

**THE POLITICS OF GLOBAL
ENVIRONMENTAL POLICIES**

By

**Enefiok Ibok
Ekong Daniel
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PREFACE

Environmental issues such as global warming and climate change are at the epicenter of debate among scholars, environmentalists, world leaders, concerned individuals, governmental and non-governmental organizations on how to balance relations between humans and the various natural systems on which they depend, in such a way that all the components are accorded proper degrees of sustainability.

This Book of Readings by like-minded academics and experts in the field lends credence to this on-going debate, especially on the need to protect and conserve our environment by engaging in environmentally friendly activities or packaging. The idea behind this masterpiece is not only to provide adequate and proper information on the burning issues but also to build and encourage dialogue and strengthen synergies among the diverse stakeholders in the preservation of our environment.

The editors are glad to be able to bring together the views and perspectives contained in each of the chapters. It is our utmost belief that the contributions in this Book of Readings which is elective in nature will provide students of various disciplines, researchers, environmentalists, governments, non-governmental organizations and the reading public with the insights that would be useful for understanding the issues, politics, nature, dimensions and dynamics of environmentalism.

Enefiok Ibok
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We wish to state here that the views contained in this book are exclusively those of the authors.

Enefiok Ibok
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FOREWORD

I came across the manuscripts of ‘The Politics of Global Environmental Policies’ towards the end of 2018. That was shortly after Mr. Donald Trump had unilaterally withdrawn the United States of America from the agreements by World Leaders on the deteriorating state of the World’s environment. That Trump-like action by the American President himself, and the widespread condemnation of the decision by the international community, was my first real experience of the politics of Global Environmental Policies in action.

This book of readings on the Politics of Global Environmental Policies, authored by young academics in the Social and Management sciences at Akwa Ibom State University, deals with an important aspect of the debate on the state of the deterioration of the world’s environment and steps being taken to normalize the situation. There are twelve chapters.

The first chapter, “The Politics of Global Environmental Issues” starts off with the various environmental problems that give rise to environmental issues. Environment in this context refers to the tangible physical or inorganic environment, land (lithosphere), water (hydrosphere) and air (atmosphere) and the organic environment (biosphere), which is made up of small parts of the three components of the inorganic environment. It notes that concern about the state of the environment is not new, but dates back to pre-history; that in the past, the issues of concern were largely restricted to the adequacy of the earth’s resources to support the small but increasing human population. Today, however, the major issues relate to the state of the natural environment (abiotic and biotic), which is increasingly suffocated by human activities, using highly sophisticated advanced technology of production and destruction of the land, air and sea.

The author classifies global environmental problems into two categories based on (1) the physical or spatial extent of occurrence of the problem (damage) and (2) social perception of the problem as global or not, by individuals, the media, in public debates or in scientific research. More importantly he sub-divided the category (1) problems into two sub-groups namely (a) systematic global environmental problems and (b) cumulative global environmental problems.

A systematic global environmental problem such as the release of ozone-depleting substances in a particular place brings about an effect or damage to the whole global system; but such damage can be controlled or repaired not necessarily at the point or country where the problem or damage started, but at any point (place) in the global system. The cumulative sub-group problems are those that occur simultaneously in various parts of the world but are not linked to a global system as in the case of biodiversity damage.

Currently, governance appears to be the central theme of global environmental politics. This point is clearly demonstrated in the dislocations and embarrassments caused by the unilateral withdrawal of the United States government of President Donald Trump from International Agreements on Global Environmental Issues, including climate change. The stand of developing countries on key proposals by developed countries to reduce the damage that humans have inflicted on the physical environment is presented under the brief discussion of the North/South Divide in Global Environmental Politics.

There are two chapters on the distribution (location) of the physical components of the earth, land, air and sea – the distribution of these elements and their structural composition. It is their functioning that produces the disasters that environmentalists seek to prevent. It is also these components that contain the resources that humans exploit for a living and in the process do great damage to the environment. That is one aspect of the geographic factor. The other is the two-way human environmental relations, which relate to the ways humans impact the environment and the ways the environment impacts humans. There is no smoke without fire, so goes the saying. It is these aspects of our environment that constitute the fires that produce the environmental disaster smoke.

A comprehensive account of the ongoing concern about the state of the world environment, starting with the Human Environment at Stockholm, Sweden, is presented in the chapter on the History of Global Environmental Meetings. The series of subsequent meetings and conferences led to the agreements signed by Heads of Government to

ensure that the decisions to contain the damaging effects of the ozone layer were carried out by the countries concerned.

Actors in and “Actors on Global Environmental Politics” constitute the core contribution to this treatise on Global Environmental Politics. The state, a political association that has authority over a country or territory, is or should be the main actor in environmental politics. In practice, there are also many other non-state actors in some countries. These other actors include local and international Non-Governmental Organizations (NGOs), civil society groups, private businesses, including transnational corporations like the Rockefeller and Ford Foundations and United Nations Agencies such as the World Bank and Food and Agricultural Organization (FAO), etc.

Non-state Actors have, over the years, become the major source of funds and personnel for the increasing number of conferences and meetings to discuss global environmental issues and to find solutions to global environmental problems. In respect of state participation, it has become increasingly clear that governance is what is most important in contemporary politics of global environmental policies. Governance is what has brought about the unilateral abrogation in 2018 of treaties signed by world leaders to protect the Earth’s environment by the President of the United States of America, Mr. Donald Trump.

Global environmental issues and problems (disasters) have become so widespread, more regular and more damaging to humans and the environment during the past four decades, that a new field of study - global environmentalism has emerged. Global environmentalism is defined as the study of the concern about the state of the global environment and the actions to help solve environmental problems. Global environmentalism is at the root of the Green Party Politics of the developed countries of the world. The principles, norms, rules and decision-making procedures that Actors have to apply in dealing with a given environmental problem or issue are referred to as environmental regime.

Regimes that deal with endangered species, hazardous waste, protection of the ozone layer and climate change have admirable goals, but are

difficult to enforce. These are issues that are best handled at the international level. The problem with international environmental regimes is that they lack the ability and authority to implement their own legal standards. Why? Politics! When formally organized, an international regime can transform into an intergovernmental organization. They are, however, not actors or non-governmental organization (NGO'S).

The overriding purpose of environmental policies and programmes is to ensure the sustainability of the Earth's environment, that is, in addition to repairing the damage caused by natural disasters and rehabilitating the victims of these disasters. Chapter nine presents a global situation report on the issues and challenges of sustainable development. It draws attention to the lack of implementation of the recommendations from the numerous global environmental meetings by many governments. The unilateral withdrawal in 2018 of the American President, Mr. Donald Trump, from the Paris Agreement (December 2015) of the World Climate Commission is a case in point.

Chapter 10 presents the special case of oil multinational companies that have caused massive destruction of the physical environment and disruption of social and family life of local populations, and this, in spite of existing international human rights. The chapter zeros in on the special case of the Niger Delta, where the inhabitants of the region that produces the crude oil and gas that fuel the Nigerian economy, live in absolute poverty in a most polluted and ravaged wetlands without potable water, electricity and basic health facilities.

The chapter on climate change, a most topical environmental issue, considers climate change to be a militating factor against sustainable development in Africa. Climate change is not new in Africa. The Sahara was once a seabed and later had extensive forests and fauna, the remains of which formed the crude oil and natural gas in Libya, etc. The difference between past climate change in Africa and the current ongoing climate change is the presence today of the human population, which is growing rapidly and on the move. The drying up of Lake Chad and severe droughts in the West African Sahel have already disrupted social life and the native economy of these regions. There is a strong

case for more people-oriented politics, for more positive action to protect the environment of the regions of Africa by national governments and international agencies such as the World Climate Commission, Forest Commission and relevant United Nations Agencies.

The study ends with an interesting, but unusual presentation on Environmental Accounting Information System, unusual in the sense that most papers on environmental studies do not consider the cost implications of the recommendations made. The editors have done a good job in putting together these papers for use by students in the related disciplines in the Faculty of Social and Management Sciences and Law.

Emeritus Professor Reuben K. Udo
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CHAPTER 1

THE POLITICS OF GLOBAL ENVIRONMENTAL ISSUES

Enefiok E. Ibok

Introduction

The most important feature of environmental degradation is that it affects all mankind. Since the whole world is a stakeholder, it raises issues on who should do what to combat environmental degradation. The environment itself encompasses the whole of life on earth and the complex interrelationship that links the biotic and the abiotic world. In a general sense, it covers everything contained within the air, land and sea (Ahmad-Khan, 2013).

Since the advent of humankind, man has established an inalienable close tie with the environment. As early as 5,000 years ago, especially after the start of human civilization, the area coverage by human colonization has been continually widened with the increase of population and progress of production technology, followed by environmental problems. Therefore, it is pertinent to say that throughout the process of human development, the entire history is actually a process during which humankind kept fighting against and adapting to the environment. For example, the Industrial Revolution of the United Kingdom, which occurred in the middle of the eighteenth century witnessed the emergence of an industrial society era. When industrialization was providing the benefits of industrialized civilization and economic growth for humans, a series of important environmental problems worsened in company with industrial globalization.

From the Industrial Revolution in the eighteenth century to 1950, the developed countries accounted for 95% of CO₂ emissions. Between 1950 and 2000, emissions by developed countries went up to 77% of world total. Of concern is that after the 1940s, when the imbalance between ecology and economy in fields like resources, energy and the environment became increasingly outstanding, the issue of environmental protection became one of the biggest concerns of the public. Certain organizations of developed countries even launched “strong initiatives” for global environmental protection. These include

the International Union for Conservation of Nature (IUCN), founded in Switzerland in 1948, the World Wildlife Fund (WWF), founded in 1961, the Club of Rome, founded in 1968, Greenpeace International (GI), established in 1971 in Canada, World Commission on Environment and Development (WCED), established by the UN in 1983. Others are Friends of the Earth, founded in 1983, the Global Environmental Facility (GEF), launched in 1997 and the International Environmental Protection Organization Association (IEPOA). All these organizations turned out to be influential advocates and implementers of environmental protection throughout the world and having made progress, contributed to the undertaking of global environmental protection. It is worth noting that the above mentioned organizations are mostly established by developed countries and the initial participants are also developed countries. It is only at a later stage that developing countries and underdeveloped countries were absorbed in (Magdoff, 2011; Xu, 2007).

The concerns over the health of our global environment continued to rise in the late 1960s and early 1970s. This concern motivated experts who met in 1968 at the United Nations Biosphere Conference held in Sweden to discuss global environmental problems. The first Earth Day was held in the United States (US) in April 1970, with twenty million people rallying. This was indeed one of the largest organized demonstrations in the history of the United States. The impact was that the same year, the United States government founded the Environmental Protection Agency (EPA). In the following year, 1971, the Canadian Government created a Department of the Environment. The result of these growing societal and political concerns was the United Nations Conference on the Human Environment, held in Stockholm, Sweden, in June 1972 (Dryzek, 1992).

Global Environmental Problems

The growing population has been a great pressure for resource environment. Excessive growth of population in spite of ecological environment load-bearing limitation is another important cause of global environmental problems. Since the nineteenth century, and particularly after the twentieth century, the rapid growth of population has triggered a series of environmental problems, such as air pollution, security of resources, piles of household garbage, etc. (Jiangang et al., 2013).

The traditional economic development pattern focusing solely on economic growth is the immediate cause of environmental issues. History shows that after the Industrial Revolution, countries like the United Kingdom (UK), the United States of America (USA) and Germany have created miracles of rapid economic development, but accompanied by the global environmental issues that threaten human development. This is because the traditional economic development pattern focused more on the achievements made in the economic sphere with the primary target being growth in total output value and economic profit and an increase in material wealth. Under this approach (traditional pattern), people tend to emphasize economic growth at the expense of the environment and where due regard is not given to resource utilization and efficiency, the ecosystem is exposed to destruction (Magdoff, 2011; Chen, 2009).

Also, the capitalist system in developed countries and the inequitable international order are the root causes of global environmental problems. Under capitalism, the environment does not exist as a natural domain where humankind must coexist with other species, but as a domain to be developed in the ever-expanding process of the economy. Ecological sociologists argue that capitalism is the root cause of the Western or even global ecological crisis and environmental problems. The expansion of capitalism goes without limitation; the trends of infinite accumulation of capital and the dominating logics of maximization of added value imply impulsive consumption of earth's resources and destruction of the natural environment and has inherently decided the unsustainability of economic development and the inevitability of ecological colonialism (Chen, 2009; Yu Jin, 2009).

It is a well-known fact that our environment is constantly changing. However, as our environment changes, so does the need to become increasingly aware of the process that surrounds it. With a mass influx of natural disasters, warming and cooling periods, and different types of weather patterns, people need to be aware of what types of environmental problems our planet is facing (www.conserv-energy-future.com, 2018).

Global warming has become an undisputed fact about our current livelihoods. Our planet is warming up and we are definitely part of the problem. But this is not the only environmental problem that we should be concerned about. Across the globe, people are facing a wealth of new and challenging environmental problems every day. Some of these problems are small and only affect fewer ecosystems, but others are drastically changing the landscape of what is already known to us. This, therefore, means that our planet is at the brink of a severe environmental crisis. It is glaring that current environmental problems make us vulnerable to disasters and tragedies, now and in the future. The whole world is in a state of planetary emergency, with environmental problems piling up around us. Unless these problems are variously and prudently addressed, we are surely doomed to disaster. This entails that the current environmental problems require urgent attention (Ahmad-Khan 2013; Benedick, 1991).

Some of the major current environmental problems confronting us are: pollution, global warming, over-population, natural resources depletion, waste disposal, climate change, loss of biodiversity, deforestation, ocean acidification, ozone layer depletion, acid rain, water pollution, urban sprawl, public health issues, genetic engineering, nuclear issues, deforestation, desertification etc. All these affect humans, animals and nations on this planet (Ahmad-Khan, 2013; Forsyth, 2011).

It is of interest to say that the attention given to the above mentioned problems has changed over time, with different perspectives, and the varying involvement of different countries and actors. It is envisaged that these views are likely to continue to change. Besides, it is now obvious that ‘global environmental problems present great complexity on how they are caused, how they impact on different people and places and how they are evaluated. What steps can we take to clarify global environmental problems or classify them into different types? Explaining further on these problems, based on location, Turner (1990) classified global environmental problems into two categories, namely: the physical extent of “global” environmental problems and the social perception of ‘global’ problems.

Turner sub-divided physical extent problems into two types, namely systemic and cumulative. Systemic environmental problems, according to him, are global because they are caused by a change in a global system. This approach emphasizes that a change in one location in the global system will impact upon the rest of the system. This therefore entails that a solution to the global system need not be located in the same place as the cause of the disturbance to the system. For example, the release of ozone-depleting substances in one country will impact on the entire ozone layer. In the same vein, reducing ozone-depleting substances in a different country will help reduce the impact of the damaged ozone layer in other countries. On the other hand, cumulative environmental problems are global because they occur globally, but are not necessarily linked to a global system. For example, biodiversity loss might be called a cumulative problem because it is accruing in many places simultaneously. There is no physical link between biodiversity loss in one country and in another. Therefore, protecting biodiversity in one location will be restricted to that location (Forsyth, 2011).

The social perception of environmental problems relates to the way that people think about the state of the environment and is influenced by scientific research, media, and public debates. It is a better understanding of how environmental issues are interpreted into social dynamics. And there is a need to improve our knowledge of social perception about environmental problems. According to Siqueira (2008), environmental issues are perceived and integrated by people in different manners, since the way people face these issues is affected by the peculiarities of individual perceptions. Such particularities have an influence on the perception of certain aspects of the environment to the detriment of other issues, which are actually under threat but remain imperceptible to the sensory organs. So environmental perceptions are crucial to the understanding of men/environment interrelations, their expectations, satisfactions, hopes, judgments and conduct within the space they are inserted in (Siquara, 2008 and Almeida, et al, 2017).

Taylor and Buttel (1992) harp on the need to understand the role of discourse in making us believe in the reality of certain environmental problems or in how environmental changes might impact on society as a

whole. Environmental discourses are the textual and spoken interactions about the environment. A discursive formation determines what should be said and how. Consequently, environmental discourses are the way we construct, interpret, discuss, and analyze environmental problems (Dryzek, 1997). The core of environmental discourses is on environmental issues – what is discussed. It can be the issue of air pollution, nuclear waste, or global climate change. So when people think, speak, and write about the environment, they interpret it through the lens of their belief system or ideology, which results in a certain environmental discourse. Explaining further, Taylor and Buttel (1992) say that the word ‘discourse’ refers to how the language we use can help create a controversial vision of reality in hidden ways. This can be used to discuss various aspects of global environmental problems and politics because it refers to how problems are framed and discussed in ways that can sometimes shape how they are defined or addressed.

Discourses are the hidden assumptions about the world that we carry in everyday speech. A discourse creates a vision of reality when people use this language in ways that do not question these assumptions. For instance, newspapers, politicians and environmentalists might talk of environmental change as a global risk. This is indeed a cognitive statement, which is aimed at making people more worried about environmental problems. But if these statements also assume that environmental risks occur because the world has fixed limits, or that fast-growing countries pose the greatest environmental threats, then these explicit meanings might be a form of hidden discourse. So the analysis of discourse within political debate aims to make these assumptions more transparent, and consequently make political debate more informed and less based on assumptions. So there exists the need to ascertain the role of global discourse as an important force in convincing people about global environmental problems (Dryzek, 1997).

Global Environmental Politics

Global environmental politics examines the relationship between global political forces and environmental change, with particular attention given to the implication of local-global interactions for management as well as the implication of environmental change for world politics (O’Neill and Stacy, 2017).

Global environmental politics is a much more recent phenomenon and is rooted in modern environmentalism with emphasis on the 'global environment' as an object of concern. This idea arose in public consciousness, particularly in the United States (US), as a result of several factors, including fear about 'global' (i.e. Third World) population growth, concern about the effects of industrialization and images of Earth from space (McCormick, 1989).

The central theme in global environmental politics today is governance. Aside from the general calls for global responses to address global environmental problems such as climate change, there is also the emergence of new actors such as non-governmental organizations in environmental politics, debate about the relationship between trade and environment and new environmental regimes that encompass both specific international laws and inter-governmental organisations. Transnational institutions, such as the United Nations and the World Trade Organization, have equally become increasingly involved broadly in environmental debates and more narrowly in environmental management (Dalby, 2002; Klare, 2001).

The term 'global' is not only about linkages that connect the world into a single place, but is also simultaneously about differentiation and disconnection among people and places. Therefore, the 'global' of global environmental politics does not indicate a particular arena for political struggle that dominates regional, national, or local arenas, but rather it is about how all these are produced and come together (or not) in environmental conflicts (Mansfield, 2003). These can further be examined within a 'formal' environmental politics that occurs within the confines of multilateral negotiations and an 'informal' environmental politics of activism and social movements (Robins, 2004; Peer and Watts, 2004).

Formal environmental politics, as the name implies, is the environmental politics of UN conferences and reports, which, in recent years, has explicitly extended into the environmental politics of free trade. Important issues are about who is actually responsible for environmental degradation, what are the most appropriate measures for achieving

environmental goals, and who should pay for them (with cash or lost development opportunities). Within this politics, the North is often presented as protector of the environment and the South as the protector of the poor, and economic growth is offered as the primary solution to both economic and environmental problems. This is anchored on the politics of neo-liberalism (Mansfield, 2003).

On the other hand, informal environmental politics generally occurs outside of official settings and is carried out by grassroots groups. Within this activist politics, the critical issue has been about the negative impacts of both conservation and development on both people and the environment. The activist discourse exposes the North for degrading the environment and the South for promoting policies that worsen problems for the world's poor. According to this view, too much economic activity is bad for the environment and leads to greater inequalities between the rich and the poor. This is 'politics against neoliberalism' (Mansfield, 2003).

A closer look at 'formal' and 'informal' global environmental politics does not only concern environmental protection but also is about equity, global power relations, and the relationship between the environment and development. So the two frameworks are important in that the "formal" is dominant and issues raised from within this debate are not exhaustive. However, the informal activists provide important perspectives about the larger or formal framework and address issues that are not generally up for discussion within formal politics. Thus, we can deduce that both formal and informal politics show that the global world is uneven and contested, while explicitly addressing informal politics highlights that the global world is produced through both linkage and differentiation (Mansfield, 2003).

Global Environmental Politics – North Versus South Divide

The disagreements about global environmental problems are often described in terms of richer versus poorer countries, or North versus the global South. It is also argued that environmental issues addressed by governance at the global level tend to be those on the priority agenda of Northern countries. These are usually issues of a 'global character', often including climate change, ozone depletion, and biodiversity. While

the effects of climate change are likely to be most adverse and severe primarily for developing countries, these countries are the ones faced with more pressing immediate concerns. It is equally claimed by the South that, the global environmental agenda is a Northern agenda, of little relevance to them, rather, the issues on which attention is focused are often far from the experience of environmental degradation of poor people in villages, towns and mega-cities in large parts of the world, where 'the environment' consists of problems associated with health, shelter, and food availability. These environmental issues prioritized by the South are less visible on the global agenda (Redclift and Sage, 1998; Gutman, 1994; Agarwal et al., 1999; Karlsson, 2017).

Environmentally, the North-South divide refers to the difference in opinion between the developed world and the developing world on carbon emission cuts, compensation, subsidies and technology transfers for moving towards a greener economy and a host of other contentious issues which have arisen in the context of global warming and climate change. The deepening contention is that since the developed world (North) is responsible for a major chunk of the historic carbon emission therefore, it has a moral obligation to accept binding emission cuts in consonance with its role in the degradation of the environment. On the other hand, the developing world (South) argues that it has limited responsibility in the impending climate crisis and therefore it should not have to adhere to limited emission cuts, and that too of a non-binding nature in any climate deal in the future (www.quorh.com, 2018).

Elaborating deeply into the classic differences between North and South, the environmentalists in richer countries of the North hold the opinion that the rapid growth of developing countries such as Brazil, India and China etc. presents a severe risk to the planet. According to them, these countries have immense populations, and will demand more and more food, electricity, fuel and other commodities. Many of them also have some of the most important tropical forests, biodiversity or areas of wilderness but comparatively low levels of environmental awareness about global problems such as climate change. They (North) expressed concern that the political capacity of states or other actors of the South to implement environmental policies is low, hence, an urgent need to transfer environmentally sound technologies to rapidly developing

countries, and also the need to create environmental regulations that work in these challenging conditions (Forsyth, 2011).

However, for many developing countries of the South, the current environmental problems from richer countries of the North raise some important additional concerns such as; why should developing countries which are poorer and have immense developmental problems, take responsibility for addressing environmental problems? Why should they not develop first and thereafter worry about environmental problems? In some cases, such as deforestation or industrialization, richer countries have been contributing to problems longer than many developing countries, so it seems unfair that poorer countries should take responsibility (Dryzek, 1997; Sachs, 1993; Forsyth, 2011).

Besides, it is also contended by the South that many developing countries have not received levels of aid that were promised some years back, so any additional help relating to the environment should not replace existing commitments to assistance. That is anchored on the fact that some aspects of climate change might impact most on developing countries and hence it is only right that they should get assistance. It is equally important to note that richer countries have not yet transferred technologies to developing countries and many resist the access of poor countries to international trade. The most important issue is that environmental worries should not be used as a reason to prevent poorer countries from gaining access to the wealth that has been enjoyed by richer countries for years, meaning that what is good for the goose is also good for the gander. So in a nutshell, it is glaring that many political controversies about global environmental problems occur between the North and the South.

Environmental Policies:

Adaptation and Mitigation

There exists a dispute or disagreement about how to address global environmental problems in effective ways. An important division is in how much emphasis is given to the mitigation of environmental problems compared with adaptation to such problems. The terms 'mitigation' and 'adaptation' are two important terms that are fundamental in the environmental change debate.

Mitigation refers to policies or actions that reduce the size of an environmental change, for example, any action that reduces greenhouse gas concentration might be called mitigation because it is reducing the physical process that creates anthropogenic climate change. Mitigation is considered to be the most effective means of addressing environmental problems because it reduces their cause. It should also be clear that mitigation tends to work best when environmental problems are considered to be systemic. If climate change is considered to be systemic, then mitigating climate change can be achieved through acts that reduce greenhouse gas concentration at any point in the world (Forsyth, 2011, www.global-greenhouse-warming.com, 2017; IPCC 4th Report).

Adaptation, on the other hand, is any response that reduces the impact of environmental change. It is an undertaking of how individuals, group and natural systems can prepare for and respond to change in climate or their environment. Adaptation has two forms. The first refers to physical actions or technologies that can reduce the impact of physical environmental changes. The second form of adaptation is to diversify social, economic and cultural behaviour that might make the impacts of change less damaging to people's way of life. Holistically, mitigation tackles the causes of environmental or climate change while adaptation tackles the effects of the phenomenon (Forsyth, 2011; Elliot, 2004).

Most policy-makers have agreed that adaptation can be hard to achieve in many developing countries where technological capacity is low or where poverty makes it hard to diversify options. It is of interest to note that most environmental policy makers agree that both mitigation and adaptation should be adopted at the same time. Be that as it may, there are still many barriers to both. For example, some deep-green activists see any form of adaptation as a way of avoiding dealing with the underlying cause of change, which is dangerous interference with the earth's natural limits (Forsyth, 2011).

The tension between mitigation and adaptation raises various important questions for global environmental policy. In philosophical terms, if a society is infinitely adaptable to environmental change, it radically

reduces the extent to which an environmental problem is actually 'problematic'. Of course, it is very few environmentalists or policymakers who suggest that societies should try to become immune to environmental change. There are many ethical, economic or cultural reasons to conserve environments or avoid risks. But the fact remains that many environmental problems are considered problematic because of assumptions we make about their impact. If we can reduce their impact or re-evaluate how we see them, then the nature of environmental problems changes too.

As already observed, most analysts propose that mitigation and adaptation should be undertaken at the same time. But it is worth noting that there are some deep green disagreements about how to integrate mitigation and adaptation. For example, at an international conference on climate change in Tokyo in 1997, a representative of China said that climate change policy should include more direct assistance to help industrializing countries such as China adapt faster to climate change and that developed countries should provide greater technological assistance to poorer countries. In response to this statement, a representative of the USA stood up and urged delegates to remember that the climate change convention was about 'climate change' and not 'development'. He therefore urged all discussions to see the main objectives of climate-change policy as reducing atmospheric greenhouse gas concentrations. In a simple word, the USA at that time was urging mitigation through any means possible, rather than adaptation (Forsyth, 2011).

Also, some critics have argued that some forms of mitigation might prevent adaptation if it damages people's overall access to development. For example, some radical environmentalists have suggested reducing economic growth, which would impact on less developed countries' right to development. Even some forms of reforestation for climate change mitigation have also been criticised for taking up agricultural land, which might provide food and employment for people (Forsyth, 2011; www.global-greenhouse-warming.com; Anand, 2013).

Conclusion

Global environmental issues or problems are now on everyone's mind. Environmental destruction caused by humans is a global problem and this is ongoing every day. This has generated worries about the impacts on humans and nature. Since the whole world is facing a planetary emergency, environmental problems must be prudently addressed. This lies in governance. But the formal politics, which implies the environmental politics of the UN conferences and reports, raise issues about who is actually responsible for environmental degradation and who should bear the burden in terms of paying the price. Within this debate, the North is often seen as the protector of the environment while the South as the protector of the poor.

Outside the official arena of environmental politics, we have informal environmental politics, which is carried out by grassroots groups. These groups focus attention on the negative impacts of development on both the people and the environment. They believed that many economic activities are bad for the environment and this leads to greater inequalities between rich and poor countries, which is a result of linkages and differentiation (Mansfield, 2003).

Attempts to address environmental change debates brought about the emergence of two important terms that are fundamental to environmental change, namely, mitigation and adaptation. As the name implies, mitigation tackles the causes of environmental or climate change while adaptation tackles the effect of the phenomenon. To solve environmental problems and save our globe, most analysts have proposed that mitigation and adaptation should be used at the same time. This is a mere proposal and not a consensus, as there still exists disagreement between the North and the South on how to effectively integrate the duo that is adaptation and mitigation in solving environmental problems facing us, especially the South, which is the developing countries.

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CHAPTER 2
GEOGRAPHICAL PERSPECTIVE OF THE
PHYSICAL ENVIRONMENT

Ekong E. Daniel

Introduction

The term “Environment” refers to all living and non-living things occurring naturally on Earth. The sum of all surroundings of a living organism, including natural forces and other living things, which provide conditions for development and growth as well as for danger and damage. The living and non-living things referred to as biotic elements thrive in the biosphere and are capable of reproducing. Examples are animals, birds, plants, fungi and other similar organisms. The non-living things include physical and chemical elements, usually referred to as abiotic elements, that are obtained from the lithosphere, atmosphere and hydrosphere. Examples are water, air, soil, sunlight, and minerals. These make up the physical earth.

The Physical Structure of the Earth

Geophysics, which studies the physics of the Earth, has led to many significant discoveries about the Earth and its makeup. For example, it has been revealed that the Earth has several distinct layers (See Fig. 1). Each of these layers has its own properties. The outermost layer of the Earth is the crust. This comprises the continents and ocean basins. The crust has a variable thickness of 35-70 km in the continent and 5-10 km in the ocean basins. The crust is composed mainly of aluminosilicates.

