

Chapter

12

GREENHOUSE GAS EMISSIONS CONTROL: ENVIRONMENTAL TAXATION, AND THE CARBON TAX OPTIONS

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12.1 INTRODUCTION

Over the past decades, there have been emissions of great magnitudes of greenhouse gases into the earth's atmospheric environment due to anthropogenic activities, and this has been going on internationally since 1800. These gases include chlorofluorocarbons (CFC), carbon dioxide (CO₂), methane (CH₄), and nitrogen oxides (NO_x) which soaks up the radiation in the earth's atmospheric system, and excess of it often affects the environment and leads to the warming of the earth's surface. Greenhouse gas emissions are caused by environmental harmful practices such as gas flaring, deforestation, bush burning, smoke from generators and vehicular movement, burning of coal amongst others. Amongst these gases, the concentration of CO₂ has increased notably in the past century. Pollution of the environment through production and consumption patterns that releases greenhouse gas emissions is encouraged because the polluter can pollute and degrade the environment at no cost to himself while a cost accrues to others. The introduction and implementation of environmental taxation (taxes, fines, levies and charges) and other disincentive principally seeks to discourage firms and individuals from polluting and degrading the environment not by persuasion, but by putting a price or financial cost on such behaviour. By this method, environmental costs are internalized into the production process. Firms who desire to maximize profits will devise means of polluting less, rather than paying more. It is believed that to keep the economy efficient, businesses should be compelled, by taxation to "internalize" the costs they impose on other activities (externalities). This view is hinged on the thought that the pollution an industry generates is a cost of that industry, and that for that cost to be paid for by other people is to create a subsidy for that industry. This study therefore, seeks to examine the reduction of greenhouse gas emissions through the concept or policy of environmental taxation. To achieve its aim, the study is divided into six parts namely: introduction, principles and practice of environmental taxation (including types of environmental taxes), reasons for using environmental taxes, the carbon tax option: theory and practice (including factors to consider in the implementation of carbon tax), location and existence of environmental taxes in Nigeria: implementation of a carbon tax regime, conclusion and recommendations.

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With the advent of science and technology, the nature, magnitude and impact of polluting activities began to expand. Science and technology made it possible for man to harness energy from burning fossil fuels to drive machines. They were developed at an ever-accelerating pace, developing more and more products, including chemicals to meet the ever-increasing and insatiable demands of the marketplace. The waste products from these new industries were discharged directly into the environment. As industries multiplied, so did the waste products of combustion and manufacturing processes, creating environmental problems of disposal of nuclear and other hazardous substances.¹ Entry of these pollutants causes disturbances in an ecosystem which manifest themselves into a chain of adverse reactions often very complex in nature.²

The scope of environmental pollution also increased to accommodate new ones such as atmospheric pollution, acidic rain, water and marine pollution, soil pollution, noise pollution, climate change and deforestation. The result being that humankind lives today in an environment where all life-supporting elements are polluted. The air we breathe in is no longer healthy. The water we drink is impure and decreases in volume and quality daily. The food we eat is contaminated. Humankind continues to witness persistent drought, low harvest, diseases and poverty as a result of climate change, deforestation, accumulation and disposition of nuclear and other hazardous substances. These ominous trends are symptoms of an unhealthy planet; a planet that can no longer cope with all the demands man is heaping upon it. The direct and indirect effects of natural and anthropogenic perturbations are manifested in early death, diseases, physical deformities, genetic mutations and physiological malnutrition suffered by humankind. In developing countries where poverty, diseases and population explosions are prevalent, environmental issues become more confused and complex. The effects on the plants, animals and ecosystem are equally devastating and condemnable.³

One of the obvious results of the several dimensions of environmental polluting activities is global climate change. Global climate change has been recognised as indisputable. Many of the changes observed, including warming of the atmosphere and ocean, diminished amounts of snow and ice, rising sea levels and increased concentrations of greenhouse gas emissions are due to the drastic increase in global levels of greenhouse gas emissions resulting from human activities with the overall effect of increase in global temperatures of more than half a degree Celsius. Greenhouse gas

1 Oludayo, G. A., (2012). "Environmental Pollution and Challenges of Environmental Governance in Nigeria" *British Journal of Arts and Social Sciences*, 10 (1), 26-41:28.

2 Emma, I. O., & Cletus, O. A. (2010). "The Pigovian Tax, Market for Pollution Rights and Environmental Pollution Control in the Niger-Delta Region of Nigeria" *Journal of Business and Financial Studies*, 2(1), 60-75:64.

3 *Ibid*, pp. 28-29.

(GHG) levels and, consequently, global temperatures remain on the increase, which has led to worldwide consensus that GHG emission levels must be stabilised. This consensus is evidenced in the adoption of the United Nations Framework Convention on Climate Change (UNFCCC), which has as its ultimate objective the 'stabilization of greenhouse gas concentrations (so as to) ... prevent dangerous anthropogenic interference with the climate system'.⁴

The Kyoto Protocol to the UNFCCC was subsequently adopted and came into effect in 2005. The Kyoto Protocol gives effect to the ultimate objective of the UNFCCC and required that the (developed country) parties included in Annex I to the UNFCCC reduce their overall emissions of specific GHG emissions by five percent below 1990 levels between 2008 and 2012 (the first commitment period).⁵

The primary GHG contributing to climate change is carbon dioxide, which has been identified as 'the most important anthropogenic greenhouse gas' and is produced primarily through the combustion of fossil fuels in order to generate energy.⁶ Global warming resulting from the emissions of CO₂ and other chemical substances in the atmosphere is a serious challenge to the global community. Regardless that developed countries are the worst culprits generating activities that cause global warming, the challenge for safe environment is exacerbated by the unregulated environmental pollutions taking place in some third world countries. This state of affair is, undoubtedly, worse in developing countries that produce oil and gas in commercial quantities. For instance, in Nigeria, gas flaring and other questionable exploratory activities are prevalent in the country causing untold environmental deterioration and economic hardship.⁷ Rapid growth of industrialization, urbanization and increasing demand of food are main driving force behind the increase in concentration of carbon dioxide in the atmosphere. Carbon dioxide has harmful climatic effect to our environment if it crosses a threshold level. Threshold concentration of carbon dioxide is that below which there are no visible harmful effects to our environment.⁸

Environmental challenges resulting from human environmental polluting

- ⁴ Louise, D. T. (2014). *Promoting Renewable Energy in South Africa through the inclusion of Market-Based Instruments in South Africa's Legal and Policy Framework with particular reference to the Feed-In Tariff*. PhD Thesis, Department of Public Law, Faculty of Law, University of Cape Town, p. 1; See United Nations Framework Convention on Climate Change (1992) 31 ILM 849 ('UNFCCC'); See Anderson, J. W. (1997). "The Kyoto Protocol on Climate Change: Background, Unresolved Issues and Next Steps". Accessed September 20th, 2017 from www.rff.org > files > RFF-RPT-kyotoprot; Norregaard, J. & Reppelin-Hill, V, "Controlling Pollution using Taxes and Tradable Permits, International Monetary Fund." Accessed September 20th, 2017 from <https://www.imf.org> > external > pubs.
- ⁵ Louise, *ibid*, pp. 1-2; Kyoto Protocol to the United Nations Framework Convention on Climate Change (1998) 37 ILM 22.
- ⁶ Louise, *ibid*; See Efe, S. I. (2016). "Evaluation of Carbon Dioxide Emissions and Temperature Variation in Nigerian Cities" *Journal of Geography, Environment and Earth Science International*, 6(2), 1-9: 2.
- ⁷ Odinkonigbo, J. J. (2011-2012). "Carbon Taxation as a Policy Instrument for Environmental Management and Control in Nigeria" *Nig. J. R.*, 10, 96-111:96; See Samuel, I. O. & Mark, A. O. (2011) "Gas Flaring, Transportation and Sustainable Energy Development in the Niger-Delta, Nigeria" *J. Hum. Ecol.* 33(1), 21-28.
- ⁸ Shyam, S., Ashish, K. M. & Ram, N. (2016) "Effect of Environmental Tax on Carbon Dioxide Emission: A Mathematical Model" *American Journal of Applied Mathematics and Statistics*, 4(1), 16-23:16.

