
Global Constraints in Environmental Management

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Abstract

Environmental management is of great concern to the wellbeing of our nations and the global societies at large. However, it is an effective process that describes sustainably practice and or human activities within the environment. Hence, if this principle is not adhered to, then we will be vulnerable to disasters and tragedies, with devastating issues and challenges we can't contend with at present and in the future. Such issues and challenges are as a results of; overpopulation, rapid urbanisation, deforestation, desertification, loss of biodiversity, genetic engineering, public health issues, natural resources depletion. Others include; waste disposal, pollution (land, air & water), global warming as well as climatic variability and natural environmental hazards. Current environmental issues and challenges require prudent and urgent sustainability management and mitigation measures to address these scourge.

Keywords: Sustainability; Resources; Globalisation; Environment; Challenges; Management;

1.0 Introduction

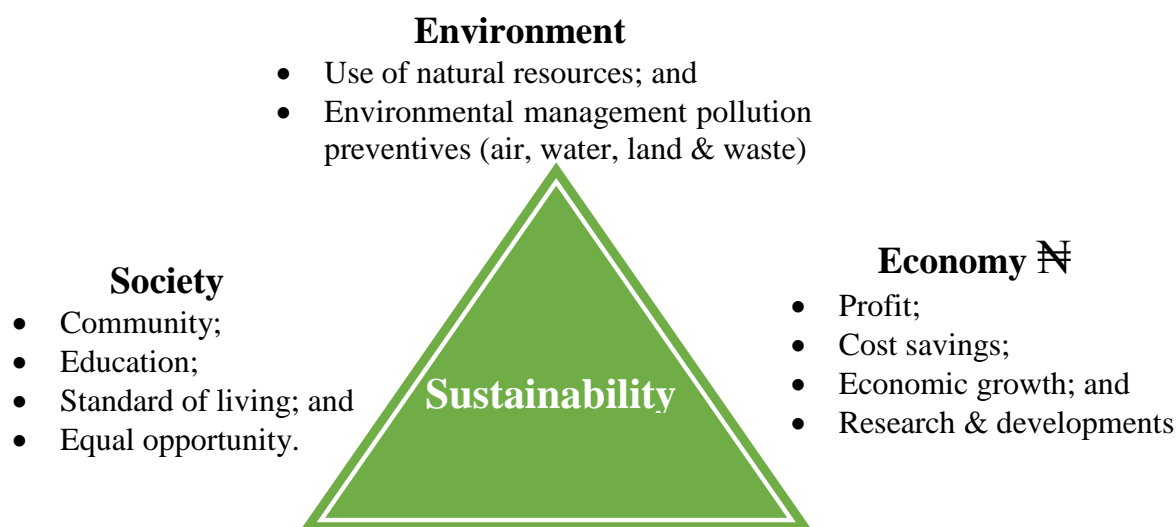
Sustainability can be defined as protecting biodiversity and the environment at present and in the future, for the oncoming generation to thrive by ensuring safe method of utilising the natural environmental available resources (Brundtland Report, 1987 and Saleh M.A, 2015). Similarly this environmental sustainability is dependent on certain indicators, if environmental management is to be achieved (Saleh M.A, 2015). Therefore, environmental management is an effective process that describes sustainably practice and or human activities within the environment. This implies that sustainability is the watchword for proactive environmental management.

1.1 Indicators problem and conflicts

What is an indicator? According to European Environmental Agency (EEA), an indicator can be referred to as certain parameter that can be used to rate or evaluate effects of physical human impact on the biodiversity, the entire ecosystem and the environment at large. The fundamental indicators can be referred to the sustainability iron triangle (Environment, Society and Economics). And each of these indicators has various derivatives sub indicators depending on certain situation to be measured, *figure 1*. (Pauline Thompson, 2008; US EPA, 2012; Sustainable measure, 2013 and Saleh M.A, 2015).

However, indicators and their types identify a particular problem and hence its solution before it becomes unbearable to handle within an environment. Therefore, an indicator is a matrix or a judgement term of saying; "**how much**" or "**how many**" or "**to what extent**" or "**what size.**" Indicators are ways to measuring certain environmental phenomenon, such as sustainability indicators which provides effective information on the interactions between environment as well as socio-economic activities (Saleh M.A, 2015).

