, wild life preservation, fewer greenhouse gas emissions, resource conservation. However, green living is not easy to adopt and so there have been imminent challenges to achieving green living lifestyle. Some of these challenges are: poor accessibility of eco-friendly products, lack of awareness among the general masses (Ragheb, El-shimy & Ragheb, 2016). The most important advantage of green living is that it reduces environmental degradation that could aggravate costly and perpetual consequences to all spheres of life. The more polluted an environment, the more amounts of pollutants that in likely to find its way into the air, soil and water (Lake, 2018). The choice to go for renewable or biodegradable resources swiftly comes to mind as it seem to be the most efficient way of reducing abuse of natural resource, clean water and air and reducing climate change. To this end, everything we use in the environment, as well as how we use them have implication on the environment.

The essence of advocating for green living can be viewed from two perspectives. First, is to attain better quality life by embarking on stabilizing healthier environment, choosing eco-friendly food and production process. Secondly, to take advantage of the environmental benefits thereof such as; conserving natural resources, curbing climate change. If everyone should adopt a green lifestyle, the society will not be disturbed with having phenomenon such as global warning differentiation, pandemic etc. Green Journal (2019) observed that more companies are creating products that help individual

live a green lifestyle, through the manufacturing of cars, light bulbs, utensils, bags and accessories that are eco-friendly. The author added that these products help us conserve water energy and natural resources to curb pollution. To this end it could be said that green living can also be called sustainable living because it advocates practices that are functional at present and later in life for the benefit of life and the environment.

Sustainability here expresses meeting present environmental, social and economic needs without compromising these factors for future generation. Practical sustainable living often is an attempt to reduce carbon footprint by suggesting alteration on transportation methods energy consumption and diet (Appropedia, 2021). At such the proposition is that man should conduct their lives in ways that are consistent with sustainability in relation with earth's natural ecology and cycles. The beliefs based on eco-living are highly interrelated with the overall ethics of sustainable development. As the human population grows, so does the quest for territory expansion and consumption of material and energy. To control the degradation of the ecosystem and exacerbation of discomfort in green living, the population, energy and material consumption ought to be at the same level or under the sustainable population limit. To achieve sustainability in green living, there should be unlimited time span of sustainable activities and at such practical sustainable green living should be unending. Going green has correlation with the sustainable development goal. For instance, the Energy Sector Management Assistance (2021) analyzed some sustainable development goals in relation to green living as follows;

SDG 6: Clean water and sanitation: To ensure the availability and sustainable management of water and sanitation for all, sustainable management of water resources and access to safe water and sanitation are essential for unlocking productivity and provide significant leverage for existing investment in health and education. The natural environment contributes to the management, regulation and availability of water. Hence, water shortage reduces food security and income. Improving water management makes resilient the economy and rain variability in order to satisfy the needs of every increasing population. In addition restoring and protecting the water ecosystem will equally purify water and restore water quality standard.

SDG 7: Affordable and Renewable Energy

Target 1: By 2030 ensure universal access to affordable, reliable and modern energy services. The Sustainable Energy, for All (SEforAll) research shows that in the sub-Saharan Africa and Asia, 20 countries have the largest gaps in electricity and clean cooking access (Energy Sector management Assistance, 2021). These regions are also represented in the 80 percent of countries worldwide without access to electricity, clean and modern energy thereby limiting possibility of achieving SDGs goals on improving public health. For instance SEforAll pointed out that replacing outdated stoves and open fires would save the lives of 800,000 children who die each year from exposure to indoor air pollution. Hence the call to achieve energy gaps by 2030. **Target 2:** Renewable energy: Renewable energy are most dynamic in the electricity sector, reaching around 25% in 2018, while progress in the heat and transport sectors. Installing off grid solar energy which provides energy access at lower cost could alleviate population without access to the central electricity grid. The report stated that Nigeria with the population of 195.87 million people have as at 2019 55% population having access to electricity 13% access to clean cooking. This rate is very poor as compared to the projected line drawn in achieving the SDG7 by 2030 to increase substantially the trim of renewable energy.

Goal 13: Take urgent action to combat climate change and its impacts. The target is to strengthen resistance and adaptive capacity to climate related hazard and natural disasters in all countries as well as improve education, awareness-raising, human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning. The indicators are; first, to access the extent to which global citizenship education and education for sustainable development are mainstreamed through, rational education policies, curricular, teacher education, student assessment. However, the consciousness of the importance of green (sustainable) living could be only engraved in the minds of the populace when they become educated and aware of green living practices that guarantee sustainable development. The science behind green living could be championed through strategized science education. Topics already existing in science subjects' (Biology, Chemistry and Physics) contents related to green living could be made stress point of knowledge on green living.