activities increase the pressure on governments to find ways to reduce environmental damage while minimising harm to economic growth. However, Governments have a range of tools at their disposal, including regulations, information programmes, innovation policies, environmental subsidies and environmental taxes. Taxes in particular are a key part of this toolkit.⁹

12.2 PRINCIPLES AND PRACTICE OF ENVIRONMENTAL TAXATION

On a general note, the main theory of environmental tax is based on the fact that "The polluters should pay" in the sense that the source of the pollution is where the tax is imposed. The idea of environmental taxation generally is usually attributed to A. C. Pigou who argued that where one person provides a service that results in 'incidental uncharged disservices' to another person and 'technical considerations' make it such that it is not possible to pay compensation to the injured party, that the person should be held responsible for these 'incidental uncharged disservices'. This can be achieved through the imposition of 'extraordinary restraints' or taxes by government, which should result in the situation where the 'tax-inclusive price faced by the consumer is then equal to the marginal social cost of the product'.¹⁰

Without government intervention, there is no market incentive for firms and households to take into account environmental damage, since its impact is spread across many people and it has little or no direct cost to the polluter. Therefore, protection of the environment generally requires collective action, usually led by government.¹¹ Governments have a range of environmental policy tools at their disposal: regulatory (or "command-and-control") instruments, market-based instruments (such as taxes and tradable permits), negotiated agreements, subsidies, environmental management systems and information campaigns.¹²

Although, no one instrument can be considered best to address every environmental challenge,¹³ in the past, environmental policy was typically dominated by "command-and-control" regulations. These approaches were generally prescriptive and highly targeted - e.g., banning or limiting particular substances or requiring certain industries to use specific technologies.¹⁴ However, recently, there has been a growing movement towards environmental taxation (and tradable permits) in many economies.¹⁵ That is, over recent decades, interest has grown in using market-based instruments such as taxes and tradable

9 Environmental Taxation: A Guide for Policy Makers. September, 2011. P 1. Accessed September 20th, 2017 from <https://www.oecd.org> > tools-evaluation.

10 Louise (n 3) 122.

11 Environmental Taxation (n 9) 2.

12 OECD. (2010) "Taxation, Innovation and the Environment" P 2. Accessed September 18th, from www.oecd-ilibrary.org > environment > T...

13 *Ibid*.

14 Environmental Taxation (n 9); See Joseph, A. A. "The History of Environmental Policy and Pollution of Water Sources in Nigeria (1960-2004): The way forward" Accessed September 18th, 2017 from www.nigerianlawguru.com > articles > T...

15 OECD (n 12).

emission permits.¹⁶

Environmental tax means to collect taxes from impersonal entities or individuals which are engaged in developing, defending or utilizing environmental resources, according to the degrees of the exploitation, pollution or protection of the environmental resources. In recent years, there has been a resurgence of interest in environmental taxation, especially for dealing with the problems of global warming and pollution. For most of the environmental problems encountered, well designed fiscal policies are the most natural instruments for reflecting environmental damages into the price of products and non-market activities.¹⁷

Environmental Taxation also delivers what is termed a "double dividend" as revenue raised through taxes on environmental "bad" are recycled to reduce taxes on economic "goods" for example on labour. According to the traditional Pigouvian framework, environmental taxes should equal marginal damages and be levied directly on the source of emissions. However, the framework has little to say about appropriate revenue use, as it leaves aside other sources of distortion in the economy so there is no scope for efficiency-enhancing revenue recycling.¹⁸

One of the key advantages of environmental taxes is that they correct false price signals in the market place by incorporating the costs of pollution and other environmental costs into prices - a process of both 'getting the prices right' and implementing the 'Polluter Pays Principle'. This advantage of green taxes (environmental taxes) was recognised by the European Environment Council in the conclusions of the Environment Council of 12 December, 1991 which addressed a Community common platform for the UNCED 1992:

In order to reach the necessary reallocation of economic resources to achieve sustainable development, full social and environmental costs should be integrated into economic activities so that environmental externalities are internalised.

This means that environmental costs and others related to the exploitation of natural resources in a sustainable way and borne by the supplier country should be reflected in economic activities. Economic and fiscal instruments could be among the measures used to achieve this.¹⁹

16 Environmental Taxation (n 9)

17 Uwuigbe, U., Uwuigbe, O. R. & Iyoha, F. (2015) "The Role of Environmental Tax in Flood Reduction: A Study of Lagos State "Nigeria". *Journal of South African Business Research*, 2015(2015), 1-11:4; See Ojeifo, O.M. & Uwadie, B. T. (2001) "Waste Disposal Problems in Emerging Urban Centres: The case of Ekpoma and Irrua in Edo State" *International Journal of Environment and Development*, 6(2), 65-72.

18 Uwuigbe, Uwuigbe & Iyoha, *ibid*; See Hasson, R., Leiman, A. & Visser, N. (2007) "The Economics of Plastic Bag Legislation in South Africa" *South African Journal of Economics*, 75, 66-83.

19 "Environmental Taxes: Implementation and Environmental Effectiveness" *Environmental Issues*

Environmental taxes have many other important advantages, such as environmental effectiveness, economic efficiency, the ability to raise public revenue, and transparency. Also, environmental taxes have been successfully used to address a wide range of issues including waste disposal, water pollution and air emissions. Regardless of the policy area, the design of environmental taxes and political economy considerations in their implementation are crucial determinants of their overall success.²⁰

12.3 TYPES OF ENVIRONMENTAL TAXES

According to European Environment Agency (2000) environmental taxes are classified based on their objectives, into the following categories:

12.3.1. Cost Covering Charges: Which are aimed at raising revenue from the users of the environment in order to cover the cost of monitoring or controlling activities.²¹ The earliest experience of environmental taxes arose from the implementation of traditional regulatory environmental policy. Regulating emissions to land, air or water costs money. In accordance with the polluter pays principle, it seemed appropriate that the cost of regulation should be paid by those being regulated. Hence, the first category of environmental taxes, still important today, is that of cost-covering charges, whereby those making use of the environment contribute to or cover the cost of monitoring or controlling that use. There are two types of Cost-covering charges:

- (a) User charges: where the charge is paid for a specific environmental service provided to the charge payer. Example: treating waste-water or disposing of waste.
- (b) Earmarked charges: where the revenue from the charge is spent on related environmental purposes but not in the form of a specific service to the charge-payer. Example: revenues to finance recycling services.²²

12.3.2 Incentive Taxes: aimed at altering environmentally damaging behaviour.²³ The level of an incentive tax can be set according to estimates of the cost of the environmental damage; what price signal will be needed to achieve the environmental objectives. Revenues are often used to further encourage behaviour change via grants or tax incentives.²⁴

Series, No. 1. European Environment Agency (EEA), Copenhagen, August 1996. P 3. Accessed September 18th, 2017 from http://pure.au.dk/files/Env_taxes_iss...

