

# **ADDRESSING GLOBAL WARMING MENACE THROUGH ENVIRONMENTAL EDUCATION AND TAXATION: THE CURRENT STATUS AND WAY FORWARD**

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## **ABSTRACT**

*Reports indicated that tax systems in several countries have not adequately provided policy reforms that supported levying taxes across the sources of emission of harmful substances, aligning taxes with redundant external damages and scaling back redundant energy taxes. Another complaint in several quarters had been that environmental education was yet to be adequately employed in attempts to control environmental pollution. To address these issues, many international organizations developed some strategies aimed at using environmental taxation, to the neglect of education, to mitigate the impact of global warming and climate change in their environments. This paper reviewed literature and highlighted the updates on the achievements recorded so far, particularly by Nigeria. It employed the content analysis research design. It found that in spite of the efforts made so far and huge resources committed to this project, every region in the universe experienced some form of climate change and that Nigeria remained one of the most hit by climate change effects. This study noted that climate change would likely increase in all the regions of the globe in the coming decades with devastating consequences if adequate remedial actions were not taken. The study recommended that the inherent complexities and uncertainties of climate change be met by applying an iterative environmental education framework to significantly reduce greenhouse gas emissions. In addition, there is need for reforms and enactment of relevant laws in order to capture the environmental tax regime in Nigeria.*

*Keywords: Global warming, Climate change, Accounting, Environmental taxation, Environmental education, Nigeria.*

## **1. Introduction**

Accounting regulations and the tax system are generally known to be interrelated. Gabriela, Simona and Nicoleta (2012) point out that, while accounting reflects tax obligations, tax regulations point at book profits as they define the taxable portion of a firm's income as reported in the financial statements. The principles of taxation often have the objective of stimulating or discouraging certain activities. Stoian (2001) cited in Gabriel et al. (2012) reports that Directive IV of the EEC established interdependence between accounting and the fiscal right.

Earth environment is a rich heritage passed over to the present generation by previous generations (Bassey, Effiok & Eton, 2013). The present civilization has involved the human communities in varied activities. Many of these activities generate wastes which have potential constituents. According to Pramanil, Shiland and Das (2007), the ultimate disposal of these wastes has caused environmental pollution in many parts of the world. The magnitude of this environmental pollution has already reached an alarming stage.

Arlinghaus and Van Dender (2017) report that governments around the world face mounting environmental challenges currently. These challenges include the global problem of climate change and more local issues such as air and water pollution and waste management. The recognition of the need to take action to limit emissions of greenhouse gases and further reduce emissions of local air pollutants has continued to increase (Williams, 2016). People are becoming more conscious of the fact that using traditional command-and-control environmental regulation to accomplish those goals would be costlier. Environmental taxes are seen to be having the

potential to address both of those issues, providing a source of new tax revenue and a cost-effective way to reduce pollution emissions.

According to Amokaiye (2012) cited in Elebiju (2020), the use of law particularly taxation to regulate environmental pollution is not new. Economic techniques involve the use of economic incentives and disincentives as well as mechanisms such as fines, effluent fees, pollution tax, licenses, user charges, loans and grants to bring down the level of pollution to desired standards. Why pollution is encouraged is because the polluter can discharge effluent at no cost to himself even while a cost accrues to others. Amokaiye (2012) reasons that the introduction of pollution tax and other disincentives is aimed at discouraging firms and individuals from causing pollution. That is done not by persuasion or by prohibiting activity through legislation but by imposing a price or economic cost on such conduct. Through this process, environmental cost is internalized into the production process. The business firms that intend to maximize profits will find ways of polluting less, instead of paying more.

In spite of the efforts of the international community to contain the global warming menace, climate change is seen to be taking place rapidly. Temperatures have continued to rise; drought and wild fires are beginning to occur more frequently, rainfall patterns are shifting, glaciers and snow are melting and the global mean sea level is on the increase (National Research Council, 2011). The environmental, economic, and humanitarian risks posed by climate change make a serious case for substantial action to be taken now to limit the magnitude of climate change and to prepare for adapting to its impacts.

## **2. Review of related Literature**

### **2.1 Conceptual Review**

### **2.1.1 Global warming and climate change**

Global warming is a concept that has to do with a gradual increase in the overall temperature of the earth's atmosphere. This is generally attributed to the greenhouse effect that is caused by increased levels of carbon dioxide and other pollutants. The principal causes of global warming are changes in the sun's intensity, industrial activity, agricultural activity, deforestation and earth's own feedback loop. Higher temperatures worsen many types of disasters, including storms, heat waves, floods, and droughts. A warmer climate creates an atmosphere that can collect, retain, and drop more water, changing weather patterns in such a manner that wet areas become wetter and dry areas drier. Carbon dioxide is the principal global warming gas.