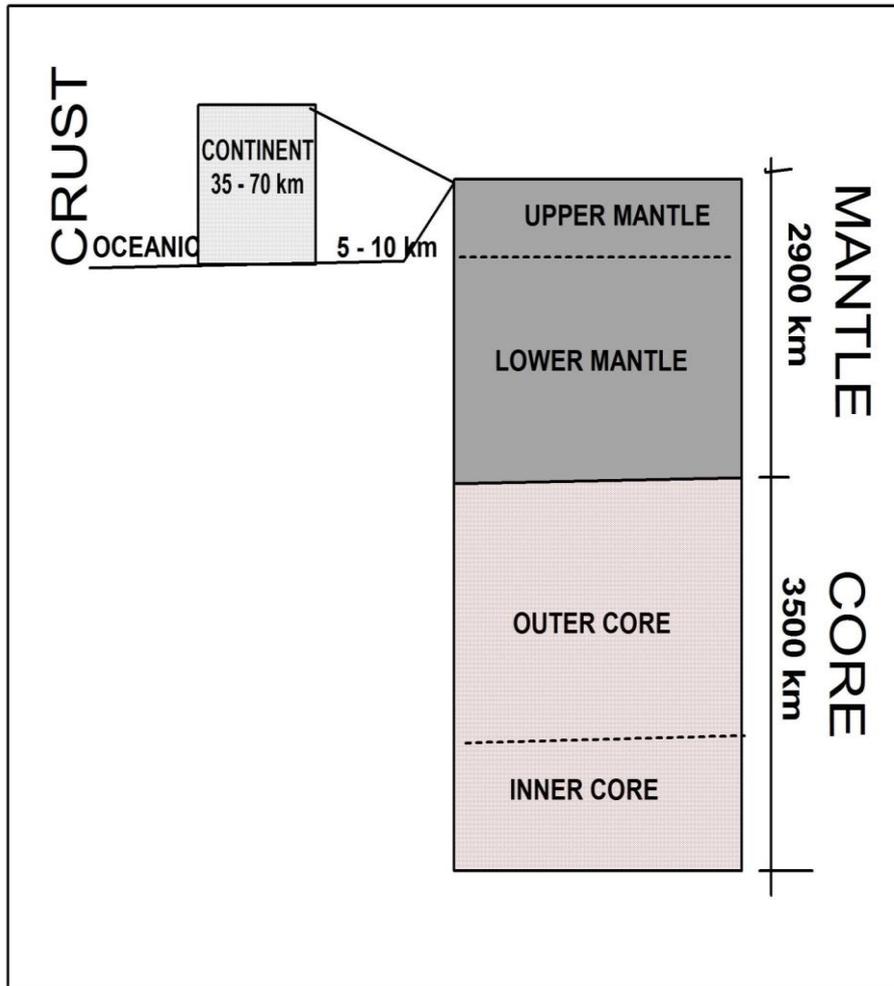


Fig.1: Cross Section of the Earth (not to scale)
 Source: Centre for General Studies, Akwa Ibom State University, Nigeria (2018)

The next layer is the mantle, which is composed mainly of ferromagnesium silicates. It is about 2900km thick, and is separated into

the upper and lower mantle. This is where most of the internal heat of the Earth is located. Large convective cells in the mantle circulate heat and may drive plate tectonic processes. The last layer is the core, which is separated into the liquid outer core and the solid inner core. The outer core is 2300km thick and the inner core is 1200km thick. The outer core is composed mainly of nickel-iron alloy, while the inner core is almost entirely composed of iron. The earth's magnetic field is believed to be controlled by the liquid outer core.

The Lithosphere

The Earth is separated into layers based on mechanical properties in addition to composition. The topmost layer is the lithosphere, which comprises the crust and the solid portion of the upper mantle. The lithosphere is divided into many plates that move in relation to each other due to tectonic forces. The lithosphere essentially floats atop a semi-liquid layer known as the asthenosphere. This layer allows the solid lithosphere to move around since the asthenosphere is much weaker than the lithosphere.

The land surface of the earth occupies about thirty per cent (30%) of the total area, and the land masses are separated by ocean basins. The land surfaces are synonymous with the seven continents. These continents are named as Asia, Europe, Africa, North America, South America, Australia and Antarctica. Various reasons have been advanced to attempt to explain the distribution of these land masses. There are certain areas, like most of Africa, which are made up of ancient crystalline rocks. These areas are known as shields and the main ones are shown in Figure 2.

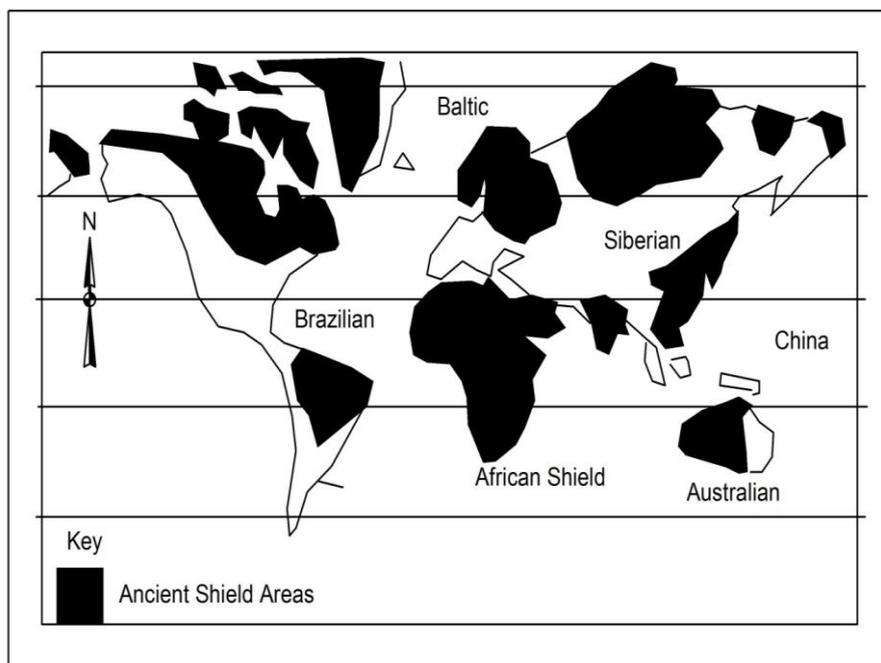


Fig. 2: Distribution of Ancient Shield Areas

Source: Centre for General Studies, Akwa Ibom State University, Nigeria (2018)

There is reason to believe that they have slowly drifted apart. The theory of continental drift was first put forward by Wegener in the 19th century and is still supported by modern research. Most of the more recent land areas of sedimentary rocks have been formed in the basins between these ancient shield areas.

The Distribution of Land on the Earth's Surface

The Northern Hemisphere contains 81 per cent of the land surface of the Earth and is usually described as the Northern Hemisphere. The remaining 19 per cent of the land surface, which lies south of the Equator, is found in the Southern Hemisphere. The location of the land surfaces north of the equator is responsible for the concentration of the world population in the Northern Hemisphere

Earth Movement and Major Land Forms

Folding, faults, and volcanic activities are responsible for the formation and types of the earth's surfaces while the agents of denudation, namely: running water, rain, frost, sun, wind, glaciers, and waves, are constantly reshaping the surfaces of the earth. They modify the pattern of mountains, plateaux and plains already modelled by movements of the earth's crust. Since the dawn of geological time, no less than nine orogenic or mountain-building movements have taken place, folding and fracturing the earth's crust. Some of them occurred in pre-Cambrian times between 600-3500 million years ago. The three more recent orogenies are:

- i. **Caledonian:**
This occurred about 320 million years ago. It formed or raised the Scandinavian and Scottish mountains.

- ii. **Hercynian:**
This occurred about 240 million years ago. It formed a range such as the Ural mountains, Russian, Pre-Cambrian hills that lie between North Atlantic ocean and the North sea in the United Kingdom and Welsh highlands in Britain.

- iii. **Alpine:**
This occurred about 30 million years ago. It accounts for Himalayas in Asia, the Andes in South America and the Rockies in North America (Holmes, 1965).

Rocks and Mineral Resources

The earth's crust is made up of different types of rocks. They differ in texture, structure, colour, permeability, mode of occurrence and degree of resistance. Detailed knowledge of these rocks is of paramount importance to geologists whose concern is the composition and physical history of the earth, but geographers and other environmental management scientists also need a basic knowledge of the most common rocks and their relationship with landforms. Rock formation is a basis for soil and influences natural vegetation types and land uses. Rocks are generally classified into: Igneous, sedimentary and metamorphic on the basis of origin and appearance.

i. **Igneous Rocks:**

These are formed when molten magma inside the core earth pushes through the earth crust and then cools. Intrusive or plutonic igneous rocks are hardened slowly beneath the surface of the earth and often form large mineral crystals within the rock. Examples of intrusive igneous rocks include granite, diorite and gabbros. The extrusive or volcanic igneous rocks are hardened quickly during a volcanic eruption and are usually smooth-grained. Examples include basalt, rhyolite, andesite, and obsidian.

ii. **Sedimentary Rocks:**

These are formed when layers of sediments like mud, sand, gravel and minerals settle in the bottom of the ocean and then compact over thousands of years. There are mechanically formed sedimentary rocks. These are formed from the accumulation of materials derived from other rocks, which have been cemented together. Examples include clay, shale and mudstones. Organically formed sedimentary rocks are formed from the remains of living organisms such as corals and shellfish whose fleshy parts have been decomposed, leaving behind the hard shells. Examples include limestone and chalk. There are also chemically formed sedimentary rocks. These are formed when water forms solutions which contain mineral matter. Examples include rock salt, potash, nitrates, gypsum and calcium sulphate.

iii. **Metamorphic Rocks:**

These are formed from either igneous or sedimentary rocks as a result of great heat and pressure. Any rock exposed to such conditions can be altered physically and chemically. Examples include clay to slate, limestone to marble, sand stone to quartzite, granite to gneiss, shale to schist and coal to graphite.

Mountains and Plateaux

Forces in the earth that cause parts of the earth's crust to rise while others sink produce mountains and plateaux. Uplift of the crust, combined with chemical and physical erosion by air, water, and ice over millions of years, produces the spectacular scenery found in mountains.

Based on mode of formation, there are four main distinguished types of mountains: fold, block, volcanic and residual mountains.

Plateaux are elevated uplands with extensive level surfaces and usually descend steeply to the surrounding lowland. According to mode of formation and physical appearance, plateaux are classified under tectonic, volcanic and dissected plateaux. Many of the world's Plateaux have rich mineral resources. Example is Jos Plateau in Nigeria which is rich in solid minerals like copper, chromium, tinstone and columbite.

The Atmosphere

The earth's atmosphere consists of a mixture of various gases surrounding the earth to a height of several kilometres. The atmosphere protects the earth's surface from being reached by dangerous solar radiation. Since gas is a loose body, it is surprising to know that it is held to the earth surface. This surprise can be explained by the earth's gravitational attraction. The air is dense at sea level and thins rapidly upward. Almost all the layers of the atmosphere that lie within the first 29km (18miles) from the surface of the earth up to 90km (50miles) have the composition of gases being fairly uniform.

The first and the lowest layer of the atmosphere, where the mixture of gases is fairly uniform, is known as the homosphere. The most important gas in this atmospheric layer is Nitrogen (N_2) which occupies 78.084%. Nitrogen does not easily enter into chemical union with other gases, although it is a very important gas, as we know. It is unlike oxygen (O_2), which occupies about 20.946%. Oxygen mixes freely with other gases in the process of oxidation, which is vital to the organic processes of the biosphere. These two gases make up 99.03% of all the gases in the atmosphere. The remaining 0.970% is made up of two gases, Argon and Carbon dioxide (CO_2). Argon contains 0.93% of the remaining 0.97%, while Carbon dioxide contains 0.033%. The remaining 0.003% is taken up by 7 other known gases; Neon (Ne) 0.00182%, Helium (He) 0.00053%, Krypton (kr) 0.000012%, Hydrogen (H) 0.00005%, Xenon (X_2) 0.00009%, Methane (CH_4) 0.00002% and Nitrous Oxide (H_2O) 0.00005%, making a total of 0.00268%. Still, the remaining 0.00032% is occupied by yet unknown gases.

Nitrogen gas in the atmosphere helps to absorb heat and allows the lower atmosphere to be warmed by heat radiation coming from the sun and from the earth surface. It is also an effective emitter of radiation and acts to cool the upper atmosphere. Green plants in the process of photosynthesis extract carbon dioxide (CO₂) from the atmosphere, converts it with water into carbohydrates. Since 1900 there has been a pronounced increase in the amount of CO₂ of the earth as a result of man's contribution of vast quantities of hydrocarbon fuels. Other gases mentioned earlier present in the homosphere are perfectly different so as to give pure dry air-a definite set of physical property just as if it were a single gas.

Beyond the homosphere is the upper layer of the atmosphere known as the **heterosphere**. It extends from about 200km up to 11,000km (7000 miles). Here, the mixture of gases is not – uniform. The heterosphere consists of four gases –nitrogen, oxygen, helium and hydrogen. The molecular nitrogen layer occupies up to about 200km (125miles). The layer dominantly occupied by atomic oxygen extends to about 1000km (700 miles) above the earth's surface. Helium layer is dominated by helium atoms. It extends up to 3500km (2,200miles) above the earth's surface. Above the helium atom layer is the atomic hydrogen layer consisting of hydrogen atoms. It is difficult to set a limit to the height of atomic hydrogen layer. Some scientists put it at 11,000km (7000miles). This is because above this height, the density of hydrogen is the same as between the outer planetary space of the planets.

Density of Gases in the Atmosphere:

The gases of the atmosphere decrease in density as they go higher. The decline is at first very rapid, but after about 20km, it is rather gradual. At the sea level, the density, which can be determined by the barometer, is usually around 1.225kg/m³. At about 35 km above sea level, the air density is just about 100th of what it is at sea level. At about 80km, it is ¹/_{10,000} of what it is at sea level. At a very high altitude of about 140km above sea level, the density declines to about ¹/_{100,000} of the density at sea level.

The absolute height of the atmosphere is unknown for certain. It may be regarded as extending outward as far as 35,000km. At this height, the hydrogen atoms rotating with the earth may be regarded as belonging to

the earth physical system. It has been noted that the density of gas molecules is extremely low at such a high altitude, about $1/100,000$ of the density at sea level.

Sub-Division of the Homosphere According to Layers of Temperature Change

The homosphere can be seen to have three distinct layers according to temperature change from the sea level up to about 90km above the sea level. **Troposphere:** The first layer of temperature change is known as the troposphere. Here, the temperature of the earth's surface lies between 15 degrees Celsius at the sea level and -65°C at about 9km above the sea level. That means the temperature decreases at some constant rate between these low heights. Put simply, the higher you go the cooler it becomes, or the layer of temperature decreases with altitude. The troposphere is a region where radiation of energy from the surface of the earth is quite intense, and this happens by means of long waves. Within this layer, too, exists matter in all three forms, namely, liquid, gas, and solid. The most important of these is liquid matter, especially water spray from the ocean surface. This water contains salt, which is absorbed from the sea and ocean surfaces during the process of evaporation. In the atmosphere, the water evaporates from the salt particles, leaving them to float about as condensation nuclei. Condensation nuclei are very useful in the process of condensation and precipitation. This is discussed in more detail under the hydrological cycle.

Stratosphere:

Above the height of 9km to 12km, the temperature begins to behave in a different way. Instead of continuing to decrease, the temperature begins to increase with altitude. The point where the temperature begins to increase is known as the tropopause and the zone where the increase takes place is known as the stratosphere. This zone of change extends from about 9km to about 30km. The stratosphere shows the temperature increasing from -65°C through 15°C to 40°C . It is in this zone that cosmic radiation continues to take place from the earth surface. Here, air pressure and density is so thin that only luminous night clouds are visible. Air turbulence begins to disappear.

Mesosphere:

After about 55km above sea level, the temperature returns to the same behaviours as was met with in the troposphere, that is the temperature starts to decline again with altitude. This second sphere of temperature decrease is known as mesosphere. Some scientists describe it as ionosphere, because it is in this sphere that ions are found in large quantity in the atmosphere. The ionosphere is a very useful layer in the atmosphere because the ions present in it do not allow dangerous solar particles to reach the earth surface. Also, it reflects the long wave radiation from the earth surface back to the earth and renders worldwide radio communication possible.

Above the mesosphere the temperature again resumes increase. This rise is very rapid between 80km to 130km altitude, the temperature increases from about -9°C to 2000°C and continues to increase. This zone of rapid increase in temperature with altitude is known as thermosphere or Heat zone. Some scientists describe it as the protosphere. Beyond this sphere the atmosphere of the earth ceases and we are actually outside the sphere influence of the earth. Other scientists like the astronomers are concerned with studies beyond the terrestrial atmosphere. Geographers and other environmental scientists however are only interested in the different zones within the atmosphere, so we shall now concentrate on the influence of the terrestrial atmosphere on the earth's surface.

The Terrestrial Atmosphere and Space

We have already noted that the atmosphere protects the earth from being reached by dangerous radiation from space. It screens off the major part of the solar electromagnetic short-wave radiation, that is, the invisible sections of the electromagnetic spectrum. Some of these invisible light rays are: infra-red and ultraviolet. The other light rays that pass through the spectrum are life-giving; they are violet, indigo, blue, green, yellow, orange and red. Solar particles such as meteors and cosmic radiation are continuously entering the atmosphere and giving rise to the colour of the sky. The troposphere affects weather conditions such as the humidity and regulates the temperature of the earth's surface.

The Difference Between Matter and Energy in the Atmosphere

If matter and energy were evenly distributed in the atmosphere, there would be no transfer of these two elements in the atmosphere. On the contrary, matter and energy are unevenly distributed in the atmosphere. For this reason, some parts of the atmosphere that have too much of one or more of these elements must give out extra to those regions that are in short supply. The purpose of this is to balance matter in space. This balancing is described as energy balance or water balance in the atmosphere. It further underscores the fact that matter and energy in the atmosphere are aspects of a physical system which must be maintained to regulate the entire physical world. The transfer can be described with a circulatory system known as the hydrosphere.

The Hydrosphere

The hydrosphere is an important component of the earth's surface. Its study provides us with the background to understand the relationship of the atmosphere to the lithosphere and the biosphere. The hydrosphere plays a major role in shaping the land forms of the lithosphere. It is also an important agent of energy and matter transfer from the atmosphere through the lithosphere to the oceanic system. In geography, a special study of how water behaves and what it does on the land surface over which it flows is known as hydrology. One who specializes in this branch of water studies is known as a hydrologist. In the environmental management practice, we find that water is present in the immediate spheres of life, namely: the biosphere, the lithosphere and the atmosphere. It is therefore necessary to devote some time to the study of the water system, both globally and locally. This can appropriately be done by discussing the hydrological cycle.

The Hydrological Cycle

Water is one of the closed systems of the earth. It has definite boundaries where matter and energy enter and where they leave it. If we begin this study of the circulation of water from the ocean, it will be easy to understand the transfer system of the globe as far as water is concerned. The ocean is the largest permanent storehouse of water on the earth. Solar energy, however, causes some of the molecules from the water storage to be evaporated into the lower atmosphere. The water

content of the atmosphere decreases with altitude and temperature. Where the temperature is high, a great deal of water is transferred to the lower atmosphere, but this soon decreases in quantity the higher one goes.

We mentioned earlier that ocean water contains salt. The reason for this is explained in this section. When evaporation takes place in the ocean, the water vapor carries along the salt particles; the evaporation taking place on the land surfaces carries dust particles. In the atmosphere, the water evaporates from the salt and dust particles taken from the ocean and land surfaces, leaving them to float about as condensation nuclei. They form the centre around which droplets from the atmosphere condense and form cloud particles. The wind system plays a role in consolidating the cloud particles into cloud families that we observed in the lower atmosphere. These cloud families give visible evidence of the presence of water in the atmosphere. With the growth of condensation, increase of water and the weight of droplets, the process of precipitation is arrived at. Here water leaves the atmosphere in the form of rain, snow, ice, fog or dew depending on the environment where the precipitation takes place. At every stage in this process of precipitation, evaporation can take place and transport part of the water back to the atmosphere to form a sub-circulation system of the water.

However, the precipitation that reaches the earth surface takes different pathways in its transfer of energy and matter. Some of it mixes with oxygen, organic and inorganic matter to form life-giving substances in the layer of the earth crust known as the biosphere. It is this sphere that gives life to all types of biological and botanical species. Evaporation takes place among most plants of the Earth's surface including sociological life. The evaporated water gets back to the atmosphere and becomes condensed for another cycle of precipitation. Another subsystem of water circulation occurs. Even the groundwater is evaporated back to the atmosphere, while the remaining water sinks through the soils. This is the underground water, which runs down any slope in the rocks and may collect as a reservoir in layers where water cannot easily pass through. This is the underground water storage, which is the source of water that man taps through boreholes for both domestic and industrial purposes. It is reasonably pure but sometimes contains a

mixture of minerals that may be injurious to health. To obtain good drinking water from this source, the water needs some form of treatment in the water works in order to remove the harmful minerals. Another name for this kind of water is infiltrated water. Some of these may emerge on the side of a slope as streams, springs or rivers. The horizontal flow which is called surface runoff, flows along the surface of the earth until it finds its way into the streams, springs or rivers and they continue to run on the surface of the land as channel flow. They are temporary water storage systems because when streams or rivers complete their work of erosion, they tend to disappear altogether, leaving their former wet plains as dry valleys. Nevertheless, the channel flow is usually very valuable for evaporation. The solar radiation takes up a large percentage of water from streams, springs and rivers back to the atmosphere for condensation and precipitation. Eventually, the surface springs, streams and rivers reach the sea or ocean where the water is permanently stored. In doing this, they bring loads of organic and inorganic matter as well as gaseous matter into the ocean. That is why ocean water is saline in taste. The ocean forms by far the greatest reservoir of the water system of the earth and it also provides the largest quantity of water back into the atmosphere.

In the ways discussed above, there is a large cycle of water from the atmosphere through the earth surface to the sea and back to the atmosphere. As we have noted, there are secondary and sub-systems of water cycle from the receiving area through evaporation and back to the atmosphere. This one major circulation system and the various systems constitute what is called the water cycle or hydrological cycle (see Fig. 3). The aim of this major system and sub-system is to transfer water from areas of surplus to areas of deficit in order to maintain the water balance of the earth.

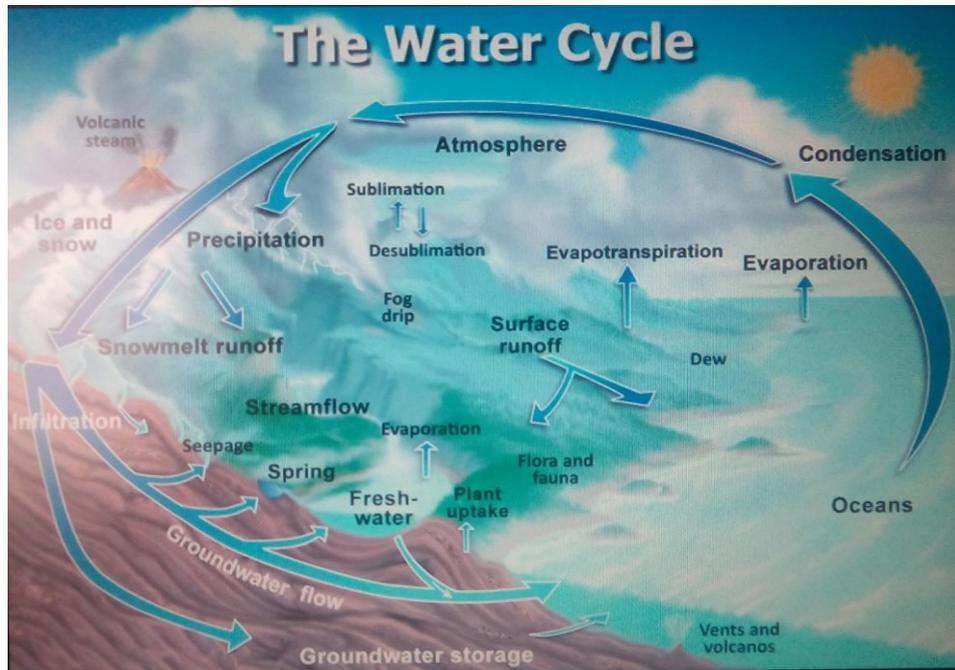


Fig. 3: The Graphical illustrations of hydrological cycle
 Source: Wikipedia (2018).

Groundwater

Groundwater is water that exists in the pores and fractures in rocks and sediments beneath the earth's surface. It originates as rainfall or snow and then moves through the soils into the groundwater system, where it eventually makes its way back to surface streams, lakes or oceans. Part of the precipitation that hits the surface of the earth, seeps down through the soils and into a zone called the zone of aeration or unsaturated zone, where most of the pore spaces are dry and filled with air. As the water penetrates deeper, it eventually enters a zone where all pore spaces and fractures are filled with water. This zone is called the saturated zone. The surface below which all openings in the rocks are filled with water, which is the top of the saturated zone, is called the water table (see Fig. 4). The water table occurs everywhere beneath the earth's surface. In the desert regions, it is always present. In the more humid regions, it reaches the surface at streams and lakes and generally tends to follow surface

topography. The depth to the water table may change as the amount of water flowing into and out of the saturated zone changes. During dry seasons, the depth to the water table increases, but decreases during the rainy/wet seasons.

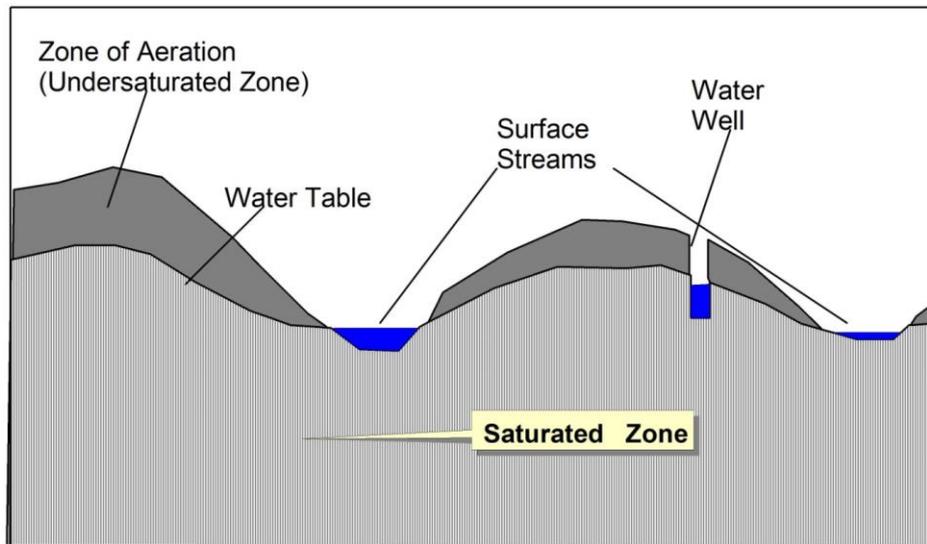


Fig. 4: The Groundwater System

Source: Centre for General Studies, Akwa Ibom State University, Nigeria (2018)

Groundwater is in constant motion, although the rate at which it moves is generally slower than it would move in a surface stream, because it must pass through intricate passage ways between free spaces in the rocks. Groundwater makes up about 1% of the water on earth. It makes up about 35 times the amount of water in lakes and streams. Groundwater occurs everywhere beneath the earth's surface but is usually restricted to depths less than about 750 meters. The volume of groundwater is equivalent to a 55 meter thick layer spread out over the entire surface of the earth.

The Biosphere

This is that part of the lithosphere, atmosphere and the hydrosphere that supports life. It extends from the lowest sea bed level to about 24km above the atmosphere. Life-supporting resources are available in this sphere. This is where the living (biotic) organisms exist and interact with each other and also with non-living (abiotic) components to sustain their life. The waste products in gaseous, liquid and solid forms are discharged into the biosphere. The concern of all environmental scientists is that though the sustaining and assimilative capacity of the biosphere is tremendous, it is not infinite. The system has been in operation for millions of years, but is now showing stress due to the impact of humans on the environment- the very essence of this academic project.

Summary and Conclusion

In the foregoing discussions, the major physical components of the environment have been highlighted. The environment in this context refers to a singular global environment (the earth) in relation to the entire humanity. Earth science generally recognizes four spheres as the major components of the Earth's environment, namely: the lithosphere, the atmosphere, the hydrosphere and the biosphere. The discussions on these various major components and their sub-components are intended to provide baseline information for the study and understanding of global environmental management issues.

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CHAPTER 3

HUMAN – ENVIRONMENT INTERACTIONS

Ekong E. Daniel and Reuben K. Udo

Introduction

The age-old debate concerning the relationship of man and the environment dates back to the writings of ancient Greek philosophers, such as Aristotle (384-322 BC) and Strabo (63-73BC). It resulted in the controversial doctrine of environmental determinism, which dominated geographic thought up to as recent as the early 1930s, when it was effectively challenged by the doctrine of Environmental possibilism. The much greater threat that human activities all over the world pose to global environment since the end of the Second World War has given rise to the new third concept of environmentalism.

Environmental Determinism

The doctrine of environmental determinism canvassed the view that the nature of the human person and his activities were controlled (determined) by the parameters of the physical environment in which he found himself. Environmental determinism derived largely from the viewpoint of classical (or ancient) geography, namely, that the purpose of geographical study was to explain the way society was conditioned by the environment. The most prominent advocates of this doctrine were Carl Ritter (Europe) and Prof. Ellen Churchill Semple (USA), who canvassed the view that “the physical environment rather than social conditions determines culture”.

Environmental Possibilism

Environmental possibilism was a reaction to extreme environmentalism. Such unguarded statements as “people in cold climates are stronger physically and more courageous than those in hot climates (Montesquieu), brought much disrespect to geography from other disciplines. The possibilist view is that nature does play some role and may set some limits to human activities, but it also does not drive people

along one particular path. Rather, nature offers several opportunities from among which people are free to choose.

Environmentalism:

This is a recent concept that views the environment from a broad range encompassing preservation, conservation, protection and improvement of the health of the environment, incorporating the impact of changes to the environment on humans, animals, plants and non-living matter. Environmentalism advocates a movement to control pollution and protect plant and animal diversity. The theory attempts to balance relations between humans and the various natural systems on which they depend in such a way that all the components are accorded a proper degree of sustainability.

Environmental Impact on Man

The first major work in English on population (man) and the environment was published in 1864 by George Perkin Marsh an American scholar and diplomat. It bore the title 'Man and Nature or Physical Geography as Modified by Human Action'. It dealt extensively with the modification of flora, fauna and the major destruction of forests, water bodies and soil by human activities. Humans are a part and parcel of the earth's ecosystem. Like other living things, human beings relate to their environment in three ways. Firstly, the environment provides the resources that human beings need for their existence and survival. Secondly, the environment provides the site for their homes, defences, recreation etc., and thirdly, the environment serves as the sink for human, agricultural, industrial and other wastes (Paul Harrison, 1993).

The earth's environment is made up of different grades of ecosystems, made up of abiotic (lifeless) substances and biotic components (living things), including human beings. All living things, including human beings, impact upon and modify the environment where they live or are found, just as the environment impacts these living things. There is no problem in this mutual relationship as long as the ecosystem (environment) made up of a great variety of species – animals, trees, herbs, humans, etc. remains balanced, such that no one organism (species) is able to cause excessive damage to the environment (or pose

a threat to other species). The trouble starts when nature's balance is upset, usually by a dominant or a few dominant species or by a natural disaster. Usually, the dominant species in the case of large-scale environmental damage is the human population.

