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Geography Education: An Indispensable Tool for Mitigating the Impact of Human-Induced Activities on The Environment for Sustainable Development in Nigeria

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Abstract

There is no gainsaying that human-induced activities in no small measure impart negatively on the environment with dare consequences on the lives of individuals and collectively as a community or a nation or even the world at large. It is against this background that this paper focuses on "Geography Education as an Indispensable Tool for Mitigating the Impact of Human-Induced Activities on the Environment for Sustainable Development". To achieve this goal, the paper highlighted the concept of geography education, impact of human-induced activities on the environment and the concept of sustainable development. Also, the consequences of human-induced activities on the environment and geography education as an indispensable tool for mitigating the impact of human-induced activities on the environment for sustainable development were discussed. It was concluded that since geography education is related to sustainability and the fact that geographers understand human-environment relationships and how to use that information to manage environmental related issues, geography education therefore becomes the most relevant school subject that can be used in achieving sustainable development and by extension the United Nations Agenda 2030 for Sustainable Development Goals (SDGs). Amongst others the paper recommended that geography be taught across all levels of our educational system in order to acquaint all citizens with requisite geographical knowledge about the environment.

Key Words: Geography Education, Indispensable Tool, Mitigating, Human-Induced Activities, Environment and Sustainable Development

Introduction

Geography is the study of man and his relationships with the environment. Hence, without geographical knowledge the much desired talked about environmental sustainability cannot be realized. It is a common knowledge that the environment is a place where man co-exists alongside several other lives. However, the interaction between the physical, climatic and abiotic factors on the environment has generated a wide variety of environmental problems on the land leading to dare consequences on man himself and the environment at large. Human activities such as agriculture, deforestation, urbanization etc have over the years posed serious threats such as global warming, pollution, acid rain, ozone layer depletion, resource depletion and biodiversity loss amongst others have affected the environment so much so that there has been a global attention towards the

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phenomenon as encapsulated in the Sustainable Development Goals (SDGs). Geography education provides the platform in which the public and the citizens are educated on variety of environmental issues including mitigating the impact of environmental challenges arising from human-induced activities on the planet earth which are geared towards achieving the Sustainable Development Goals (SDGs). In this wise, geography education plays an important role in enhancing sustainability and improving human capacity in addressing environmental related issues. This is so because geography is a discipline and a school subject that studies the relationships between people and their environment. Hence, the knowledge and values harnessed when used in the right way will pave the way for achieving the much talked about sustainable development. More so, geography is a social science subject that deals with current and emerging fundamental environmental issues and how man in his wisdom proffer solutions in order to make the environment a safe place for all.

Concept of Geography Education

Geography is not just maps, compasses, mountains, valleys and other things we see around us. According to National Geographic Society (2020) geography is the study of places and the relationships between people and their environment. The importance of geography does not just come from understanding the physical properties of the world which of course is important as it were. The importance of geography also comes from how it connects people to their environment. Hence, the ability to understand this connectedness makes geography an important part of education, of our understanding of the world around us, and our understanding of human history. Furthermore, geography explores both the physical properties and the human societies spread across it. It also examines how human culture interacts with the natural environment and the way those locations and places can have an impact on people (NGS, 2020).

According to Dahlman and Renwick (2014) geography is a field of science devoted to the study of the lands, features, inhabitants and phenomena of earth. Similarly, geography as defined by Burt (2009) is an all-encompassing discipline that seeks an understanding of earth and its human and natural complexities-not merely where objects are, but also how they have changed and come to be. More succinctly encapsulated Hughes (1863) stated thus:

> *Names of places are not geography-to know by heart a whole gazetteer full of them would not in itself, constitute anyone a geographer. Geography has higher aims than this. It seeks to classify phenomena (alike of the natural and of the political world, in so far as it treats of the latter), to compare, to generalize, to ascend from effects to causes, and, in doing so, to trace out the laws of nature and to mark their influences upon man. This is a description of the world-that is geography. In a word, geography is a science-a thing not of mere names but of argument and reason of cause and effect (p 66).*

In the view of Sala (2009) geography is simply referred to as the bridge between the natural science and the social science disciplines. From the foregoing definitions it is obvious that geography is a subject which deals with the why, when, how and when of environmental issues whose knowledge and effective application would lead to sustainable development.