Figure 1: Sustainability iron triangle



Source: (Saleh M.A, 2015)

1.2 Environmental Management:

Environmental Management is the act of studying, protecting, conserving and controlling the natural environmental resources. While environmental protection refers to the act of protecting the natural habitats (land, water and air), as well as any other environmental resources, including general conditions and factors that has direct and indirect negative bearing on the lives and the development of organisms to includes humans and animals. According to (Gray, 2010), environmental management has been given the higher degree of concerns during the past decades. Similarly, (Porter & van der Linde, 1995; Everett & Neu, 2000; and Rahaman, Lawrence, & Roper, 2004), researches has indicated that, the various stakeholders both governmental and nongovernmental agencies, parastatals, ministries, organisation, corporate leaders and societal groups, had all engaged in collaborative debates and brainstorming on the way forwards to rescuing and safeguarding the natural environment from its present states of deformation caused by human activities. However, these tasks are enormous to accomplish.

Total attention and considerations must be devoted on the physical environments, in order to limit and to stop further environmental degradations as well pollutions (Ritchie & Hayes, 1998). If these phenomenon are not taking with serious concerns, we run the risks of having the environments and ourselves being destroyed by our own hands. (Hawken, 1993) objected that, for an enduring society, there must be dependency on a system based on commerce and industries laid on restorative sustainability. Thus, to achieving these, individual countries as well as its businesses requires an effective integration of biological, economical and the human system to establish sustainable commercial system in the environment (Beate & Griessler, 2005). Similarly, government and non-governmental agencies and or organisations should incorporate general flexibilities that reward effective and proactively environmental management practices, for transformation to systematic and strategical environmental management activities. (Adegbite, et al. 2012).

2.0 Environmental management and globalisation:

The quest for food from agricultural practices had begun 8,000 year back, and it was a major source to the changes on the natural lands (Torrey, 2004). However, human beings are the

principal actor to the drastic transformation of the environment as far back as 10,000 years. Similarly, urbanisation and the industrial revolutions have footprints on the atmosphere. Thus the present rise in the global population has resulted to the quest for agriculture as well as economic activities. These phenomenon has resulted to globalisation, thereby increases the environmental pressures. Globalisation has many negative effects on the environment, but it's the source to an economic growth of any nation that brought about drastic structural change. Thus, it had been the major source to resource use, but a contributor to environmental pollution levels. Therefore, it can be justified that, the natural environment has been hampered by globalisation drive (Panayotou, 2000 and Festival, 2017).

Globalisation principles aimed at converting available values, assets (cultural and natural) into capital. Apparently, it has become necessary to assess and evaluate globalisation as it leads to ecological changes (Keleş, 2014). The focal points are centred on the depletion of the earths blanket, pollution, and the deterioration of certain natural resources which includes; biodiversity and agricultural vegetation, land/soils, water quality, climatic variability, and air quality. Thus, approximately nearly two (2) billions of arable hectares of agricultural lands, husbandry and pasturing, as well as global forestry, had been degraded over the periods of fifty (50) years. One of the drawbacks of economic instability can be attributed to desertification, as contributor to political uncertainty within the affected landmass. Similarly, according to (Keleş, 2012), it has been estimated that, almost half of the total global wetlands had vanished within the last century, and water demand will rise up to 50% in 30 years' time. So also, half of the global populations will thrive under stringent needs for the quest of sustainable palatable and managing water resources (CEF, 2017).

2.0 Aim and Objective

To critically examine and evaluate environmental issues and their respective implications as well as constraints facing effective implementation of environmental management.

3.0 Materials and Methodology:

3.1 Materials:

The applicability of physical ecological management process, the use of relevant scholarly researches, (published and unpublished) articles, journal, conference and seminar proceedings, and current internet resourced materials and or data.

3.2 Method:

The methodology of this research work involves the use of quantitative and descriptive analytical review and summary of relevant scholarly resourced data. So as to draw logical, comprehensive and effective facts to outlining environmental management issues and its challenges, in cooperated with individual physical and live experiences.

4.0 Results and Discussions:

Environmental constraints can be mitigated and managed through proactive environmental management, which is an effective and systematic mechanism to finding most sustainable and practical approach to solving the rising issues and challenges aimed at minimising the negative environmental impacts. However, some of the major issues and challenges of environmental management includes: Pollutions (water, land air), Global warming, Overpopulation, Natural resource depletion, Waste disposal, Climate change, Loss of biodiversity. Others are; Deforestation, Ocean acidification, Ozone layer depletion, Acid rain, Public health issues, Urban sprawl, Genetic engineering among others.