20 Environmental Taxation (n 9) 1.

21 Lalu, M. (2013) *Environmental Taxation Practice and Revenue Performance in Ethiopia*. Master's Thesis, Department of Accounting and Finance, College of Business and Economics, Addis Ababa University, Addis Ababa, Ethiopia. Pp. 8-9. Accessed September 20th, 2017 from [etd.aau.edu.et > bitstream](http://etd.aau.edu.et/bitstream).

22 Environmental Taxes: Implementation and Environmental Effectiveness (n 20).

23 Lalu (n 22).

24 Environmental Taxes: Implementation and Environmental Effectiveness (n 20); See Pigou, A. C. (1920) *The Economy of Welfare* (London: MacMillan and Co., Limited); Baumol, W. J., & Oates, W. E.

12.3.3 Fiscal Environmental Taxes: aimed at raising government income.²⁵ Such revenues may be used to finance budget deficits; or shift taxes away from high income taxes, or high non-wage labour taxes, towards taxes on the consumption of resources and environmental pollution.²⁶

Environmental taxes classified according to their field of operation include:

- Energy taxes;
- Transport taxes (e.g. taxes on vehicles) and;
- Taxes on pollution and non-energy natural resources (e.g. taxes on emissions, non-energy products, raw materials and waste).

Environmental taxes classified according to their point of application are usually levied on polluting activities. Examples include taxes on quantities of pollutants in wastewater (e.g. Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD)) and air pollution (sulphur dioxide (SO₂), oxides of nitrogen (NO_x)).

Classification of taxes according to the tax base is an extension of the classification by fields of application. For example, it distinguishes between such bases as petrol, diesel, coals, coke and other energy carriers (Europe an Environment Agency 2000).²⁷

12.4 REASONS FOR USING ENVIRONMENTAL TAXES

12.4.1 Bringing 'Externalities' into Prices (Taxes Directly Address the Market Failure by "Pricing in" Environmental Costs)

The primary rationale for the use of environmental taxes is the externalities argument. This says that in deciding how much, and in what way, to produce or consume, a polluter will not take into account the costs imposed on society at large from their private actions, meaning that, from a socially optimal point of view, too much pollution will be generated. Environmental taxes may be able to align the private incentives of the polluter with the socially desirable outcome. They will also conform to the so-called 'polluter pays principle' (PPP) whereby the costs of pollution control are paid by the polluter themselves and not by society at large.²⁸

Thus, the main economic reason for using taxes in environmental policy is to bring the costs of pollution and other costs of using the environment- called externalities- into the prices of the goods and services produced by economic

(1975/1988) *The Theory of Environmental Policy*
(Cambridge: Cambridge University Press).

25 Lalu (n 22).

26 Environmental Taxes: Implementation and Environmental Effectiveness (n 20) 21.

27 *Ibid*.

28 Lalu (n 22) 17; See Ademola T. S. (1993) "Environmental Crisis and Development in Nigeria" An Inaugural Lecture Delivered on Thursday, 11th February, 1993 at the University of Port Harcourt, University of Port Harcourt Inaugural Lectures Series, No. 13, Pp. 1-38:34. Accessed September 18th, 2017 from [www.uniport.edu.ng/files/13th Inaug...](http://www.uniport.edu.ng/files/13th%20Inaug...)

activity. Such pollution costs are called 'externalities' because they are side effects of the economic activity and their costs are not part of the prices paid by the producers or consumers directly involved.²⁹ Environmental Taxes: Implementation and Environmental Effectiveness (n 19) 15; See Gilbert, E. M. (2015) "A Conceptual Framework for Measuring the Effectiveness of Green Fiscal Reforms" Paper prepared for the Green Growth Knowledge Platform Third Conference on "Fiscal Policies and the Green Economy Transition: Generating Knowledge - Creating". For example, pollution from coal fired power stations helps cause acid rain which damages soils, vegetation, water and buildings belonging to people and countries that do not directly benefit from the power station. And because the prices paid by the power producers and consumers do not include these 'external' costs, they give incorrect market signals, encouraging power production beyond the level of economic efficiency for the economy as a whole. Similarly, the full costs of using a car, which include the use of land, air pollution, noise, accidents, congestion etc. are 'external' to the car driver and not fully included in the price of cars or fuel. When such externalities are not included in prices they create large distortions in the market by encouraging activities that are costly to society even if the private benefits, for example, of car driving, are substantial.³⁰

Economists have argued that for resources to be rationally allocated and value maximized, every cost (external or internal) associated with the production process must be internalized as a disincentive to mismanage scarce resources. It is obvious that, without some form of cost internalization, the polluter would simply ignore the victim. The concept of cost internalization was first articulated by Arthur Pigou. Pigou had put forward an influential view, that to keep the economy efficient, business should be forced, by taxation, regulation or the operation of tort system, to "internalize" the costs they impose on other activities (externalities). Pigou's argument is based on the idea that the pollution an industry creates is a cost of that industry, and that for that cost to be paid for by other people (whether through the extra expense of cleaning clothes dirtied by polluted air or taxes paid so that the government can clean up polluted water) is to create a subsidy for that industry. Therefore, for the market to return to being true and fair, these externalities should be internalized - the industry should pay the equivalent of the costs its activity has imposed on other actors.³¹

When a polluter does not need to pay tax (compensation) for its polluting activities, its officials may disregard the cost implication of their decisions impose on the victims and their private properties. Environmental taxes creates a budgetary effect which forces polluters to internalize these costs and serves as a built-in mechanism that verifies the efficiency of polluters' decisions which affect

29 Environmental Taxes: Implementation and Environmental Effectiveness (n19) 15; See Gilbert, E.M.(2015)"A Conceptual Framework for Measuring the Effectiveness of Green Fiscal Reforms" Paper prepared for the Green Growth Knowledge Platform Third Conference on "Fiscal Policies and the Green Economy Transition: Generating Knowledge - Creating".

30 Environmental Taxes: Implementation and Environmental Effectiveness (n 20) 15.

31 Oludayo (n 1) 32; See Pigou (n 25). Saul, L. (1990) "Just Compensation and Just Politics" *Conn. L. Rev.*, 22, 285, 306-08; Saul, L. (1991) "Compulsory acquisition, Torts, and Special Interests" *Va. L. Rev.*, 77, 1333, 1344-48; Marc, R. P (1993) "Compulsory acquisition and Natural Hazards Policy: Public Choice on the Beachfront" *Rutgers L. Rev.*, 46, 243, 260-83.

private interest. Thus, a business firm whose activities have harmful effects on others must be subjected to a cost-benefit analysis that requires it to bear the cost of harms to others. So long as a polluter does not bear the cost of the pollution, he has no reason to prevent it. Again, the fact that the cost of pollution is not internalized may produce an inefficiently high level of good production and an inefficiently low level of pollution control. In effect, without some form of cost internalization, the polluter would simply ignore its neighbours, overuse the air and water, maximizes short term economic gains and carries on its business as usual by continuing polluting the environment to the detriment of person or category of persons affected by its action.³²

An environmental tax tries to bring these external costs into prices (the 'internalisation of externalities') so that both social and private costs are brought closer together. The better prices allow the markets for instance, transport or power production, to work more efficiently.