Impact of Human-Induced Activities on the Environment

According to Pius and Kabiru (2019) the environment under normal circumstances is expected to be a highly preserved resource despite the strong need of man to exploit what nature has endowed on him for his socio-economic development. This reason coupled with population explosion in the world, man has continuously find ways of meeting his needs. He has developed and used different technology available to him to achieve his goal. However, in doing this, man's activities have greatly impacted the environment negatively. There is no gainsaying therefore, that these human activities

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have far reaching consequences on our planet earth. Hence, the way we live our lives, the things we produce and consume and how we move around affect the earth, causing substantial damage to the environment ranging from pollution, ozone layer depletion, global warming, agriculture, deforestation, resource depletion, soil degradation, over population and over harvesting. To save our environment, we need to be aware of these impacts and work towards mitigating them as much as possible. This is a very difficult mission to accomplish but it is vital to, if we want to protect the earth for future generations and at the same time achieve the sustainable development goals. Examples of some selected human activities on the environment are briefly discussed below:

Atmospheric Pollution

Pollution is the release or injection of substances or energy into the atmosphere in substantial quantities that are harmful to man, animals and plants. Aligning with this definition, the Natural Resources Defense Council (NRDC, 2016) opined that pollution means the exposure of pollutants into the atmosphere which are detrimental to human health and the entire planet in general. To further stress the health hazard inherent in pollution, the World Health Organization (WHO) cited in NRDC (2016) noted that pollution is responsible for nearly 7 million deaths globally every year. Furthermore, it confirmed that 9 out of ten human beings currently breath air that exceeds the WHO's guideline limits for pollutants, with those living in low- and middle-income countries the worse hit. There are various sources of Air Pollutants as identified by NRDC (2016) which include the following; Gases and particles discharged from industrial plants, Smoke from the exhaust of vehicles, marine vessels, aero plane and trains, Domestic fires, Radio-active fallouts, Gas flaring from fields, Chloral-fluro-carbons (CFC) from freezers and coolants, Fumes from insecticide sprays, Dust particles from surface manning/quarries, Dust storms, Harmattan haze, Burning of fossil fuels, Burning of tyres, Decomposing waste. NRDC (2016) identify the following as the major effects of air pollution in the world; Climate change/greenhouse effect, Increase in atmospheric temperature, Depletion of the ozone layer, Destruction of vegetation and crops, Migration/death/extinction of some animal species, Thawing/melting of permanent ice, Rising of sea level, Submergence of low-lying coast lands and islands, Health hazards (e.g. lung diseases, concerns, hearing impairment), Cause of acid rain, Makes rain water unfit for domestic use, Defacing of buildings and movements, Acid rain increases chemical weathering of building walled blocs, metal roofs and statues, Impede air transportation, Causes poor visibility.

Water Pollution

Water pollution is the release of harmful substances (chemicals or micro-organisms) into water bodies or sources thus contaminating the water making it unusable or unfit for drinking, cooking, cleaning, swimming and other activities (Harvard School of Public Health, HSPH, 2023). Similarly, National Resource Development Center (NRDC, 2018) opined that water pollution is the release or injection of substances into the water bodies in quantities or level that are harmful thus degrading water quality and rendering it toxic to man, animals and plants and the environment at large. NRDC (2018) claimed that water pollution has serious health consequences on humans, noting that unsafe water kills more people each year than war and all other forms of violence put together. According to NRDC (2018) water pollution can occur in various ways, some of which are: Herbicides, Pesticides, Industrial waste discharge, Heat from power and industrial plants, Use of chemical fertilizers, Flooding, Acid rain, City drainage, Untreated sewage, Mining activities, Discharge from ships, Fisting with chemicals, Dumping of refuse in water, Erosion materials, Volcanic eruption, Oil spillage, Leakage from landfills, Washing clothes in rivers with detergents, Animal dung in rivers Iberdrola (2023) claimed that water Pollution have negative effects on the environment which are state below:

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Destruction of biodiversity, contamination of the food chain, lack of portable water, infant mortality and diseases.

Ozone Layer Depletion

BYJU'S (2023) describe the ozone layer as the layer or part of the earth's atmosphere that protects, prevents or reduces the amount of ultra-violet radiation from the sun from reaching to the earth surface. The ozone layer is mainly located at the lower portion of the earth's atmosphere. The ozone layer is said to have the potential to absorb 97-99% of the harmful ultra-violet radiation coming from the sun (BYJU'S, 2023). However, ozone layer depletion also known as Ozone holes is the gradual thinning of Earth's ozone layer in the upper atmosphere caused by the release of chemical compounds containing gaseous chlorine or bromine from industry and other human activities.