There are countless impediments to practicing green living. Green living requires a lot of conscious practices and most which are not plausible considering the uniqueness of different regions. Based on this, Heather (2019) and Maharjan (2019) asserted that amongst the impediments to green living among others are; complications of local waste recycling, cost, and transportation options, poor garbage disposal. The advocacy for green living is part of the overall plan for sustainable development that aims for optimum processes to reclaim natural environment (Kubba, 2011). Hence, the efficient use of

resources such as water, energy and other raw materials makes the environment more productive, comfortable healthier for individuals (Hasan & Zhang, 2016). Despite the importance of green living, individuals in the society remain adamant in propagating the indications for environmental degradation. This study therefore is set to identify those impediments to green living as well as proffer strategies to overcome those impediments.

Purpose of the Study

The main purpose of the study is to find out the impediment to and strategies of implementing sustainable green living. Specifically, the study determined.

1. The impediment to sustainable green living
2. Strategies for implementing sustainable green living

Research Questions

The following research questions guided the study.

1. What are the impediments to implementing sustainable green living?
2. What are the strategies for implementing sustainable green living?

2. METHODS

The design of the study is descriptive research design. The study was conducted in Anambra State of Nigeria. The justification for the choice of Onitsha is because the area and its environments are known to be over-populated because it is the heart of economic activity as well as industrial capital of the South-East region of Nigeria. The pattern of activities in that area undoubtedly posed serious problem for the inhabitants’ environmental sanitation, (wastes disposal erosion control, land degradation). Therefore, the State is considered lacking in eco and sustainable green living practices. The population of the study consisted of 77 science teachers in 10 Government owned secondary schools in Onitsha North local Government area of Anambra state. There was no sampling since the population is manageable. A research structured questionnaire on impediment and strategies for implementing sustainable green living (QISISGL). The instrument was face validated by three experts from the Department of Science Education University of Nigeria Nsukka. The internal consistency reliability using Cronbach alpha was used to obtain a reliability coefficient of 0.90. The instrument was administered to the 77 respondents by the researcher with the help of two research assistants and was collected on the same day. Data collected were analyzed using mean and standard deviation. A mean of 2.5 and above was adopted as a benchmark for acceptance; while a mean below 2.5 were not accepted.

3. RESULTS

Research Question One:

What are the impediments to implementing sustainable green living?

Table I: Mean scores and standard deviation of the respondents on impediments to implementing sustainable green living

| S/N | Statement | Mean | SD | Remark |
|-----|---|------|------|----------|
| 1. | Cost and socio-economic status of individuals | 3.55 | 0.62 | Accepted |
| 2. | Lack of government support | 3.18 | 0.81 | Accepted |
| 3. | Ignorance of what green living is | 3.06 | 0.95 | Accepted |
| 4. | Complicated waste recycling and waste disposal system | 3.28 | 0.74 | Accepted |
| 5. | Preference for existing ways of life | 3.05 | 0.94 | Accepted |
| 6. | Transportation of green living infrastructure | 2.77 | 1.08 | Accepted |
| 7. | Availability to green living infrastructure | 2.77 | 1.10 | Accepted |
| 8. | Increasing food shortage | 3.19 | 0.86 | Accepted |
| 9. | High economic dependency on natural resources | 3.18 | 0.90 | Accepted |
| 10. | Corruption in the society | 3.29 | 0.86 | Accepted |

From the table I, all the items (1 -10) were accepted as they scored above the criterion mean of 2.50. This indicated that the respondents accepted all the items (1 -10) are impediments to green living in Anambra state. Hence, the impediments to implementing sustainable green living in Anambra State, Nigeria include cost and socio-economic status of individuals, lack of government support, ignorance of what green living is, complicated waste recycling and waste disposal system, preference for existing ways of life, transportation of green living infrastructure, availability to green living infrastructure, increasing food shortage, high economic dependency on natural resources and corruption in the society

Research Question Two:

What are the strategies for implementing sustainable green living?