Climate change is a long-term change in the earth's weather patterns caused by some greenhouse gas emissions (Coppolino, 2019). While climate change includes rising global temperatures, it also comprises many other impacts which those greenhouse gases are having on the planet. It even includes some regions becoming colder. The term refers to unexpected, abnormal, and longer-term changes brought on by human activity.

Even though both of them are often used interchangeably, global warming and climate change are two distinct processes which cannot be totally separated. Both terms have been a part of the climate science lexicon for some time, even stretching back some 100 years. While global warming refers to a single process (rising global temperatures due to increased greenhouse gas production), climate change encompasses all the symptoms experienced as a result of pollution and greenhouse gas production damaging and altering human environment. Global warming connotes a steady and consistent rise in global temperatures and is therefore only one aspect of the broader phenomenon of climate change. Although the earth's temperature fluctuates over long periods of time (hundreds

to thousands of years), the term global warming most commonly refers to the rising temperatures brought on by human activities over the last 100 to 150 years. This increase is caused by an excess of greenhouse gas emissions (carbon dioxide, nitrous oxide, methane, ozone, and water vapor) in the earth's atmosphere - mainly due to the burning of fossil fuels since the industrial revolution. As the level of emissions trapped in the earth's atmosphere continues to rise, so do global temperatures. These gases build up and trap in heat from the sun. If not for those gases, that heat would normally be radiated back out into space. Instead, the sun's energy stays within the earth's atmosphere, causing the hothouse (greenhouse) effect. This was first observed by Arrhenius back in the 1800s. Every year over the past decade, CO<sub>2</sub> concentrations (the most common greenhouse gas) have been steeply rising and are now at their highest levels in more than 60 years of observation. 2018 was also the fourth hottest year on record globally, and the 3rd, 2nd, and number 1 hottest year last decade.

### **2.1.2 Greenhouse gas (GHG) emissions**

The United Nations Framework Convention on Climate (UNFCCC) (1992) cited in Okubor (n.d, p.11) defines greenhouse gases as some 'gaseous constituents of the atmosphere both material and anthropogenic, that absorb and re-emit infrared radiations'. Greenhouse gas (GHG) emissions include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydro- and perfluoro-carbons (HFCs, PFCs) and sulfur hexafluoride (SF<sub>6</sub>) emissions from fuel combustion, process reactions and treatment processes. The climate change issue related to increasing concentrations of greenhouse gases is a global concern. As it is closely linked to emissions from energy sources, it is relevant across businesses. The amount of GHG emissions to air from fuel combustion, process reactions and treatment processes, including CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs and SF<sub>6</sub> are reported in

metric tons of CO<sub>2</sub> equivalents in connection with the value added to get the net value added per unit of metric ton contributed to global warming.

### **2.1.3 Environmental taxation**

Ballandras-Rozet (2021) considers environmental taxation as the main foundations of which are the theory of internalization of externalities and the polluter-pays principle. It has not only a financial but also an economic purpose. It is a behavioral tax which contributes to taxpayers' awareness of the harmful effect of their activities on the environment. Environmental taxation is a monetary response to major environmental issues by developing tools that focus on energy, transport, pollution and natural resources. Over and above its binding nature, it includes dissuasive and incentive measures such as pollution permits, subsidies, subsidies and incentive pricing.

Environmental taxes are a part of the available environmental policy instruments. According to Köppl and Schratzenstaller (2021), two basic categories of environmental policy instruments can be distinguished. They are market based (e.g., fiscal) instruments and non-market-based instruments. The non-market-based instruments are regulatory instruments. The market - based instruments, in turn, can be differentiated into incentives that make environmentally undesirable behavior more expensive (taxes, emissions trading) or that promote environmentally desirable behavior (environmentally beneficial tax incentives, subsidies, grants) ( Köppl & Schratzenstaller, 2021). Market-based instruments seek to address the market failure of environmental externalities. They do this either by incorporating the external cost of production or consumption activities through taxes or charges on processes or products, or by creating property rights and facilitating the establishment of a proxy market for the use of environmental services. (OECD, 2007 cited in Arlinghaus & Van Dender, 2017).