Ozone Layer Depletion according to NRDC (2016) can be induced by various human activities as follows; Gas flaring, Increase in human activities, Carbon emission, Deforestation, Chlorofluoro-carbon (CFC) gases released into the atmosphere, Volcanic eruption etc

Global Warming

National Resource Development Center, NRDC (2016) viewed global warming as a gradual increase in the overall temperature of the earth's atmosphere generally attributed to the greenhouse effect caused by increased level of carbon dioxide, CFCs, and other pollutants. In other words, global warning occurs when carbon dioxide (CO_2) and other air pollutants collect in the atmosphere and absorb sunlight and solar radiation that have bounced off the earth's surface. Under normal circumstances this radiation would escape into space, but these pollutants, which can last for years to centuries in the atmosphere trap the heat and cause the planet to get hotter. These heat-trapping pollutants – especially carbon dioxide, methane, nitrous oxide, water vapour and synthetic fluorinated gases –are known as "greenhouse gases" and their impact is called "the greenhouse effect". Global Warming can be caused by the following factors; Power plants, Agriculture, human activities, Vehicles and transportation, Offshore drilling, Deforestation and Overfishing amongst others. Global warming affects the environment in numerous ways: Disappearing glaciers (shrinking glaciers), Rising sea levels – will lead to even more coastal flooding, Hotter temperature, Diseases, Drought, Economic consequences, Conflicts and wars.

Acid Rain

Acid rain which is also called acid precipitation or acid deposition is one of the negative effects of human activity on the environment. According to www.britannica.com, acid rain occur as a result of pollutants emanating from power plants and other industries react with the atmosphere to produce that falls back to the earth as rain, snow or fog. Simply put acid rain means rain made so acidic by atmospheric pollution that it causes environmental harm, mainly to forests and lakes. The most common cause of acid rain is the burning of fossil fuels such as oil and coal. Other causes of acid rain are; wild fires, decaying vegetation and other biological processes within the environment.

Resource Depletion

Human activities have affected the quality and quantity of natural resources available to life on earth. Hence, depletion of natural resources is one of the most serious environmental problems that mankind is confronted with today. It has reached a situation in the world today where availability of natural resources is decreasing as against their increasing demand. According to Agricultural and Environmental Data Archives (AEDA, 2023) resource depletion is the exhaustion of raw materials within a region. It noted that resources are commonly categorized into renewable and non renewable resources. The use of either of these forms of resources beyond their rate of replacement amounts to resource depletion. Resource depletion is mostly common in reference to farming, fishing, mining, water and fossil fuels. Another definition of resource depletion by National Resources Conservation

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and Advances for Sustainability (NRCAS, 2023) states that resource depletion is the economic function resulting from misappropriation of supply and demand of a particular resource.

Consequences of Human-Induced Activities on the Environment

The consequences of human-induced activities on the environment are numerous, some of which include; Loss of biodiversity, Population displacement, Vulnerability to climate change, Species extinction, Incremental and continuous rises in the sea level and record setting hot temperatures in the earth's greenhouse atmosphere. It is to be noted that, it is the realization of these consequences that had led to the formation of the Sustainable Development Goals (SDGs) agenda by the United Nations World Commission on Environment which was adopted in the year 2015 by all United Nations Member States aimed at mitigating the impact of human-induced activities on the environment by the year 2030. However, whether the SDGs have achieved its mandate remains to be seen in the near future.

Concept of Sustainable Development

According to Wikipedia (2023) sustainable development is an organizing principle that aims to meet human development goals, while at the same time enabling natural systems to provide necessary natural resources and ecosystem services to humans. The desired result is a society where living conditions and resources meet human needs without undermining the planetary integrity and stability of natural system. This goes to show that sustainable development tries to find a balance between economic development, environmental protection and social wellbeing. However, the most widely used and accepted definition of sustainable development is the one given in the report of the United Nations World Commission on Environment and Development in 1987 titled "Our Common Future" popularly called the Brundtland Report. The report defined sustainable development as the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. So the whole concept of sustainable development emanates from the idea that human societies must live and meet their present needs but must be careful not to jeopardize the needs of future generations yet unborn. Furthermore, the Brundtland report noted that sustainable development is a way of organizing of organizing society so that it can exist in the long term. This means taking into consideration both the imperatives present and those of the future, as the preservation of the environment and natural resources or social and economic equity. It is important to note that the definition of sustainable development in the Brundtland report contains two key concepts: Firstly, the concept of needs, in particular, the essential need of the world's poor, to which overriding priority should be given. Secondly, the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