This internalisation of external costs will lead to a re-allocation of resources of an economy according to 'fair and efficient' prices by redistributing the costs.³³ It is believed that attaching a price to polluting activities, will help to discourage polluters from imposing (externalising) the costs of their polluting activities onto others.³⁴ Thus, environmental taxes help to implement the polluter pays principle, as they confront polluters with the full costs of their polluting activity.³⁵

12.4.2 Incentive Effect

An environmental tax provides an incentive to avoid the tax by using, or generating less of, the substance being taxed. For example, if sulphur emissions are taxed then producers have an incentive to reduce the emissions by filtering etc. or by using materials and processes that create less sulphur pollution. The tax that is paid will raise prices to the consumer who also gets an incentive to use less of the taxed product. In both cases they affect both consumers and producers by changing relative prices and therefore behaviour. This is called the incentive effect of environmental taxes. A key change in behaviour is to reduce pollution, and taxes can be a more cost effective tool for reducing pollution than regulations. This is because many polluters, even those with low pollutant reduction costs, will often pay tax on the pollution remaining after all their cost effective reduction measures have been taken. However, the tax payments will

32 Oludayo (n 1) 32.

33 Environmental Taxes: Implementation and Environmental Effectiveness (n 20); EC (European Commission). (1992) *Towards Sustainability - A European Community Programme of Policy and Action in Relation to the Environment and Sustainable Development*, Vol. II, COM(92) 23 final, European Commission, Brussels.

34 Malcolm, F. (2016) "When Will People Pay to Pollute? Environmental Taxes, Political Trust, and Experimental Evidence from Britain" Paper presented at the WAPOR Conference on "Political Trust in Contemporary Representative Democracies," Barcelona, 15 November, 2016. P. 2. Accessed September 18th, 2017 from https://eventum.upf.edu/_event/file; See Afolabi, E. (2012) "Time for Environmental Taxation in Nigeria?" *Taxspectives*. Originally published in *Thisday Lawyer*, 30th October 2012, p. 12.

35 Environmental Taxes: Implementation and Environmental Effectiveness (n 20).

provide a continuous incentive to look for new ways of reducing pollution, unlike regulations which provide no such incentive once the regulatory standard has been met. This dynamic incentive of taxes is one of the ways in which environmental taxes help to minimise pollution control costs and to encourage innovation.³⁶

Taxes on pollution provide clear incentives to polluters to reduce emissions and seek out cleaner alternatives. By placing a direct cost on environmental damage, profit-maximising firms have increased incentives to economise on its use, just like other inputs to production. Compared to other environmental instruments, such as regulations concerning emission intensities or technology prescriptions, environmental taxation encourages both the lowest cost abatement across polluters and provides incentives for abatement at each unit of pollution.³⁷

12.4.3 Environmental Taxes Minimise Pollution Control Costs by Leaving Consumers and Businesses with Flexibility to Determine the Least-Cost Way to Reduce Environmental Damage

A regulation on pollution control usually expects all polluters to reduce their pollution by the same extent, irrespective of their costs of doing so. An environmental tax allows each polluter to decide whether it's cheaper to pay the tax or to reduce pollution. Those polluters who face the highest costs of pollution reduction will tend to pay more of the tax whilst those facing low reduction costs will reduce pollution instead. The costs of achieving any given level of overall pollution reduction with a tax will therefore be cheaper than with a regulation. In theory, a regulation could be applied differently to each polluter but the information and administrative costs of doing so would usually be too high.³⁸

Most regulatory approaches involve the government specifying how to reduce emissions or who should do the reduction. Similarly, subsidies and incentives for environmentally preferable goods or practices involve the government steering the economy in favour of certain environmental solutions over others. Both approaches involve the government trying to "pick winners" - directing the market in a prescriptive way. This requires significant information about ever-changing conditions and technologies, and carries significant risk of making suboptimal choices. Regulations generally result in higher costs than taxes, since they force particular types of abatement, even if cheaper alternatives are available.³⁹

The higher cost of the polluting activity that results from the environmental tax makes the activity less attractive to consumers and businesses. In contrast to regulations or subsidies, however, a tax leaves consumers and businesses full flexibility to decide how to change their behaviour and reduce the harmful

36 *Ibid.*, p. 17.

37 OECD (n 12).

38 Environmental Taxes: Implementation and Environmental Effectiveness (n 20) 17-18.

39 Environmental Taxation (n 9).

activity. This allows market forces to determine the least-cost way to reduce environmental damage. For example, many countries impose significant taxes on motor fuels like petrol and diesel because their use contributes to global warming and local air pollution. The resulting increase in the cost of driving a vehicle is an incentive to reduce emissions that could be achieved in a number of ways, in both the short-term and the long-term:

- Drive a smaller or otherwise more fuel-efficient vehicle.
- Drive a vehicle that uses a lower-emission power source, such as a hybrid-electric vehicle.
- Drive less, perhaps by greater use of low- or no-emission alternatives like public transit, cycling, walking, living closer to the place of work, or otherwise changing habits to reduce the need to travel.⁴⁰

The environmental tax provides a greater range of abatement options than instruments such as a regulation requiring a minimum fuel efficiency level for vehicles or a subsidy that privileges electric vehicles, which target only some solutions. Of course, if regulations are tough enough and strictly enforced, they can have significant effects. However, this achievement may be bought at the expense of unnecessarily high costs.⁴¹

12.4.4 Environmental Taxation Stimulates Innovation through the Development and Diffusion of New Technologies and Practices

If the prices of fossil fuel energy, or water, or waste are increased through environmental taxes then this can encourage new ways of meeting our needs. Such innovation can lead to new technologies, processes and products. For example, the US tax on CFCs helped to encourage the development of substitute chemicals that were then exported. Similarly, the Swedish tax on sulphurous diesel helped to encourage the development of new, less polluting fuels,⁴² the increased demand for more fuel-efficient and alternatively powered vehicles induced by fossil fuel taxes provides an important incentive for automakers to develop such vehicles and for consumers to adopt them. Under regulation-based approaches, these incentives disappear once firms have complied with the regulated standard.⁴³ Environmental taxes can therefore help to move our economies towards the more 'eco-efficient' use of energy and resources by raising the price of nature. Given the uncertainty about the human and environmental effects of many of our chemicals and other products, any increase in eco-efficiency that environmental taxes encourages also helps to implement the 'precautionary principle' i.e. the reduction of exposures to substances before there is conclusive evidence of serious harm.⁴⁴

Environmental taxes encourage innovation, as firms and consumers seek new, cleaner solutions in response to the price put on pollution. These incentive

40 Ibid

41 Ibid

42 *Environmental Taxes: Implementation and Environmental Effectiveness* (n 20) 18.

43 *Environmental Taxation* (n 9) 3.

44 *Environmental Taxes: Implementation and Environmental Effectiveness* (n 20)

also make it commercially attractive to invest in Research and development (R&D) activities⁴⁵ to develop technologies and consumer products with a lighter environmental footprint, either by the polluter or by a third-party innovator. Putting a price on pollution creates opportunities for a wide range of types of innovation. This gives taxation an advantage over more prescriptive end-of-pipe innovations (i.e. innovations reducing the emission of pollution but not the creation of it). A typical example is a 'scrubber,' a device put on the end of a smokestack to limit emissions. Such innovations are important, but are often less efficient than measures which reduce the pollution in the first place. The wide range of actions that can be induced by taxation encourages a more equal mix between cleaner production process innovation and end-of-pipe abatement measures.⁴⁶

Even for firms that do not have the resources or inclination to undertake formalised research and development activities, the presence of environmental taxation provides increased incentives to bring in the latest technologies that have already been developed elsewhere. In Sweden, for example, the introduction of a tax on Nitrogen Oxides (NO_x) emissions led to a dramatic increase in the adoption of existing abatement technology: only 7% of firms had adopted abatement technology in the year that the tax was introduced but the fraction rose to 62% the following year.⁴⁷

12.4.5 Raising Revenue

Given that producers and consumers will probably not cease entirely the activities that are being taxed; the taxes and charges will raise revenues. These may be used to address environmental problems directly; or they may be used to subsidise producers or consumers to shift to more environmentally-benign activities, providing a second incentive for environmental improvement; or they may be applied to other government purposes, allowing, for the same level of government expenditure, other taxes, for instance on labour, to be reduced. In general, taxes on labour, capital and savings are often more costly in terms of economic welfare than environmental taxes, so that a shift of tax burden from these activities to environmental taxes increases economic efficiency and welfare.⁴⁸ Revenues from environmental taxes can be used to reduce the distortions of existing taxes thereby offsetting at least part of potentially negative tax interaction effects.⁴⁹

45 Research and development (R&D) activities, also known in Europe as research and technological development (RTD), refers to the investigative and innovative activities undertaken by businesses (corporations) in developing new services or products or improving existing services or products. See Research and Development (R&D) - Investopedia. Accessed October 3rd, 2017 from [www.investopedia.com/terms/randd](http://www.investopedia.com/terms/r/randd).