By internalizing external costs, the damage caused by pollution is reflected, or at least better reflected, in market prices. Market-based instruments differ from regulation-based approaches to reducing environmental damage because the latter do not directly modify prices, even if compliance of course is costly in general. Arlinghaus and Van Dender (2017) argue that the market-based instruments in general are among the more cost-effective environment policy instruments. The authors opine that market-based instruments should form part of an environment policy package that aims to deliver environmental improvements at the lowest cost. This kind of instruments also interact with broader tax and fiscal policy. A strong advantage of market-based instruments is that the revenues accruable from them can be used in several ways, many of which are socially beneficial. However, the risk exists that revenues would not be used well, in which case the appeal of market-based instruments declines considerably (Arlinghaus & Van Dender, 2017).

Environmental taxes are a subset of market-based instruments. They are taxes “whose tax base is a physical unit (or a proxy of it) that has a proven specific negative impact on the environment. Four subsets of environmentally related taxes are distinguished, namely energy taxes, transport taxes, pollution taxes and resources taxes (OECD, 2005 cited in Arlinghaus & Van Dender, 2017). Tradable pollution permit systems similarly put a price on processes or products with a proven negative environmental impact. Environmental taxes are taxes that aim to improve alignment of tax rates with (marginal) external costs.

### **2.1.6 Environmental Education**

One of the greatest challenges of man is ignorance. Very little number of people give thought to environmental education as an indispensable component of good environmental management practices. Many countries of the world dissipate reasonable efforts in imposing regulations to

control environmental pollution with near neglect to environmental education. Mbah (2019) opines that efforts in controlling environmental pollution must be matched with adequate education of the entire citizens and corporate bodies. Since education entails process of change, inculcating good environmental consciousness in the minds of the society has the propensity to produce a reorientation capable of making meaningful impact in the global quest for environmental control. If well coordinated, it can give amazing results with associated cost savings. Previous efforts in environmental control without adequate education appear not only incomplete but defective in approach. While environmental taxation and other regulations enforce physical discipline in the management of environment, education goes beyond that to address the consciousness of the society.

## **2.2. Theoretical Review**

### **2.2.1 Corrective Taxation**

The idea of using taxation to correct negative externalities, such as pollution, is generally credited to Pigou (1920). Such corrective taxes are sometimes referred to as Pigouvian taxation (Köppl & Schratzenstaller, 2021). A negative externality is a case in which production or consumption of some good harms someone other than the buyer or seller of that good. This represents a market failure since the buyer's and seller's decisions fail to take into account that external cost. Consequently, an unregulated free market will generally result in an inefficiently high quantity of any good with an associated negative externality. This theory claims that imposing a tax on the externality-generating good is capable of correcting the externality. It posits that if the tax rate is made equal to marginal external damage (the total harm to parties apart from the buyer and seller from one additional unit of the good), that external cost is brought into the transaction. There is, therefore, an assurance that the buyer pays the full marginal social cost of the good. Consequently,

the incentive provided by the tax ensures that the market produces the efficient level of the good (in the absence of any other uncorrected market failures).

However, a complication would arise if the marginal external damage from a good varies based on who produces the good or how it is produced. For instance, the carbon dioxide (CO<sub>2</sub>) emissions from a megawatt-hour of electricity produced from a power plant that burns natural gas are much lower than the CO<sub>2</sub> emissions if the same quantity of electricity is produced by burning coal (and much lower still if produced by a wind turbine). All the same; it is easy to incorporate that apparent complication into this simple theory, either by considering them as different goods (and thus charging different tax rates on electricity produced from different sources) or, by viewing CO<sub>2</sub> emissions as the good with the negative externality, and imposing a tax per ton of CO<sub>2</sub> emissions. In the same manner, if the marginal damage from local air pollutants varies based on where those pollutants are emitted, then emissions in different locations ought to face different tax rates (Köppl & Schratzenstaller, 2021).

### **2.3 Empirical review**

Beredugo and Mefor (2012) evaluated the relationship between environmental accounting and reporting and sustainable development in Nigeria. Pearson correlation coefficient and Ordinary Least Squares were employed for data analyses. The results of the study show that there is a significant relationship between environmental accounting and reporting and sustainable development, that environmental accounting encourages organizations to track their GHG emissions and other environmental data against reduction targets, and there are consequences for non-compliance with environmental accounting and reporting.

Schaltegger and Sturm (1989) posit that the aim of environmentally sound management is to increase environmental report by reducing the environmental impact while increasing the value of an enterprise.

Middleton (1995) asserts that the benefit from mining must be worth the impact of mining on the environment and damages done to the environment if the environment could be restored. Emphasis on social contract theory and quality of life theory holds the notions that sovereignty resided in the people for whom governments were trustees and that such governments could be legitimately overthrown if they failed to discharge their functions to the people (Katznelson, 2008).