We find the Eric Zimmermann (1951) model of man in the environment, in his monumental work, *World Resources and Industries*, to be helpful in explaining the role of man in environmental degradation and related problems. Zimmermann holds the view that to understand the meaning and nature of resources, it is necessary to conceive of human beings as existing at two levels, namely the animal level as man and the supra-animal level as MAN. At the animal level, man is a part of the natural ecosystem and, like other animals, is subject to the same laws of passive adaptation. At this primitive level, man has very little means to subdue the environment; rather like other animals, he struggles to obtain his basic needs and is subject to famines, exposed to harsh weather conditions and attacks by other animals, large and small. He moves about on foot or on the back of animals. His impact on the environment is minimal and is restricted to bush burning, largely because of the low level of technology at his disposal.

At the supra-animal level, or human level, the human being, now living in society, develops culture, the driving force in the transformation of the environment. Culture, which encompasses technology, helps human beings to emancipate themselves from the environment by exploiting and creating resources, a situation which enables them to steadily take control of, and eventually subdue all other living things. Further, the more advanced the level of technology, the greater the demand for cultural wants as distinct from basic needs. What follows is an increase in the level of consumption of natural resources and a greater transformation and destruction of the environment – the production of industrial toxic waste, carbon dioxide and other gases that have reduced the ozone layer to create climate change. Up till the Earth Summit of 1992 at Rio de Janeiro, humans (Man) appeared to have forgotten or pretended not to be aware that the word, *replenish* was a component of the divine injunction on the use of the earth's resources.

Environmental Impact on Man

Although the human impact on the environment is more readily discernible, it is a fact that the environment also impacts on the life and activities of man. Indeed, the now discredited doctrine of environmental determinism was based on the belief that the nature of human activity was controlled by parameters of the physical environment – topography, climate, vegetation, etc in which the people lived (Johnston, 1979). The rejection of crude environmental determinism does not mean that the environment has not impacted the people who live in it. Rather, there are two major situations in which the environment greatly impacts the activities of man, and these are at the primitive to pre-industrial stage and at the stage of extreme population pressure on land and at the peak of industrialization and large-scale production of toxic waste.

At the primitive stage, that is, before the development of culture and village life, man and his family, like any other animal, had very little or no control over the environment where they lived. His movement was constrained by a lack of roads, no bridges across water channels, and no sophisticated weapons to protect himself from wild beasts. He had little or no contact with people in distant places; he was exposed to hunger, epidemics and attacks by more powerful groups of people etc. This scenario still exists today in the vast wetlands of the mangrove forests and rain forests of the Niger Delta, the rugged and forested highlands of the Eastern Borderlands of Nigeria, the sparsely inhabited rain forests of the Congo River basin and the extensive rain forest of the Amazon River Basin and Indonesia.

The second stage of environmental impact on man is that in which man has overexploited the environment and damaged it to an extent that it is difficult to rehabilitate. This is the stage that exists in the devastated gullied landscape of Agulu, Nanka, and Ukehe in Anambra State, the over-farmed and over-grazed Sahel and Sudan Savanna zone areas of the Chad Basin, the Niger/Nigeria borderlands and large areas of Ogoni homeland and the central Niger Delta, where farmlands and fishing grounds have been destroyed by oil-spills. In this second stage, the environment tends to push the people to move to look for a livelihood in other climes.

Environment Aspects and Impacts of Human Actions

Humans have played a dominant role in modifying the natural environment. They do this through agricultural practices, urbanization and industrialization, thus giving rise to terms such as “Man-made environment”, built environment”, socio-economic environment, etcetera. In the human-made environment or human-modified environment, there can be found cultural heritage, social amenities and economically valuable features. The various activities of humans, be it at the personal, family or organizational level impact on the various elements of the physical environment. The concern of environmental management is to ensure that the negative impacts are reduced to the least levels to keep the physical environment constantly at a state of equilibrium. The physical environment is like the living cells in living bodies that have the ability to renew, repair and replace dead cells with new ones. This system of regeneration or recuperation can continue on and on as long as the resilience level is not exceeded. The state at which the environment can recuperate despite the impact from the activities of man is referred as the ‘state of equilibrium’. The maintenance of this state of the environment is the very essence of environmental management process.

In order to properly identify, assess and manage human and environmental interactions, it is important to isolate clearly environmental aspects and impacts of every human action. Environmental aspects refer to the elements or components of the human action (proposed or actual) that can interact with the environment. As an example, photocopying a paper by using a photocopy machine is an activity. When performing this activity, papers are consumed, and electricity operations take place to power the photocopy machine. Thus, the consumption of paper and the electrical operation to power the photocopy machine constitute the environmental aspects of this human action. Environmental impacts refer to the changes to the environment, whether adverse or beneficial, wholly or partially resulting from the environmental aspects of human activities. In the example cited about environmental aspects of making photocopies of documents from a copying machine, environmental impacts of the action include the trees cut down to produce the papers and the consumption of fossil fuel through the operation of the electrical machine among others.

Importance of Impact Study

An impact study should be done before any human action is carried out. For example impact study should be carried out before we build houses, roads, dams, power plants and other projects to better understand how we will affect the environment. Generally, too little is known about the impact of human activities to make predictions concerning overall damage. As a result, we most often rely on educated guesswork or speculation. More recently, there have been legislations requiring environmental impact studies or environmental impact reporting on every proposed project, whether it is publicly owned or privately owned. This is a noble development index in Nigeria. Nevertheless, no meaningful results have been achieved so far. The reason, from our experience, is that most often, especially in public projects, the environmental impact studies are usually done after the project had commenced. This practice usually brings conflicts between the contractors and the environmental management experts. The result has always been non implementations of the recommendations of the environmental management experts. The consequences of these irregularities in implementing environmental impact study law in our public projects are usually the transfer of the negative impacts on the same people that were supposed to be the beneficiaries of such projects. For example, it is a common experience in Akwa Ibom State, Nigeria, that road projects in many communities usually cause flooding in the neighbourhood settlements adjoining/bordering the newly constructed roads. This is serious, because the affected people are usually very poor to ameliorate the crisis. Thus, these groups of people are usually made worse off by the project meant supposedly for improvement of life.

Assessing the Probability of Impacts

One way of dealing with uncertainty is to carefully analyse impacts with respect to the degree of probability of their occurrence. First, when analyzing a potential impact, determine the probability of its happening. For convenience, probability can be divided into four levels: high, medium, low, and unknown. High probability is indicated when data supporting a given conclusion are strong and numerous. Medium probability is indicated when the impact is suspected, but there is some uncertainty. Low probability is assigned when the impact might

theoretically happen, but the data do not support the conclusion. The unknown probability is when there are no data at all showing either an impact or the absence of one (Chiras, 1985).

Natural Disasters

Natural disasters are major adverse events resulting from natural processes of the earth and other geologic processes. Natural disasters seem to be very much in the news. More people than ever before are victims of one calamity or another. Statista (2018) reports that in 2017 alone, there were 330 disasters. The number of reported disasters has also increased consistently during the last three years (2017, 2016, and 2015). For example, between 2005 and 2014, well under 300 disasters were recorded each year (see Table 1). However, between 2015 and 2017, the average was above 300 per year. Why so many disasters? A United Nations report on global disasters states: “Populations are too often being concentrated in risky areas such as flood plains. In addition, the destruction of forests and wetlands is hampering the capacity of the environment to withstand hazards. Above all, there is the threat of global climate change and rising sea levels as a result of increased greenhouse gas concentrations caused by human activity” (UNF, 2018). Though much of this ‘human activity’ is said to be for economic progress, it is in reality the work of the selfish and greedy spirit that permeates the world. It is true, as the Indian Leader named Gandhi was quoted as saying, ‘ The earth has enough to satisfy the needs of mankind generations after generation, but certainly not enough to satisfy the greed of man’ (Chiras, 1985). Consequently, many experts now recognize that greed and indiscriminate human activity have intensified the devastating effects of the disasters that occur. Therefore, many disasters are the result of greedy and careless human activities. Also, some of the adverse events would not have risen to levels of disasters if they occurred in areas without a vulnerable population. In other words, some disasters would not have been as devastating were it not for where they occurred. In many parts of the world, the effects of natural disasters have been greatly aggravated by the underhanded dealings of unscrupulous individuals or by the fact that masses of people have been forced to live in hazardous areas as a result of the economic or social inequalities inherent in the world today. This section discusses some examples of natural disasters and their socio-economic impacts. They

include hurricanes, volcanic eruptions, earthquakes, tsunamis, flooding and droughts.

Table 1: World Record of Disaster 2000 - 2017

S/n	Year	No. of Disasters
1.	2000	338
2.	2001	326
3.	2002	328
4.	2003	193
5.	2004	175
6.	2005	232
7.	2006	277
8.	2007	253
9.	2008	235
10.	2009	248
11.	2010	326
12.	2011	258
13.	2012	298
14.	2013	291
15.	2014	257
16.	2015	302
17.	2016	316
18.	2017	330
TOTAL		4983

Source: Statista (2018)

Hurricane

A hurricane is a very powerful, sometimes violent storm with strong winds and heavy rains. The spiriting storm usually begins over a warm sea, near the equator. When a hurricane hits land, it can do great damage through its fierce winds, torrential rains, inland flooding, and huge waves crashing ashore. A powerful hurricane can kill more people and destroy more property than any other natural disaster. Beginning in 1953, the first storm of the season was given a woman's name starting with the letter A, the second storm was a woman's name beginning with the letter B, and so on. It was not until 1979 that men's names began to be used. Every sixth year, the names repeat. However, if the storm is

particularly violent or destructive, the name is taken off the list. That way, when someone mentions hurricane Camille, most people know they mean the storm that hit the Mississippi Delta in 1969. Sometimes, names are specially changed to suit the area of the world that is hit. When hurricanes approach within 1,000 miles of Hawaii, for example, they are given Hawaiian names. Generally, the hurricanes once named are not renamed. In some cases, the hurricanes may travel to another region, where they get a new name. A hurricane may weaken and then develop into a strong form and is considered a new hurricane with a new name. Sometimes, human errors lead to the renaming of hurricanes. The tendency of the hurricanes to cause widespread destruction makes them one of the most fierce forces of nature.

Flooding

A flood is an overflowing or eruption of a great body of water over land not usually submerged. It is an extreme weather event naturally caused by rising global temperature, which results in heavy downpour, thermal expansion of the ocean and glacier melt, which in turn result in a rise in sea level, thereby causing salt water to inundate coastal lands. Flooding is the most common of all environmental hazards and it regularly claims thousands of lives per year and adversely affects millions of people worldwide. In the Niger Delta Region of Nigeria, two separate and distinct floods are usually experienced. The rain flood and the river flood. The rain floods are caused by local rains, about 300mm of which are concentrated within a few months of the year. Since the sandy soils are porous and very pervious, there is a rapid rise in the groundwater level, a process which subsequently floods the lowlands. The River flood is in effect caused by the arrival in the area of the Black Flood from the upper reaches of the Niger. It has nothing to do with local rains and is thought to be due to last year's rain coming down the River Niger from the hinterland of Sierra Leone and Guinea. At Lokoja confluence, it is joined by the Benue flood, caused by the current year's rainfall in that river-basin; and together the flood sweeps down the lower Niger valley, submerging all sandbanks and washing downstream vast quantities of sand which form new sandbanks when the flood subsides (Udo, 1970). Flooding in various parts of the country has forced millions of people from their homes, destroyed businesses, polluted water resources and increased the risk of diseases.

Earthquake

An earthquake is a sudden movement of the earth that causes seismic waves by the abrupt release of strain that has accumulated over a long time. Earthquakes are caused mostly by the dislocation of the earth crust. During the breaking process, the vibrations called seismic waves are generated. These waves travel outward from the source of the earthquake along the surface and through the earth at varying speeds depending on the material through which they move. The focal depth of an earthquake is the depth from the earth's surface to the region where an earthquake's energy originates (the focus). Earthquakes with focal depths from the surface to about 70 kilometres (43.5 miles) are classified as shallow. Earthquakes with focal depths from 70 to 300 kilometres (43.5 miles – 186 miles) are classified as intermediate. The focus of deep earthquakes may reach depths of more than 700km (435 miles). The focus of most earthquakes is concentrated in the crust and upper mantle. In Nigeria, recently, there have been reported cases of earth's tremor in some major cities. These may be attributed to uncontrolled mining activities and drilling of water boreholes.

Drought

Drought is a condition usually associated with a deficiency in water supply. Since people use water in so many different ways, there is no universal definition of drought. To most environmentalists, drought is a prolonged and abnormally extended dry period of months or years when there is not enough water in a region for users' normal needs (Michael, 2010). Drought is caused by a reduction in the amount of water vapor in the atmosphere, combined with the upward forcing of the air mass containing the water vapor that would have resulted in rainfall. This process is triggered by an above average prevalence of high pressure systems that are winds carrying continental air mass rather than the maritime air mass, thus preventing the development of thunderstorm activity. Drought is not simply low rainfall, but occurs when a region receives consistently below-average precipitation. Human activity leads to many drought-triggering factors such as over-farming, excessive irrigation and deforestation.

Volcanic Eruption

A volcano is an opening, or rupture in the earth crust which allows hot magma, volcanic ash and gases to escape from the core zone of the earth crust. It usually begins when pressure on a magma chamber forces magma up through the conduit and out from the volcano's vent. Since the magma is always building up pressure and the earth is always spinning, it sometimes causes a crack in the earth. The two sides of the crack may shift. This is called plate tectonics. The magma will burst through the crack and when magma comes out or erupts, it is called lava. If this crack is in the ocean, an Island can be created. After it erupts numerous times, a cone is created. When there is an eruption in a volcano, the place where pressure builds up and where the magma is, is called the magma chamber.

Volcanic eruptions in populated regions are a significant threat to people, property, and agriculture. The danger is mostly from fast-moving, hot flows of explosively erupted materials, falling ash, and highly destructive lava flows and volcanic debris flows. In addition to explosive eruptions, even from volcanoes in unpopulated regions, can eject ash high into the atmosphere, creating drifting volcanic ash clouds that pose serious hazards to airplanes.

Tsunami

The term tsunami comes from the Japanese language meaning "harbour wave" it is fairly common in Japan and other countries that are located along the coast of the oceans. It is one natural disaster that can cause tremendous damage to an ecosystem. A tsunami is a series of great sea waves caused by an earthquake, landslide or volcanic eruption. Tsunami is not a single wave but a series of waves, which is known as a wave train. Tsunami waves can rise above 10 meters and deposit debris or silt up to about 200 million tons on the water Island.

Tsunamis are sometimes called tidal waves. Tidal waves are simply the surging and warning swells that are called tides and are caused by the gravitational pull of the sun and the moon. Even the massive waves that are sometimes over 25m high (90 feet) whipped up by gale-force winds cannot be compared with tsunamis. If one were to drive beneath these tidal waves, one would find that their influence weakens the deeper one

goes, and at a certain depth, the water is hardly disturbed. But it is not so with tsunamis. Their influence reaches from the surface right to the ocean floor, even though the water may be kilometers deep. A tsunami runs deep because it is generally caused by violent geologic activity on the seafloor. This is the reason scientists sometimes refer to tsunamis as seismic waves.

Natural Disaster Management

The United Nations defines a disaster as a serious disruption of the functioning of a community or a society. Disasters are categorized under pandemic emergencies, complex emergencies, environmental emergencies and natural disasters. Our discussion in this section primarily focuses on the management of environmental emergencies and natural disaster though there are basic principles that apply generally to other forms of disasters mentioned above. Natural disasters that occur in populated regions, whether it is rural or urban settlement, usually interrupt essential services, such as healthcare, electricity, water, sewage/garbage/waste removal, transportation and communications. The interruptions can seriously affect the health, social and economic networks of local communities. Disasters can have a major and long-lasting impact on people's lives long after the immediate effect has been mitigated. Poorly planned relief activities can also have a significant negative impact not only on the victims but also on donors and relief agencies. It is very unfortunate that the implementation of this plan in the oil-rich Niger Delta Region of Nigeria seems to be an illusion. Why? The answer is in the title of this book. Nevertheless, I think we can still go on to discuss other aspects of disaster management.

Disaster Prevention

Disaster prevention comprises activities designed to provide permanent protection from disasters. However, in the case of natural disasters, there is always little or absolutely nothing that can be done to prevent most of them, but the risk of loss of life and injury can be mitigated with good evacuation plans, environmental planning, design and construction standards. The global plan for natural disaster risk reduction can be found in the document known as "the Hyogs framework" adopted in 2005 (Hyogo Framework, 2018). The document contains the guiding

principles, priorities for action, and practical means for achieving disaster resilience for vulnerable communities.

Disaster Preparedness

Disaster preparedness involves all activities that are designed to minimize loss of life and damage. They include removing people and property from a threatened location, timely, and effective rescue, relief and rehabilitation. These and other measures are actions usually taken promptly in order to reduce the impact of disasters. Community-based preparedness and management is seen to be the best disaster management practice.

Disaster Relief

Disaster relief refers to the coordinated multi-agency response to reduce the impact of a disaster and its long-term results. It includes activities such as rescue, relocation, provision of food and water, diseases and disability prevention, repair of vital services like transportation, communication, provision of temporary shelter and health care services.

Disaster Recovery

Disaster recovery involves activities aimed at returning the affected people and support communities to their normal life situation. This includes rebuilding the damaged infrastructures, and rehabilitating health care services, restoration of development activities through capacity building, such as human resources development. It also includes developing policies and programmes that can help avoid or reduce the vulnerability of the place in the future.

The Concept of Sustainable Development

Following the publication “Our Common Future” by the World Commission on Environment and Development in 1987, much effort has been made to develop principles for sustainable development. The principles and guidelines of sustainable development applied to Nigeria are as follows:

Principles of Sustainable Development:

The first principle is **Integration of Environmental and Economic Decisions**. The implications of this principle are as follows:

(a) Economic decisions should adequately reflect environmental, human health and social effects. (b) Environmental and health initiatives should adequately take into account economic, human health and social consequences.

The second principle is **Stewardship**. This principle implies that (a) the economy, environment, human health and social well-being should be managed for the equal benefit of present and future generations. (b) Nigerians are caretakers of the economy, the environment, human health and social well-being for the benefit of present and future generations. (c) Today's decisions are to be balanced with tomorrow's effects.

The third principle is **Shared Responsibility and Understanding**. This implies that: (a) Nigerians should acknowledge responsibility for sustaining the economy, the environment, human health and social well-being, with each being accountable for decisions and actions in a spirit of partnership and open cooperation. (b) Nigerians share a common economic, physical and social environment. (c) Nigerians should understand and respect differing economic and social views, values, traditions and aspirations. (d) Nigerians should consider the aspirations, needs and views of the people of the various geographical regions and ethnic groups to facilitate equitable management of the country's common resources.

The fourth principle is **Prevention**. The implication of this principle is that Nigerians should anticipate, and prevent or mitigate, significant adverse economic, environmental, human health and social effects of decisions and actions, being particularly careful with regards to decisions whose impacts are not entirely certain but which, on reasonable and well-informed grounds, appear to pose serious threats to the economy, the environment, human health and social well-being.

The fifth principle is **Conservation and Enhancement**. This implies that Nigerians should (a) maintain the ecological processes, biological diversity and life-support systems of the environment; (b) harvest renewable resources on a sustainable yield basis; (c) make wise and

efficient use of renewable and non-renewable resources; and (d) enhance the long-term productive capability, quality and capacity of natural ecosystems.

The sixth principle is **Rehabilitation and Reclamation**. The implications of this principle are that Nigerians should: (a) endeavour to repair damage to or degradation of the environment; and (b) consider the need for rehabilitation and reclamation in future decisions and actions.

Global Responsibility

Is the seventh principle, implying that Nigerians should think globally when acting locally, recognizing that there is economic, ecological and social interdependence among provinces and nations, and working cooperatively, locally, nationally and internationally, to integrate economic, environmental, human health and social factors in decision making while developing comprehensive and equitable solutions to problems.

In order to ensure a successful and sustainable development at all levels, the following Guidelines must be adhered to:

1. Efficient use of Resources:

This involves (a) encouraging and facilitating the development and application of systems for proper resource pricing, demand management and resource allocation together with incentives to encourage efficient use of resources; and (b) employing full-cost accounting to provide better information for decision makers.

2. Public Participation:

This embraces (a) establishing forums which encourage and provide opportunity for consultation and meaningful participation in decision-making processes by Nigerians; (b) endeavouring to provide due process, prior notification and appropriate and timely redress for those adversely affected by decisions and actions; and (c) striving to achieve consensus amongst citizens with regard to decisions affecting them.

3. Access to Information:

This entails (a) encouraging and facilitating the improvement and refinement of economic, environmental, human health and social information; and (b) promoting the opportunity for equal and timely access to information by all Nigerians.

4. Integrated Decision-Making and Planning:

This necessitates decision-making and planning processes that are efficient, timely, accountable and cross-sectorial and which incorporate an inter-generational perspective of future needs and consequences.

5. Waste Minimization and Substitution:

This demands (a) use of substitutes for scarce resources where such substitutes are both environmentally sound and economically viable; and (b) reducing, reusing, recycling and recovering the products of society.

6. Research and Innovation:

This requires continuous research to generate knowledge, create innovations and development of new technologies and applications and sharing of same to further our economic, environmental, human health and social well-being.

Conclusion

The year 2012 began with a dismal proclamation by the scientific community. According to the article 'Is the World out of Control?' (2017), a group of scientists declared in January 2017 that the world first got closer to the worst catastrophe ever. Using the symbolic Doomsday clock to illustrate mankind's proximity to a global disaster, scientists moved the clock's minute hand forward by 30 seconds. The doomsday clock is now set at merely two and a half minutes to midnight – nearer to a global catastrophe than at any time in over 60 years. The article says.

This raises concern about the future state of the global environment, especially now that human-environment interactions seem to be at crises

level. Factories continue to pollute earth's atmosphere. Millions of people die every year from breathing contaminated air. Individuals, communities and government agencies continue to dump sewage, medical and agricultural wastes, plastics and other pollutants into the oceans (...out of Control?, 2017). According to Nicols & William (2009), these toxic pollutants poison marine animals and plants as well as humans who consume contaminated sea life.

Also, Water.org (2018) warns that the world faces a water crisis that will touch every part of the globe. It has been admitted that the water scarcity is largely a man-made problem and that it poses a grave danger. Storms, hurricanes, tornadoes, typhoons and earthquakes bring about devastating floods, crushing landslides and other types of destruction. More people than ever are killed or are otherwise adversely affected by these forces of nature. Ekanem (2018), points to a greater potential for more intense storms, deadly heat waves, and more extreme flood-drought cycles due to the undeniable facts of climate change. Is there any reason for optimism? Science, especially Environmental Management Science, has provided the technology and innovations and will continue to do so to reduce the negative impacts of human activities on the earth's systems and thus delay the possibility of a global disaster. Notwithstanding, the environmental problems and challenges we face have never been greater and the capacity of science to meet these challenges seems to be inadequate to put our trust in man. The fact is that the world is not like a run-away train, completely out of control and heading to a catastrophic end (.....out of Control?, 2017). The earth's dynamic and intrinsic systems reveal that there must be an intelligent being behind its origin and existence. If this is true, there must be established boundaries or limits on how much damage humans can inflict on themselves. Therefore, it is the position of the author that the prediction of the doomsday clock will not happen. Rather, there is a bright future for mankind and the earth (New World, 2013).

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CHAPTER 4

THE HISTORY AND ACHIEVEMENTS OF GLOBAL ENVIRONMENTAL MEETINGS

Ofonmbuk E. Atakpa

Introduction

An understanding of those patches of issues that constitute the history of global environmental meetings, also referred to as “global environmental mega conferences”, is relevant as a review of the problems that have bedevilled the environment (over time), upon which solutions have been sought. This is bearing in mind that the scientific pathway is usually an attempt at finding solutions to problems. The fact of a world in constant change and the inevitable responses to those changes by organisms (formal and informal) in the generic sense is not in doubt; also are the formal attempts by man to deal with these issues as they arise. Thus, beginning from the period of the geological climate change which Simmons (2008) terms as ‘the glacial maximum of the Pleistocene’ estimated to have occurred between 1.8 million and 11,500 years ago; through the postglacial age with manifestations of notable fluctuations as sudden descents into cold phases and long periods of intense drought, there have been continuous responses by living organisms whose populations have grown or fallen and which have changed their distributions.

In the same vein, humans have witnessed changes from a population that was wholly dependent on hunting and gathering, with agriculture becoming dominant after about 8000 BC, through the industrial economies that emanated from Europe and North America after the mid-eighteenth century, through a fossil-fuel based industry which became the world’s major economy up until about 1950, to the post-industrial economic era of ‘globalisation’ modeled by communication and rapid transport and allowing intensification and acceleration of most

forms of interaction between humans on the one hand, and between humans and the non-human world of the globe, on the other hand. Although the exact relationship between population growth and technology remains a matter of controversy, there can be no denying the fact that, in combination, these two elements were responsible for the increasingly rapid environmental change which began in the mid-eighteenth century. At present, change is often equated with deterioration, but then technological advancement promised such a degree of mastery over the environment that it seemed such problems as famine and disease, which had plagued mankind for centuries, would be overcome, and the quality of life of the world's rapidly expanding population would be improved infinitely. That promise was fulfilled to some extent, paradoxically, the same technology which had solved some of the old problems, exacerbated others, and ultimately created new ones (Kemp, 2004). The bottom line is that all these changes (each often labeled an era) have been accompanied by both rise in the human population from a few million in 10,000 BC to just over 6,000 billion (6 bn) in AD 2000 and alterations in the material world as well as shifts in ideas about how to make the world a better place for its growing population (Simmons, 2008).

Thus, the history of environmental meetings may be seen as embedded in, and springing from the many forms of interactions and agreements (whether binding or non-binding) among individuals, groups, societies, nations and international agencies, with the aim of understanding what is happening and utilizing such to devise ideas, ethics, approaches, regulations that would point to any form of progress towards a better Planet and for the maximization of the conditions of living of all that is relevant to the earth.

Global environmentalism was really born during the 1960s. By environmentalism, it is meant, raising the consciousness that the entire planet or globe is at risk from environmental change and consequently that all people (from every part of the world) as well as all living things are also in danger; and by implication that cooperation in policies and programmes aimed at safeguarding the world environment will benefit everybody. During this period, cross-boundary problems such as air and water pollution had increased, raising awareness of the need for

international cooperation. This growing awareness was emphasized by the first pictures of earth taken from space (Seyfang and Jordan, 2002). Also reinforcing this awareness were key environmental concerns which emerged in developed countries, coupled with the publication of some important and influential books about the environment, such as Rachel Carson's famous book, *Silent Spring* (1962), which focused on the use of pesticides on ecosystems. For her, the 'silent' spring would occur when birds died because of a lack of food and the impact of pesticides on birds themselves. As noted by Forsyth (2011), apart from the discovery of large amounts of mercury poisoning in the Minamata region of Japan, which was linked to rapid industrialization, there was also the problem of oil and other forms of pollution in the Great Lakes of the USA/Canada and in Europe. Thus, all these helped to inspire national environmental movements that in turn led to an increased consciousness of global problems and the connectivities between economic activity in some countries and environmental impacts elsewhere.

History has it that it was a Swedish representative who, at the Economic and Social Council Biosphere meeting hosted by the United Nations (UN) in 1968, first proposed the idea, at which time, Sweden was under a lot of political domestic pressure to tackle the issue of acid rain (Seyfang and Jordan, 2002).

Some Specific World Environmental Conferences

Although there have been many world meetings/conferences, below are the ones that most people refer to as milestones on how global environmentalism has been addressed:

United Nations Conference on the Human Environment (Stockholm 1972)

Background Information

As mentioned earlier, it was a Swedish representative who first proposed the idea of a world conference at the Economic and Social Council Biosphere meeting hosted by the UN in 1968. During this period, Sweden was known to be under a lot of political domestic

pressure to tackle the issue of acid rain and offered to host the proposed environmental mega-conference. Thus, Stockholm, Sweden, became the very first host of a global meeting about a single issue as well as the first coordinated attempt to discuss an international issue at a global level (Seyfang and Jordan, 2002), hence the title "Stockholm 72".

The Stockholm meeting of 1972 took place the same year in which the book "*The Limits to Growth*" was published. The original version of the book presented a model based on the fact that five variables: world population, industrialization, pollution, food production and resource depletion would grow exponentially (rapidly), while the ability of technology to increase resource availability would only be linear (step by step). The book postulated two scenarios, an "overshoot" or a "collapse" of the global system by the mid to latter part of the 21st century, while a third scenario would result in a "stabilized world" (Pirages and Cousins 2005). Consequently, much debate at Stockholm considered the possibility of resource shortage or famine.

The Stockholm conference was attended by 113 delegates and two heads of state, Olaf Palme of Sweden and Indira Gandhi of India (United Nations, 1997). One noticeable feature at Stockholm was the classic dividing lines between richer and poorer countries established at the meeting. For example, while the US government reflected the concerns of some prominent conservationist NGOs by seeking a ban on whaling and other measures to protect endangered species, it, however, resisted attempts from some other countries to restrict industrial pollution or to start a ban on nuclear weapons testing. The Soviet Union and other Warsaw Pact nations boycotted the conference as a protest against the non-inclusion of East Germany. East Germany was, however, denied participation because it was not a member of the United Nations (Anthony, 1972).

Forsyth (2011) observes that perhaps the most significant moment of the Stockholm Conference was when the Indian Prime Minister, Indira Gandhi, made a speech emphasizing that 'poverty' was the world's most important environmental problem. The objective of the speech was to

ask the richer countries to help poorer countries, such as India, develop more quickly in order to have a greater ability to address environmental problems. Gandhi's speech inadvertently provided the background for the most important principles for discussions:

First, the principle of the 'Right to Development' was adopted. This principle asserts that poorer countries should not be penalized by environmental policy and that economic development should come first.

The second theme was the assumption (still held by many policymakers) that poor people are more likely to cause environmental damage than richer people. This belief is extremely controversial because it tends to focus on the impacts of poor farmers or city dwellers through activities such as agricultural expansion into forest areas, using wood fuel for energy, or affecting air quality by burning cheap fuel. It does not give equal consideration to the higher levels of consumption among richer sections of society, or within richer countries.

A final reflection of the Stockholm Conference was on how far humanity could identify 'global' environmental problems as uniform and shared by all.

Achievements of Stockholm '72

The Conference published a book called *Only One Earth*, reflecting the well-known concern of many environmentalists that we need to be concerned about global limits because we live on one planet. Yet, the overriding conclusion from the discussions at the Conference was that the world was severely divided between the rich and the poor, and with strongly divided environmental values. In social terms, if not ultimately in physical terms, this was hardly 'one' Earth.

The most important achievement is probably the fact that this conference, for the first time, raised a generation's awareness of an issue hitherto little talked about and that is the global environment. By so doing, the Stockholm conference secured a permanent place for the environment on the world's agenda and led to the establishment of the United Nations Environment Program (UNEP).