46 OECD (n 12) 3.

47 Ibid.

48 Environmental Taxes: Implementation and Environmental Effectiveness (n 20) 19.

49 Lalu (n 22) 17; Goulder, L. H. (1995) "Environmental Taxation and the Double Dividend: A Readers' Guide" *International Tax and Public Finance* Pp. 157-183. Accessed September 18th, 2017 from www.nber.org/papers.

12.5 THE CARBON TAX OPTION: THEORY AND PRACTICE

Tax policies are increasingly being used as instruments of environmental policy.^{50 51} Of particular recent interest has been consideration of carbon taxes as a means of meeting the international goals for stabilizing global climate change. This was proposed at the United Nations Conference on Environment and Development (UNCED). Individual countries were given the responsibility to develop their own strategies for meeting goals the Climate Change Convention adopted.⁵¹ One of the policy instruments canvassed for the reduction of GHGs is the carbon tax.⁵² Carbon tax falls within the pigouvian group of taxes: that is, taxes that are designed to ensure that private parties feel the social and economic burdens of their actions. Specifically, carbon tax could be defined as a brand of taxation that taxes the carbon content or the emitted carbon dioxide emanating from combusted fossil fuels. It is also known as carbon dioxide tax or CO₂ tax. In every fossil fuel (such as coal, oil, and gas) there is always the ubiquitous presence of carbon and hydrogen atoms. It is the synergistic bond between carbon and hydrogen atoms that is the source of energy for every fossil fuel. This bond equally gives rise to the release of heat when fossil fuel is combusted. Indeed, when fuel is burnt, all carbon atoms are quickly converted into CO₂ and released into the atmosphere.⁵³

Though carbon dioxide is generally innocuous when released, it gets permanently settled in the atmosphere where it traps heat re-radiated from earth's surface and thereby causes harmful climatic changes leading to global warming and other environmental hazards. It is in a bid to regulate the amount of heat or CO₂ released into the atmosphere that carbon tax resurfaced as a complementary instrument that could be used alongside other regulatory instruments to control the emission of CO₂ into the atmosphere. Thus, it may be safe to say that carbon tax is an environmental tax or tax on pollution that is designed to impose a tax cost on some activities or products that are harmful to the environment. Because of its punitive nature, some American scholars have preferred to call it "sin tax".⁵⁴

Simply put, carbon tax refers to a tax on activities or production processes that can give rise to GHGs emissions.⁵⁵ A Carbon Tax (carbon dioxide tax or CO₂ tax) is a fee based on the carbon content of fuels. Because of the strict proportionality between fuels' carbon content and their carbon dioxide emissions when burned, a carbon tax is effectively a tax on the carbon dioxide

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- 50 James, M. P & Julio, J. R. "Implementing Environmental Taxes on Intermediate Goods in Open Economies" *MITCEEPR 94-006WP*, June 1994. P 1.
- 51 Richard, L. O. & William, B. M. (1994) "The Case for State Pollution Taxes" *Pace Environmental Law Review*, 12(1/6), 103; G-Res. 45/212, UNCED, 5th Sess. U.N. Doc. A/AC. 237/18 (Part 11) (1992) reprinted in *Agenda 21 & The UNCED Proceedings 1685 - 1713* (Nicholas, A. R. ed., 1992).
- 52 Gbenga, A. (2014) "The Prospects and Challenges of the Proposed Carbon Tax Regime in South Africa: Lessons from the Nigerian Experience" *Afe Babalola University Journal of Sustainable Development Law and Policy*, 3(1), 177-188:178.
- 53 Odinkonigbo (n 6) 99; See Janet, M. (2008) "Carbon Taxes in the United States: The Context for the Future" *Vermont Journal of Environmental Law*, 10, 1, 3-10; Richard & William (n 51) 110-111.
- 54 Odinkonigbo (n 6) 99-100.
- 55 Gbenga (n 52).

emissions from burning fossil fuels.⁵⁶ The objective of a Carbon Tax is not creation of revenue for government, but to decarbonise country's economy through price signals it sends to the market, meant to change demand side behaviours and stimulate supply side to shift towards low carbon options.⁵⁷ Thus, the goal of carbon tax is to reduce environmentally harmful behaviour by ensuring that emitters of greenhouse gases bear the full costs of their actions.⁵⁸

Economists regard pollution as a negative externality. Externalities refer to a situation where effects of production or consumption are borne by others but cannot be traced to the originator. The main indicia of an externality are the separation between the affected individual and the source of the effects. Externality is not reflected in the price of goods and services. Thus, goods and services are underpriced because the total costs of production (pecuniary and non-pecuniary) are not reflected in the purchase price. This is a market failure that has to be addressed through government intervention. When faced with a negative externality such as pollution, the solution should be to impose a per unit tax on the emissions from a polluting activity. The tax rate would be equal to the marginal external social damage caused by the last unit of pollution, at the efficient allocation. Faced with this tax on emissions, firms would "internalize" the externality. By minimizing their private costs, firms would simultaneously minimize the costs to society as a whole.⁵⁹

The carbon tax system is anchored on the Polluter Pays principle. The Polluter Pays Principle states that:

National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.⁶⁰

Recent proposals to tax carbon fuels in the European Community and the United States are motivated at least as much by concerns about the effects of fossil fuel combustion on global climate as by revenue needs. In the United States, reductions in consumption of chlorofluorocarbons (CFCs) to comply with the terms of the 1987 Montreal Protocol have been achieved in part through a

56 Tanja, K. (2016). The Influence of Carbon Tax Implementation on Green Growth in South Africa. Master's Thesis in the Electric Power Industry (MEPI), Erasmus Mundus Joint Master in Economics and Management of Network Industries (EMIN), Madrid. P 49; See Okubor, C. N. (2016) "Legal Issues on Environmental Taxation" *Ajayi Crowther University Law Journal*, 1(2), 1-21:16-19.

57 Tanja, *ibid*.

58 Gbenga (n 52).

59 *Ibid*, pp.178-179.