Table II: Mean scores and standard deviation of the respondents on Strategies for implementing sustainable green living

| S/N | Statement | Mean | SD | Remark |
|-----|--|------|------|----------|
| 11. | Recycling of waste | 3.25 | 0.75 | Accepted |
| 12. | Production and use of eco-friendly materials | 3.14 | 0.64 | Accepted |
| 13. | production and use of materials that can be recycled easily | 3.22 | 0.72 | Accepted |
| 14. | Setting up mitigation options against pathways of non-green living | 3.12 | 0.61 | Accepted |
| 15. | Conservation of natural resources | 3.30 | 0.74 | Accepted |
| 16. | Creation of a non-toxic environment | 3.29 | 0.78 | Accepted |

From the table II, all the items (11 -16) were accepted as they scored above the criterion mean of 2.50. This indicated that the respondents accepted all the items (11 -16) are the strategies for implementing sustainable green living in Anambra state.

4. DISCUSSION

Table I showed that cost and socioeconomic status of individuals, lack of government support, ignorance of what green living is, complicated waste recycling and disposal system, preference to existing ways of life, transportation infrastructure, availability of green living infrastructures, increasing food shortage, high dependency on natural resources are impediments to green living. These findings are not unlikely considering that most of the people have been accustomed to non-green living lifestyle induced by poor living condition which could be a major factor limiting adoption of green living.

Cost and socio-economic status is also a critical impediment as shown from the results of the study. The difficulty of green living increases with the cost of materials for its execution. Individual's ability to express green living is very much dependent on awareness of what green living actually is all about. That is why Hasan and Zhang (2016) consistently mentioned the importance of society knowledge and cognition enhancement in going green.

The increase in food shortage could make individual go for alternative for daily food. Man's daily need for food is a major element in need satisfaction. However, the relentless satisfaction of food on its own impacts the environment. For instance, the amount of meat consumption depends on the quantity of wild life hunted from forests which depletes the normal wild life interaction and cycle that affects the environment. Food distributed through transportation emits one of the most common dangerous gases (Carbon-monoxide) into the atmosphere.

People need food security, hence the over-exploitation of natural resources, depopulation of world animals and destruction of habitats. Hence, going green also reduces the threat to marine wildlife that dies each year as a result of encountering pollutants or trash in the water supply (Lake, 2018). Buying locally produced food such as going subsistent in farming and rearing of domestic animals for meat will not only support local farmer but also reduce the consumption of energy and emission of gases into the atmosphere. In the quest to contribute to sustainable green living, organic food production is becoming an emerging trend in most parts of the world. It is based on minimal use of off-farm inputs and on management practices that restore, maintain or enhance ecological harmony. Furthermore the major goal for going organic in food production is to optimize the health and productivity of interdependent communities of soil life, plants animal and people.

One of the several ways of practicing organic farming is crop rotation, compost green manure and biological pest control while restricting the use of manufactured fertilizers and pesticides food additives and genetically modified organisms (Iowa State University, 2013). Furthermore, with individual's ability to grow own food, they become handy and there is definitely a limit if not no chemical and other food additive. Hence there is less population both in the environment and body of the consumers.

It is also noteworthy that there is a trend of bio-fuel utilization, where people and industries converts degradable waste into eco-bio-fuel. Going bio-fuel is more efficient in green living provided individuals have the skills and infrastructure to convert degradable wastes to bio-fuel. In most parts of the country power companies that harness the conversion of household and community waste are projecting their activities. With the increase in the world population, there occur the increase in the emission of carbon dioxide and other hazardous into the soil, water and air. Man cannot go green in the presence of increase in health, social, and financial crisis arising from waste accumulation. That is why a crucial component of sustainable green living is waste consciousness achieved through reducing waste, reusing commodities and most efficiently recycling. Reducing paper waste and reducing our water use in indoor appearances such as toilet, showers, dish-washers, washing machines and others. The more water is consumed the more tendency of any land, reduced sea level.

Results on table II shows that recycling of waste, production and use of eco-friendly materials, production and use of materials that can be recycled easily, setting up mitigation options against pathways of non-green living are strategies that can facilitate the implementation of green living. According to Heather (2019), recent changes in how recycling bundles are accepted overseas have led to more restrictions on what you can throw into the bin. This could make individual become more responsible about creating a cleaner recycling stream, making implementation of green living unproblematic

5. CONCLUSION

Going green is a necessity especially in modern times where the uses of non-biodegradable materials are in vogue; the environment is degrading rapidly. Based on the results of the study, it is concluded that are enormous impediments of not implementing green living. Nevertheless, there are different strategies that could be used to make our environment greener and safer, as well as be able to sustain the natural resources for present as well as future generations.

IMPLICATION TO SCIENCE TEACHING

The following implications for science teaching in Nigerian secondary schools are hereby noted:

1. Environmental education should be integrated into the core science subjects like biology, chemistry and physics to ensure green living literacy.
2. Local resources that can be recycled should be sourced and used in science teaching.
3. Green living clubs should be formed in all the secondary schools in Nigeria as a source of campaign for green living for sustainability in Nigeria.