The conference and its aftermath made known the international nature of the environment and introduced the idea of the relationship between development and the environment. It has been said that the only way to unite the countries of the world is for them to face a common enemy and that environmental degradation is dire enough to be that enemy (United Nations, 1997).

According to a publication from the India Education Desk (2015), the other achievements of the Stockholm conference include:

The United Nations Environment Programme (UNEP), set up after the conference, is responsible for running the World Environment Day activities worldwide. Besides, Resolution 2994 (XXVII) of the United Nations Conference on the Human Environment officially designated June 5 as World Environment Day and urged the governments and UN organisations to undertake activities at the global level for the preservation and enhancement of the environment. It recommended that such activities should be designed to rouse environmental awareness in the people and pursue the objectives as determined at the Conference. The resolution was taken at the 2113th plenary meeting on December 15, 1972. This has been the tradition every year since 1973.

Following the above resolution, UNEP normally chooses a special theme for the Environment Day or the Eco Day every year, which focuses on the major environmental issue at the time. Since 1987, the UNEP also chooses a host city or country every year where international celebrations of World Environment Day (WED) take place.

It is also worthy to note that globally, World Environment Day is celebrated in different ways, some of which are:

- i. Sporting events like WED marathons, cricket matches, and football games are organised e.g. Marathon and Motor-Free Day in Ulaanbaatar, Mongolia, which combined a fun-run on designated car-free roads, and Race and Clean Up in Kenya, where families rode together collecting garbage and learning about WED facts and figures.

- ii. Film festivals like Green Film Festival and Cinemambiente, photography and painting exhibitions on environment-related themes.
- iii. Music and dance performances such as the live performance of 200 strong national choirs 'Shakti Sings' in the UK on WED 2013.
- iv. Education and learning activities to spread awareness about carbon footprints, its environmental impacts and actions that need to be taken. This is done through community lectures, school and youth activities and projects, spreading awareness about sustainability at work, planting activities and arts and crafts festival on WED related themes.

**The World Commission on Environment and Development
(WCED) –
The Brundtland Commission**

Background Information

About a decade after the Stockholm meeting of 1972, no catastrophe in the mold predicted in the book, "*The limits to growth*" had occurred and as expected. Skeptics of that prediction had a field moment in attempts to vitiate the level of concerns raised in that and other predictions that harbored various degrees of negative consequences for the earth.

Incidentally, the economic and social policies of the world (during this time) was dominated by the forces of globalization with attendant economic prosperity as exemplified in the fact that infant mortality was falling; human life expectancy was increasing; the proportion of the world's adults who can read and write was climbing; the proportion of children starting school was rising; and global food production had increased faster than population growth (WCED, 1987). The same WCED report however drew attention to the counter-productive side of the prevailing development course, insisting that the same processes that produced these gains, also gave rise to trends that the planet and its people could no longer bear. Thereafter, these negative occurrences were divided into what was termed 'failures of development' and failures in the management of our human environment. The report also noted that on the development side, in terms of absolute numbers, there were more

hungry people in the world than ever before and that their numbers were increasing. So were the numbers of those who could not read or write, the numbers without safe water or safe and sound homes and the numbers short of wood fuel with which to cook and warm themselves. Besides, the gap between rich and poor nations was widening - not shrinking - and there was little prospect, given present trends and institutional arrangements, that this process would be reversed.

Apart from the above, there were also environmental occurrences that threatened to radically alter the planet thereby endangering the lives of many species including human beings. It was documented that each year, another 6 million hectares of productive dry land were turned into worthless desert and that if this trend was not reversed, it could amount to an area roughly as large as Saudi Arabia in the next three decades. Besides, more than 11 million hectares of forests were destroyed yearly, and this, over three decades, could equal an area about the size of India. The other area of concern to environmentalists and policy makers was the burning of fossil fuels which put carbon dioxide into the atmosphere, causing gradual global warming. This 'greenhouse effect' was predicted to increase average global temperatures enough to shift agricultural production areas, raise sea levels to flood coastal cities and disrupt national economies early the next century. Yet other industrial gases threatened to deplete the planet's protective ozone shield to such an extent that the number of human and animal cancers would rise sharply and the oceans' food chain would be disrupted, industry and agriculture put toxic substances into the human food chain and into underground water tables beyond reach of cleansing.

At some more specific levels, tragedies such as the African famines, the leak at the pesticides factory at Bhopal, India, and the nuclear disaster at Chernobyl, USSR appeared to justify the grave predictions about the human future that were becoming commonplace during the mid 1980s. These problems were aggravated by grave cross continental economic woes including the debt crisis, stagnating aid to and investment in developing countries, falling commodity prices and falling personal incomes; just as there was the question of population - of population pressure, of population and human rights - and the links between these

related issues and poverty, environment and development (WCED, 1987).

Unfortunately, despite all these smaller versions of those possible collapses predicted in the 1970s, nothing portrayed the growing skepticism on the part of policy makers to them than the observation by Gro Harlem Brundtland, former Prime Minister of Norway that the decade of the 1980s was marked by a standstill or even deterioration in global co-operation; a retreat from social concerns where, while scientists brought attention to urgent but complex problems bearing on our very survival, world leaders responded by demanding for more details and by assigning the problems to institutions ill-equipped to cope with them.

However slow the responses to these growing concerns were on the part of world leaders, they could not ignore the dawning of a growing realization among national governments and multilateral institutions that it is impossible to separate economic development issues from environment issues. This was based on the realization that many forms of development erode the environmental resources upon which they must be based; that environmental degradation can undermine economic development; that poverty is a major cause and effect of global environmental problems; and that it is therefore futile to attempt to deal with environmental problems without a broader perspective that encompasses the factors underlying world poverty and international inequality. These concerns were behind the establishment of the World Commission on Environment and Development (WCED) by the UN General Assembly. Thus, in December 1983, the Secretary General of the United Nations, Javier Perez de Cuellar asked the Prime Minister of Norway, Gro Harlem Brundtland to create an organization independent of the UN to focus on environmental and developmental problems.

Objectives of the World Commission on Environment and Development (WCED)

With the passing of Resolution 38/161, "Process of preparation of the Environmental Perspective", the UN General Assembly mandated the Commission to, among others:

- i. Propose long-term environmental strategies for achieving sustainable development by the year 2000 and beyond;
- ii. Recommend ways in which concern for the environment may be translated into greater co-operation among developing countries and between countries at different stages of economic and social development and lead to the achievement of common and mutually supportive objectives which take account of the interrelationships between people, resources, environment and development;
- iii. Consider ways and means by which the international community can deal more effectively with environmental concerns, in the light of the other recommendations in its report; and
- iv. Help to define shared perceptions of long-term environmental issues and of the appropriate efforts needed to deal successfully with the problems of protecting and enhancing the environment, a long-term agenda for action during the coming decades, and aspirational goals for the world community, taking into account the relevant resolutions of the session of a special character of the Governing Council in 1982.

Structure of the Brundtland Commission

Brundtland Commission, also known as the World Commission on Environment and Development (WCED), was headed by the former Norwegian Prime Minister, Gro Harlem Brundtland as Chairman and Mansour Khalid as Vice-Chairman. Other members included politicians, civil servants, and environmental experts representing 21 different nations (both developed and developing countries). Many of the members were important political figures in their home countries, like William Ruckelshaus, former head of the US Environmental Protection Agency. There were 23 members serving in the expert rather than official state capacity – 13 were from the south including India, China and Brazil. Among the G7 countries, only France and the United Kingdom did not send representatives.

Report of the Brundtland Commission

The Brundtland Commission adopted a catch phrase tagged “A Call for Action” as the title of its report, promoting the idea that people can build a future that is more prosperous, more just and more secure. The report promoted sentiments which read thus:

Our report, our common future, is not a prediction of ever increasing environmental decay, poverty, and hardship in an ever more polluted world among ever decreasing resources. We see instead the possibility for a new era of economic growth, one that must be based on policies that sustain and expand the environmental resource base. And we believe such growth to be absolutely essential to relieve the great poverty that is deepening in much of the developing world (WCED, 1987).

The Brundtland Commission’s Report provided an alternative perspective on sustainable development, pushing for the idea that whereas the "environment" was previously perceived as a sphere separate from human emotion or action, while "development" was a term habitually used to describe political goals or economic progress, it is more comprehensive to understand the two terms in relation to each other. It insisted that we can better understand the environment in relation to development while also understanding development in relation to the environment, because they cannot and should not be distinguished as separate entities.

Brundtland argued that, ‘the environment’ is where we live; and "development" is what we all do in attempting to improve our lot within that abode, the two are inseparable; that the environment is something beyond physicality and include social and political atmospheres and circumstances; that development is not just about how poor countries can ameliorate their situation, but what the entire world, including developed countries, can do to ameliorate our common situation.

It was in the Brundtland Commission report that the ground breaking concept ‘sustainable development’ was coined. It defined sustainable

development as the kind of development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The two key concepts of sustainable development are: the concept of ‘needs’, in particular the essential needs of the world's poorest people, to which they should be given overriding priority; and the idea of limitations which is imposed by the state of technology and social organization on the environment's ability to meet both present and future needs. As noted by Desai who was both the Deputy Secretary General for the 1992 Rio Summit, and Secretary General of the 2002 Johannesburg Summit, as well as the Under Secretary General at UN Headquarters from 1993 to 2003, “Sustainable development is a bridge concept connecting economics, ecology and ethics, the challenge is to connect and integrate various sectoral policies such as agriculture, energy, trade or investment. To get real action, the ownership of the concept of sustainable development must extend to all sectoral agencies and – most importantly – to key private-sector stakeholders” (United Nations, 2007).

The content of the Brundtland report is described as an ingenious compromise. It did not foresee any necessary limits to growth and industrialization, but contended that natural resource production under correct management was acceptable and indeed inevitable for some countries and called for a transfer of environmental technologies and economic assistance to support sustainable development in the South. It also called for more effective controls on population growth as well as better education and food security in the South. The report portrayed poverty as a core cause of unsustainable development, noting that the source of much poverty in the south is the position of developing within the global structure. It thus prescribed that the best way forward was to stimulate – not slow – economic growth: not the unchecked growth of the 1960s and 1970s, but growth from the perspective of sustainable development.

It is believed that the Brundtland report strongly influenced the convocation of the Earth Summit Development in Johannesburg, South Africa in 2002. Also, it is credited with crafting the most prevalent definition of sustainability. It was the international structure and scope of the Brundtland Commission that kick-started the idea for allowing

multiple problems, such as deforestation and ozone depletion to be looked at from a holistic approach; in fact, the 1992 and 2002 Earth Summits were the direct results of the Brundtland Commission.

The 1992 United Nations Conference on Environment and Development (UNCED): The Rio Earth Summit

Background Information

Twenty years after the 1972 conference, quite a number of environmental issues still needed to be addressed such as the need for the protection of air, land and water; conservation of biological diversity, forests, and natural resources; and sound management of wastes and technology. There were also persisting serious differences between countries of the North and South with regard to patterns of development that caused stress to the environment, poverty in developing countries, economic growth, unsustainable patterns of consumption and demographic pressures and their impact on the international economy.

Granted that during this period too, there had been many international environmental agreements, some of which had been ratified by Canada including the 1978 Great Lakes Water Quality Agreement; the 1979 Geneva Convention on Long-range Transboundary Air Pollution; the 1985 Helsinki Agreement (a 21-nation commitment to reduce sulphur dioxide emissions); the 1988 Montreal Protocol on Substances that Deplete the Ozone Layer; and the 1989 Basel Convention on Transboundary Movements of Hazardous Wastes, a lot still needed to be done and it was this kind of international cooperation that the 1992 Rio Conference sought, but on a larger scale. The Rio Conference therefore provided a unique opportunity for world leaders to curtail the human activities that are threatening the planet and bringing about pollution of land, ocean and the atmosphere, drought, desertification through land degradation, thinning of the ozone layer, global warming, the threat of rising sea levels, and the extinction of plant and animal species. It was designed to seek agreement on concrete measures that will help to reconcile economic activities with protection of the planet to ensure a sustainable future for all people. This was predicated on the notion that

the only way to unite the countries of the world is for them to face a common enemy and that environmental degradation was precarious enough to be branded as that enemy.

The groundwork for the Rio Earth Summit was spearheaded by Canada through its National Secretariat in conjunction with its External Affairs, International Trade Canada (EAITC) and the Canadian International Development Agency (CIDA). The preparations also received inputs from a large number of interest groups connected to the environment, development, business, industry, labour, the churches, universities, women, natives, and youth, as well as all levels of government. Thus an interdepartmental committee on UNCED was established and co-chaired by Environment Canada and EAITC with representation from 20 federal departments and agencies. This group was responsible for coordinating the federal government's preparations for both UNCED and the International Preparatory Committee Meetings (PrepComs). Under the heading Agenda 21, groups were organized to address each of 21 issues, synthesizing departmental interests into drafts of the Canadian positions and identifying desirable outcomes from UNCED (United Nations, 1997).

The Earth Summit was unprecedented for a UN conference in terms of both its size and the scope of its concerns. The conference, which was held in Rio de Janeiro, Brazil between June 3 and June 14, 1992, was designed to coincide with the twentieth anniversary of the Stockholm Conference on the Human Environment. It drew representatives from 178 nations, of which 108 were at the level of Heads of Government. There were 2,400 representatives of non-governmental agencies (NGOs) and other interested parties, approximately 30,000 in total, including members of the media (United Nations, 1997).

Objectives of the Rio Summit

The conference was quite ambitious in its objectives, which covered the following key environmental issues:

- i. Protection of air, land and water;
- ii. Conservation of biological diversity, forests, and natural resources;

- iii. Sound management of wastes and technology.
- iv. A programme to persuade world leaders to curtail human activities that threaten the planet thereby bringing about pollution of land, ocean and atmosphere, drought, desertification through land degradation, thinning of the ozone layer, global warming and the threat of rising sea levels, and the extinction of plant and animal species; and
- v. To address concerns that led to serious differences between countries of the North and South. i.e. the patterns of development that cause stress to the environment, poverty in developing countries, economic growth, unsustainable patterns of consumption, and demographic pressures and their impact on the international economy.

Powerful Messages from the Rio Summit

Some of the messages that provided the philosophical pathway of the Rio Summit were:

“We do not inherit the earth from our fathers, we borrow it from our children (Inuit saying).

“We cannot betray future generations. They will judge us harshly if we fail at this critical moment” (Gro Harlem Brundtland, Prime Minister of Norway, UNCED, 1992).

“We can waste the planet's resources for a few decades more...we must realise that one day the storm will break on the heads of future generations. For them it will be too late” (UN Secretary General Boutros-Ghali, UNCED, 1992).

“Every bit of evidence I've seen persuades me we are on a course leading to tragedy. I don't agree with those who say the status quo is the answer” (UNCED Secretary General Maurice F. Strong, UNCED, 1992).

Ultimately, the conglomeration of all the messages at the Summit was galvanized into the idea that nothing less than a transformation of our attitudes and behaviours would bring about the necessary changes. This message was transmitted by almost 10,000 on-site journalists and heard by millions around the world. The message reflected the complexity of the problems facing us and that is: that poverty, as well as excessive consumption by affluent populations, place damaging stress on the environment. Governments recognized the need to redirect international and national plans and policies to ensure that all economic decisions fully took into account any environmental impact.

Decisions of the Rio Conference

At the Conference, 130 nations signed a Convention on Climate Change and a Convention on Biodiversity. Apart from the 27 Principles adopted at the Convention (as outlined in Chapter 5), the delegates also reached agreement on Agenda 21, an action plan for developing the planet sustainably through the twenty-first century, and on a broad statement of principles for protecting forests.

All nations present accepted what was dubbed “the Rio Declaration”, a non-binding statement of broad principles for environmental policy. New international networks, both formal and informal, were set up to carry out and oversee implementation of the agreements.

On the Issue of Finance:

UNCED negotiations were based on the notion that the industrialized nations have it (finance) whereas the developing nations want it. The understanding was that if the industrialized nations want environmental protection, they must be prepared to pay for it. The tensions between the rich and the poor and the financial conflicts that underlie them were at the heart of every major negotiation. They agreed to the fact that the countries should contribute a minimum of an extra \$10 billion a year of ‘new money’ to finance summit commitments in the Third World.

On Climate Change:

The Conference targeted the stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent

dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner. The developed countries were to take the lead with Canada as the leader, by reducing greenhouse gas emissions to the 1990 level by the year 2000. It should be noted that the convention principles state that any policy and measure to deal with climate change should be cost-effective so as to ensure global benefits at the lowest cost possible.

On Biodiversity:

The convention noted that conservation of biodiversity is more than an aesthetic or moral issue as it is integral to our health and economy. Species loss threatens the natural resources upon which sustainable development depends. Genetic material from plant and animal species (many still undiscovered) is the foundation for the agricultural, pharmaceutical and other biotechnology-based industries. It is estimated that one-quarter of all the pharmacological products used in North America contain ingredients derived from wild plants. Biodiversity is integral to the maintenance of the environment and supports water purification, soil production, carbon cycling and oxygen production. As such the convention canvassed for the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by the appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

Secondly, countries also signed a treaty that committed them to the protection of endangered species and their habitats. Measures included the compilation of inventories of vulnerable and threatened species at two levels, global and national. The Convention set rules for granting access to tropical plants and animals, many of which are essential to the genetic tailoring of ingredients for new drugs, pest-resistant crops, fast-growing trees and other products. The convention also called for tropical countries to receive a share of profits from the development of

such products and for financial assistance in meeting their obligations under the treaty.

Agenda 21

Agenda 21 was the major overall document that came out of the Rio Summit. Agenda 21 was an environmental action plan for the next century. It was not legally binding but formed the basis for a new international partnership for sustainable development and environmental protection worldwide.

It was devised to deal with some of the fundamental problems of resource degradation and aid to the developing world. It addressed many issues with respect to global sustainability, including core chapters related to financing, the implementation of technology transfer and institutional follow-up to UNCED. The primary goal of Agenda 21 was to ensure that development proceeds in a sustainable manner: The system of incentives and penalties which motivate economic behaviour must be reoriented to become a strong force for sustainability.

The other goal was to eliminate poverty throughout the world through better management of energy and natural resources and improvement of the quality of life by ensuring access to shelter and clean water, sewage and solid waste treatment. Agenda 21 also attempted to achieve the sustainable use of global and regional resources such as atmosphere, oceans, seas and freshwater, and marine organisms.

The final goal was for improved management of chemicals and wastes. It was estimated that one third of the deaths in the third world were caused by food and water contaminated with human or industrial waste.

Agenda 21 addressed all those groups and professions involved in the achievement of its goals. This was to lead to an increase in the transfer of environmental technologies and highlighted the need for financing from the industrialized world to the developing world. Governments agreed that durable solutions must be found to the debt problems of low and middle income nations. Creditors were requested to provide debt relief to the poorest heavily indebted countries that are pursuing structural adjustment.

Delegates largely avoided the population issue and its relation to poverty and development. The argument that the population increase in the Third World was no more damaging than that in the developed world had some merit in that a child in the West will consume 18 times more than a child in the developing world. On the other hand, it is naive to believe that the population crisis is not a large problem and the cause of much environmental degradation. The developing world must slow its population growth and the developed world must use fewer resources per person. Both approaches are important.

Lastly, the use of environmental destruction as a weapon of war was not examined, nor was the need for more open trade and its environmental and developmental impacts.

World Summit on Sustainable Development (WSSD); RIO+10; Johannesburg Summit 2002

Background Information

Ten years after the 1992 Rio Summit, environmentalists agreed that records on moving towards sustainability so far appeared to have been quite poor and that the vast majority of humanity still lacked access to basic needs such as clean water, adequate sanitation, electricity and so on. This, they observed, was against the backdrop of an increasing amount of wealth in fewer hands.

The above scenario therefore constituted a form of indictment on previous international environmental meetings on sustainable development, which seemed to have impacted very little on the welfare of world's majority. Thus the Johannesburg Summit was conceived with the hope of drafting a more ambitious agenda that would remedy the persisting sustainable development problems.

The Johannesburg Summit's Agenda

The World Summit on Sustainable Development (WSSD) also referred to as "RIO+10" was held in Johannesburg, South Africa with a view to taking actions on a broader agenda than those obtained from the Rio

Summit of 1992. The Johannesburg Summit also included a huge number of delegates representing nations, business interests and non-profit environmental and development/citizen/social justice groups.

It did not have to discuss climate change or biodiversity because there were already meetings planned to advance these agreements. But the Johannesburg meeting broke new ground by focusing almost exclusively on the dilemmas faced by poorer nations such as extreme poverty and insufficient drinking water. The summit also focused on new forms of governance that would allow states and non-state actors (such as companies and large NGOs) to forge partnerships that would enable them to implement environmental policies more effectively at the local level, rather than creating new treaties addressing new topics of environmental concern.

The key issues that were addressed in varying degrees by the Summit included:

- i. Poverty
- ii. Water quality and availability
- iii. Cleaner energy
- iv. Health
- v. Good governance
- vi. Technology
- vii. Production and consumption
- viii. Oceans and Fisheries
- ix. Tourism
- x. Globalization
- xi. Women's rights (Shah, 2002).

Outcome of the Rio+10 Summit

According to Shah (2002), there were a number of outcomes “Plan of Action” on key areas from the Summit, some of which are:

Water and Sanitation:

Governments agreed to halve the number of people lacking clean drinking water and basic sanitation by 2015. This agreement was perhaps the most positive outcome of the Summit.

Energy:

Governments agreed, in principle, to take action to help the poor gain access to affordable energy though there were no specific targets on things like boosting renewable and 'green' sources such as solar or wind power. The agreement contained just a wording to 'substantially increase' the global share of renewable energy. Various OPEC (Oil Producing and Exporting Countries) and the United States opposed these targets while Europe and various environmental and development organizations wanted them. The definition of what constitute "renewables" actually caused a stir because while some wanted nuclear and hydro-electric power to be included in this definition, others did not and environmental organizations in particular did not like the outcome.

Global Warming:

The agreement referred to the need to ratify the Kyoto Protocol though various organizations and nations were hoping for more concrete plans. Russia and some other nations announced their readiness to ratify the Kyoto Protocol and this was seen as positive because earlier, some countries had indicated that they might not and had they not (with the U.S. already rejecting the Protocol), Kyoto could have headed for collapse.

Biodiversity and Natural Resources:

In this regard, Nations agreed to the following:

- i. That by 2010, the rate at which extinctions of rare plants and animals are occurring should be cut;
- ii. A commitment to restore fisheries to their maximum sustainable yields by 2015;
- iii. To establish a representative network of marine protected areas by 2012; and
- iv. To improve developing countries' access to environmentally-sound alternatives to ozone depleting chemicals by 2010.

Trade/Global Economic Related Issues:

- i. This was a thorny issue for some because it was argued that the WSSD was seen mainly as a place to iron out issues about World Trade Organization and not really tackle sustainability. Some

WTO wordage changed specified (or implied) that environment shouldn't be secondary to trade, and this was considered as a positive development.

- ii. There was no new commitment or timetable to the E.U. and U.S. farm subsidies or the crisis in commodity prices.
- iii. Nothing changed in terms of aid or debt relief.
- iv. There was a report that several African delegates were angry at the way that the World Trade Organization's Doha agreements had dominated much of the discussion - and particularly at attempts to give the WTO resolutions primacy over the WSSD's own agreed positions. Africans also blamed rich countries for the failure to make progress on the ending of agricultural subsidies to their own producers seen as restricting developing countries' access to markets.

Health:

- i. Attempts to link women's rights and health services to human rights were opposed by some nations and religious groups.
- ii. There was agreement that access to healthcare should be consistent with human rights, and "cultural and religious values". Various groups criticized the U.S., the Vatican and some developing countries that tried to oppose this stronger linkage due to issues around women's rights, abortion issues, etc.
- iii. Countries agreed to phase out the production and use of chemicals that harm human health and the environment by 2020.

Corporate Accountability:

There was recognition that corporate accountability must be increased. Before now, Environment News Service had commented that the U.S. attempted to circumvent efforts to develop new, binding international rules on environmentally irresponsible corporate behavior and wanted it to apply only to existing international agreements. However, country delegates in the end rejected this and prevented the United States from evading a commitment to corporate accountability for environmental crimes. The World Development Movement (WDM) which had expressed disappointment on the overall outcome of the summit actually

endorsed the corporate accountability as the only glimmer of hope for proper regulation of multinational companies.

There were various other issues that had been discussed as well but in a lot of cases, there were only agreements to do something, without any specific targets or action plans. The inference being that this Summit became an arena for nations and businesses to say they will do things, while often avoiding actual obligations. In addition, because the sanitation agreement was the only really concrete agreement, development and citizen groups saw the Summit as a failure.

Various organizations, some leaders and delegates from developing countries were critical on numerous aspects of the world system, especially on the agenda and interests of the richer nations. The World Development Movement, for example, felt the Summit was a failure for the world's majority and that 'much of the failure can be attributed to the two major world powers - the US for active obstruction and the EU for pursuing the politics of self-interest.

The 2015 United Nations Climate Change Conference, COP 21 or CMP 11

Background Information

While scientists once warned that climate change was a problem for future generations, recent scientific reports concluded that it had started to wreak havoc, from flooding in Miami to droughts and water shortages in China. Scientists prescribed that to avert future devastating consequences, including rising sea levels, severe droughts and flooding, widespread food and water shortages and more destructive storms, there was the need for countries in the world, especially major emitters, to cut global greenhouse gas emissions by about half, enough as should be necessary to stave off an increase in atmospheric temperatures of 2 degrees Celsius or 3.6 degrees Fahrenheit (Davenport, 2015). As an action plan to solve the problems, countries agreed, during previous climate negotiations, to outline actions they intended to take within a global agreement, by October 1, 2015. These commitments were known

as Intended Nationally Determined Contributions or INDCs. Together, the INDCs was designed to reduce global warming from an estimated 4–5 °C (by 2100) to 2.7 °C, and reduce emissions per capita by 9% by 2030, while providing hope for further reductions in the future that would allow meeting a 2 °C target (Nuttall, 2015). Some of the concerns of stakeholders and their positions on sustainable development drives are captured in Chapter 5.

A setback on this hope was witnessed in 2009 when the climate change summit meeting in Copenhagen collapsed in acrimonious failure after countries could not unite around a deal. This was as long as policy makers in Washington (America) and Beijing (China) didn't put all their political capital behind the adoption of ambitious carbon-emission capping targets. Unfortunately too, the laudable efforts of other G20 governments often remained in the realm of pious wishes (Firzli, 2015).

However, things changed for the better on November 12, 2014 when President Obama and General Secretary Xi Jinping agreed to limit greenhouse gases emissions, with China committing for the first time to cap carbon releases and the US unveiling a plan for deeper U.S. emissions reductions through 2025 (Firzli, 2015). In the same vein, Dwortzan (2015) observes that since the U.N. Intergovernmental Panel on Climate Change was formed in 1988, scientists have become much more certain and specific in framing the problem and urgent in calling for worldwide reductions in planet-warming greenhouse gas (GHG) emissions. These were the consciousness and agreements that made way for the COP21.

COP 21 or CMP 11

The 2015 United Nations Climate Change Conference also referred to as COP 21 or CMP 11 was held in Paris, France, from November 30 to December 20, 2015 with 196 parties in attendance. It was the 21st yearly session of the Conference of the Parties (COP) to the 1992 United Nations Framework on Climate Change (UNFCCC) and the 11th session of the Meeting of the Parties to the 1997 Kyoto Protocol (UNFCCC, 2015). COP 21 was distinguished from the climate talks of the 1990's, in

that Paris, the host country adopted what is termed a “bottom-up” approach in which each participating nation (including developing countries whose contribution to the problem has grown considerably) defined its own contribution to reducing global greenhouse gas GHG emissions based on local interests, politics, and economics, rather than adopting a worldwide “top-down” target.

Pope Francis published an encyclical called *Laudato si* intended, in part, to influence the conference. The encyclical called for action against climate change. The International Trade Union Confederation called for the goal to be ‘zero carbon, zero poverty’, and its General Secretary, Sharan Burrow repeated that there are "no jobs on a dead planet" (UNFCCC, 2015).

The conference negotiated on what it termed the Paris Agreement, a global agreement on the reduction of climate change, the text of which represented a consensus of the representatives of the 195 countries and what France's Foreign Minister, Laurent Fabius, described as ‘ambitious and balanced’ plan; and ‘historic turning point’ in the goal of reducing global warming.

The agreement was to become legally binding if joined by at least 55 countries which together represent at least 55 percent of global greenhouse emissions. Such parties were expected to sign the agreement in New York between 22 April 2016 (Earth Day) and 21 April 2017 and also adopt it within their own legal systems (through ratification, acceptance, approval, or accession).

In specific terms, the agreement called for zero net anthropogenic greenhouse gas emissions to be reached during the second half of the 21st century. In the adopted version of the Paris Agreement, the parties were to pursue efforts to limit the temperature increase to 1.5 °C. The 1.5 °C goal would require zero emissions sometime between 2030 and 2050, according to some scientists (The Editorial Board, 2015). However, no detailed timetable or country-specific goals for emissions were incorporated into the Paris Agreement – as opposed to the previous Kyoto Protocol.

In another development which may be considered as one of the low points of the Paris Agreement, the final language did not fully satisfy everyone. This was evident in the fact that representatives of some developing nations expressed dissatisfaction. That is because poorer countries had pushed for a legally binding provision requiring that rich countries appropriate a minimum of at least \$100 billion a year to help them mitigate and adapt to the ravages of climate change. In the final deal, that \$100 billion figure appeared only in a preamble, not in the legally binding portion of the agreement.

Thus, the Paris pact built in a series of legally binding requirements that countries ratchet up the stringency of their climate change policies in the future. Countries will be required to reconvene every five years, starting in 2020, with updated plans that would tighten their emissions cuts. Countries will also be legally required to reconvene every five years starting in 2023 to publicly report on how they are doing in cutting emissions compared to their plans. They will be legally required to monitor and report on their emissions levels and reductions, using a universal accounting system (Davenport, 2015). Eulogizing the outcome of the Paris Agreement, the then United Nations Secretary General, Ban Ki-moon declared, “this is truly a historic moment. For the first time, we have a truly universal agreement on climate change, one of the most crucial problems on earth.”

However, despite the celebration of the milestones reached by the countries of the world in the Paris Agreement, a major setback was witnessed when in June, 2017 President Trump announced, in a Rose Garden Speech that the United States would withdraw from the accord, fulfilling one of his frequently repeated campaign promises. Mr. Trump had long argued that the agreement was excessively onerous and hampered American businesses (Stack, 2017). Under the accord, the United States had pledged to cut its greenhouse gas emissions from 26 to 28 percent, below the 2005 levels by 2025 and commit up to \$3 billion aid for poorer countries by 2020 (Shear, 2017).