4.1 Human overpopulation:

This is a phenomenon that explains an unexpected, persistent and drastic rise in human populations around the globe is beginning to reach unsustainable levels, as one of the current environmental constraints. Thus, we are left with the scarcity of vital resources such as palatable water, clean fuels, food sources, physical environmental safety and hygiene. These phenomenon is more attributed or faced by less developed as well as developing countries of the world to over stretch the existing fewer available resources within their environment. Instances are, intensive agricultural practices to produce foods, inflicts serious damages on the environment through the application of chemically processed fertilizers, insecticides as well as pesticides. Similarly, overpopulation hampers the provision of adequate medical facilities for people as well as persistent outbreaks of difficult and unknown cases of outbreak of diseases. Therefore, overpopulation is a phenomenon which will bring about higher competition for acquiring readily available resources within our immediate environment. Thereby, resulting to excessive depletion of these environmental resources, with devastating consequences to human existence at large.

4.2 Deforestation and Diminishing of Biodiversity:

Deforestation is the act of removing by cutting or clearing of green plantation agricultural covers, to provide for space and open land for construction works (residential, commercial purposes and industrial). The growing concerns for shelters, use of timber as fuel charcoals, food and cloths, as a result of increasing human population has led to unethical cultivation and the utilization of available forest resources. And the resulting effects are low production of carbon dioxide, fresh oxygen forest is lacking, deficiency in temperature regulation as well as rainfall. Presently forest cover is rapidly reducing and is diminishing every day from the physical environments. However, human activities are the major cause of species extinction, loss of habitat and the biodiversity. The ecosystem requires symbiotically balancing process of cross pollination, but this is threatened by presence of human activities.

4.3 Natural Resource Depletion:

The earth cannot exist without the natural environments. Depletion of the natural resources is another concern for sustainable living. One of the contributory depletion mechanisms to the natural environment is the consumption of fossil fuel, with resulting consequences in greenhouse gases emission. And thus leads to global warming as well as climatic changes. This phenomenon can only be mitigated by the use of renewable energy sources, in the forms of; wind, solar systems, geothermal, biogas among other major sources. The developed countries are taking rapid steps to installing and maintaining infrastructural facilities for renewable energy sources at whatever cost. But the less developing countries are still lacking behind with this developmental efforts.

4.4 Natural resources pollution (Land, water and air):

The pollutions of the land, water, and air are as a result of human unsustainable practices within the environments. Hence, this has grossly affected the immediate environment, and will take millions of years to mitigate. The fumes from industrial/factories machines, motor vehicular exhaust as well as open burning/combustion of municipal solid wastes and fossil fuels, toxins and various gases are the major contributor for air pollutions. However, pollution can be linked with the presence of heavy metals, toxins, nitrates as well as plastic materials. Thus water pollution is majorly attributed to oil spillage, chemical and nuclear disasters, urban runoff, as well as acid rainfall. While industrial, chemical and radioactive

wastes are the principal causes of land and soil pollutions, this grossly retards the soils from vital and essential nutrients.

4.5 Waste Disposal:

General wastes are any form of disposed items, materials, chemicals, in their liquids and or solid forms. Waste definitions are always subjective as a result of what constitutes waste to an individual and moreover which may represents a valuable sources of resources to another. Waste and disposals are always environmental problems which remain to be of serious concern for both the local inhabitant, state and the central government and the world at large. Solid waste disposal has been a relative problem and an issue affecting the human existence in the environment within every countries landscape. In furtherance, the global populations has rising over the past centuries as well as the bulk of waste that has been generated. The increasing need for urbanisations has contributed immensely towards the increasing bulk of waste generated globally. Similarly, excessive amounts of waste are today duped into the rivers, oceans and sea which is life threatening and hazardous to man and the marine environment, as well as the ecosystem at large. It is also health hazardous to dispose nuclear and electronic waste indiscriminately in the environment.