Geography Education an Indispensable Tool for Mitigating the Impact of Human Activities on the Environment for Sustainable Development

The planet earth at the moment remains the only dwelling place for man among other 8 planets and therefore numerous activities and interactions goes around which have some causes and effects on the environment. To protect the environment and thus mitigate the impact of human activities on the environment for sustainable development the knowledge and understanding of geography is paramount. From the foregoing analysis, geography education can truly serve as an indispensable tool for mitigating consequences of human-induced activities because of its highly interdisciplinary nature makes it appropriate perspective to consider complex issues such as sustainable development that involves economic, social and environmental dimensions. Hence, appropriate geographical knowledge should ensure a more careful use of natural resources by people and increase environmental awareness by making positive changes in their knowledge, attitudes and behaviours in relation to the environment. More, so the fact that geography is a bridge between the natural

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sciences and the social sciences makes it ideal platform for providing the right environmental education which will go a long way in bringing about sustainable development. Similarly, Meadows (2020) also confirm the appropriateness of geography education in mitigating impact of human-induced activities when he noted that geography actually is a discipline that bridges the gap between human and society and the physical environment and uses modern technology to find solutions to some of the world's most pressing problems such as environmental change, population dynamics, biodiversity loss, unsustainable urbanization and global inequalities which can lead to sustainable development. The discipline of geography has a distinct advantage in developing a more holistic understanding of global environmental challenges in that it reaches across all the sciences (including social sciences and humanities). Geography education therefore, represent and important vehicle for citizens of all ages to help them understand the complexity of the sustainability goal and what can (and should be done to achieve a more sustainable future. Geography is a science for sustainability; hence it has an increasingly important role to play in developing the knowledge and the skills to equip future generations with the tools to adapt to and mitigate potentially catastrophic global environmental change. Additionally, Gonzalez and Sebastian-Lopez (2022) noted that geography is an academic discipline and school subject that equips students well with knowledge, skills and values related to education on Sustainable Development Goals (SDGs), he asserted that this can greatly assist in achieving United Nations Agenda 2030 on sustainable development goals. According to Garcia-Gonzalez, Palencia and Ondono (2021) environmental problems seriously poses a threat to the sustainability and survival of our planet. Hence, they opined that the only way to raise awareness of the seriousness of this menace among future generations and instill proactive behaviours that would place the environment at the center of decision making is environmental education which only geography can provide, doing this will create the right attitude and value for nature. Furthermore, De-Castro and Girona (2021) noted that the United Nations should create necessary awareness on the sustainable development goals to the community of geography in all levels of education as a key related geographic education; hence, they should in turn embrace it to ensure that the message on sustainability reaches the nook and cranny of the world.

Conclusion

The 17 Sustainable Development Goals (SDGs) was adopted by all United Nations member states in 2015 with 169 targets to be reached by 2030 or even sooner. The goals and targets are universal; this implies that all countries around the world must comply. In this regards, it is hoped that countries around the world must as a matter of urgency put in necessary machineries and reactivate all decisions reached at previous global environmental conventions aimed at mitigating all environmental challenges arising from human-induced activities in order to save our planet earth. Since geography education is related to sustainability and the fact that geographers understand human-environment relationships and how to use that information to manage environmental related issues and to protect the planet as a whole. Geography education is therefore the most relevant school subject that can be used in achieving the United Nations Agenda 2030 and Sustainable Development Goals (SDGs).

Recommendations

1. Geography should be taught across all levels of our educational system in order to acquaint all citizens with requisite geographical knowledge on how and why the environment should be cared for.

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2. Geographical societies in schools should be revived and made functional for easy transmission of geographical knowledge and information on environmental issues; this is to ensure that geographical knowledge gets to the grassroots for better sustainability.
3. International and national based Organizations should intensify campaign and enlightenment to citizens on the need to care for the environment.
4. International and State legislations should be enhanced in order to ensure that environmental laws are strictly adhered to for sustainable development.

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