Soon after the announcement by President Trump, several large companies based in the United States declared their support to the international pact, saying that they were disappointed by the decision and would continue their environmental efforts. Their supportive stance for the Paris Agreement was so vehement that two chief executives who sat on Mr. Trump's economic advisory council, Elon Musk and Robert A. Iger said they were leaving that group because they disagreed with the exit from the Paris agreement. While Mr. Trump said the decision to exit the deal was made to protect American jobs (a contention that environmental groups have disputed) some large companies urged the president to stay in the accord. So far, twenty-five companies, including Apple, Facebook, Google and Microsoft bought full-page ads in The New York Times, The Wall Street Journal and The New York Post to argue their case. Some of those companies and others with similar views in the technology, energy and engineering sectors, also reacted quickly. But so did some companies, particularly in the coal industry, that supported Mr. Trump's decision (Victor, 2017).

Apart from Syria and America, the rest of the world as championed by western countries like France, Germany and Italy vowed to continue their commitments to the Paris Agreement. Within the United States itself, it is believed that so far, at least thirty mayors, three governors, more than 80 university presidents and more than 100 businesses may have submitted a plan to the United Nations pledging to meet the country's greenhouse gas emissions targets under the Paris Agreement (Smale, 2017).

As the politics of climate change control continues to rage especially among the G7 countries and major emitters of greenhouse gas, the future of the Paris Agreement, though somewhat hazy given the action of the President of America, still holds prospects going by the support base to the other willing parties from NGOs, sub-national governments and other relevant individuals within America. Also, given the timeline set for the affirmation of the first proposed reconvened meeting that would help tighten emissions cuts, a picture of the fate of the Paris Agreement should be clearer by the year 2020.

Core Functions of World Conferences

According to Seyfang and Jordan (2002) below are some of the core functions which world conferences on environment perform:

i. **Setting Global Agenda:**

It is instructive to note that world environmental meetings/conferences, because they are often large scale and high profile, do capture the attention of the world's media due to the breadth of issues they cover and the notable stakeholders they attract. These conferences command the headlines surrounding them and allow environmental activists, non-governmental organizations (NGOs) and the public to apply domestic pressure on the outcomes as environmental issues take centre stage. The role of the media is thus important in setting global agendas. Through media attention surrounding these conferences and subsequent public debate and domestic political pressure, environmental issues have not only made it onto the global political agenda but also have maintained their position there. They serve in uniting otherwise disconnected issues and the UN is probably the only forum where global dimensions of common problems such as sustainable development can be adequately resolved. For example, the Stockholm Conference (the first environmental mega conference) successfully identified the terms of reference of what is now a continuing global environmental debate and fused the simmering conflict between the environment and development.

ii. **Facilitating Joined-up Thinking:**

Discussing interconnected issues of sustainable development problems on a global scale demands joined-up thinking. What this means is that world environmental meetings offer a platform outside normal short-term political agenda for governments and stakeholders to address both wide range and integrated issues. Interestingly, attempts to achieve joined-up thinking have increased progressively. For instance, it is believed that the issues

raised at Rio and Johannesburg (arguably aided by the sustainable development discourse) were considerably more wide ranged than those raised at Stockholm.

iii. **Endorsing Common Principles:**

It is believed that world environmental meetings have produced what is termed 'soft laws' which are not only important and authoritative but also are regarded as halfway stage on the road to legally binding frameworks. This is predicated on the strong expectations that nations would gradually adhere to these 'soft laws' which are expected to become 'harder', more precise and more legally binding in the short or long term. For example, many principles agreed upon at the Stockholm conference formed the basis for national, regional and European Union laws. This is not that surprising as Stockholm was the first of the mega conferences and was treading new territory. It thus follows that now that common principles have been established, policy makers and governments are attempting to move onto more definitive detailed action plans.

iv. **Providing Global Leadership:**

World environmental meetings provide a stage for global leadership. One of the best examples of this is the Agenda 21 agreement which evolved from the Rio Summit and which gave a blueprint for action at lower levels of governance. The type II partnerships created at the World Summit on Sustainable Development (WSSD) also demonstrate a strong 'take home' action plan carrying the weight of global agreement. However, it is questionable how well these world conferences adhere to the subsidiary principle (the idea that problems should be addressed at the lowest effective level of governance). Nevertheless, the EU, through the integration of the concept of sustainable development in internal and international policies and development strategy, has been able to offer leadership and carry the sustainable development flag on the international scene. Many have cited the EU as important actors in providing this leadership. It is equally note worthy that as these world environmental conferences force the EU policy to interact with other political structures and actors,

they also engender the conversion of ‘soft laws’ into hard EU policies and that these laws demonstrate leadership that could be replicated in other areas of the world, for example, in the African Union which would surely be a huge success for future environmental mega conferences.

v. **Building Institutional Capacity:**

It is on record that efforts of past environmental meetings, having addressed a range of issues, also led to the creation of new institutional bodies such as the UNEP and the Commission on Sustainable Development. Maurice Strong, who headed the Stockholm conference and an advocate of environmental mega conferences, believes that the ‘process is the policy’ and that world environmental meetings, rather than being a one-off, isolated events’ are ‘one contribution to a much larger process of societal and institutional change. This is despite the slow pace and continual frustrations that critics are wont to highlight. Indeed, there have been commendable forward movements which are important yardsticks that domestic pressure groups can use to maintain influence; therefore, conference after conference has helped in building a cycle of ever increasing domestic commitment. However, criticisms persist that these new institutions are weak both financially and legally thereby necessitating calls for them to be vested with far greater legal and administrative powers in order for them to function better as engines of sustainability.

vi. **National Governance:**

As a result of actions taken at the different world environmental meetings, new institutional domestic capacities have been built indirectly by the creation of domestic political opportunity structures. This is possible in that, as policy makers, for a short while, operate outside their normal constraints of short term political thinking, they can thus consider other long term environmental issues in the process. It is instructive that Type II partnerships which were formed at WSSD also put more emphasis on environmental actions at the national and sub-national levels. Along with the creation of new institutional processes, world

conferences offer a move away from global level governance and encourage states to provide a more comprehensive account of their own national sustainable development strategies. An example can be cited of developments following the Stockholm conference (UNCHE) where European leaders met in Paris at an environmental conference while regional inter-governmental meetings were also convened simultaneously. The point here is that though world environmental conferences do not specifically generate national level governance, this was encouraged through the emphasis on what is termed the 'commonality of national purpose'. It has been claimed that national environment ministries have gained the most from respective world environmental conferences of this nature.

vii. **Legitimizing Global Governance through Inclusivity:**

As indicated earlier, world environmental conferences have a wide range of participants and through this level of participation, some form of legitimacy has been conferred as more people are involved in the decision-making process and by implication, have also bought into decisions made. This is however not without criticisms from the home fronts because of the perceptions that such decisions may fail to capture grassroots debate about sustainable development and that only the well resourced, large interest groups are able to attain a seat at the table, with smaller groups remaining outside the formal decision-making process. Despite this, the increased numbers of participants throughout the evolution of world environmental conferences is encouraging. It is on record that total NGO involvement at these conferences has grown from 134 in Stockholm (a tenth of which were from developing countries) to over 1400 in Rio (a third of which originated from developing countries). It is also noteworthy to state that informal, 'fringe' discussions involving as many as 17,000 attendees also took place external to the main event at the Rio Conference. First, they helped NGOs to appreciate their different perspectives and agenda and to confront the difficulties of collaboration across lines of language, culture, and wealth. Second, they provided an international platform and stature for many organizations that were ignored, starved of resources, or

actively oppressed in their countries. Finally, the internet became the new method for the expansion of public and stakeholder participation. In the building-up to Johannesburg, individuals could participate via websites such as the UK government's Sustainable Development website. Rio+20 in 2012 had websites to which major groups and stakeholders could contribute and use to get involved in the preparatory process as well as links with Facebook and Twitter. In the UK, 'e-petitions' were launched in August 2011 which enabled the public to create and sign online petitions on topics to be discussed in the House of Commons. This online community has been adequately utilized in subsequent conferences with remarkable results and ease of mobilization and engagements.

Conclusion

Global environmentalism, that is, raising the consciousness that the entire planet is at risk from environmental change and consequently that all people as well as all living things are also in danger, has been behind concerted efforts/cooperation in policies and programmes aimed at safeguarding the world environment. This has been the rationale behind the various world environmental meetings, the major ones which have been discussed above.

However, due to the non-binding nature of most of the agreements reached at most of these conferences, critics have dismissed the processes involved in governing the global environment and its sustainability issues as a romantic notion as nations, policy makers and stakeholders may have been operating within a restrictive framework with incoherent internal policies. Also, there have been other criticisms that Summits such as these painfully highlight inactivity and/or the inability to fundamentally change the lives of the poor or act decisively on climate change. Be that as it may, it is not out of place to state that environmental mega conferences have served their purpose in pushing environmental issues onto the global agenda and now voluntary, bi-laterally agreed partnerships and domestic policies can take the centre stage in world environmental politics. On the other hand, advocates conclude that world environmental conferences still serve an important function in contemporary governance, even though they are not the

panacea that some had originally hoped they might be. Furthermore, if determined activists organize their campaigns and demand to be heard, it is possible that this sort of pressure has the potential to keep the cycle of environmental mega conferences alive (Seyfang and Jordan, 2002).

As canvassed by Angela Merkel in the aftermath of the Paris agreement, “We will gather all our strength to meet the great challenges of humanity like climate change and to successfully master these challenges... Let us continue along this path together, so that we are successful for our Mother Earth. What we began over 20 years ago and continued in Paris one and a half years ago with a historic quantum leap will lead to success. The path, there is no doubt about it, is rocky... But I am also convinced, if I look back at these more than 20 years, that the path is irreversible.

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CHAPTER 5

ISSUES AND IMPACTS OF MEETINGS ON WORLD ENVIRONMENT

Joseph Isaiah Akpan

Introduction

The growing concern for the environment according to David Hunter (1999) is a global phenomenon that has enveloped developmental and urbanization endeavors. This is manifestly seen in the increasing number of world environmental meetings, conferences, conventions and seminars, some of which have resulted in treaties to protect the environment, international laws on the sustainability of the environment and multinational agreements. There is currently preponderating environmental consideration as suggested by Wymann (2004) over developmental activities both nationally and internationally. Put simply, a no-project option is preferred to a project-option that degrades the environment. In 1969 under the National Environmental Policy Act (NEPA) (Wood, 2002), the United States Government developed the Environmental Impact Assessment (EIA) mechanism for the integrated study of developmental projects and their effect on the natural environment (Chatterjee, 2011). This gave rise to the first conscious legal effort in establishing the process of evaluating environmental impact of developmental projects. Impact considerations under the EIA garner basic environmental concerns likely to arise in the course of a project and assess their possible impact on environment with the aim of addressing them (Carin, Alan and Schalk, 2005). It is the considered opinion of this author that environmental impact assessment that has now become common international law is conceived out of environmental concerns. Thus, the morphing process of EIA which is largely shaped by global environmental problems, politics and policies gives a good study guide of history, issues and impacts of world environmental meetings. Importantly, most global environmental meetings raise concern of one environmental problem or the other, and the basic tool used in studying this with a view to addressing the concern is EIA. Discerningly, it could be acknowledged that; advertently or

inadvertently, global environmental meetings aimed at solution dovetails to EIA, thus this work leans to this awareness.

The process of addressing identified environmental adverse impact could take the form of alternative project development procedures, mitigation measures, amelioration and outright no project option as stated by Steinemann (2000). International Laws, Treaties and Conventions resulting from world meetings therefore, seek to provide convergence of practices to address discordant requirements making room for the best possible options and procedures, Pulp (2006). In Nigeria, the Environmental Impact Assessment Act 1992 which is the reflection of Principle 17 of *Rio Convention* stipulates the process of carrying out an EIA and makes it mandatory for every major activity that is likely to negatively impact the environment. *The Espoo Convention* and the Antarctic Protocol represent major United Nations Conventions developed by United Nations Economic Commission for Europe (UNECE) that provide mandatory requirement to conduct EIA. Outstandingly, the role of international laws, international co-operations, Treaties and Conventions are seen to be much more inclined to the respect of sovereignty of nations. Sovereignty thus implies that each nation can express their required standard for assessment of project impact on the environment. Whereas uniformity and world best practices should be key in sampling, data analysis, amelioration, mitigation and even attenuation of impact, much more depend on the socio-political consideration of nations. And the issue of sovereignty plays the most prominent role.

Interestingly, international conventions and international case laws have entrenched EIA as a Customary International Law. The streamlining effect of international conventions seeks to protect the environment from the ripple effects of environmental pollution in one nation from affecting other nations in the global village that we live in. The need for uniformity in handling environmental concerns became very necessary because of the global village situation of the universe, seen in the global non partition, from nation to nation; of the atmosphere, air, underground water, surface water and other natural resources. Further need for uniformity in handling environmental concerns resulted in several world conferences that have come up with proposals and recommendations.

The Stockholm Conference

In 1972, Sweden hosted the first world conference on the human environment convened by the United Nations in Stockholm. This eye opening meeting introduced to the world the effects of environmental pollution and peered into it with a global focus deviating from hitherto localized perception. The ripple effects and the trans-boundary movement of environmental contaminants by natural or human means in the course of national interaction became a focus. This globalization of environmental concerns led to the establishment of the United Nations Environmental Programme (UNEP). This agency of the United Nations has, from inception played a major role in the regulation between nations on environmental concerns. The resulting training programmes of this organ of the United Nation (UN) help to highlight the intertwining effect of pollution in one environment and its attendant effect in other locations. Global warming is one such effect where industrialized nations consume and burn high amount of fossil fuel to power their industries, but the developing world also shares the effect of atmospheric reaction in their countries. The heating up of the universe results in the melting of ice with its attendant increase in water levels thus the resultant flooding which of course may even occur in a nation that is a low carbon emitter. It was at this conference that the global village nature of the world was highlighted. Stockholm brought about salvos of other global environmental gatherings that are now shaping environmental consideration and developmental programmes.

World Environmental Meetings:

Environmental World Gathering	Location	Year
Great Lake Water Quality Agreement	US/Canada	1972
Long Range Transboundary Air Pollution	Geneva	1979
21 Nation Commitment to reduce Sulphur Dioxide Emissions	Helsinki	1987
Protocol on substances that deplete the Ozone Layer	Montreal	1988
Convention on Transboundary Movement of Hazardous Waste	Basel	1989

In the web of these plethora of world gatherings on environmental issues; social, economic, national politics and sovereignty play the determinant role in any decision reached. It would be economically impossible to attend such meetings hoping that the industrialized world would pull down their factories so that developing nations can breathe cleaner air, neither is it even possible that some nations would change their fueling system to adopt cleaner, safer and better fueling for a cleaner, safer environment with attendant implementation costs. The Stockholm Conference of 1972 thus became a start point in a cesspool of increasing environmental degradation, meeting that draw attention to environmental endeavour that would shape global developmental activities.

Brundtland Commission

The 1983 World Commission on Environment and Development (WCED) brought to fore the fact that; in the undeniable divergence of environmental consideration between nations for national, continental and other valued reasons of countries, there exist albeit a synergy in global environmental meetings. '**Our common future**' which was the outfall of Brudland report is a case in point. Following Stochholm Conference was the formation of the 1983 World Commission on Environment and Development (WCED), the chairperson Gro Harlem Brundtland in 1987 released a report named '*our common future*'. The identifying role of the Stocholm conference was the formulation of the need for coordinated global effort to tackle environmental problems. This gave rise to Brundtland defining sustainable development as: '*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*'. It was the consideration of Gro Harlem Brundtland's report that showed the reason of the much poverty in the south against the riches of the north. This report contended that this was due to the non-sustainable patterns of consumption and production in the two hemispheres. This was identified to be environmental in nature. The meeting called for a strategy that will equate development at both spheres, which was collaborated by The Federal Office for Spatial Development Switzerland (1987).

Consequently, any proffered solution that was suggested had to be rested on a three pronged pedestals of: environmental protection, economic growth and social equality. This framework gives rise to the remodeling of every economic activity in such a way that it promotes social equity in a protected environment such that future generation can continue in the chain unhindered by past generation's excesses. In arriving at this; over exploitation, environmental degradation, over-population and sidelining of less productive alternatives with more environmental advantages for more productive alternatives with less environmental consideration was discouraged. These three pillars were accepted even by Non-Governmental Organizations (NGOs) and indigenous people where production ventures are carried out. However this was reluctantly accepted by greater emitter nations mostly to the utter objection and discomfort of the producers for economic reasons. Arising from this grumblings by the heavy emitter nations came the philosophy of development as purely economic growth. Thus, the higher emitter nations proposed the notion of environmental concerns becoming independent issues that are not integral part of economic policy. This is against the background that economic policy brings about environmental degradation and thus should be jointly planed. As a result, Nations therefore were willing to sacrifices the environment just to grow their economy hence their military and economic influence in the comity of nations. Michael Redclift argues (in Drexhage and Murphy, 2010) that "the superficial consensus that has characterized much of the early debate has given way to a series of parallel but distinct discourses around sustainability". This argument could be sustained on the 1992 Earth Summit that focused on RIGHTS rather than NEEDS, as a principal line of enquiry. This argument places sovereignty and neo-liberal economic agenda of the 90s ahead of environmental needs and conservation. This right based consideration, linked with human system and environmental right, assisted with conflicting scientific consideration often skewed against sustainable environmental consideration (Redclift (2005). However it is globally accepted that sustainable development is the foundation for the leading global framework for international cooperation. It is on this that the 2030 Agenda on Sustainable Development and the Sustainable Development Goals (SDGs) hinges. The defined 17 SDGs have been targeted to be

achieved in 2030 and the targeted goals are universal in nature thus requiring the integration of all governments, businesses, civil society and people everywhere to key into. Brundtland commission therefore became the hope for the preservation of the future and preservation of the environment for the generation unborn yet highly dissented by the industrialists.

Rio Earth Summit

The United Nations Convention on Biological Diversity (*Rio Earth Summit 1992*) is one very important global environmental meeting with very far reaching effects. The convention in its 27 principles could be seen as shifting towards state rights and control of environmental policies. A careful examination of the 27 principles is very informative.

Principle 1: Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.

Principle 2: States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

These principles are right centered and are very political in that they provide for any state to exploit resources within its national jurisdiction. Indeed, RIGHT is the fulcrum of this principle, the addition that such activity should not cause damage to the environment of other states is political as it has no sanctions attached. To illustrate: the wind blows from one nation to another with no nation owning its own air, same for rain-runoff, rivers and oceans. Thus these 'global communal' resources used communally when polluted is globally polluted. Thus, the possibility of careful pollution of these communal resources is not possible, therefore uniform conservation should be applied and sanction for breach attached as deterrent. Principle 3 as stated below is only advisory without bite for flouting only advisory without bit for flouting.

Principle 3: The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.

Principle 4: In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.

Unquestionably, principle 4 is a reenactment of Brundtland, and the curtailing of the philosophy of separating economic activities from environmental considerations. However, some countries choose to pass the process of their developmental project through the process of EIA while others may not. This principle, rather than being a mandatory sanctionable requirement is only an optional requirement allowing for national politicking.

In principles 5 and 6, the report of Gro Harlem Brundtland of 1987 endorsed by the Federal Office of Statistics Switzerland is here provided for:

Principle 5: All states and all people shall co-operate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of the people of the world.

Principle 6: The special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable, shall be given special priority. International actions in the field of environment and development should also address the interests and needs of all countries.

In principle 7, the most emitting (polluting) nations introduced the green belt grant as a means of making for their role in atmospheric pollution resulting from their heavy industries:

Principle 7: States shall co-operate in a spirit of global partnership to conserve, protect and restore the health and integrity of the earth's ecosystem. In view of the different contributions to global

environmental degradation, states have common but differentiated responsibilities. The developed countries acknowledged the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.

Industrialized nations sometimes find it hard to cope with the eighth principle of Rio because of the cost involved in dismantling the old and installing environmentally friendly facilities. Worse still, even when such old environmentally unfriendly items (waste) are dismantled, these are transferred to poorer nations as second hand items thereby continuing the pollution cycle. Principle 9 emphasizes sharing of technology, which is seldom the case between technologically contesting nations.

Principle 8: To achieve sustainable development and a higher quality of life for all people, states should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies.

Principle 9: States should co-operate to strengthen endogenous capacity-building for sustainable development by improving scientific understanding through exchanges of scientific and technological knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies.

Principle 10: addresses the need to include the indigenous people and NGOs when evaluating environmental concerns, and provides as follows: environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and

administrative proceedings, including redress and remedy, shall be provided for.

The Rio Earth Summit freehandedly gave states the right to make their own laws devoid of any encouragement at uniformity. This is seen in principles 11, 12, 13 and such grant greatly leave room for lack of uniformity which should not be.

Principle 11: States shall enact effective environmental legislation. Environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply. Standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries.

Principle 12: States should co-operate to promote a supportive and open international economic system that would lead to economic growth and sustainable development in all countries, to better address the problems of environmental degradation. Trade policy measures for environmental purposes should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade. Unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided. Environmental measures addressing trans-boundary or global environmental problems should, as far as possible, be based on an international consensus.

Principle 13: States shall develop national law regarding liability and compensation for the victims of pollution and other environmental damage. States shall also co-operate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction.

The impact of principle 14 to 16 is to curtail the act of trans-border movement of hazardous waste.

Principle 14: States should effectively co-operate to discourage or prevent the relocation and transfer to other states of any activities and

substances that cause severe environmental degradation or are found to be harmful to human health.

Principle 15: In order to protect the environment, the precautionary approach shall be widely applied by states according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Principle 16: National authorities should endeavor 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.

The offshoot of the Rio-Earth convention triggered several researches sponsored by the United Nations, its agencies and affiliates that sought to integrate traditional ecological knowledge in the management of Environmental Impact Assessment. This convention iterates and reenacts EIA precepts as a global standard for sustainability. The role, albeit expanding, strengthens the use of EIA in the expansion of international business practice, due diligence and good governance as a milestone in the evolution of international law on the protection of the environment for sustainability. The need to pass all developmental projects through EIA is emphasized in principle 17. This provision has greatly advanced the use of EIA internationally to a point that EIA has now become a Customary International Law (CIL).

Principle 17: Environmental Impact Assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.

In the Premium Times Newspaper of September 16, 2018, the Director General of the National Emergency Management Agency (NEMA) said: “there is a Memorandum of Understanding (MoU) between Nigeria and Cameroon that the Cameroonians must give us a long notice in the event

that they want to release water from the dam so we can take precautionary measures to contain any havoc as a result of the release". The background to this is that, Lagbo dam in Cameroon when released resulted in the overflow of the banks of River Niger and River Benue in Nigeria. So, principles 18 and 19 work to cater for situations like this between nations.

Principle 18: States shall immediately notify other states of any natural disasters or other emergencies that are likely to produce sudden harmful effects on the environment of those states. Every effort shall be made by the international community to help states so afflicted.

Principle 19: States shall provide prior and timely notification and relevant information to potentially affected states on activities that may have a significant adverse trans-boundary environmental effect and shall consult with those states at an early stage and in good faith.

In any given community, women, children, youth, the elders and the elderly form part of the socioeconomic component of the environment and principles 20 to 23 provide care for these ones.

Principle 20: Women have a vital role in environmental management and development. Their full participation is therefore essential to achieve sustainable development.

Principle 21: The creativity, ideals and courage of the youth of the world should be mobilized to forge a global partnership in order to achieve sustainable development and ensure a better future for all.

Principle 22: Indigenous people and their communities, and other local communities, have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.

Principle 23: The environment and natural resources of people under oppression, domination and occupation shall be protected.

Rio made provision for war situations, with the aim of streamlining even types of military armament used to curb unnecessary impact on the environment. This is enshrined in principles 24 and 25

Principle 24: Warfare is inherently destructive of sustainable development. States shall therefore respect international law providing protection for the environment in times of armed conflict and co-operate in its further development, as necessary.

Principle 25: Peace, development and environmental protection are interdependent and indivisible.

Finally, resolution of environmental conflict is provided for in principles 26 and 27.

Principle 26: States shall resolve all their environmental disputes peacefully and by appropriate means in accordance with the Charter of the United Nations.

Principle 27: States and people shall co-operate in good faith and in a spirit of partnership in the fulfillment of the principles embodied in this declaration and in the further development of international law in the field of sustainable development.

The leitmotif for this convention was ‘sustainable environment’ just as it is for all environmental programmes of the United Nations and its affiliates. The acceptance of traditional knowledge of the environment was also promoted by Rio Earth and now play very significant role on the conducting and reporting of EIA.

Traditional Knowledge

Stems from observable year to year phenomenon that has come to be synonymous with a given environment and such predictable reoccurrence influences the actions and activities of inhabitants of an area. It is this hindsight that predicates farming and even the setting up of settlements in some locations. Armed with the fore knowledge of the river flood line of a location, settlement line is determined (and this could not empirically be determined by strangers but only through long

years of observation). To this end, the indigenous people's knowledge is very important for sustainable environmental development of project which was emphasized in the convention.

A major EIA cardinal objective aligned with this principle of the indigenous people's knowledge was promoted at the Rio-Earth convention. The common EIA practice of call for socio-economic sessions where focus group discussions are held to articulate the peoples' view in the study is an offshoot of Rio. During these discussions, depending on the item for consideration, anticipated targets, groups present their informed opinion on environmental and socio cultural issues. Traditional matters are allowed to be handled by elders and traditionalists, gender issues, youth empowerment, and the like are handled by appropriate youth authorities, and so on.

Public Display/Public Panel Review:

Public display of conducted EIA study is a strict compliance with the Rio-Earth convention as it allows the people to independently access, and comment on the study and the proposed project for their community. This privy makes indigenous people's contribution and concern heard, appraised and articulated in the study for a final decision on the sustainability of the project or not. Their invited chosen representatives can also be the community-mouth-piece in expressing their indigenous, ecological, socio-economic and relevant experience for final decision making on the sustainability of the proposed project.

This world discourse created room for new ideas and inventions in environmental management and tool creation for the purpose. The far reaching effect of Rio and its morphing effect on environmental management is a wonderful indication of the effectiveness of global gatherings in environmental conservation.

The Johannesburg Earth Summit of 2002 and Beyond

The Johannesburg Earth Summit of 2002 on sustainable development was a follow-up to the Rio Earth Summit of 1992 and expanded the ideas of Rio with the explanation that sustainable development now hung on the United Nations definition. This was hinged on the three pillars of economic, environmental and social justice. Attendees of the

summit canvassed differently, wooing other stakeholders to align with the interest of their countries, regions and organizations.

Stakeholders	Position Canvassed
<p>The G7 (this group is made up of the developing countries)</p>	<p>Under economic consideration of development and infrastructure, it was canvassed that the developed countries should look more into the deteriorating global environmental concerns since they are not only the main cause and culprit but they have the financial and technical capacity to handle them. The developing nations contended that coping with and struggling for survival is enough trouble for them, that it is when they meet the development standard of the developed nation that they could afford to be distracted by environmental responsibilities. Also canvassed by the developing nations was that the developed nations should bear the brunt of developing initiative and transferring of environmentally sound technologies to them, a reason the United States advanced for not signing the Kyoto Protocol.</p>
<p>The European Union</p>	<p>The EU was more vocal on concrete prescriptions, rules, and enforcement to curb environmental degradation. It was their position that traditional ways of bringing about development was fraught with environment related negative issues. The Union requested the adoption of the targets laid down in the Kyoto protocol and thier implementation.</p>

Norway, Canada and Japan	<p>Social justice was the favour of these three nations. It was their position that: sustainable development revolves around environmental protection, social justice in the course of economic development. Economic capacity, in their reasoning plays into a larger sphere of interest where human life, social stability, security and equity are involved. Canada was particularly at the conference pressing for increased development for Africa with their approach adopting the three pillars of sustainable development. The role of Canada in pushing for censoring noncompliance of environmental laws was forceful, but was scuttled.</p> <p>Canadian minister of the environment in another front may have won in his emphasis on health care and human rights as medical access is now seen as human right alongside culture and religion</p>
NGOs, human right and women groups	<p>These groups aligned more with the Norway, Canadian and Japanese position given the wide range of considerations to incidental issues that were canvassed. Their position on social development was better catered for by this proposition.</p>
Africa	<p>The conference made provision for the improvement and increased support to Africa to the tune of \$6 billion.</p>
Domestic Concern	<p>Domestic companies in Canada made the country reconsider the ratification of the Kyoto Protocol. There were strong pressures from Alberta's oil and gas limited, Ontario and British Columbia (BC) which made them call for flexibility in</p>

	emission trading.
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(Scot Fogden, 2002)

It is however noteworthy that the Johannesburg conference was held to address issues of the degradation of the environment caused by economic growth at the expense of life sustaining natural resources to guarantee sustainability of future generation. Although economic growth happens to be the major focus, military advancement was an underlying current with global harp on disarmament (Sulabh International Social Service Organization 2002).

This event, described as the biggest event till then also was aimed at setting a platform for the implementation of the Agenda 21 (a non-binding action plan of the United Nations with regard to sustainable development, a product of the Rio de Janeiro 1992 Conference).

The foregoing indicate that global environmental gatherings are either initiative in nature or a continuation and expansion of existing initiatives. At all instances, international politics is the determining factor of any decision reached which often is skewed to the most powerful. Even more so is the reluctance of politicians to implement complex or ambitious agreements due most times to suspicion of underlying adverse implications (Seyfang, 2003) and (Hens and Nath, 2003).

At the end of the summit, the UN resolved under the ‘making it happen’ as follows: *We are in agreement that this must be an inclusive process, involving all the major groups and Governments that participated in the historic Johannesburg Summit.*

We commit ourselves to act together, united by a common determination to save our planet, promote human development and achieve universal prosperity and peace.

We commit ourselves to the plan of implementation of the World Summit on Sustainable Development and to expediting the

achievement of the time-bound, socio-economic and environmental targets contained therein.

From the African continent, the cradle of humankind, we solemnly pledge to the peoples of the world and the generations that will surely inherit this Earth that we are determined to ensure that our collective hope for sustainable development is realized (World Summit on Sustainable Development, 2002).