4.6 Global Warming and Climatic Variability:

Climatic variability is a physical footprint of global warming. And it is as a result of human regular practices within the environment, amounting to the emission of greenhouse gases from waste disposals, gas flaring, industrial activities etc. Global warming is the main cause to the rising temperatures of water bodies and on the earth surface, with a resultant consequences of melting of polar ice caps, unexpected flooding, rising sea and ocean levels, as well as desertification, excessive snowfalls. While climatic change can be defined as direct or indirect involvement of human activities which alters the global atmospheric composition and this is in line with the natural climatic variability considered over a comparable periodic of time. Climatic changes/variabilities impact on the earth causing severe environmental consequences, among which are;

- Apparent Rise of sea levels which will results to flooding of the coast and river deltas communities
- Shrinking mountains of glaciers and the apparent reduction in snow covers that will reduce drastically fresh water resources;
- Sporadically outbreaks of infectious disease and increasing heat associated mortality
- The possibility of losing the biodiversity with negative effects on the ecosystems; and
- Low yield and productivity on agricultural plantations etc.

Greenhouse gases (GHGs). GHG can be refers to as “heat trapping gases,” GHGs exists in both natural and man-made forms that traps heat from the atmosphere and then result to greenhouse effects. However several chemical compounds exist within the global atmosphere in the forms of GHGs. These GHGs permits the passage of direct sun lights which however have relatively short wave energies (visible & ultraviolet spectrums) which reaches the earth surfaces unimpeded. Similarly, as a result of mining activities, burning of naturally existing forest land and the persistence burning of coals as fuels and industrial activities. The carbon cycle is consequently been distorted. And this is the effect of moving carbon in its solid states to gaseous form, subsequently increases concentrations in the atmosphere, and however creates global warming and then its resultant effects leads to the phenomenon called climatic change or variability.

4.7 Acid Rain and Ocean Acidification:

The availability of certain pollutants within the atmosphere are the resultant consequence of acid rain. Similarly, the release of sulfur dioxides as well as nitrogen oxides into the atmosphere, from fossils combustion or as a result of volcanic eruptions, or from rotten agricultural plantations calls for acid rain. Major effect of acid rain is serious health implications on human beings, animals and the aquatic lives. Ocean acidification leads to continuous decrease in the pH of water bodies caused by plankton, shellfish and human activities of the use of fossil fuels, contributing to the up taking of carbon II oxides (CO₂) from the atmosphere.

4.8 Genetic Engineering:

The back bone to human, animals and organism survival in the environment is the food chain. However, the quest for food resulting from increasingly higher population rates of humans has brought about genetic modification of essential food items via biotechnology process. Thus, genetically modified foods have over the years brought about bumper yields and harvest in both plant and livestock farming. However, this has several risk some of which are; the increasing rate of toxins and diseases due to allergic transfer of genes from plant to target plans. Similarly, genetically modified genes account for toxins in wildlife resources, as well as organism. So also, a major concern for genetic engineering is that, organism has higher probability of developing resistance to antibiotics for the use of insect resistance plants.

5.0 Conclusion:

Protecting biodiversity and the environment at present and in the future, for the oncoming generation to thrive by ensuring safe method of utilising the natural environmental available resources is referred to sustainability. While environmental Management is the act of studying, protecting, conserving and controlling the natural environmental resources. Some of the major issues and challenges of environmental management includes: Pollutions of water, land and air, global warming, overpopulation, natural resource depletion, waste disposal, as well as climate change, loss of biodiversity. Others includes; deforestation and desertification encroachment, ocean acidification, ozone layer depletion, acid rain, public health issues, urban sprawl, and genetic engineering among others. The quest for globalization threatens the existence of the entire environment and ecosystem, as well as the future of all living organisms. However, sustainability is the only available effective means to global environmental issues and its rising challenges.

6.0 Recommendations:

- The introduction and enforcement of an effective global environmental policies and practices with efficient monitoring process;
- It should be made mandatory to inculcate environmental education and awareness into the minds and practices of humans at all levels of educational institutions (formal and informal).
- Government and stakeholders of countries should come up with vibrant, effective and sustainable ecological friendly developmental decision making;
- It is high time we switch on to the use of sustainable renewable energy source and put an end to the use of fossil fuels; and
- Environmental Impact Assessment (EIA) as well as Best Practice Environmental Options (BPEO) should be the watch word prior and during any physical projects within the environment at large.

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References.