60 *Ibid*, p. 179; See Rio Declaration on Environment and Development, 13 June 1992, UN Doc.A/CONF. 151/26 (Vol.I); Principle 16, 31 ILM 874 (1992).

federal tax⁶¹ on products that contain CFCs.⁶² Most particularly, the US Congress adopted a tax on chlorinated fluorocarbons (CFCs) in 1990 to accelerate the phase-out of these stratospheric ozone depleting chemicals. Also, the US Clean Air Act also contains a number of fees for violation of standards that are geared to pollutant emissions and act very similarly to pollution taxes. The Clean Air Act specifies that pollution taxes are one authorized means by which states can meet its air emission requirements.⁶³

The European Community has put under consideration, a carbon tax and a number of European countries have already adopted carbon taxes on their own as means of meeting the Climate Change Convention targets. The overwhelming majority of carbon dioxide releases come from combustion of fossil fuels at utilities, in industrial processes and in motor vehicles. Carbon taxes can take a variety of forms, largely dependent on the point at which the tax is imposed. In each case, the objective is to create the maximum reduction of carbon dioxide emitted with maximum economic efficiency.⁶⁴

Carbon tax can be imposed at any point between the extractions of carbon-rich fuel sources as a proxy for carbon dioxide emissions, to the emissions themselves. For a state carbon tax, on the surface it would appear easiest from an administrative and enforcement standpoint to impose the tax "upstream" at the mine mouth for coal or the well-head for oil or natural gas. However, there are several problems with this upstream taxation. It gives no credit for controls or improved combustion processes that may be added downstream to reduce carbon emissions. It gives no incentives to develop technologies for carbon dioxide emission reductions and it imposes administrative difficulties for treatment of high-carbon fuels imported into a state.⁶⁵ States could also impose a "midstream" tax on the carbon content of imported fuels at their point of entry into the state, whether by truck, tanker, rail or pipeline' or at the utility or fuel distribution centre to which the fuels are delivered. Taxation at the point of delivery also gives no credit for more efficient combustion processes or for other emission reduction technologies, but is probably easiest administratively.⁶⁶

Finally, carbon tax could be imposed on the emissions themselves at the point of use. This might be relatively easy for utilities and large industrial facilities where the emissions can be readily measured and monitored, but virtually impossible to administer relative to commercial or residential fuel combustions or with respect to motor vehicles. To the extent that actual emissions can be measured and monitored, however, taxation downstream of the emissions is the best option environmentally and from the standpoint of

61 The U.S. government currently levies three environmental excise taxes: a Superfund tax on petroleum, a tax on ozone-depleting chemicals (ODCs), and a tax on toxic chemicals other than ODCs.

62 James & Julio (n 50).

63 Richard & William (n 51) 105-106; See Clean Air Act § 101, 42 U.S.C. § 7401 (West 1983); See Andrew, J.H. (1990). *New Clean Air Bill Directs States to Collect Environmental Taxes*, 49 TAX Notes 944 (1990).

64 Richard & William, *ibid*, p. 110.

65 *Ibid*.

66 *Ibid*, p. 111.

economic efficiency, since technological improvements can be fully taken into account.⁶⁷ Therefore, it is timely for states to consider pioneering in adoption of taxes on carbon and other pollutants.⁶⁸

An important advantage of a carbon tax is that it provides an efficient and least-cost way to reduce emissions. Efficiency results in part because a carbon tax provides flexibility to firms regarding when emissions will be reduced, and so firms can choose to implement emissions reductions at a time when it is most suitable (and cheapest). In addition, as the price of a carbon tax is fixed, it provides certainty to those subject to the tax and allows taxpayers to plan ahead and adapt their behaviour. This stability is important for firms wishing to make 'long-term investment decisions'. Carbon taxation also results in revenue that 'is likely to be more predictable and stable and hence can allow for better planning (by government) of revenue recycling or tax-shifting programmes'.⁶⁹

A carbon tax could be an important tool to promote renewable energy, as 'a tax (set) at an appropriate level and phased in over time to the "correct level" will provide a strong price signal to both producers and consumers to change their behaviour over the medium to long term'.⁷⁰ For instance, two main behavioural responses are noticed when a carbon tax is introduced. Firstly, energy saving technologies is being developed and implemented due to increased fuel prices and secondly incentives are created in the energy sector primarily to shift towards less or noncarbon intensive fuels. In both cases GHG emissions are being reduced and green part of Green Growth is being achieved.⁷¹ Furthermore, establishing a 'meaningful carbon price, through internalising environmental and social costs would help to create 'a level playing field between renewable and conventional energy options'.⁷²

Thus, the market place can be used to promote manufacture of less polluting products and to encourage use of less polluting processes. Carbon (pollution) taxes promote efficiency improvement in industry that can make the taxed manufacturers more competitive. They foster the development of new pollution prevention and control technologies which open up new business and job opportunities. They promote efficiencies in the use of energy which can lower energy bills, again fostering competitiveness.⁷³ Furthermore, in a time of revenue stringency for all levels of government, pollution taxes create substantial revenues that can be used to balance budgets and for environmental purposes. This would alleviate the economic gross, sectoral and equity impacts of existing taxes.⁷⁴ Finally, a recent study demonstrates that tighter pollution requirements in this case carbon tax; induce affected enterprises to become more efficient, thus more competitive. The added efficiencies create new businesses to

67 *Ibid.*

68 *Ibid.*, p. 112.

69 Louise (n 3) 123-124;

70 *Ibid.*

71 Tanja (n 56) 50.

72 Louise (n 3) 124.

73. Richard & William (n 51).

74 *Ibid.*, pp. 105-106.

manufacture the more efficient processes and pollution control devices, which in turn create new export business opportunities for the affected industries.⁷⁵

12.6 FACTORS TO CONSIDER IN THE IMPLEMENTATION OF CARBON TAX

There are various factors that must be considered in implementing a carbon tax, namely the tax base, the tax level, who is subject to the tax and the use of the revenue.

A. Tax Base

It is preferable that environmental taxes, including a carbon tax, are 'directly linked to the source of the pollution'. This would require that carbon dioxide that is emitted from factories etc. is monitored and taxed directly. This is the most effective and efficient way to encourage a decrease in carbon emissions as it is the most 'precisely targeted'. However, monitoring of emissions can be difficult and expensive, especially in developing countries. The next best option is to 'tax an input or other activity that is associated with the polluting activity'. Therefore, in the case of electricity generation for instance, carbon tax could be imposed indirectly on the coal used to generate electricity or on the actual electricity generated from the polluting activity. The former approach, i.e. taxing the input, has been recommended for developing countries and is considered to be more targeted than the latter.⁷⁶ Consequently, in the case of oil or natural gas, carbon tax can be imposed midstream on the carbon content of imported fuels at the point of entry into the state or imposed downstream on the emissions themselves at the point of use. For example, commercial or residential fuel combustions and motor vehicles emissions.⁷⁷

B. Tax Level

The carbon tax should be set at the correct level to ensure that external costs are internalized into the cost of production of goods and services for example, electricity generation. Ideally, the cost of reducing pollution should be less than the tax itself in order to provide an incentive to reduce pollution. However, determining these costs may be difficult, practically and politically. A number of studies have been carried out to establish the price of carbon dioxide.⁷⁸

75 *Ibid*, p. 106.

76 Louise (n 3) 125; See Himes, S., & De Kam, F. (1999) "Environmentally-Related Taxes: A Tax Policy Perspective" In OECD Environmental Taxes: Recent Developments in China and OECD Countries. P 57; See also Perman, R., McGilvray, Y. M. J. & Common, M. (2003) *Natural Resource and Environmental Economics* 3rdEdn., (Harlow, Essex: Pearson Education Limited) P 217; See also The World Bank Environmental Fiscal Reform: What Should be done and How to Achieve It 2005, pp. 36-37; Devarajan, S. et. al. (2011) "Tax Policy to Reduce Carbon Emissions in a Distorted Economy: Illustrations from a South Africa CGE Model" *The Berkeley Electronic Journal of Economic Analysis & Policy* 11, 122: 15.