The 2015 Paris Conference

The UN climate change negotiation in Bonn Paris attended by over 190 nations from 30th November to 11th December 2015 was a follow up of previous international engagements on environment. The main aim was to find a way forward on the reduction of global greenhouse gas emissions. Nations in previous international engagements made commitments that should be converted to agreement and such past commitments are on the verge of expiration. For more than 20 years there have been genuine concerns over rising carbon emissions and scientists have developed empirical measurement of such increases as opposed to hitherto theoretical assumptions and the results are worrisome. The significance of Paris 2015 is predicated on the near halt of the Kyoto commitment due to apathy. There are emerging economies like China, South Korea and Mexico that in the Kyoto agreement were not given cut quota whereas developed economies were all given emission quotas to cut down. The Paris convention therefore became an important avenue through which this could be discussed and decided on. Furthermore, the biggest emitter (USA) had not ratified the Kyoto agreement, thus, further negotiation became inevitable. The ratification by Russia, though a very strong boost that made the agreement accepted by the World Trade Organization (WTO) still needed the big arm of the USA to make it globally accepted (Fiona, 2015).

The 2015 Paris climate change was supposed to be a conference of parties (COP21) intended primarily to foist an agreement between world nations on cutting down emissions to the point that global temperature may not exceed 2° C (3.6° F) (Comte, 2016).

At the end of the convention, roles were assigned not only to nations but also to international organizations like the EU and non-governmental

organizations and other stakeholders in the sector with basically no sanctions attached (European Commission, 2015).

Historically, world environmental meetings have had recurring attributes of only non-sanction final agreements that are not enforceable due to national political and economic interest guaranteed and protected by sovereignty.

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CHAPTER 6

ACTORS IN GLOBAL ENVIRONMENTAL POLITICS

Ofonmbuk E. Atakpa and Benson E. Udoms

Introduction

The interconnectedness of the world in terms of environment related problems and the compelling inevitability of actions needed to resolve them is commonplace. As noted by the German Advisory Council on Global Change (1998):

Many of today's environmental risks are global by nature. If the Gulf Stream ceases, sea levels rise or a new Spanish influenza pandemic afflicts the world, then the consequences for the whole of humanity will be so incisive and conceivably also irreversible...Global risk potentials and their interplay with economic, social and ecological processes of change have emerged as a novel challenge to the international community. Never before has human intervention in nature assumed global dimensions.

The degree of despondency inherent in the above statement is even more accentuated by pundits who aver that the traditional nation-state is weakened by the fragmenting forces of global capitalism and by a resurgence of identity politics, where a vast network of local and international nongovernmental organizations that comprise relatively new local, national, and international political actors interact for the common good (see Lipschutz and Mayer, 1996). A contemplation on the subject matter of actors in global environmental politics is concerned with how global environmental problems and the political responses to

them might be executed or enacted, not just at the level of the nation states, but also how, increasingly, political responses to environmental problems come from a variety of international organizations as well as non-state actors such as businesses, NGOs and the ordinary citizens of the world environment. This is as a result of the growing concern for the health of the global environment (the earth) which itself is rooted in the public consciousness about the effects of factors ranging from population growth (as may have emanated from third world countries of the southern hemisphere) and the consequences of industrialization (coming from the economically advanced countries of the northern hemisphere) and the fears of the overall impacts of climate change phenomena on the entire globe. Thus, there has arisen the inevitable need for cross global interactions and cooperation in tackling both the real and perceived problems which all threaten the lives of every human being and every organism on the globe.

As observed by Vinita (2011), climate change is one of the greatest social and economic challenges today and adverse weather conditions are impacting society on all fronts, be it food, habitat, livelihood or income. It is a global problem which needs a global solution, therefore, there is an urgent need to take into consideration inputs from all segments of society, and for this, each country has to play its part in reaching that global solution through local actions.

In the view of Mansfield (2003), “the global” in the sense so mentioned is not only about linkages that connect the world into a single place, but also those elements of differentiation and disconnections among people and places. With relevance to the field of environmental politics, the “global” does not indicate a particular arena for political struggle other than regional, national or local arenas, but is rather about how all these are produced and come together (or not come together) in environmental conflict. Herein lies the sense behind the idea of governance, which, in the words of Dalby (2002), is a central theme in global environmental politics today.

According to Stoker (1998), governance is a mode of conflict solving and ascertaining the priority of political decisions. Its outcome of concrete actions takes place in terms of management of regulation, the

essence being its focus on governing mechanisms which are not based on recourse to the authority and sanctions of government but involve recognising the limits of government. This governance perspective draws attention to the increased involvement of the private and voluntary sectors in service delivery and strategic decision-making.

In the same vein, this governance principle is global in nature, being a purposeful order that emerges from institutions, processes, norms, formal agreements, and informal mechanisms that regulate action for a common good. It encompasses activities at the international, transnational and regional levels and refers to activities in the public and private sectors that transcend national boundaries (Haas *et al*, 2014, cited in Behr, 2014). The implication is that decision-making in the field of climate change and other environmental problems of global significance is connected with multiple potential conflicts involving various stakeholders and the international governmental programmes that are designed to solve these problems by the same stakeholders. Thus, the political analysis of global environmental problems focuses on how different actors agree and disagree about matters of global environmental change.

Furthermore, the need for such governance structure stems from the fact of general calls for global responses to address global environmental problems such as climate change, the debate about the relationship between trade and environment and new environmental regimes that encompass both specific international laws and inter-governmental organizations; the new challenges relating to environmental security and a combination of trends in terms of challenges to traditional nation-state framework and the rise of global governance as an alternative (Lifton, 2003). It is this governance structure(s) that chart the course towards agreements on ways to deal with these problems.

It is pertinent to note that while some agreements have been based on existing methods of international negotiation or political governance, others have been based on new thinking and a need to break new grounds in achieving political agreements. Forsyth (2011), for instance reasons that although different policymakers have approached

environmental problems in the past, and what challenges there are at present, and in the future, some of the most difficult political problems arise when trying to implement global policy at the sub-state scale such as the clashes between local forest users in developing countries and international actors implementing global climate and biodiversity policies. Accordingly, this chapter is concerned with broader political approach to environmental governance than is usually associated with the discipline of international relations. It seeks possible answers to issues relating to global environmental problems that demand governance actions and seeks answers to questions such as: who decides what should be done about a particular environmental problem, who should manage or handle it, who should pay for it and for what purpose? Discussed below, are the key actors that are relevant in the politics/governance of world environmental problems and issues.

States as Actors in Global Environmental Politics

As is the case with the realm of International Relations, global environmental politics thrives on the crest of growing interdependence among states, which, in the view of Grenn and Colgan (2012) often use international organizations to achieve both domestic and foreign policy goals. One way states respond to demands for cooperation is to delegate authority to international organizations and private actors. As noted by Forsyth (2011), states, in technical language, are political associations that claim authority over a country. They perform the main duties of government, such as running the economy, deciding on foreign policy, forming military or other forces, the judicial (or legal) frameworks of a country, and its administrative apparatuses, such as the civil service. States perform the following two key functions in terms of global environmental problems and politics:

1. They are key actors in negotiating international agreements about global environmental problems. Any international agreement, such as a convention, requires the signature of states. States then have to ratify these agreements within their own government system.
2. States formulate and implement new policy approaches to addressing environmental problems domestically. For example, a state might be able to coordinate or encourage activities among the citizens or businesses located within one country that can

contribute to achieving the objectives of policy. A state might also take a proactive role in formulating new ideas for environmental policy, such as working with business partners to develop new technologies or new means of communicating ideas about environmental problems. The state might then use this approach to address its own population or take the innovation and propose it to the international community of other states. States therefore perform crucial roles in conducting global environmental politics. But, clearly, there is much diversity between different states in both their international influence and in their domestic capacity to formulate and implement policy. For example, the most powerful state in the world is clearly the USA, and the USA is a key influence on many global environmental problems and their associated politics. Smaller states with smaller populations, gross domestic products or contributions to world trade will have less influence. Similarly, larger states might also have greater domestic capacity (through, for example, domestic industries) to implement policies.

Experience has shown that when it comes to reaching environmental agreements at the global level, the most important international actors are states, but to further understand the role of states as principal actors in the field of global environmental politics, an elucidation on the disposition of a given state would help define its role in a given situation, problem or agreement. Thus, Chasek, Downie and Brown (2006) hypothesize that an actor may play one of four possible roles: (1) lead state, (2) supporting state, (3) swing state or (4) veto/blocking state (more elaboration on capabilities of states, their actions and dispositions as may be determined by state interests are well outlined in Chapter 8).

A lead state provides a formula as the basis of agreement. Luthra (2013) defines swing states as nations that possess large and growing economies, occupy central positions in a region or stand at the hinge of multiple regions and embrace democratic government at home. Increasingly active at the regional and global level, they desire changes to the existing international order but do not seek to scrap the interlocking web of global institutions, rules and relationships that have fostered peace, prosperity and freedom for the past six decades. This

idea was borrowed from the U.S. foreign policy, where a focus on these nations can deliver a large geopolitical payoff because their approach to the international order is more fluid and open than that of more established powers like China or Russia. In addition, the choices they make about whether to take on new global responsibilities, free-ride on the efforts of established powers, or complicate the solving of key challenges may, together, decisively influence the course of world affairs. Due to their mixed orientation and potentially outsized impact, these nations resemble swing states in the U.S. domestic context. An example of swing state action is the activities of Finland and Sweden in the Vienna Convention on the negotiation of the Ozone layer in 1985.

Further understanding of the role of states in Chasek *et al.*'s (2006) classification can be gleaned from the behavior of state actors on the way to establishing the Montreal Protocol. Before the Protocol could be made, there was a need for a framework for negotiation. This process began in 1977 when the international community, responding to concerns about the ozone layer, commenced the political definition of the problem and the bargaining process in 1982. This time lag was partly due to a lack of scientific evidence and certainty about exactly how ozone-depleting substances (ODS) interact with the ozone. However, by 1985 the framework convention (the Vienna Convention for the Protection of the Ozone Layer) was agreed on the middle ground between the US, Canada, Norway, Sweden, Finland, Suisse (acting as the lead states), while the EU, Japan, Brazil, China, India, Soviet Union opposed the Convention (thereby acting as the veto states. Countries like India and China argued that there was no way they could be party to the protocol because of their potential to expand their CFC market, and a regime without such developing countries would be weak. Initially, since no compulsory Chlorofluorocarbon (CFC) reductions were mentioned, the Convention had to set up the possibility for renewed negotiations if new scientific evidence came to light. That evidence came with the British publication that revealed the ozone hole, thereby necessitating resumed negotiations and culminating in 1987 with the Montreal Protocol (Thanki, 2011).

However, states may change from a veto/block status to swing status. For example, though India in June 1990 rejected the Montreal agreement

that needed them to phase out chlorofluorocarbons (CFCs) by 2010, that status was changed when they were offered financial assistance that would see them implement an alternative technology.

The question that may follow would be, what could cause a state actor to act in any of the four roles explained above, with regard to making decisions on agreements at the international arena? The answer lies in discovering the peculiar interests of states and what is at stake at the decision moment. Behr (2014) outlines the following as what shapes the interest of states in such decision moments:

1. **Domestic Political Factors**

The interests of a state usually take the form of its domestic economic, political and ideological leanings. For example, Norway, Japan and Greece played veto or swing roles on marine pollution from oil tankers due to their interests in the economic importance of their shipping industries.

2. **Costs and Benefits of Environmental Regime**

In 1990, an alliance of 32 small Island states was formed to lobby against carbon emission to the air by industrialized nations that jeopardize the very existence of these states. The UN Convention on climate change has also received massive support from nation-states with dense population at the coastal plains such as Netherlands, Egypt, and Bangladesh.

3. **International Political-Diplomatic Considerations**

A state may opt for a lead role or a veto role depending on where the choice will place it on the international diplomatic arena. The 1992 Rio Summit damaged US image following its rejection of the convention on biodiversity. Germany and Japan though they shared the US position, avoided the veto role to protect their prestige and image. Japan avoided a veto role on the ban of African elephant ivory for fear of the repercussion it will have with its major trading partner, US and Europe.

In all of the above stated interactions and relationships, states have, over the last decades, entered into a growing number of international

environmental agreements, and they have tended to establish them separately from each other. It is on record that to date, more than two hundred agreements have been concluded. On the average, one treaty was adopted per year prior to the 1970s. This number has grown to five since the 1980s (Beisheim et al. 1999), in fact, in the last three decades, there has been an explosion in international environmental law; as there are now more than 1,000 multilateral and 1,300 bilateral environmental agreements in force (Mitchell 2012).

Non-State Actors

An exposition on the role of non-state actors in the arena of world environmental politics is predicated on the notion that as in other areas of international relations, the forces of globalization have considerably weakened traditional governance processes thereby reducing the power of national governments (state actors) and invariably granting access to other economic and political actors. By implication, global environmental politics is not simply a function of states alone because in recent years, the role of non-state actors, political actors that are not directly linked to any specific state, has increased significantly and as observed by Charnovitz (1997), the 1990s witnessed a dramatic increase in the involvement of these non-governmental organizations (NGOs) in global governance.

Forsyth (2011) categorizes non state actors into two groups: civil-society actors such as non-governmental organizations (NGOs) and private businesses such as transnational corporations (TNCs). He lists some famous environmental NGOs to include Greenpeace, World Wildlife Fund (WWF), and Friends of the Earth (FOE). Some influential TNCs include oil companies such as Exxon and BP-Amoco, or food production companies such as Monsanto. However, non-state actors do not have to be large corporations or organizations. They also include smaller social groupings, and even individuals.

In their mode of operation, nongovernmental organizations (NGOs) have increasingly seized opportunities to participate in global environmental governance through expert knowledge and innovations on global environmental issues and have been committed to goals that cut across national or sectoral interests and their representative nature

(Speth, and Haas, 2006, cited in Behr, 2014). While viewing NGOs and other civil society groups as stakeholders in governance, Gemmill and Bamidele-Izu (n.d) also consider them as a driving force behind greater international cooperation through the active mobilization of public support for international agreements. They identify five major roles that civil societies might play in their contributions to global environmental governance.

The Roles are:

- (1) collecting, disseminating, and analyzing information;
- (2) providing input to agenda-setting and policy development processes;
- (3) performing operational functions;
- (4) assessing environmental conditions and monitoring compliance with environmental agreements; and
- (5) advocating environmental justice.

Still within their key role as major influences in the formation of environmental regimes, Behr (2014) maintains that these influences are demonstrated through:

1. the definition of a new issue or redefinition of an old one;
2. the lobbying of own governments or others to accept a more advanced option towards an issue via advancing new proposals, carrying out consumer boycotts and educational campaigns or fashioning lawsuits;
3. the proposal of draft convention prior to a conference;
4. lobbying and participating in international negotiations;
5. monitoring the implementation of conventions and reporting to the secretariat/parties.

Beyond the exertion of influence, NGOs, in their bid to accomplish their mandate often focus on a wide range of issues and rely on a variety of means to accomplish their goals including:

1. acquiring and managing endangered land;
2. performing field research;
3. lobbying government institutions and creating information campaigns to raise public awareness;

4. others may serve as “watchdogs” to hold governments accountable to their past agreements for example, the Kyoto Protocol (Behr, 2014).

However, nongovernmental organizations as actors in global environmental politics do not operate in isolation. Lipschutz paints a picture of the existence of multi-faceted interactions within and between sectors of a network of technologies, ideas, practices, values and knowledge which flow through more networks of international and local organizations. Global nongovernmental organizations depend on the legitimacy, expertise and credibility of local efforts, and local organizations receive knowledge, support and techniques from international change organizations/associations and groups which constitute a social learning system called global civil society. This complex process has become a force that influences public and private actions, and it can change the dominant mode and character of social and political problem solving (Lipschutz and Mayer, 1996).

In recent years, many academic analysts have become more optimistic about the role of non-state actors in global environmental politics, others have proposed that states and non-state actors might be more aligned than commonly thought. For example, some businesses might influence state policy in ways that lead to alliances between states and specific industries. This claim has been made concerning the oil and coal industries in the USA and the US participation in climate-change policies in the 1990s. Also, some NGOs might reflect the interests of certain parts of society or social classes more than others. Also, there are arguments that certain environmental values linked to wilderness or environmental conservation might be connected to long-term changes in urbanization, industrialization and overall development. Consequently, the agenda of some NGOs might be based mainly upon the views of some social classes rather than all sectors of society, and indeed there might be conflicts between social groups. For example, critics have suggested that large conservationist NGOs such as the World Wildlife Fund (WWF) have promoted policies about forests in countries such as Indonesia, Tanzania and Brazil that have not always reflected the interests of poorer people living on forest margins. NGOs are key actors in liberal approaches to global environmental politics because they seek

to share ideas and bring states together to make new agreements. But critics worry that the more powerful NGOs might in effect become hegemony within civil society, and crowd out voices from less powerful NGOs and citizens (further explication on the nature and roles of hegemony is provided in Chapter 8).

International Organizations

International Organizations (IOs) or Intergovernmental Organizations (IGOs) are the other set of actors that play an important role in global environmental politics. The actions of intergovernmental organizations are founded on the tenets of neo-liberalism where states appoint IGOs to look into matters that generate mutually beneficial gains, with the goal of reducing uncertainty and cost of transaction. Their increasing relevance in the field of environmental politics stems from a combination of trends in terms of challenges to the traditional nation-state framework and the rise of global governance as an alternative (Lifton, 2003).

Although there are instances where states create IGOs in pursuit of their interests and to undermine those that do not belong, international organizations are generally formed by member states for multiple purposes as in the case of the UN, or for regional purposes such as the Organization of American States. Others are geared towards specific goals as in the case of Food and Agricultural Organization (FAO) and World Health Organization (WHO). They also include organizations such as the World Bank (WB) and the World Trade Organization (WTO) which have become increasingly involved broadly in environmental debates and more narrowly in environmental management. They perform important duties in overseeing areas of international activities such as trade, aid, economic monitoring and in creating the needed platforms/arenas for international environmental agreements to be negotiated and implemented (Forsyth, 2011).

For a better understanding of how international organizations influence the politics of world environmental management, Behr (2014) summarizes their spheres of influence under the following headings:

1. **Setting Agendas and Influencing Regime Formation:**
This determines which issues to deal with by the international community, for instance, the United Nations Environmental Programme (UNEP) being a catalyst and a coordinator of environmental activities from the 1972 Stockholm Conference has received a growing mandate of setting agendas over global environmental issues;

2. **Developing Nonbinding Norms:**
These may include codes of conduct, declaration of principle, global action plans, or agreements that create norms and expectation without the binding status of treaties. UNEP through this process saw the worldwide pesticide trade being inclined to an environmental friendly approach in terms of responding to threats associated with environmental health. Be that as it may, soft laws may be turned into binding international laws through:
 - (a) being regarded widely as appropriate norms;
 - (b) political push from those dissatisfied with on and off adherence to soft laws, hence turning a nonbinding agreement into a binding one;

3. **Influencing National Development Policies:**
Outside the context of regime negotiations, IOs can influence states on policies. These may include forest management, how to generate and use energy supplies, amongst others. This is done through processes such as financing, advising and offering technical assistance in development projects, undertaking research to influence the path taken by a state in policies and exerting pressure on a state on matters of sustainable development policy issues; and

4. **They May Convene and Influence Negotiations on Global Environmental Regimes:**
A typical example is the case where the Food and Agricultural Organization (FAO) has had greater impact in developing world through utilization of some of the above measures. Intense

capacity building by IOs or developed states can help improve implementation.

It must be noted that each international organization would normally specialize in one of the four functions mentioned above as none influences the global environmental politics by performing all the functions. A discussion of some specific examples of the involvement of international organizations in specific issue areas would suffice.

1. The UN as the world's foremost umbrella organization has been prominent in both the formal environmental politics that occur within the confines of multilateral negotiations and the informal environmental politics of activism and social movements. The formal politics incorporates the various UN conferences and reports which, in recent times, have explicitly extended into the environmental politics of free trade. It is concerned with key issues about who is actually responsible for environmental degradation, what are the most appropriate measures for achieving environmental goals and who should pay for them. In this regard, the North is often presented as the protector of the environment while the South is regarded as the protector of the poor and economic growth is offered as the primary solution to both the consequent (or associated) economic and environmental problems.

The informal politics on the other hand generally borders on issues outside of official settings and carried out by grassroots groups. Its very crucial theme has been about the negative impact of both conservation and development on both people and the environment. The activists' discourse exposes the North for degrading the environment and the South for promoting policies that tend to exacerbate problems for the world's poor. Beyond the seeming dichotomy between the formal and the informal politics of global environment, the crux of the matter is that both types of environmental politics as championed by the UN raise key issues about environmental protection as well as about equity, global power relations and the relationship between environment and development (Mansfeild, 2003).

2. The World Bank has been involved in activities towards the health of the global environment, for example, in the mid-1980s criticisms from NGOs and the government of the United States of America saw the World Bank embarking on environmental friendly support projects to save its image. The multilateral fund of the Montreal Protocol is one of them. Also the embankment in afforestation support projects in Indonesia and other environmental friendly projects have seen the bank shifting its gears towards global environmental governance (Chasek et al, 2000).
3. A ranking example of the involvement of an international organization in international environmental governance concerns is the relationship between the World Trade Organization (WTO) that promotes free international trade and several multilateral environmental agreements that establish new trade restrictions such as the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer. The WTO has constrained the options available to environmental policymakers in these cases and may have limited the effectiveness of the environmental agreements concerned (Oberthür and Gehring, 2006).
4. From the perspective of the European Union, Oberthür et al. (2006) also report that the EU Structural Funds provide financial support to economic development projects which the EU feels have undermined the effectiveness of EU nature conservation policies enshrined, in particular, in the EU Habitats Directive. In this case, Structural Fund rules have been revised so as to provide incentives for the implementation of the Habitats Directive.
5. There are the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO), both of which are the prime international organizations responsible for international aviation and shipping, respectively. Their major objectives are the promotion and enhancement of these modes of

international transport. Shipping and aviation interests (owners, builders, operators) are their main stakeholders. As of mid-2005, ICAO had 188 and IMO 165 member states (Oberthur *et al* (2006).

6. We also have the International Council for the Exploration of the Sea (ICES) whose responsibility is in the formulation of scientific advice on fisheries management, notably the implementation of the precautionary approach; and in turn, the interaction between ICES precautionary advice and the EU Common Fisheries Policy (Stokke and Coffey, 2006). See other types of international organizations in Chapter 7.

Conclusion

The chapter considered the activities of states and non-state actors at the arena of global environmental politics, from where some form of purposeful order has emerged by way of processes, norms, and formal agreements with a view to regulating the mechanisms of action for the common good of all. Be that as it may, pundits have expressed reservations over the expected successes from these interactions and actions, arguing that there is no assurance that it will, or that a loose network of organizations will adequately govern the planet's environment. Lipschutz and Mayer (1996) insist that the governance system has some powerful opposition in the persistent and powerful incentives of global capitalism for consumption of the environment and in the actions of short-sighted governments.

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CHAPTER 7
STAKEHOLDERS IN
GLOBAL ENVIRONMENTAL POLICIES

Joseph Isaiah Akpan

Introduction

Global environmental politics is an emerging field of study in international relations. Its focus is on issues of social, economic and human interaction with the natural environment in relation to global security and political economy (Cass, 2015). The actors usually may not be purely environmental regulators or the environmentally concerned thereof, it oftentimes becomes sociopolitical, underpinning sovereignty. To illustrate: one nation may choose a certain method of production that the neighboring nation's environment becomes the recipient of the after effect. The level to which the recipient nation pushes for the abeyance of the effect of the action of the other nation rests on a lot of factors. Ensuing struggle may elicit sanction, suspension of aids and other assistance and outright trade embargo. Thus, giving attention to global environmental politics before embarking on such dispute is very important.

The Emergence of Global Environmental Politics

Contemporary environmental politics "was driven by the idea of a global ecological crisis that threatened the very existence of humanity." And "modern environmentalism was a political and activist mass movement which demanded a radical transformation in the values and structures of society." Environmental concerns were rooted in the vast social changes that took place in the United States after World War II. Although environmentalism can be identified in earlier years, only after the war

did it become a widely shared social priority. This began with outdoor recreation in the 1950s, extended into the wider field of the protection of natural environments, and then became infused with attempts to cope with air and water pollution and still later with toxic chemical pollutants. After World War II, environmental politics became a major public concern. The development of environmentalism in the United Kingdom emerged in this period following the great London smog of 1952 and the Torrey Canyon oil spill of 1967. This is reflected in the emergence of Green politics in the Western world beginning in the 1970s. It could therefore be safely said that; global environmental politics is an exigential paradigm contiguous upon emerging dangerous environmental practices having global consequences.

Environmental issues experienced increased interest and attained political relevance in the late 1960s and early 1970s. Reacting to a series of industrial disasters and warnings like Rachel Carson's *Silent Spring*, the modern environmental movement emerged around the industrialized world demanding government intervention to protect air, water, and other natural resources. This grassroots movement resulted in the creation of modern environmental laws and regulatory institutions in advanced economies.

This same shift also marked a turning point for environmental politics at the international level. As observed by Strong (1971), scientific experts from the developing world released the Founex Report (named after the location of the meeting, Founex, Switzerland). The report made three important contributions to the broader political dialogue.

First, it recognized that developing countries also experienced "environmental" problems, though these were of a very different sort than those in the developed world.

Second, it laid the foundation for further discussion on the relationship between economic development and environmental protection at the UN Conference on the Human Environment, held in Stockholm in 1972.

At first, these tectonic political shifts went largely unnoticed by international relations scholars. But one very important exception came

from a figure at the very center of the discipline's scholarship-policy nexus: George Kennan. Writing in *Foreign Affairs* in 1970, Kennan called for the creation of an International Environment Organization to coordinate global efforts to protect the planet (Falk 1971; Sprout 1971). Such an institution could facilitate research and information-sharing and coordinate national regulatory strategies, he argued. More radically, he also suggested it could directly regulate the global commons over which no nation exercised sovereignty. Though not explicit or developed, the functionalist institutionalized logic that underpinned Kennan's argument would have been immediately recognizable to the regime's theorists in subsequent decades.

Kennan's proposal had a real-world test just a few years later. In 1972, states held the first global conference on environmental issues, a kind of environmental "Bretton Woods." The Stockholm Conference on the Human Environment grew out of the problems identified in the Founex Report 113. Nations, along with representatives of international organizations and NGOs convened to decide how to address these issues. This conference established basic principles to guide future action. Importantly, this included recognition of states' sovereign right to exploit resources within their borders (Principle 21), as well as humans "solemn responsibility to protect and improve the environment for present and future generations" (Principle 1). These two principles, among others, would become important aspects of soft laws in future environmental rulemaking.

Second, the Conference outlined a "Plan of Action" identifying a series of steps that states should take to establish a comprehensive agenda and work programme on environmental issues.

Third, and finally, states created the UN Environment Programme, an international institution charged with "promoting international co-operation in the field of environment." From the perspective of international relations scholarship, the UNCHE conference was significant in that it created the international institution and institutional framework that would become the focus of academic research in the 1980s and 1990s - a point to which we will promptly return.

It has become obvious that some nations and economic giants have hijacked issues of environmental concern in a twisted overture to better their interests at the expense of the worrying state of the environment. Product manufacturing and even service providers and producers are in all forms influenced by certain environmental dictates and the *'first to reach'* insist on *'the reach'* to practice alone, such that developing nations find it very difficult to practice in certain fields. The political sphere has made it such that certain environmental procedures have become a *'certified brand items'* even if such brands are not better than existing unbranded techniques. The process of getting new environmental ideas branded and certified is tended through hitherto branded process that is tilted to benefit only known and pre-determined components.

The controlling mechanism of climbing the ladder to have an acceptable new process said to be environmentally compliant is highly political and shrouded in machinations. At other times, sovereignty becomes a deliberate shield to block intrusion into what is seen as generally environmentally unacceptable practice. Is global environmental politics not playing out in the green belt grant? Greenbelt Foundation (2005): like grant is given by the friends of the Greenbelt foundation, Ontario Greenbelt Fund and other such global organizations and projects for low carbon schemes and other allied schemes from industrialized nations. Industrialized countries owning heavy carbon emitting industries, instead of pulling down their factories and go for low carbon emitting ones would prefer to pay grant to developing areas and nations for afforestation to help in carbon reduction. The sheer implication is gleaned in the condition to qualify to benefit from the grant; benefiting area or states would have to embark on massive tree or crop cultivation and low industrialization with the belief that, the afforestation socks the excess carbon thus counter-balancing the global ecosystem.

The manufacturing nation makes profit from the sales of its product, while on the other hand the afforesting area and state receive grant for the conservation endeavours. In this arrangement, the master nation, so to say and the subservient nation stand out. This clearly shows that there are nations that are more influential than others as actors in global environmental politics. Take also the shrimp turtle case of World Trade

Organization (WTO), 1998 case No. 58 and 61 between the United States and other nations (India, Malaysia, Pakistan and Thailand) on the importation prohibition by the US of certain shrimps and shrimp products into their country. Whereas the WTO appellate body ruled against the US because it applied its import measures in a discriminatory manner at the first instance, it revised its measures by introducing flexibilities in favour of developing countries. The appellate body subsequently concluded that the US ban was consistent with WTO rules thus upholding their ban. This is a clear implication that as in law, certain actions and legal procedures can help evade adverse judgment, and that clear liberality toward the weak brings succor, which of course depends on the depth of knowledge of world environmental politics.

The administration of environmental policies is highly political as national policy makers work within the framework set for them by their national laws and procedures which of course is strewn with economic and political interest. Secondly, environmental laws are largely vague and oftentimes contradictory and flawed such that those charged with the responsibility to protect the environment must follow political procedures that were set by suspicious politicians to protect national political interest. This may include fighting off pressure while keeping an eye on loopholes for easy escape during international environmental litigation.

As earlier stated, some environmental laws are largely inconsistent; this is obvious in such inconsistencies even perceivable in high level laws as those of the United Nations articles and principles as follows:

According to MacLean (1983), Principle 26 of the 1992 Rio Declaration (see more information on Rio in the chapter “history issues and impact of Meetings on World Environment) clearly sets out that states have to “resolve all their environmental disputes peacefully and by appropriate means in accordance with the Charter of the United Nations.

On the other hand, Art. 33(1) of the UN Charter, states that the settlement of disputes can be reached “through negotiation, enquiry, mediation, conciliation, arbitration, judicial settlement, resort to regional agencies or arrangements, or other peaceful means of their own

choice.” Thus, it puts forward two kinds of means (procedures) for dispute settlement:

1. Diplomatic means, such as negotiation, inquiry, mediation, conciliation; and
2. “Judicial” (Ehrmann, 2002), “legal” (Sands, 1996), “adjudicative” (Romano, 2000) and “arbitration” (Savasan 2014).

It could clearly be seen from the above that whereas the Principle of Rio is straightforward and rests all disputes of environmental issues on the provisions of the charter of the UN, Article 33 (1), the UN charter on the other hand accepts negotiations and intra governmental agreements between nations as substance sufficient, without addressing such issue as: “suppose the agreed procedure between the agreeing nations is not of world best practice and may impose other environmental negative impact on the global environment”. These inconsistencies and lacunas make environmental settlements between nations sometimes controversial.