6. RECOMMENDATIONS

The following recommendations were made based on the findings of the study:

1. Focus needs to be shifted to areas where there is dire need to achieve greening especially those that have direct impact on the environment.
2. Various sectors such as healthcare, agriculture and marketing should be encouraged to adopt green living in their professional practices. This is to ensure that there is minimal or no harmful effect on the environment.
3. Eco-friendly products are difficult to come by, especially when almost everybody has come to rely more on non-eco friendly modern technology. In addition, most eco-friendly products are usually too costly to afford. There is therefore a need for adequate and practical means of sensitizing the society on possible ways of practicing green living for sustainability through appropriate technology.

REFERENCES

- [1] Ainoa, J., Kaskela, A., Lahti, L., Saarikoski, N., Sivunen, A., Storgards, J., & Zhang, H. (2009). *Future of living*. In Neuvo, Y., & Ylonen, S., (eds) 174 – 204. Helsinki University of Technology (TKK), MIDE, Helsinki University Print; Finland
- [2] Appropedia (2021). *Sustainable development*. https://www.appropedia.org/Sustainability#cite_note-3
- [3] Capital, A. (2010). *Challenges and benefits of “going green” in Nigeria*. <https://www.howwemadeitinafrica.com/challenges-and-benefits-of-going-green-in-nigeria/2528/>
- [4] Energy Sector Management Assistance (2021). *2021 tracking SDG7 reports*. Retrieved <https://trackingsdg7.esmap.org/downloads>.
- [5] EPA (2012). *Climate change: Basic information, video and factsheets, environmental protection agency*. Retrieved from <http://www.epa.gov/climatechange/basicinfo.html>
- [6] Funari, E., Manganelli, M. & Sinisi, L. (2012). Impact of climate change on waterborne diseases: section I; Health risks from water and new challenges for the future. Istituto superior di sainta, Rome, Italy. *Scientific Elctronic Library Online*, 48(4), 473-487.
- [7] Green Journal (2019). *The importance of green living in our life and environment*. Retrieved from <https://www.greenjournal.co.uk/2019/12/the-importance-green-living-in-our-life-and-environment/>
- [8] Hasan, M. S. & Zhang, R. (2016). Critical barriers and challenges in implementing green construction in China. *International Journal of Current Engineering and Technology*, 6(2), 435 – 445
- [9] Heather, B. (2019). *Overcoming challenges to living an eco-friendly lifestyle*. <https://greenhomeguide.com/knowhow/article/overcomingchallengestoliving-an-eco-friendly-lifestyle>. retrieved 3/4/2022
- [10] Iowa State University (2013). *What is organic agriculture*. Retrieved from <https://web.archive.org/web/20131026221030/http://extension.agron.iastate.eduorganicag/whatis.html>.
- [11] Kaza, S., Yao, L., Bhada-Tata, P. & Van Woerden, F. (2018). What a waste 2.0. A global snapshot of solid waste management to 2050. Washington: The World Bank. Retrieved from <https://openknowledge.worldbank.org/handle/10986/30317>
- [12] Kubba, S. (2010). *Green construction project management and cost oversight*. Elsevier, United States of America.
- [13] Lake, R. (2018). *Positive effects on the environment from going green*. <https://science.com/positive-effects-on-the-environment-from-going-green-5117214.html>
- [14] Maharjan, S. (2019). *The challenges of going green*. Retrieved from <https://smartfamily.com.np/technology/the-challenges-of-going-green>
- [15] Murugesan, S. (2007) Going green with IT: Your responsibility toward environmental sustainability. Cutter consortium business – IT. *Strategies Executive Report*,10(8), 1–24.
- [16] Murugesan, S., & Gangadharan, G. R. (2012). *Harnessing green it principles and practices*. A John Wiley & Sons, Ltd., Publication: West Sussex, United Kingdom
- [17] Ogwueleka, T. C. (2009). Municipal solid waste characteristics and management in Nigeria. *Iran Journal of Environmental Health Science and Engineering*, 6(3), 173-180
- [18] Ragheb, A., El-shimy, H., & Ragheb, G. (2016). *Green architecture: A concept of sustainability*, 216. 778-787. <https://doi.Org/10.1016/j.sbspro.2015.12.075>.
- [19] Schipper, R. (2022). *Why is green living so important? (we find out)*. Retrieved from <https://planetrenewed.com/why-is-green-living-so-important-we-find-out>