Ramanathan (1976) further explained the relationships of Social contract theories, viewing a company as an integral part of the society that the society supports and is expected to follow the law of that society. It is expected that they contribute to the society proportionately enough to what the society has given to them.

Castiglione et al (2014) assert that the effect of taxes on environmental quality and on economic performance were addressed by several studies, namely Ekins (1999), Ekins and Barker (2001), European Environment Agency (2005), Kosonen (2010), Scringeour, Oxley and Fatai (2005), among others. Those studies found a positive impact of environmental taxation in European economies. Some other studies highlighted in Castiglione et al. (2014) observed a lot of evidence of the importance of the degree of economic development for environmental awareness. The studies in this group include Dasgupta, Mody, Roy and Wheeler (2001), Dind (2004), Galeotte, Lanza and Pauli (2006). They found that economic growth increases the demand for environmental protection. According to Castiglione et al, (2014), when considering environmental quality one should keep in mind both the positive and negative tendencies.

According to Arlinghaus and Van Dender (2017), a recent study for 27 EU countries employed the macro-econometric E3ME model to investigate the effect on growth and employment of shifting taxes from labor towards fossil fuels and carbon emissions, while also increasing standard and reduced VAT rates and raising taxes on electricity and water use for large users. A total of EUR 554bn was shifted from labor towards natural resources and consumption, which is equivalent to 13% of labor tax revenue. The outcome was a 5.6%-point reduction of average personal income tax rates. The econometric model suggests that gradually introducing the tax shift over the period 2016 – 2020 would increase employment by 3% in 2020, GDP would rise by 2%, while water use, energy use and carbon emissions would decline by more than 5%. The implication was that there would be a substantial double dividend.

According to Organization for Economic Co-operation and Development (OECD) (2011), environmentally related taxes account for approximately 5% of total tax revenues in the OECD countries. Those taxes are collected to shrink the tax base as against the aim of other taxes to increase revenues at minimal cost to the base. Golusin et al, (2013) suggest that increasing revenues from environmental taxes should be interpreted with caution, as such increases may have been caused by the introduction of new taxes or an increase in tax rates, or alternatively may be linked to an increase in the tax base.

Williams (2016) investigated potential environmental tax policy reforms. The author focused primarily on carbon tax but also considered a range of other possible changes, such as potential changes to the taxes on motor vehicle fuels which are the largest environmental taxes in the US. The results of the study showed that an efficient carbon tax should be imposed on the carbon content of fossil fuels at a rate equal to the social cost of carbon estimated at roughly \$45/ton and

would rise slowly overtime. The study projected the rise of the cost of carbon over time by roughly 1.5% to 2% a year.

Nguyen, Nguyen and Ha (2020) investigated the relationship between the level of environmental financial accounting practices (EFAP) and cost of capital. The population of the study was 1.188 firm-year observations but 408 firm-year with less than 2 years of information was excluded to calculate EFAP. 73 firm-year was without sufficient financial accounting information to calculate the cost of capital and 35 firm-year was without sufficient financial accounting information to calculate control variables. The paper used a sample of 672 firm-year observations of listed companies on the Vietnam stock market for 5 years from 2013 to 2017. Two-stage regressions with the lag term were adopted to address econometric issues and to improve the accuracy of the regression coefficients. The results showed that Vietnamese firms with higher EFAP performance were capable of rapidly reducing their cost of capital.

Ganda and Garidzirai (2020) employed a system-Generalised Method of Moments (GMM) framework to evaluate the environmental impacts of tax systems in selected 28 EU economies from 2010 to 2017. The results of the study demonstrated that aggregate environmental tax was not effectively lowering greenhouse gas emissions as expected, although it improved environmental sustainability. The authors blamed the situation on the possibility that the environment tax revenue collected in the European Union countries was not used to enhance energy efficiency; hence it could not lower greenhouse gas emissions. Köppl and Schratzenstaller (2021) provided a detailed overview of the theoretical and empirical literature on the effects of carbon taxes. The study focuses on the most important impact dimensions of carbon taxes: environmental effectiveness, effects on important macroeconomic variables (especially growth

and employment), effects on innovation and competitiveness, distributional effects, and public acceptance.

### **3. Materials and Methodology**

Materials were gathered from extant journals, conference materials, research work papers, seminar papers. The study adopted table content analysis methodology.