Economic interest and the institutions involved also play a major role in global environmental politics and in disputes determine most times where the pendulum will swing at the end of the day. Take the American Protection Agency regulation limiting emission of mercury and other toxic pollutions for coal firepower plants for instance. Obama’s administration through the Chief Justice John G. Robert Jr. refused to carry out the ruling of the Supreme Court for American Economic interest. This clearly shows economic and political interest’s interference in environmental regulation of the American clean Air Act. Obama’s reasoning; *“It is not rational, never mind ‘appropriate,’ to impose billions of dollars in economic costs in return for a few dollars in health or environmental benefits* (Liptak and Davenport 2016). Thus economic interest nations can decide not to abide by court ruling on global environmental issues. To this end, national economic interest is one major actor (influence) in global environmental politics.

The European Union (EU) is another very influential actor in global environmental politics and policy making across its 28 member nations (Warrick, 2016). These nations in adopting EU environmental standard and subjecting themselves to the ruling of the European Court of Justice make the EU a supranational (Aless, 2014). (supranational organizations

have power or influence that transcend national boundaries and sovereignty which include the United Nations, EU, International Monetary Fund, etc.) with attendant political and economic influence (Selin and VanDeveer 2015).

Effective participation in global environmental politics is often vital for the avoidance of severe environmental risks such as anthropogenic global warming and is also dependent on possession of specialized knowledge available only to a small section of the world's elite (Bernstein, et al. 2018).

Global environmental politics examines the relationships between global political forces and environmental change, with particular attention given to the implications of environmental change and environmental governance for world politics and development parameters. Global environmental politics requires the participation of state actors, non-state actors, including NGOs, international organizations in solving the global environmental issues. This also is usually influenced largely by economic policy of the global industrial giants.

Global environmental politics is a relatively new field of study within international relations that focuses on issues involving the interaction of humans and the natural world. As early as the mid-19th century, there were scholars writing about the role of natural resources in global security and political economy. However, much of the literature prior to the 1980s related specifically to resource extraction and development issues. It was only in the 1980s and into the 1990s that global environmental politics began to establish itself as a distinct field with its own dedicated journals and publishers, and the focus of study expanded to include global environmental problems such as ozone layer depletion, climate change, biodiversity loss, deforestation, population explosion, over-exploitation of natural resources, desertification and the like. It has emerged as a centre of interdisciplinary work that integrates research from a range of fields including geography, economics, history, law, biology, ecology and numerous others. The interdisciplinary approach makes it difficult to define the boundaries in this rather immense field of study. The focus in this entry will be on global environmental politics

research that falls primarily within the larger field of international relations.

Global environmental problems present many unique challenges and have thus spawned a range of subfields of study. Global environmental problems frequently involve substantial scientific complexity and ambiguity. This has produced wide-ranging scholarship on the relationships between science and policy. The very long time frames of both the consequences of environmental problems as well as the efforts to address them create a number of governance challenges given the much shorter political time frames of politicians and diplomats.

In addition, because environmental problems typically do not respect borders, they pose challenges for international cooperation, which has thus produced a growing literature on global environmental governance. The widespread potential for massive economic, political, and ecological dislocation from the consequences of global environmental problems as well as from the potential policies to address those problems have led scholars to study global environmental politics from every paradigm within international relations as well as drawing on research in numerous other disciplines. Finally, efforts to address the consequences of environmental problems have produced controversial, ethical and distributive-justice questions that have produced an important philosophical literature within global environmental politics. Global environmental politics has thus emerged as a very rich and diverse area of scholarship.

State Actors in Global Environmental Politics

States actors are almost the most powerful environmental political actors in environmental management decision and policy making. This is so because of the principle of sovereignty which gives sovereign nations the right to control its national territory. Their full participation is therefore essential to achieve sustainable development. The diversity of state participation in global environmental politics is acknowledged in Agenda 21, the comprehensive sustainable development blueprint adopted at the 1992 Rio Earth Summit.

The United Nations Conference on Environment and Development (UNCED), which took place in Rio de Janeiro in June 1992, was a milestone event, bringing together more Heads of State and Chiefs of Government than any other meeting in the history of international relations, along with senior diplomats and government officials from around the globe, delegates from United Nations agencies, officials of international organizations and many thousands of nongovernmental organization (NGO) representatives and journalists. UNCED made it plain that we can no longer think of environment and economic and social development as isolated fields. In addition to major international treaties and agreements concluded at the Earth Summit on issues of global climate change, biological diversity, deforestation and desertification, the Declaration of Rio contains fundamental principles on which nations can base their future decisions and policies, considering the environmental implications of socio-economic development.

Rio de Janeiro listed as it were almost all environmental political stakeholders in its about 30 principles that were adopted at the end of the epoch making conference.

Actors in Global Environmental Politics as Identified by the United Nations in Rio

UN enabling Principle	Actor in Global environmental politics	Powers of the actor
Principle 1,7	The State or A Nation	This principle empowers any nation with the sovereign right to exploit its own resources pursuant to its own environmental and developmental policies, and the responsibility to ensure that activities within its jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction.

		A clear direct import of this is that all states are actors in environmental politics.
Principle 2, 27	International Law	International law is a very important personified international environmental political factor and Principle 2 provides that states should key into it in accordance with the Charter of the United Nations and the principles of international law. This principle is manifest in several international court judgments that have shaped international environmental considerations and global environmental politics as in: <i>Commission v Spain</i> involving the refurbishing project, relying on <i>council directive 97/11/EC and council Directive 85/337/EEC</i> all of <i>Annex 1</i> ; <i>Commission v. Ireland</i> [2014] ECLI C-427/7. In the case of EIA directive; <i>C – 416/10, C – 420/11</i> . Individuals should be able to rely on the directive and national court should take this into consideration; <i>C - 72/95, C - 435/97, C – 287/98 and C – 201/02</i> . See also the Aarhus Convention dimension in <i>C – 240/09, C – 115/09, C – 332/04</i> and that participation should not be confined to administrative procedure; see <i>C – 263/08</i> . Access to court should be guaranteed; <i>C – 427/0</i>
Principle 10, 22	Publics and all concerned citizens of an affected state	Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held

		<p>by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided. This is in line with the United Nations Declaration on the Rights of Indigenous People (UNDRIP) adopted by the General Assembly on Thursday, September 13, 2007. Of the 159 nations that voted, a majority of 144 were in favour, 4 were against and 11 abstained. However, the 4 that voted against had since reversed their vote in favour. This is to illustrate what powerful position the public have in influencing global environmental politics which of course, is demonstrated in many international case laws (<i>stare decisis</i>)</p>
Principle 26, 27	The United Nations	<p>States shall resolve all their environmental disputes peacefully and by appropriate means in accordance with the Charter of the United Nations. The use of the United Nations' Charter is an indication of the preponderating role of the United Nations in global international environmental politics</p>
Principle 10, 22	The NGO	<p>Non-governmental organizations (NGOs) play very important informative, research and independent opinion</p>

		controlling influence in environmental protection advocacy. Their influence is aptly considered in Chapter 5 (History, Issues and impacts of Meetings on World Environment)
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Participation of Non-State Actors in Global Environmental Politics

The term 'Non-State Actors' (NSAs) refers to a wide range of public and private actors, including inter-governmental organizations, international organizations, NGOs, and any individual or group of individuals (Andonova and Mitchell, 2010).

NSAs are influential players in global environmental politics. Their involvement in environmental governance is highly diverse, including local, national, regional and international groups with various missions dedicated to environmental protection, sustainable development, poverty alleviation, animal welfare and other issues.

Non-state actors (NSAs) include firms, non-governmental organizations (NGOs), grassroots organizations, scientific associations, special interest groups (national and international), universities, businesses, trade associations, environmentalists, individuals, the media, churches and religious organizations, independence movements, sub-national governments, political parties, government bureaucrats, foundations, social entrepreneurs, and consumer groups (Biermann and Pattberg, 2008; Bulkeley, 2005; Newell et al., 2012).

The Roles of Non-State Actors in Global Environmental Politics

NSAs are all those actors that are not (representatives of) states, yet that operate at the international level and that are potentially relevant to international relations (Arts et al., 2001; Furtak, 1997; Higgot et al., 2000).

Non-state actors appear to be the leaders of environmental activities at local and global levels. While participating in formulating, promulgating and enforcing rules, non-state actors affect the behavior of a wide range of other actors. Non-state actors carry instrumental function, especially

in information gathering, policy development, and 75 policy assessments for the states' regulatory actions.

NSAs play the following roles:

- 1) Collecting, disseminating, and analyzing information;
- 2) Providing input to agenda-setting and policy development processes;
- 3) Performing operational functions;
- 4) Assessing environmental conditions and monitoring compliance with environmental agreements; and
- 5) Advocating environmental justice.

The Involvement of NGOs in Global Environmental Politics

In the past three decades, notably since the Stockholm Declaration of 1972, NGOs have played crucial roles in international environmental decision-making processes. NGOs act to shape the global environmental agenda. Lack of information and scientific uncertainty often become barriers to global efforts to combat environmental degradation. That is why in recent years; NGOs have had the opportunity to play an important role in the processes that led to many of the conferences where international environmental treaties were negotiated and signed. They make their knowledge and resources available to government officials and inter-governmental organizations, thereby advocating, promoting and at times even initiating multilateral environmental conventions. NGOs also act to correct mistakes by pointing out errors and inconsistencies in the proposal of new convention.

The United Nations often use NGOs as consultants through the United Nations Economic and Social Council (ECOSOC), and has a list of hundreds of accredited NGOs for that purpose. By providing policy information, research and scientific evaluations NGOs help to reduce costs of policy development for governments and mobilize public opinion by bringing credibility to issues at hand.

International Organizations Fighting Environmental Degradation

These six major international environmental organizations are striving hard to address such problems as habitat destruction, poaching, pollution, and global warming.

1) Earth System Governance Project (ESGP)

The ESGP began in January of 2009 out of the International Human Dimensions Programme on Global Environmental Change, a research project that focused on the human impact on global change. This project is a network of around 300 active and 2,300 indirectly involved academics from around the world. The goal of the ESGP is to publish research on the science concerning the difficulties of regulating global environmental change. By doing this, researchers hope to better understand the roles and responsibilities of governments, institutions, and organizations in issues of global commons and pollution.

2) Global Environment Facility (GEF)

The GEF was established in 1991 as collaboration among 183 nations, civil organizations, private businesses and international institutes. This organization finances projects concerning climate change, land degradation, international water, biodiversity and the ozone layer. Currently, it is the largest public funder of these types of projects in the world. In total, the GEF has provided \$12.5 billion, \$58 billion in shared financing endeavours and \$653.2 million in small grants. Together, these funds have contributed to 3,690 projects in 165 countries.

3) Intergovernmental Panel on Climate Change (IPCC)

The IPCC works under the UN as an intergovernmental and scientific organization, established in 1988 by the World Meteorological Organization and the previously mentioned UNEP. Its purpose is to offer the world an unbiased, scientific assessment of climate change and its effects. The IPCC reports are based on published literature by non-IPCC scientists on a voluntary basis. In 2007, this organization, along with Al Gore, received the Nobel Peace Prize

Major International Organizations Fighting Environmental Destruction

These major international environmental organizations are striving hard to address such problems as habitat destruction, poaching, pollution and global warming. Environmental organizations operate around the world in an effort to analyze, track and conserve the global environment. These organizations are:

iv. United Nations Environment Programme (UNEP)

The United Nations Environmental Programme was founded in June of 1972 after the UN Conference on the Human Environment. It is responsible for a number of environmental issues concerning various UN agencies. Some of these responsibilities include: developing international environmental agreements, encouraging environmental science and creating development policies with national governments. Experts of the UNEP have contributed to guidelines of treaties and policies in terms of potential contaminants.

The UNEP mandate is to establish international standards for environmental policy and provide direction to international initiatives based on scientific knowledge. The UNEP's activities can be summarized as follows:

- iv. Monitoring and assessing global, regional and national trends related to the environment;
- v. Developing national and international tools to address environmental problems;
- vi. Assisting national institutions that support environmental management;
- vii. Facilitating the transfer of science and technology related to the environment in the context of sustainable development; and
- viii. Encouraging partnerships and new initiatives in the public, non-governmental and private sectors with the aim of bringing the most pressing environmental issues to the attention of authorities.

The UNEP strategy for the 2010-2013 periods, which reflected the organization's vision and mandate, focused on six thematic priorities:

- i. Climate Change

- ii. Disasters and Conflicts
 - iii. Sustainable management of ecosystems
 - iv. Environmental management
 - v. Harmful substances and hazardous waste
 - vi. Resource efficiency - sustainable production and consumption
- v. **World Nature Organization (WNO)**
Planning for the World Nature Organization began in 2010 by the developing countries which are most threatened by climate change. These nations are located around the Pacific Ocean and the Caribbean as well as a few countries in Africa. The Preparatory Commission published the WNO Treaty in June of 2012, but lack of interest left the agreement unsigned. This organization did not come into effect in May of 2014 as planned. Its goal was to promote economically friendly businesses, technology, energy and activities.
- vi. **International Union for Conservation of Nature (IUCN)**
The International Union for Conservation of Nature was established in 1948 and is comprised of over 1,200 government and non-government members. Its mission is promoting nature conservation and sustainable use of natural resources around the globe. This environmental organization also focuses on issues such as poverty, gender equality, and sustainable business practices in order to achieve its objective. This organization is responsible for publishing the IUCN Red List which categorizes biological species by their conservation status.

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CHAPTER 8

GLOBAL ENVIRONMENTALISM AND ENVIRONMENTAL REGIMES

Enefiok E. Ibok and Imoh Imoh-Ita

Introduction

Global environmentalism is an activity to tackle worldwide natural issues. Environmentalism is global in two perspectives. First, it asserts the priority of a global entity i.e. an ecosystem that operates according to universal laws; a tangled web of planetary interdependence. Second, it refers to a worldwide social process – world level discourse and activity that together have reconstituted nation-states and individuals (Imran and Shukla, 2017).

Efforts to address the causes and consequence of environmental problems have produced an important philosophical literature within global environmental politics. Thus, global environmental politics has emerged as a very rich and diverse area of scholarship. Environmentalism is a very common concern today, yet there are many types of environmentalism. So any discussion of environmentalism or environmental politics should acknowledge that there is no “one” environmental viewpoint, instead that environmental values and priorities can vary between different actors, countries, or social groups (Forsyth, 2011; O’Neil, 2009).

It is of interest to note that much worry about ‘global’ environmental politics can imply that the entire planet is at risk from environmental change, and consequently that all people and living things are also in danger. On the other hand, it might be implied that environmental policies will accordingly benefit everyone. But these ideas are equally highly contested not just by people who try to downplay environmental problems, but also by different types of environmentalists. This therefore, gives rise to one of the biggest themes of global environmental problems and politics in identifying how far global environmental changes do present a problem for all people; and how far proposed policies do, or do not, include the viewpoint of all. The big

question is why are environmentalists so divided? At this point, we shall examine different views on environmentalism, and how they relate to global environmental politics, (Forsyth, 2011; Chatterjee and Finger, (1994).

Deep Green or Ecocentric Views of Environmentalism

Deep green is a radical environmental movement that views mainstream environmental activism as being largely ineffective. This movement is committed to deep ecological sustainability and they believe that the environment is the bottom line, and resistance is protection. Deep green believes that technological innovations, no matter how well intentioned, inevitably lead to accelerated resource depletion and more pollution. It sees fear and anger as rational responses to the scale of the rape of the natural world and the destructive nature of society. This movement channels its energy into activity bringing down the apparatus of civilization and creating communities based on the values and social structures of the original people. The deep green movement also values joy, happiness connection and positive action, but does not value/judge them to be more valid or productive than fear, anger or direct actions (McGregor, 2014).

Deep greens contend or believe that the fragility of the planet earth is the most important consideration in environmental policy. They see human activities as controlled by natural limits such as the maximum carrying capacity for humans or other population. Deep-green environmentalists are worried that rapid growth of human population or the pace of economic development will threaten environmental limits and lead to social collapse or create political and economic shocks such as famine and conflict. Some well-known environmental writers and activists who championed this view are Lester Brown (The Co-founder of the Worldwatch Institute) and Paul Ehrlich (who has written about the potential problems of population growth) Forsyth, 2011, Stott, 1999, Jacob, 1994).

The issue of population growth and shrinking resources predate Robert Malthus. At first, the issue centred on the adequacy of resources for a rapidly growing population. The environment that produces the resources was taken for granted until the Stockholm conference (United

Nations) of 1972. However, the truth is that, most deep-green environmentalists are influenced by the writings of the British Cleric Thomas Malthus, whose *Essay on the Principle of Population* (published in two versions in 1798 and 1803) predicted that population growth would outstrip food production. It is equally of note that another major work in English on population pressure and the environment appeared in 1864, about 66 years after Malthus, under the title “Man and Nature, or Physical Geography as Modified by Human Action.” The author, George Perkins Marsh, an American scholar and diplomat dealt extensively with modifications and in some cases the destruction wrought on forests, water resources and channels, soils and wild life by humankind in the process of extracting natural resources for its use. He (Marsh) emphasized the need to study and understand the complex interactions of natural processes in the environment prior to human intervention and also the extent and gravity of the destruction, often unintended, caused by human action, (Udo, 2012). Also another most influential environmental writings in recent years have been Meadows. For example, the book entitled; *the Limits to growth* by Meadows et al (1972), predicted how far reserves of natural resources would last under current rates of economic growth. The book concluded that, unless rapid reductions in population, industrialization, pollution and consumption of nonrenewal natural resources growth were made, there would be rapid economic decline and that ‘short of a world effort, today’s already explosive gaps and inequalities will continue to grow larger. That the outcome could only be disaster’ (Meadows, et al., 1972: 195).

Also, many deep-green writings emphasize the global nature of environmental problems, and the need for all human society to live within global limits. For example, the scientist Janet Lovelock (2006) described the “Gaia” concept, in which he sees the entire Earth as a single living system that is fragile to the impacts of humans. He argued that unless humanity can reduce these impacts, some billions of people are likely to die as a result of climate change and other consequences of environmental degradation (Fosyth, 2011).

In contrast to this group (Deep Green), there are other forms of environmentalism that place less emphasis on the notion of the fragile and universal ‘nature’ of environmental problems. These groups look at

the ability of technological innovation to provide ways of avoiding and reducing environmental problems, or the political and social bias in how environmental problems can be managed. They are called “Light Green Environmentalists”.

Light Green or Technocentric Environmentalists

Light green or technocentric environmentalists are transformational activists who see protecting the environment as first and foremost a personal responsibility. They do not emphasize environmentalism as a distinct political ideology, or even seek fundamental political reform. Instead, they often focus on environmentalism as a lifestyle choice (Steffen, 2009).

Members of this group are sometimes called ‘light greens’ because they acknowledge the existence of environmental problems, but are more optimistic about the ability of human societies to find ways to reduce them. For these reasons, this group is sometimes also called ‘technocentric’ because it is concerned with how technological innovation or social reorganization could minimize pressure on earth’s ‘natural’ limits. A good example of a writer from this group is Ester Boserup (1965), whose book, *The Condition of Agricultural Growth*, argued that Malthusian collapse was unlikely if people were able to anticipate limits and adopt innovations to help increase food production or decrease the impacts of human activities. For example, the introduction of irrigated rice terraces in many parts of the world in order to improve food production and or the replacement of copper wiring with fibre optics (Boserup, 1965; Forsyth, 2011).

Other analysts have argued that market mechanisms will operate to reduce pressure on resources by making substitute products more attractive and accessible. For example, the limits to growth predicted that many metals such as copper would become scarce as economic growth continued. But copper is still mined, and many previous uses of copper have been superseded by more efficient resources (e.g. the replacement of much copper wiring by fibre optics). This sort of trend encouraged technological optimists to point out that the most important determinants of environmental scarcity were not natural limits, but the limits to human innovation. Or, as is commonly said, the Stone Age did

not end because of a shortage of stone. Also, in 1980, deep-green environmentalist Paul Ehrlich entered into a wager with the technological optimist, Julian Simon, to test this assertion. Ehrlich believed that commodity prices would be higher by 1990 as a result of resource scarcity and population growth began to slow. Simon argued they would be cheaper. Simon won the bet or was right (Forsyth, 2011).

The techno-centric, light-green approach to environmentalism is important as it is often encountered today in arguments about climate change or other global environmental problems. A point of note between the deep-green and light green environmentalism is that the deep-green approach to environmentalism tends to suggest that the best way of avoiding problems is through a process of mitigation, or reducing the causes of environmental problems, such as increasing greenhouse gas concentrations. On the other hand, more technological and optimistic approaches discuss adaptation as a way of avoiding and reducing environmental problems or trying to reduce the damages that are caused, (Forsyth, 2011; Steffen, 2009).

Sustainable Development Approach

It happens that there is yet another approach to environmentalism, which is in addition to the deep or light green groups. This last group focuses instead on the politics of sustainable development and international equity, on how environmental problems are created and addressed. The view of this group has three important implications for the discussion of global environmental problems and politics.

First, they question how far the current understanding of environmental change is truly 'global' in the sense that it presents equal challenges for all countries or people. This group, therefore, disagrees with deep-green descriptions of global environmentalism because they see environmental problems as more varied and as related to the context and values of different people. Secondly, this group questions how far technological or market-based responses to environmental scarcity are available across the world. They point out that technology adaptations are not easily accessible to everyone. And thirdly, they argue that the incidence of environmental problem is closely linked to the vulnerability of different countries, peoples or individuals to the challenges posed by

environmental change, and by their own political or economic ability to develop responses to these challenges (Baker, 1997).

It is of interest to note that this group does not deny the existence of environmental problems, nor does it question the role of technology. Rather, it focuses on the issue of international equity often along North-South lines on which environmental problems are addressed, what kinds of solution are proposed, and who wins and loses as a result of these policies. A key part of this approach is to enquire about how and by whom global environmental problems are identified as 'global' and how proposed solutions impact on different countries and social groups (Forsyth, 2011).

Environmental Regimes

Most global environmental problems are addressed through regimes. A regime is a name given to unified behaviour across different states that can address a political problem. Young (1999) defines regimes as social institutions that consist of agreed upon norms, rules, decision-making procedures, and programs that govern the interactions of actors in specific issue areas.

According to List and Rittberger (1992), a regime is a form of collective action by states, based on shared principles, norms, rules, and decision-making procedures, which contain the behaviour of individual states in specific issues areas. Regimes are more specialized arrangement that pertain to well-defined activities, resources, or geographical areas and often involve only some subset of the members of international society (Young, 1989).

From the above definitions of regimes, we notice that a regime is a form of institution. An institution is a concept in political science that refers to shared behaviours or norms that regulate social activity. They can be composed of formal rules (such as official state-based legislation), or informal behaviour (such as activities that people adopt, but which are not enforced by law). Institutions could equally be seen as the framework that humans create to structure human interaction. They are made up of formal rules (constitutions, laws, and regulations) and

informal constraints (conversations and norms of behaviour) and the way both are enforced (Worth, 2000; Forsyth, 2011).

In the light of the above, an environmental regime therefore comprises principles, norms, rules and decision-making procedures around which actors can converge where there is a given environmental problem or issue. At times, this might mean sharing the same behaviour, or adopting different means of achieving the same end point. So the rise of environmental regime has come about as a result of the expansion or increase in organization and activity in many sectors of global society. They can be state-based activities, such as the adherence to an international agreement on an environmental problem. They can also be comprised by informal activities that are not regulated by international agreements, but which nonetheless help address environmental problems (Helmet et al, 2006).

These informal activities in particular might involve non-state actors such as businesses, civil society organizations and citizens. These actors might be involved by following state-based rules or guidelines in accordance with domestic or international legislation, or on a more voluntary non-coerced basis. For example, drawing from ozone-depletion, many states might regulate the sale of ozone-depleting substances following the Montreal Protocol (1987), which is a formal interstate agreement. This treaty makes it illegal to buy or sell products that damage the ozone layer. But many citizens might choose voluntarily to perform environmentally friendly tasks where there is no international agreement, such as in the recycling of household waste. In this case, states or NGOs might assist this process by providing information and guidelines, but there are still relatively few laws concerning recycling of everyday items (Keck and Sikkink, 1998, Forsyth, 2011).

The creation of an environmental regime does not necessarily require the signing of an international agreement, if actors within different states can be persuaded to behave in certain ways. But sometimes an international agreement is the most effective way to create change in how societies and actors operate within states. According to Levy et al (1993) environmental regimes may limit the scope of governments to act

unilaterally, but they also facilitate collective state-based problem solving.

Routes or Approaches to Environmental Regimes

Regimes may be reached by various routes, and or agreed upon despite disagreements or competition between states. Analysts usually argue that there are three main ways of achieving environmental regimes, which reflect different emphases on realism, liberalism, and the role of generating knowledge (such as by NGOs). These are called power-based, interest-based and knowledge-based approaches to regime formation.

Power-based Approach

The power-based approach adopts a realist vision of international relations under which any possibility of reaching environmental agreements has to acknowledge the reality that all states will focus on their own interest. In particular, it will be difficult to persuade hegemon to change their behaviour if there are no strong pressures upon them to do so. Alternatively, a hegemon might coerce other states to agree to a regime the hegemon itself is proposing by using techniques such as threatening to withdraw assistance, market access, or other benefits that smaller states might enjoy from the more powerful state (Haas, 1992, Forstyth, 2011).

Academics within international relations might use further specific terms to refer to power-based regimes. For example, the concept of 'Hegemonic Stability Theory' (HST) assumes that interstate agreement is only possible if a single actor (the hegemon) has a preponderance of power. Some hegemon might be considered 'benign' if they are facilitators for regimes (for example, by bearing costs of agreements, or offering technical assistance). Hegemon might be considered 'malign' if they consider only their own short-term interests, or if they use their influence to resist the construction of a regime. For example, some analysts have debated whether the USA might be considered a hegemon in global climate-change policy. The USA withdrew from the Kyoto Protocol in 2001, claiming that it was not in its interests to be a party to it. If the treaty failed as a result of this action, the USA might be called a hegemon, but other states were able to ratify the agreement.

Consequently, some other authors have argued that the USA might not be called a hegemon in this respect (Falkner, 2005; Haas, 1997, Dimitrov, 2003). These approaches to power-based regimes are influenced by the realist perspective, which assumes that states will inevitably compete and protect their own interests. A different approach stems from neo-Marxist thinking about global capitalism and the relationship between developed and developing countries.

Under the neo-Marxist approach to regime formation, the most important source of power is not the willingness of states to protect their own interests, but the influence of global capitalism as a key factor in deciding the location of economic power. This approach to regime theory has been influenced by Dependency Theory, which was an approach to international development proposed in the late 1950s and 1960s. Dependency Theory argued that economic growth in the richer, northern countries took place at a cost to the poorer, southern countries. Consequently, as countries in Europe and North America grew rich by trading with developing countries supplying raw materials, the developing countries that supplied resources became progressively 'under-developed'. Proponents of this neo-Marxist theory therefore argue that the Northern great powers (such as in Europe and North America) are linked closely to the forces of global capitalism, and that they will always act to protect their control over trade and economic production (Okereke and Ekpe, 2002; Offiong, 1980).

Interests-based Approach

The interests-based approach to regime formation is influenced by liberal perspectives on international relations, and the ability of states to create new regimes despite competition and unequal power relations. Sometimes, this regime might be based on the belief that collective action is necessary in order to avoid a communal disaster. For example, some theorists of climate-change policy have suggested that regime has emerged because some states appreciate that not responding to scientific information will result in damage to all.

Academics sometimes use different terms to refer to behaviour by states acting in cooperative ways. For example, 'rational-egoistic' behaviour by one state might occur if it acts to persuade other states of the need to follow its advice about environmental problems. For example, the European Union has adopted a position of demonstrating international leadership on matters of climate change by setting itself higher targets to reduce greenhouse gas emissions than the USA, Japan, or other states. 'Rational-harmonic' behaviour might occur when a state and others negotiate and act to reach mutual agreement on certain matters. Sometimes, international-relations scholars use the terms 'neoliberal institutionalism' and 'cooperation under anarchy' in order to indicate occasions when states can come together to maximize their collective interests, even when there are incentives for individual states not to act this way (Keohane and Levy, 1996; Dimitrov, 2003).

Knowledge-based Approach

The third approach refers to the generation and communication of knowledge about the environment as a means to achieve regimes. This approach moves away from the concerns of traditional interstate politics and instead emphasizes the role of global consensus and social movements. In turn, this approach also refers more to non-state actors than the preceding theories about regimes.

A knowledge-based theory of regimes argues that the production of scientific or environmental knowledge is most important in creating regimes because it can influence actors' responses to problems. For example, the production of scientific reports, or the communication of ideas through media, NGO activism, or social movements can result in

making people more aware of environmental problems. In turn, this can have one or two practical effects on creating an environmental regime. First, it might influence a state to take action, perhaps to acknowledge the growing public support for action about environmental problems. Second, it might persuade various non-state actors such as citizens and businesses to take action regardless of an interstate agreement. Both of these results are, in effect, the creation of an environmental regime.

There are many advantages to understanding regimes through a knowledge-based approach. First, it stresses the increasing role of non-state actors such as pressure groups in defining and communicating concern about environmental problems. Second, it gives welcome attention to domestic politics as a key influence] on international politics. Third, it shows that the understanding of environmental problems is often dynamic and evolutionary; regimes usually do not occur because of government reports and decisions; more often they result from public debate and worry.

One of the most important questions about knowledge-based explanations of regime is 'where does the knowledge come from? This, in turn, leads to two further concepts that are important for global environmental problems and politics.

First, the term 'epistemic communities' is used to refer to sources of authoritative knowledge that can drive knowledge-based regimes. The term is often attributed to the international-relations theorist Peter Haas, who expressed the view that:

An epistemic community is a network of professionals with recognized experience and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue area... what bonds members of an epistemic community is their shared belief or faith in the verity and the applicability of particular forms of knowledge or specific truths (1992: 3).

The second concept related to knowledge regimes is 'advocacy coalitions', or the extension of knowledge via networks and coalitions, often by larger NGOs in collaboration with smaller NGOs or citizen

groups. According to Keck and Sikkink (1998, p. 215): international advocacy coalition allows 'ecological values to be placed above narrow definitions of national interest'. Accordingly, the extension of environmental or scientific knowledge to new societies or countries might be used to indicate growing support for an environmental regime. But sometimes the advocacy coalitions communicating this knowledge are NGOs and activists (rather than formal scientific bodies) (Lahsen 2004; Jasanoff, 1996).