77 Louise, *ibid*.

78 *Ibid*, See Barde, J. P (1999) "Environmental Taxes in OECD Countries: An overview" In OECD Environmental Taxes: Recent Developments in China and OECD Countries. P 33; See Faure, M. & Ubachs, S. (2003) "Comparative Benefits and Optimal Use of Environmental Taxes" In Milne, J. et. al. (Eds), *Critical Issues in Environmental Taxation: International and Comparative Perspectives*, (Vol 1), (Oxford:

C. Who is Subject to the Tax?

Government must decide who the tax will be imposed on. Concerns have arisen regarding the impacts of a carbon tax on the poor and on energy-intensive industries. These concerns may be alleviated by providing exemptions to the poor and to energy-intensive firms or these groups could pay a reduced tax.⁷⁹

D. Use of the Revenue

There is no consensus on how the revenue raised from a carbon tax should be used and this aspect would depend on the priorities of the relevant government. The revenue raised from a carbon tax could be directed to the general focus or environmentally-related programmes, or more specifically to investments in renewable energy or energy efficiency. It has also been suggested that government could reduce other taxes such as value-added tax (VAT) or taxes on food, in order to address concerns regarding the impacts of a carbon tax on the poor. Another option is to pay compensation to the poor, or to decrease the social security contributions paid by employers (which would lower labour costs). It is widely agreed that 'revenue recycling can significantly lower the costs of a carbon tax'.⁸⁰

E. Revenue Neutrality and Double or Triple Dividends

While it is not possible to discuss this fully, revenue neutrality refers to the principle that the overall tax burden should not be increased, which is important with regard to the acceptability of environmental taxes. Therefore, if government introduces or increases one tax (in this case, a carbon tax) other taxes (such as taxes on foodstuffs or labour) should be decreased. This has been demonstrated internationally and a number of Organisations for Economic Co-operation and Development (OECD) countries have implemented 'fiscally neutral environmental tax reforms'. It has been found that by reducing taxes on 'goods' (such as labour) and increasing taxes on 'bads' (such as pollution or carbon) a so-called 'double dividend' may be achieved. This may result because a tax on carbon should lead to a reduction in carbon dioxide, thus reducing pollution, which is a 'welfare gain'. If the revenue generated from the carbon tax is used to reduce other taxes (such as taxes on labour) a second gain is possible as reducing other taxes will reduce welfare losses.⁸¹

Oxford University Press) P 33; Nkomo, J. C. (2006) "Energy and Economic Development" In Winkler, H. (Ed), *Energy Policies for Sustainable Development in South Africa: Options for the Future* (Energy Research Centre, University of Cape Town) P 423.

79 Louise (n 3) 126.

80 *Ibid*, See Andersen, M. S. (2008) "Environmental and Economic Implications of Taxing and Trading Carbon: Some European experiences" *Vermont Journal of Environmental Law*, 10, 61-85:84; Fisher, B. S. et. al. (1995) "An Economic Assessment of Policy Instruments for Combating Climate Change" In Bruce, J. P, Lee, H. & EF Haites, E. F. (Eds), *Climate Change 1995: Economic and Social Dimensions of Climate Change (Contribution of Working Group III to the Second Assessment Report of the Intergovernmental Panel on Climate Change)* (Cambridge University Press, Cambridge, United Kingdom). P 410.

81 Louise (n 3) 127; See Barde (n 78); The World Bank Environmental Fiscal Reform (n 76).

F. Carbon Leakage

The impacts of the carbon tax on local firms could lead to carbon leakage, which occurs when firms move their businesses to countries that do not have carbon pricing in place, in order to reduce their costs. This could be addressed through the imposition of border tax adjustments (BTAs), which are taxes that are imposed by a country that has carbon pricing in place (country A) on carbon-intensive goods imported into that country from another country (country B) that does not have carbon pricing in place. This would serve to prevent the 'leakage' of carbon emissions to country B. It would also serve to protect the competitiveness of local firms (in country A) as they would not have to compete against products that are not subject to carbon taxation.⁸²

12.7 LOCATION AND EXISTENCE OF ENVIRONMENTAL TAXES IN NIGERIA: IMPLEMENTING A CARBON TAX REGIME

Environmental taxation has, from the onset, been an integral part of the gas flaring legal regime in Nigeria, and has been one of Nigerian government's frontline policies in seeking to eliminate gas flaring.⁸³ Gas flaring is a means of disposing of waste gases through the use of combustion. Nigeria flares more natural gas associated with oil extraction than any other country on the planet. It is estimated that about 70% of Nigerian natural gas is wasted through flaring.⁸⁴ In principle, Section 3 of the Associated Gas Reinjection Act⁸⁵ outlaws gas flaring, but allows polluters to continue to flare on payment of a fine. The Section provides as follows:

Subject to subsection (2) of this section, no company engaged in the production of oil or gas shall after 1 January, 1984 flare gas produced in association with oil without the permission in writing of the Minister.

(2) Where the Minister is satisfied after 1 January 1984 that utilisation or re-injection of the produced gas is not appropriate or feasible in a particular field or fields, he may issue a certificate in that respect to a company engaged in the production of oil or gas:

(a) Specifying such terms and conditions, as he may at his discretion choose to impose, for the continued flaring of gas in

82 Louise (n 3) 271; See National Treasury Carbon Tax Policy Paper: Reducing Greenhouse Gas Emissions and Facilitating the Transition to a Green Economy 2013, P 16.

83 Gbenga (n 52) 185.

84 Abdulkarim, I. (2014). Assessment of the Legal and Institutional Framework for the Prevention of Environmental Degradation by Oil and Gas Companies in Nigeria. Phd Thesis, Faculty Of Law, Ahmadu Bello University, Zaria, Nigeria. P 44.

85 The Associated Gas Re-injection Act 1979 No. 99 (Laws of the Federation of Nigeria 1990, Cap. 26) came into force on 28 September 1979 and along with its subsidiary legislation, the Associated Gas Re-injection (Continued Flaring of Gas) Regulations 1979 (as amended) represents the only direct piece of composite Nigerian legislation to date concerning the exploration and development of natural gas. Other provisions appear as sections within the Petroleum Act and PPT Act. See Silvana, T., & Yahya, A. Local Content Policies in the Oil and Gas Sector: Case Studies. National Regulation of the Hydrocarbons Industry. Hydrocarbons: Economics, Policies and Legislation. Volume IV p. 758. Accessed September 18th, 2017 from <https://books.google.com.ng/books>.

- the particular field or fields; or
- (b) Permitting the company to continue to flare gas in the particular field or fields if the company pays such sum as the Minister may from time to time prescribe for every 28.317 standard cubic metres (SCM) of gas flared:
- Provided that, any payment due under this paragraph shall be made in the same manner and be subject to the same procedure as for the payment of royalties to the Federal Government by companies engaged in the production of oil.⁸⁶

The penalty was initially fixed at two kobo (N0.02) (equivalent to US\$0.0009 in 1985) against the oil companies for each 1,000 standard cubic feet (scf) of gas flared. In 1990, the penalty was increased to fifty kobo (N0.50)/1,000 scf. Fines for gas flaring were raised in January 1998 to Ten Naira (N10.00) naira (U.S.11C) for every 1,000 standard cubic feet of gas.⁸⁷ In 2009, the government established the National Domestic Gas Pricing and Supply regulations, which also increased the flaring penalty to US\$3.50 (equivalent to 560 naira today) for every 1,000 scf of gas flared.⁸⁸ Nigeria is also planning to raise the penalty to the international market value of the tax flared.⁸⁹ In 2012, the Nigerian National Petroleum Corporation (NNPC) confirmed that gas flaring is only down by 15 percent, which means 85 percent of Nigerian gas is still being flared.⁹⁰

In determining the effectiveness of a policy approach, policy makers should consider the following factors and questions:

- Environmental Effectiveness: Does the policy instrument accomplish a measurable environmental goal? Does the policy instrument result in general environmental improvements or emission reductions? Does the approach induce firms to reduce emissions by greater amounts than they would have in the absence of the policy?
- Economic Efficiency: How closely does the approach approximate the most efficient outcome? Does the policy instrument reach the environmental goal at the lowest possible cost to firms and consumers?
- Reductions in Administrative, Monitoring, and Enforcement Costs: Does the government benefit from reductions in costs? How large are these

86 Gbenga (n 52) 185; Associated Gas Re-injection Act 1985 (Nig), Section 3.

87 Human Rights Watch (1999). *The Price of Oil: Corporate Responsibility and Human Rights Violations in Nigeria's Oil Producing Communities*. P 66.