## **4. The Current Status of Global Warming and Climate Change and Way Forward**

### **4.2. Current levels of global warming and the predictions about the future**

As the concentration of greenhouse gases in the earth's atmosphere increases, heat is trapped. This leads to an overall warming of the globe and other related changes to the climate. The most important of the greenhouse gases is carbon dioxide. This is emitted primarily through burning fossil fuels. Other types of greenhouse gases like methane are equally important. A tax on such emissions would be a cost – effective means for minimizing such emissions.

According to Ganda and Garidzirai (2020), the European Environmental Agency had in 2019 reported that there was still the necessity to continue implementing zero-carbon practices in European Union (EU) countries even though there was already a noted decrease of 22% in emissions when compared to their 1990 levels.

### **4.3 Nigeria's environmental challenges and climate action**

Nigeria faces a wide range of environmental challenges. Some of the specific phenomena include Climate Change, deforestation and de-vegetation, causing biodiversity loss and land degradation; floods, drought and desertification which are degrading the environment especially in the semi-

arid areas of the country; environmental pollution encompassing air, water, land and noise; waste generation; mineral excavation and the accompanying environmental degradation as well as limited access to safe water and poor sanitation

Nigeria is one of several African countries having a growing youth climate movement (Dunne, 2020). It is the most hit by climate change effects which range from floods to droughts down to heat wave. This leads to loss of lives and livelihoods Nigeria is part of the three negotiating blocs at international climate talks. The country's annual greenhouse gas emissions were reported to be 506m tonnes of CO<sub>2</sub> equivalent in 2015, based on the data compiled by the Potsdam Institute for Climate Impact Research (PIK).

#### **4.4 Efforts made by the international community to address the menace of global warming and climate change**

The United Nations Environment Program (UNEP) and the World Meteorological Organization (WMO) established a body called the Intergovernmental Panel on Climate Change (IPCC) in 1988 for assessing the science related to climate change. This UN body was put in place to provide political leaders with periodic scientific assessments concerning climate change, its implications and risks. Another objective for creating IPCC is to put forward adaptation and mitigation strategies. In that same year that the IPCC was formed, the UN General Assembly endorsed the action by the WMO and UNEP in jointly establishing the IPCC. The IPCC has 195 member states. Thousands of experts from all over the world contribute to the work of the IPCC. For the assessment reports, IPCC scientists volunteer their time to assess the thousands of scientific papers published each year in order to provide a comprehensive summary of what is known about the

drivers of climate change, their impacts and future risks as well as how adaptation and mitigation can reduce those risks.

There exists a UN-wide campaign called Greening the Blue. Greening the Blue was established to support the move towards environmental sustainability. Working in liaison with all UN organizations, Greening the Blue seeks to engage staff across the UN and share best practice internally and externally. In addition, it publishes the annual Greening the Blue report, which details the UN System's environmental footprint and the efforts being made to reduce it.

The European Environmental Information and Observation Network is another body that collaborates with the European Environment Agency (EEA) to gather data and produce assessments on a wide range of topics related to the environment. The EEA provides sound, independent information on the environment for those involved in developing, adopting, implementing and evaluating environmental policy, and also the general public.

## **5. Observations and Discussion**

This paper observed that environmental values are gradually being reflected in corporate accounting across the globe. Nations, especially developed countries have begun to create a new network of relationships which are developed between environmental accounting and economic measures of environmental protection. The ISAR is not relenting in formulating detailed guidance for a number of environmental items which could be considered by the board of directors of companies for disclosure in their report or management discussion. However, the latter are still generally reluctant to imbibe the new culture of reflecting environment accounting in their final accounts.

Environmental taxation is still considered to be a controversial policy instrument, notwithstanding that a huge number of countries in the European Union and OECD have accepted it as a means of not only protecting their environments but also as an avenue for boosting their tax revenue. It is still contentious whether environmental taxes should be put in place in developing countries. Further, the findings demonstrate the interdependence of economic development and environmental quality. The role of institutional enforcement is also being emphasized as a *sine qua non*.

Environmental education was discovered to be obviously absent from previous efforts in combating environmental pollution. This appeared to have limited the expected results on the impact.

Finally, the connection between economic development and environmental awareness is considered to be inevitably requiring the application of functional environmental policies.

## **6. Conclusion and recommendations**

This study concludes that environmental pollution has become a global menace. The search for its solution is still a work in progress. In view of this, the following recommendations are made:

1. There is need for reforms and enactment of relevant laws in order to capture the environmental tax regime in Nigeria. Public enlightenment and awareness are equally required in order to make such legislations effective.
2. In alignment with National Research Council (2011), that the inherent complexities and uncertainties of climate change be met by applying an iterative environmental education framework to significantly reduce greenhouse gas emissions.

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