- Abdul-Rahman, A. A., Sunday, O. A., Idowu, O. O., & Oyefuga, I. O. (2012). Sustainable Development Policy and Corporate Social Responsibility in Business Organisations in Nigeria. *Journal of Sustainable Development*, 5(6), pp83-89. [online], available: <http://dx.doi.org/10.5539/jsd.v5n6p83> [accessed 19th June 2017]
- African Development Bank (2007) Tunisia [online], available: www.afdb.org [accessed 11th June 2017]
- Africare (2017) Challenges of Environmental Sustainability Development in Africa. [online], available: <https://www.africare.org/the-challenge-of-environmentally-sustainable-development-in-africa/> [accessed 5th July 2017]
- Beate, L., & Erich, G. (2005). Social sustainability: a catchword between political pragmatism and social theory. *International Journal of Sustainable Development*, 8(1/2), pp65-79. [online], available: <http://dx.doi.org/10.1504/IJSD.2005.007375> [accessed 29th June 2017]
- Everett, J., & Neu, D. (2000). Ecological modernisation and the limits of environmental Accounting. *Accounting Forum*, 24, pp5-29. [online], available: <http://dx.doi.org/10.1111/1467-6303.00027> [accessed 4th July 2017]
- Festivals (2017) *Environment Problems* [online], available: <http://www.weide19461946sj.com/list-of-15-major-environmental-problems/> [accessed 4th July 2017]
- Gray, R. (2010). Is accounting for sustainability actually accounting for sustainability and how would we know? An exploration of narratives of organisations and the planet. *Accounting, Organizations and Society*, 35(1), pp47-62. [online], available: <http://dx.doi.org/10.1016/j.aos.2009.04.006> [accessed 16th June 2017]
- Harnessing Technologies for Sustainable Development– United Nations Economic Commission for Africa
- Hawken, P. (1993). *The Ecology of Commerce*. New York, NY: Harper Business. PMCid: PMC1015374
- Keleş, R. (2014). Sanayileşme ve çevre etiği. Paper presented to the 17th Congress of National Public Health, Edirne, Turkey.
- Keleş, R. (2012). The quality of life and the environment. *Procedia – Journal of Social and Behavioral Sciences*, 35: 23-32
- Millennium Development Goals Report 2007– United Nations Development Program- [online], available: www.undp.org/mdg [accessed 7th June 2017]
- Panayotou, T. (2000). Globalization and environment. [Online], Available: <http://archive.unu.edu/interlinkages/eminent/papers/WG1/Panayotou.pdf> [accessed 7th June 2017]
- Pauline Thompson (2008) *Measuring sustainability*. In: Pauline Thompson sustainability in civil engineering. 2nd ed. School of Energy, Geoscience, Infrastructure and Society Heriot-Watt University, Edinburgh. United Kingdom
- Porter, M., & van der Linde, C. (1995). Green and competitive: ending the stalemate. *Harvard Business Review*, pp121-34.

- Rahaman, A. S., Lawrence, S., & Roper, J. (2004). Social and environmental reporting at the VRA: institutionalised legitimacy or legitimation crisis? *Critical Perspectives on Accounting*, 15(1), pp35-56. [online], available: [http://dx.doi.org/10.1016/S1045-2354\(03\)00005-4](http://dx.doi.org/10.1016/S1045-2354(03)00005-4) [accessed 2nd July 2017]
- Ritchie, I., & Hayes, W. (1998). *A Guide to the Implementation of ISO 14000 Series on Environmental Management*. Prentice Hall, NJ.
- Saleh Mamman Abdullahi (2015) *sustainability in civil engineering*, [MSc. Research Module].
Available at: School of Energy, Geoscience, Infrastructure and Society. Heriot Watt University Edinburgh, United Kingdom. [unpublished]
- Special Report on The Regional Impacts of Climate Change–An Assessment of Vulnerability Intergovernmental Governmental Panel on Climate Change (IPCC): [online], available: <http://www.grida.no/ipcc/regional/006.htm> [accessed 3rd July 2017]
- Sustainable measure (2013) what is an indicator of sustainability? [online], Available: <http://www.sustainablemeasures.com/node/89> [accessed 28th June 2017].
- Torrey, B. B. (2004). Urbanization: An environmental force to be reckoned with. [online], Available:
<http://www.prb.org/Publications/Articles/2004/UrbanizationAnEnvironmentalForceToBeReckonedWith.a> [accessed 28th June 2017].
- United State Environmental Protection Agency (2012) a frame work for sustainability indicator [online], available: <http://www.epa.gov/sustainability/docs/framework-for-sustainability-indicators-atepa.pdf> [accessed 19th June 2017]
- World Commission on Environment and Development (1987) *our common future*, 1st ed. oxford New York: Oxford university press
- World Development Indicators (2006) World Bank Group. [online], available: data.worldbank.org/products/data-books/WDI-2006 [accessed 16th June 2017]