88 Jamilu, I. M. (2016) "Comparing Nigeria's Legal Framework for Combating Gas Flaring with That of Norway-Lessons for Nigeria" *Imperial Journal of Interdisciplinary Research (IJIR)*, 2(9), 1252-1261:1254; Gbenga (n 52); Uchenna, J. O. (2014) "Moving from Gas Flaring to Gas Conservation and Utilisation in Nigeria: A Review of the Legal and Policy Regime" *OPEC Energy Review* of June 2014, 149-183.

89 Gbenga, *ibid*; See Petroleum Industry Bill, An Act to Provide for the Establishment of a Legal, Fiscal and Regulatory Framework For the Petroleum Industry in Nigeria and Other Related Matters, 7th National Assembly, 2012, Section 277(3).

90 Gbenga (n 52).

- cost savings compared to those afforded by other forms of regulation?
- Environmental Awareness and Attitudinal Changes: In the course of meeting particular goals, are firms educating themselves on the nature of the environmental problem and ways in which it can be mitigated? Does the promotion of firm participation or compliance affect consumers' environmental awareness or priorities and result in a demand for greater emissions reductions?
 - Inducement of Innovation: Does the policy instrument lead to innovation in abatement techniques that decrease the cost of compliance with environmental regulations over time?⁹¹

Considering the above policy questions, one can rightly say that the negligible rate of reduction rate in gas flaring in Nigeria after many years of implementing the gas flaring tax system raises questions on whether environmental taxes significantly discourage environmental pollution in Nigeria through the reduction of greenhouse gas emissions. It questions the efficiency of the policy and the attitudinal change on the part of Multinational Oil Companies in opting for innovative abatement techniques that reduces greenhouse gas emissions through gas flaring. It also raises questions on the effectiveness of the monitoring and reporting system put in place to ensure that reduction rates are proactively disclosed and verified.⁹²

Nigerian gas is still being flared partly because the Associated Gas Re-injection Act 1979 and its amended provisions did not contain specific, stringent measures against oil companies that flouted environmental regulation. Specifically, the Associated Gas regulation empowers the Minister of Petroleum Resources with certain discretionary power which is sometimes exercised in favour of the Multinational Oil Companies in order not to disrupt oil and gas exploration activities for which the government holds majority equity. Historically, no oil well and/or gas flaring site has ever been shut down for flaring since the Associated Gas Re-Injection Act and its amended provisions were promulgated. This brings to question the seriousness of the environmental protection agencies in standard settings and enforcing measures⁹³ of environmental taxation.

Oil companies prefer to pay the meagre penalty that is comparatively cheaper than utilising the Associated Gas. Therefore, the penalty on gas flaring appear not to have achieved its aim, in fact, the fines monetised Associated Gas flaring at a very cheap rate, and made it more economical for oil companies to flare Associated Gas rather than its utilisation or reinjection. Thus, despite the

91 Chapter 4 Regulatory and Non-Regulatory Approaches to Pollution Control. Guidelines for Preparing Economic Analyses, December 2010.P 21. Accessed September 18th, 2017 from <https://yosemite.epa.gov> > EE-0568-04.pdf

92 See Gbenga (n 52).

93 Philip E. A. (2015) "The Dilemma in Nigerian Petroleum Industry Regulations and Its Socioeconomic Impact on Rural Communities in the Niger Delta" *International Journal of Management Science*, 2(5), 84-92:88; See Omofonmwan, S. I., & Odia, L. O. (2009) "Oil Exploration and Conflict in the Niger-Delta Region of Nigeria" *Kamla-Raj, Journal of Human Ecology*, 26(1), 25-30.

fact that the government adopted an economic approach to encourage AG flaring reduction, the approach failed to achieve the desired objectives. This state of affairs has continued to the present day as all efforts to end gas flaring has been without success.⁹⁴

12.8 CONCLUSION AND RECOMMENDATIONS

While the need to change production and consumption patterns that results in global climate change due to increase in greenhouse gas emissions of carbon dioxide has gained wide acceptance since the Rio Summit in 1992, "... most production and consumption trends remain unchanged...". Environmental taxation, among other policy instruments, can help achieve such structural changes, by correcting price signals and market distortions. They should therefore be used more extensively in Nigeria and other nations of the world especially, developing countries where environmental taxation is yet to be introduced and implemented. The benefits of environmental taxation and the potential for its increased use is considerable, but careful design and implementation is necessary to realise these gains in practice⁹⁵ so as to stimulate a more environmentally sustainable economy.⁹⁶

In the light of the foregoing, this study therefore, recommends⁹⁷ that the Federal Government of Nigeria and other nations of the world especially developing nations yet to introduce and implement environmental taxation should:

- Introduce environmental taxes currently in use in some developed countries. These "environmental taxes" should comprise levies or charges on air and water pollution, waste, noise and potentially harmful products. They are based on "polluters Pay Principle" and are designed to make polluters pay for the costs of environmental pollution (clean-up or damage done to the environment) thus; providing the positive incentives to limit pollution of the environment.
- Integrate social, environmental and other costs of negative environmental externalities into economic activities, so that prices will properly reflect the correct and total value of resources. This will help prevent cases of environmental degradation; integrating environmental costs to decisions of producers and consumers helps to discourage them from treating the environment as a free good.
- Develop and execute a mechanism for charging emission fees and fines for all pollutants and effluents (based on quantity, quality and harmful effects) thereby internalizing every costs and other negative externalities into the production process and output prices; imposing

94 Jamilu (n 88).

95 See Environmental Taxes: Implementation and Environmental Effectiveness (n 20) 11.

96 Iliya, G. (2017) "Sustainable Development through Environmental Taxation in Nigeria: Challenges and Prospects" *Indian Journal of Economics and Development*, 5(4), 1-7:6.

97 See generally Ishmael, O., & Rosemary, A. A. (2015) "Environmental Degradation and Sustainable Economic Development in Nigeria: A Theoretical Approach" *Researchjournal's Journal of Economics*, 3(6), 1-13:11-12; See also Ademola (n 30) 34.

penalty taxes, fines, and charges for noncompliance to environmental standards and regulations makes violations to such regulation become costly to the violators.

- Promote tax reliefs that encourage investment in pollution abatements through: Grant of accelerated depreciation allowance on pollution abatement equipment; the removal of import duty on abatement equipment; the grant of tax holidays and pioneer status to environmentally sound new projects and the use of other tax credit schemes.
- Use some of the proceeds from environmental taxes to set up a “Green Bank” or Natural Resources Development and Conservation Bank which can provide loans to entrepreneurs for installing pollution abatement equipment or funds to the inhabitants of areas affected by ecological disasters. Thus, more revenues from environmental taxes should be ‘earmarked’ for environmental expenditures. The political acceptability of environmental taxes is usually higher when the revenue is visibly earmarked for environmental services. Additionally, introduce insurance policies and other risks management programmes to remedy and restore polluted and degraded areas.