Regime Formations: The Case of the Ozone Regime the 'Ozone Model'

The international environmental regime to counter ozone depletion is a good example of how an environmental regime came into being. Indeed, the relative speed and success of this regime at the end of the 1980s gave the impression to many policy makers that these events could present a 'model' for regime formation in the future (Benedick, 1991). The climate-change negotiations tended to follow this model during the early 1990s. The model, of course, is a simplified version of real events. But the essence of it can be summarized in the steps outlined below:

- Stage 1:** Forward-thinking scientists produce information about an environmental problem (first step towards making an epistemic community).
- State 2:** Interested politicians and NGOs take this knowledge further and communicate it to the policy process (strengthening of the epistemic community). Sometimes this stage experiences strong resistance from some actors (such as businesses) who fear that environmental reform might affect profits or encourage inflexible regulation.
- Stage 3:** International organizations take on the role of facilitating meetings and the first steps towards an environmental agreement.
- Stage 4:** An international conference occurs, in which a framework convention is signed by different states. (The framework convention has no fixed targets, but acknowledges the existence of a problem and commits states to take further steps eventually).
- Stage 5:** A further conference produces a protocol to the framework convention that specifies hard targets for

states (a ‘Protocol’ is an amendment to a ‘framework convention’).

- Stage 6:** Business actors respond by changing products to comply with the protocol.
- Stage 7:** Further interstate meetings lead to a strengthening of the targets, and an increase in countries that are Parties to the Convention (this is the principle of incrementalism).
- Stage 8:** A fund is created to assist developing countries to implement the agreement.
- Stage 9:** Adherence to the targets, and increased membership, mean that the environmental regime has been created and that environmental behaviour has been changed.

This classic ‘ozone model’ of environmental regime formation reveals that in the case of the agreements about ozone, the initial Framework Convention was the Vienna Convention of 1985. The Montreal Protocol of 1987 provided the first hard targets for states. The London Agreement of 1990 then added to these targets and allowed more countries to join.

Meanwhile, two other factors also helped the emerging regime. Developing countries were assisted in implementing the Montreal Protocol by the Multilateral Fund of the Montreal Protocol. And business actors – initially hostile to the concerns about regulating Chlorofluoro Carbons (CFCs) – had developed new products that did not deplete the ozone layer. These products were attractive to business for two reasons. The products could be patented, and hence guarantee profits to the manufacturer if used widely. And they could also be used with an eco-label, or labeling on the packaging of the product that communicated to consumers that the product had an environmental benefit; it could also therefore command a higher price.

Together, these steps leading to the ozone regime have been called a model for constructing environmental regimes. Former UN Secretary-General Kofi Annan called the ozone regime ‘perhaps the most successful environmental agreement to date’. In a book published in collaboration with the WWF called *Ozone Diplomacy*, Richard Benedick (1991) argued that the experience of negotiating this regime carried important lessons for how regimes could be formed, based upon

the complementary role of actors such as scientists, NGOs, concerned politicians, states, and eventually businesses.

Conclusion

Concern about global environmental problems has been on the increase since the 1960s. Global environmental problem is a political act because it makes assumptions about global extent of a problem and the vulnerability of different societies to the problem. On the strength of this, many deep-green thinkers believe that environmental problems are 'global' because the world has fixed limits, which we are dangerously close to testing. On the other hand, many development-oriented thinkers, however, believe that we need to see how far different societies are vulnerable to environmental problems before saying any problem is 'global'. This has given rise to historic international negotiations about the global environment which have shown a strong division between developed and developing countries, especially concerning the fear that environmentalism might be used as a request for poorer countries not to industrialise. In turn, this bifurcation or division has led to arguments between different analysts concerning the need to address environmental problems through mitigation (Lessening physical changes) and or adaptation (reducing people's vulnerability to them) (Forsyth, 2011).

An environmental regime is a shared policy or environmental behaviour between different states and societies. Many scholars identify three approaches to explaining regimes. They are: power-based (based on a position of realism, or acknowledging the power that some states hold): interest-based (reflecting liberal beliefs about how states might sacrifice short-term interests in order to build regimes); and knowledge-based theories (focusing on achieving shared knowledge about problems, often resulting from the actions of states and non-states actors such as NGOs.

An epistemic community is seen as important component of a knowledge regime, as it is made up of a body of experts such as scientists who can advise policy makers. So the evolution of the ozone regime in the late 1980s and early 1990s is considered by some analysts to be a good 'model' of how to build an environmental regime because it was apparently based on good cooperation between willing states, and concerned epistemic communities and NGOs.

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CHAPTER 9

SUSTAINABLE DEVELOPMENT: ISSUES AND CHALLENGES

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Introduction

This chapter examines sustainable development, its objectives and succinctly outlines the challenges confronting sustainable development and how the challenges can be addressed. The concept of sustainable development was first used by the world conservation strategy presented by the International Union for the Conservation of Nature and Natural Resources in 1980. As a concept, it stresses the balance between the interests of economic growth and environmental protection, emphasizing the importance of intergenerational transfers, the preservation of non-renewable resources and a variety of loosely defined principles regarding the responsibilities and accountability of policy makers (Mc Lean and Mc Milian, 2003).

Every society desires to develop and if it is already developed, it tries to improve on the level of her development so as to meet up with the already developed countries of the world. Sometimes the development projects that are carried out produce unintended damages to the environment and though some of such projects may not stand the test of time, their negative impacts on the environment subsist (with potential detrimental impact on future generation). The desire to improve on the wellbeing of the people is always the concern of every administration especially in developing countries as they strive to effectively achieve development. A greater proportion of the population of the people in developing countries resides in the rural areas, most of which are deprived of certain basic infrastructure while the developed countries intensify effort in breaking new grounds. In an attempt to develop any area, certain damages are done to the environment.

The concept of sustainable development came to being in the 1980s, emphasizing that development should be continuous. The concept is popular since it responds to many crisis facing the world in recent years

such as climate change, food and economic crises. It provides an alternative idea with the promise of growth and development while the ecosystem will be protected leading to poverty alleviation.

Concepts of Development

It is important to understand the concept of development because it is the basis for understanding sustainable development. The concept of development is one of the most controversial concepts in the social and management sciences because it means different things to different people depending on their discipline, consequently, there is no generally acceptable definition of development. This article does not intend to look at the controversies associated with the word development, however some definitions of the word will be discussed.

According to Rodney (1971), development is a many sided process. At the level of the individual it implies increased skills and capacity, greater freedom, creativity, self-discipline, responsibility and material wellbeing. Development from the angle of the individual implies self-improvement; It goes beyond economic indicators only. For development to be meaningful, it must aim at the realisation of human potentials through gainful employment. Development refers to the improvement in the economic well-being and the social welfare of the people as well as the infrastructural status of the area in which they live. The bottom-line of development whether at the local, regional or national level is improved standard of living (Onumadu, 2013). Development may be conceived as planned mobilisation and direction of scarce resources to achieve rising societal goals and values (Uwakwe, 2009) As opined by Todaro (1989),

development is a multi-dimensional process involving the re-organization and reorientation of the entire economic and social system. This involves, in addition to improvement of income and output, radical changes in institutional, social and administration structures as well as in popular attitudes, customs and beliefs.

Development is multi-dimensional, indicating that every part of the individual must improve. Development is a complex and continuous process which manifest itself in improved quality of life, cultural

regeneration, social homogeneity and cohesion, political awareness and the stabilization and consolidation of participatory political institution (Onwuka, 2008). To the nation, it implies change and improvement of the social system as well as the economic system. It involves progression, movement and advancement towards something better both in the material and non-material aspects of life. It involves action, reaction and motion, a people in search of self-improvement, a group concerned with and committed to its advancement through its own effort in relation to the international economic order (Egonmwan and Ibodje, 2001). National development is more than economic growth, establishment of industries and building of roads, it is all-encompassing. As defined by Ogai (2007) development is,

a widely participatory process directed towards social change in a society, intended to bring about social and material advancement including greater equality, freedom and other valued qualities for the majority of the people through their gaining greater control over their environment.

From the definition above the benefiting community of any developmental project should be part of that developmental effort of the community. The change arising from the development initiative must have an impact on the people of the community.

Moreso, Ajaegbo (2000) maintained that:

- i. Development is dynamic and never static. It is perceived as a progressive transformation of society. As a dynamic phenomenon, it manifests itself in all facets of social life. This means that development takes place in a society if the economic, political, social and environmental structures of that society undergo a process of continuous change.
- ii. Development should be systematic, balanced and positive, and should be directed towards achieving some desired goals.
- iii. Development must be predicated upon the utilization of the resources available to a given geographical territory or political unit.
- iv. It is a human problem and therefore should be human centred. The ultimate objective of development should be training and well-being of human beings.

Development should be seen to be multi-dimensional, dynamic, human centred and participatory in nature aimed at changing the people's standard of living. However, it is pertinent to distinguish between economic growth and economic development because often times, growth and development are used interchangeably and are usually measured in terms of per capita income. This difference is necessary because the global North sees economic development and economic growth differently from the South. The complex nature of developing countries makes this difference very essential. For instance, Kuwait's per capita real income may be higher than that of the United States of America but the standards of living between these countries are not the same. Economic development is the problem of underdeveloped countries while economic growth is the problem of the developed countries. The developed countries tend to take economic development for granted as something that is automatic and so have focused on the short term movement in the economy as reflected in the change in the national income.

To the developed countries growth in national income is supposed to contribute to a general rise in the living standard of the people. Middison (1970) cited in Jhingan (2004) distinguished the two terms thus "The raising of income levels is generally called economic growth in rich countries and in poor ones it is called economic development". Some analysts have argued that this opinion has not pointed out the underlying forces which raise the level of the two. Economic growth implies more output while economic development implies more output and change in the technical and institutional arrangement by which it is produced and distributed (Kindleberger, 1965, in Jhingan, 2004). Some analysts see economic growth as the quantitative sustained increase in a country's per capita output or income while economic development is taken to mean growth plus change.

Economic issues remain very salient in the analysis of sustainable development because the welfare of future generations is accounted for in the present economic decision. Also financing of global initiatives is very paramount since there are some initiatives that will benefit mankind across borders. The structural changes in the environment affect

economic growth of the society. Economic development can be measured in the following ways:

1. Long term increase in Gross National Product (GNP)
2. Gross National Product Per Capita
3. Welfare
4. Social indicator

Sustainable Development

Human activities over the years have impacted negatively on the environment and this brought about global environmental issues as a result of exploitation, such global environmental issues includes:

- a. Ozone layer depletion
- b. Marine pollution
- c. Global warming
- d. Disappearance of tropical forest
- e. Trans-boundary movement of hazardous waste
- f. Desertification
- g. Dwindling varieties of wildlife
- h. Acid rain
- i. Environmental pollution in economically developing countries (Ardayfio-Schandof and Asiedu, 2003).

Consequent upon the above global environmental issues, there was a global concern about the environment that needs to be protected because of human activities on the environment that has caused the environment to be degraded. The first effort was the United Nation Conference on the Human Environment which was held in Stockholm in 1972 with the aim of addressing concern of environmental issues caused by industrialization and increase in population as well as pollution and scarce resources for countries of the North and poverty and global in equality for countries of the South.

The developed countries (North) consumed most of the world resources and produced most of the world's pollution, but they see it as an equal problem to be shared by all while the developing countries (South) feared they would be made to remain underdeveloped so that they can provide environmental protection to the North which implies paying for what they did not cause. It was against these fears raised by the South

that the central theme of the meeting was that, environment and development are not opposed: environmental protection need not hinder development and development need not harm the environment (Mansfield, 2003). The Stockholm conference brought the awareness and emerging global agenda for environmental conservation. The nexus between environment and development was subsequently institutionalized in sustainable development. The term “sustainable development” emerged in the late 1970s but was popularized in 1987.

In 1987, the United Nations Commission on Environment and Development (UNCED) report titled “*Our Common Future*” (also known as the Brundtland report) chaired by Norway’s Prime Minister, Gro Harlem Brundtland, popularized and brought firmly into the international agenda, the concept of sustainable development. The Brundtland report defined sustainable development as economic and social development that meets the needs of the current generation without endangering the ability of future generations, satisfying their needs and choosing their life style. Sustainable development is a strategy that provides a framework under which communities can use resources efficiently, create efficient infrastructure, protect and enhance the quality of life, and create new businesses to strengthen their economies. It helps in creating healthy communities that can sustain our generation, as well as those that follow ours. Sustainable development therefore must meet the needs of the present without compromising the ability of future generation to meet their own needs (Uluocha 2003, Nyagba 2009, cited in Okazie and Baharuddin 2013).

Instead of trying to bring development into a conservative framework as opined by the Stockholm conference, the Brundtland report treats development and environment as inseparable. Not only is it possible to have development without environmental degradation, but development is a necessary precursor to environmental sustainability (Mansfield, 2003). It is very true that poverty can lead to environmental degradation because the poor will forcefully exploit the natural resources like cutting down trees for survival. To tackle poverty, development seems to be the obvious solution. It is through economic growth including international trade that a country can hope to close the gap with industrialized

countries of the North thereby reducing poverty and alleviating pressure on resources (Mansfield, 2003).

To sustain simply put, means to hold, maintain, prolong, support and keep the existence of something. Sustainable development comprises ideas and values that are perceived to be desirable and necessary to be used in the current global environmental problem and development. It embodies the notion and idea of development process that is equitable and socially responsive; that recognizes the extensive nature of poverty, deprivation and inequality between and within nations, classes and communities (Onah, 1995). Sustainable development seems to be a major achievement target for the South, because poverty and global inequalities were recognized as major problems and developing countries were no longer being asked not to be industrialized for the interest of the developed countries that are already industrialized. This global inequality is believed to have contributed more to environmental degradation due to the North's high level of industrialization, thus the advocacy that they (the North) should have taken greater responsibility for environmental problems arising from their activities so as to reduce the gap between the rich and the poor (North and South). The North is often presented as the protector of the environment and the South as the protector of the poor (Mansfeld, 2008). Sustainable development offered something for everyone but it only did so by avoiding some of the politically contentious issues about responsibility for environmental problems and their solutions.

Sustainable development is generally centred on two schools of thought namely, the economic school of thought and the ecological school of thought. The economic school of thought is concerned with the optimal usage of available resources without causing damage to the resource base of the future while the ecological school of thought emphasis the usage of resources without degrading the environment so that future generation can also use it.

The Steps to Sustainable Development Include:

1. Getting stake holders agreement on implementing a sustainable programme.
2. Conducting a community assessment.

3. Creating a community vision and developing a roadmap for reaching that vision.
4. Developing sustainable indicators to measure progress.
5. Identifying sources of help.
6. Projects implementation, monitoring, evaluating and making adjustments as needed (Ekanem 2013)

Something is sustainable when it can continue into the future, coping with and recovering from stresses and shocks, while not undermining the resources on which it draws for existence. In handling sustainable development, it is important to take the following

Characteristics of Development Paradigm into Consideration:

- i. Greater priority must be given to environmental effects of man's productive activities if economic policies are to support sustainable development.
- ii. The environment provides both direct and indirect contributions to the enhancement of quality of life. Poor environmental conditions for instance, lead to air and water pollution, stress and ill-health.
- iii. Judicious exploitation of resources coupled with sensible preservation, replenishment and protection activities are necessary.
- iv. Positive anthropogenic impact of productive activities on environment and resource use should be explored.
- v. Machinery concerned with the alleviation of poverty and improvement of social welfare must be put in place. This is to cater for the needs of the poor in the society who actually constitute the most vulnerable group.
- vi. Environmental quality and the general services performed by natural environment are far more important than past development planning assumed. There is need to fuse environmental management with economic planning for sustainable development to subsist. (Atteh, 2003).

Sustainable development has some underlying axiomatic principles as identified by Eboh (1995). They include equity, stability, food, security, co-evolutionary growth and participation.

1. **Equity:**
People should be treated equally without preference to age, sex, religion, race, tribe etc, as well as the present generation and taking into account the future generation. Maintenance of intra-generational equity (especially elimination of poverty), and intra-generational equity (improving the right of future generations) remain an important aspect of sustainable development. (Aregbeyon and Adeoye, 2012).
2. **Stability:**
The stability of biological and physical system, preserving resilience and dynamic ability of the overall ecosystem to adapt to change rather than conservation of some ideal static state (Aregbeyen and Adeoye, 2012). Also economic stability in terms of sustained growth in the economy and political stability in terms of enduring democratic institutions/culture and unhindered political transition that is free from rigging and political intimidation.
3. **Food Security:**
This is a situation where individuals in the society (urban and rural areas) are able to provide food for the family without harming the chances of the future generation.
4. **Co-Evolutionary Growth:**
This connotes the nexus of knowledge systems, value systems, organisational system, technological systems and environmental systems which co-evolve inherently and inter-connectedly (Eboh, 1995). The knowledge system must be seen not to work in isolation of the environmental issues as well as value systems, organizational systems and technical systems. The ideas on inventions should be in-line with the challenging environmental issues so that the future generation can benefit. According to Sobin *et al* (1991) cited in Ayichi (1995) Sustainable development entails that new technology should be one that is “cleaner, more efficient and more sparing of national resource in order to reduce pollution, help stabilize climate and economic activity”.

5. **Participation:**

Sustainable development should be seen to be participatory in nature, the international organisations, governmental organisation, non-governmental organisations, community based organisations as well as individuals should be involved in making and implementing decision for the benefiting of all.

It should be noted that sustainability does not imply that there is no change but that there is an ability to adapt over time. These resources may be natural, social, economic or institutional which is why sustainability is often analysed in four dimensions: economic sustainability, environmental sustainability, institutional sustainability and social sustainability.

i. **Environmental Sustainability:**

This could be achieved when the productivity of life-supporting natural resources is conserved or enhanced for used by future generation.

ii. **Economic Sustainability:**

This is achieved when a given level of expenditure can be maintained over time.

iii. **Social Sustainability:**

This is achieved when social exclusion is minimized and social equity maximized.

iv. **Institutional Sustainability:**

This is achieved when prevailing structures and processes have the capacity to continue to perform their functions over the long term.

v. **Technological Sustainability:**

This is achieved only when local technologies and knowledge are the starting point. It cannot be helped by the introduction of the exotic, inappropriate, unreachable and incompatible techniques, practice and tools/implementation (DFID, 2001, Eboh, 1995).

Objectives of Sustainable Development

The following have been identified as the objectives of sustainable development:

1. Reviewing economic growth.
2. Changing the quality of growth.
3. Ensuring a sustainable level of production.
4. Meeting essential needs for jobs, food, energy, water and sanitation.
5. Merging environment and economics.
6. Re-orientating technology and managing risk.
7. Conserving and enhancing the resources base (Brundtland Report, 1987 cited in Anikeze, 2015).

Indicators of Sustainable Development

There are indicators that show a nation is moving towards achieving sustainable development. This is measured by the development indicator designed to monitor the progress report of developmental efforts. Chapter 40 of Agenda 21 of the United Nations Conference on Environment and Development (UNCED), held in Rio, 1992, clearly spells out the responsibility of indicators in helping countries to check the level of their progress in sustainable development. The indicators of sustainable development include statistical values that collectively measure the capacity of a nation to meet present and future needs. Measurement of development policy implementation and performance in the context of sustainable development, to reduce poverty and enhance the quality of human life underlies the evolution of the indicators of sustainable development. Indicators are agents of change and can be designed to measure how well or how poorly policies work, implicitly pointing the way towards better approaches. In doing all these, countries at the national level as well as international, governmental and non-governmental organisations are to develop reliable indicators monitors for effective appraisal of developmental efforts (WRI, 1995, in Ivbijaro, 2012).

Challenges of Sustainable Development

Sustainable development is that type of development that is enduring overtime which contributes to the quality of life within a particular

geographical region through continuous improvement in natural environments. Be that as it may, there are a number of challenges that are confronting effective implementation of sustainable development such as poverty, illiteracy, lack of basic infrastructure, capitalist tendencies, lack of implementation of international policies, increasing population and insanity. These challenges are examined below:

Poverty:

Poverty does not encourage sustainability because the limited natural resources are over exploited for daily living. The poor work for sustenance on land and water and in mines and forest (Jhingan 2004). Especially in developing countries of the world human activities tend to have an adverse effect on the environment, such as bush burning for agricultural purposes that affects the ecosystem. Due to the level of pressure that is mounted on the already over used natural environment, these human activities on the environment, expose the ecosystem to degradation which is another source of poverty in itself. Empirical evidence has shown that poor people are commonly bound to reside in areas with poor environmental quality and these have been described as ecological vulnerable areas which include rural areas of low agricultural potential and squatter settlements within urban areas (Ivbijaro, 2012). These urban squatters are often exposed to environmental pollution.

Illiteracy:

The level of illiteracy is very vital to sustainable development. Lack of awareness on the danger of one's action on the environment has remained one of the challenges of sustainable development because despite government efforts towards creating awareness, the uneducated might not show any interest in such efforts, thus undermining the good intension.

Lack of Basic Infrastructure:

Most developing countries lack basic infrastructure that will make life more meaningful to them. Electricity, good road, hospitals, good shelter and so on cannot be found in most rural areas thus making the rural populace for instance to continue to cut down trees for various use such

as road maintenance, building of houses and for fuel. All these activities have an effect on the environment

Capitalist Tendencies:

With capitalism, every individual wants to be rich at all cost not minding the effect of their activities that have been causing degradation on the environment. The tendencies to compete with others in terms of wealth have made man and government to over exploit the environment. This greed has been a challenge for sustainable development because in most case, conscious effort is not made to protect the environment for the future. Oil companies that are owned by capitalists exploit the resources and most of their activities like gas flaring, oils pillages, disposal of industrial waste and so on tend to affect future generations in most cases

Lack of Implementation of International/Conventions:

There are a number of conventions/ protocols that so many countries are signatory to so that the environment can be preserved, such as:

- (a) 1972 Conventions on the preservation of marine pollution by Dumping of waste and other matters.
- (b) 1973 Convention on International Trade in Endangered Species of Wild and Fauna (CITES).
- (c) 1954 International convention for prevention of pollution of the sea by oil.
- (d) 1985 Convention for the protection of the Ozone layer.
- (e) 1987 Protocol on substances that Deplete the Ozone layer.
- (f) 1997 Protocol to the United Nation framework convention on climate change.
- (g) 1992 Biodiversity convention.
- (h) 1992 Kyoto protocol.
- (i) 1972 Stockholm Declarations.
- (j) 1992 The Rio Declarations and so on.

All these global environmental efforts are made to protect the environment for future generations but the implementation has remained relatively impossible since most countries are independent countries. For instance in Nigeria some of these conventions are not followed. The country is still flaring gas despite these international

conventions/protocols on climate change which she is a signatory to. The effect on human health seems to be disregarded; every administration gives reasons for the continuous gas flaring in Nigeria. However, these excuses may be anchored on poor or low technological know-how in the oil and gas industry in Nigeria. According to the World Health Organization (WHO), the health effect of major air pollutants include respiratory limitation, shortness of breath, impaired pulmonary function, increased susceptibility to infection, altered immune defense, heart and brain damage, kidney diseases, cancer and so on (Atairet and Mark, 2016).

Government Policies:

There are some government policies that undermine sustainable development. In Nigeria for instance government's deliberate act of shifting the deadline for gas flaring. In 1969 Gen. Gowon gave an order to all the companies flaring gas to stop gas flaring in Nigeria by 1974; later the date was extended to 1979. With the gas re-injection Act 1979, companies were to submit gas utilization programme by April 1980. By this commission, every company was expected to stop gas flaring by 1st January, 1984. This deadline was again shifted to 1st January, 1985 which was never achieved till the emergence of Chief Olusegun Obasanjo as a democratic elected president and a target of 2003 was set with huge investments in NLNG but it was later shifted to 2006. When it was not possible, a new date of 2008 was agreed and in 2009 the Senate passed a bill making gas flaring illegal by December, 2010. The aim of that bill was not achieved and the house of representative proposed a deadline of December, 2012 as well as a fine of \$500,000 for any company which failed to report within 24 hours emergency flaring on equipment failure (Atairet and Mark, 2016).

This same situation is still obtainable till now as gas is flared without sanction. The reason for this continuous shift in deadline may be due to lack of adequate infrastructure in the oil and gas industries. In Obasi (2005), Dr. Ibe Kachikwu the former Nigerian National Petroleum company (NNPC) managing director was quoted to have said "to stop that flaring we need investment and lots of that money is not there". This investment could be in area of technology which much has not been done. The federal government of Nigeria has made efforts to curb gas

flaring through NLNG processing plant in the country but did not succeed due to certain limitations. For example, it took decades to get one NLNG started in Bonny, the other two (Olakola LNG and Brass LNG) yet to be operational. This delay may be political, economic, bureaucratic, or lack of will power on the part of government to start it.

Increasing Population:

The land mass of any country has not increased but the population of every country has consistently been on the increase which implies that more pressure is on the limited natural resources. This increase in population depletes the limited resources and threatens sustainable development. Thus rapid growth in population and environmental degradation go hand in hand (Jhingan, 2004). Increase in population requires food; the subsistence farming method could not cope with high demand for food, hence the need for improvements in farming methods which involves mechanization of farming and the use of fertilizers to enrich the soil for good harvest which in turn can adversely affect the environment.

Security:

Security challenges in most countries of the world have been a source of challenge to sustainable development. Suicide bombing, acquisition of nuclear weapons that have the capacity to destroy the world is a great source of concern for the future. Every act of bombing affects the environment. For instance, Nigeria has been facing the challenges of insecurity in the country occasioned by Boko Haram in the northern part and militancy in the southern part. All these lead to losses in human and material resources and the environment (in most cases) is badly affected.

Transportation:

In the urban centres, there are more cars, commercial vehicles, air planes, all these are needed for commercial activities but they all have adverse effect on the environment through the emission that comes from the engine. Also in constructing roads, rail lines, airports and sea ports, the environment is greatly tampered, through the effect on the environment might not be immediate but will manifest overtime.

Technological Advancement:

It is the desire of every country of the world to advance technologically and the advancement goes with environmental challenges. For instance, building of GSM masts everywhere especially in developing countries like Nigeria is a source of health hazard to the people and the environment, also the establishment of industries such as fertilizer industry, refineries, chemical industries etc, all these have effect on water, air and land. Gas emission from these industries depletes the Ozone layer thus causing an environmental challenge to sustainable development. Dumping of toxic waste generated by these industries either on the land or sea has made conservation of certain species relatively impossible. All waste affect man and his environment (air, land, surface and underground waters).

Addressing the Challenges of Sustainable Development

Having identified these challenges that have adversely affected sustainable development; policies emanating from government should be aimed at addressing the already identified challenges. According to Jhingan (2004), environmental degradation can be reduced by a judicious choice of economic and environmental policies and environmental investments.

Jhingan identified the following measures

1. Reducing Poverty:

In addressing the challenges of sustainable development, deliberate efforts should be made by government in reducing poverty. Government should encourage programme and policies that will create employment for her citizens. This effort will reduce over dependency/exploitation of the natural resources.

2. Removing Subsidies:

Most government in the developing countries like Nigeria subsidizes the cost of certain services to her citizens such as electricity, fertilizers, petrol, water etc. The removal of subsidies will reduce wastage of these items. For instance, in Nigeria with the introduction of prepaid metres, electricity consumers are now conscious of the fact that there is need for them off electrical appliances not in use which hitherto was not the case. Also, if

farmers are allowed to buy their fertilizers they will handle and applied it with care to the soil. Removal of subsidies will bring about economic benefit as well as environmental benefit.

3. **Clarifying and Extending Property Rights:**

Any property that belongs to all tends to be over used since no one takes charge of it. In reducing pressure on some properties certain rights should be given to people to own property so that they can conserve those properties. For instance, if a particular creek in the Niger Delta states of Nigeria belongs to all, the level of fishing activities will go on without check but if it belongs to a group, there will be checks so that future generation will come and inherit such fishing grounds. Public land tends to be over grazed and overgrazing affects the ecosystem.

4. **Market Based Approaches:**

This is an approach where deliberate market action is taken to protect the environment. For instance, in goods that tend to have serious effect on the environment, high tax is placed on such goods so as to reduce the interest of the public in such goods thereby helping to conserve the environment.

5. **Regulatory Policies:**

To prevent damage to the environment, a number of policies should be put in place with regard to choosing between the quality and the price of pollution or resource use or technologies. In taking decision, the regulatory authority should take into account whether the policies has direct or indirect environmental problems.

6. **Economic Incentives:**

Like the regulatory policies, economic incentives relate to price, quantity and technology. These incentives can come in the form of rebates if less waste is generated.

7. **Trade Policy:**

The trade policies initiated by government should be that type of policy that encourages environmental sustainability. These trade

policies should be consistent and in line with improving the environment.

8. **Public Participation/Awareness:**

Public awareness and participation is essential in improving environmental sustainability. If the public is educated on certain behaviours that have negative impact on the environment, the negative impact will be reduced. This will help the populace to always act with care as it affects the environment.

9. **Participation in Global Environmental Effort:**

There are many international conventions/agreements on environmental protection and conservation, deliberate efforts should be made to observe and follow these protocols.

10. **Monitoring and Evaluation:**

Regular monitoring and evaluation of all the efforts aimed at addressing the challenges of sustainable development should be carried out. Policy/programme consistency should be adopted and their efficiency monitored and evaluated against specific goals. It is very likely that most of the policies are not properly monitored and evaluated making them to be policies on papers only and not in action.

Conclusion

This chapter has explored the concept of sustainable development. Development is an essential process for the improvement of economic, political, social and cultural conditions of an individual and the government. No individual or government wishes to stay at the same level, everybody wants to increase in capacity, such increase should be carefully followed without undermining the effect on the future generation.

Sustainable development as global environmental policy should not only be on the lips of individuals, government and agencies, but should also be fully implemented and enforced by all. The chapter identified some challenges of sustainable development. If the identified challenges are addressed, environmental sustainability will be enhanced.

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CHAPTER 10

THE POLITICS OF OIL RESOURCE MANAGEMENT AND ENVIRONMENTAL DEGRADATION IN THE NIGER DELTA REGION, NIGERIA

Monday E. Dickson

Introduction

Sometimes referred to as the “Giant of Africa,” with a population of over 200 million, among other capabilities, Nigeria has traditionally ranked as Africa’s largest producer of crude oil and sixth in the world (Siollun,2009:1; Gwaambuka, 2018:1). Since the discovery of oil resources in the Niger Delta region about six decades ago, oil exploration and exploitation activities have led to an increased resource-based economic activity, especially in the nine states that make up the region. However, despite producing the overwhelming majority of Nigeria’s wealth as well as years of recorded investments, which drove much of the nation's economic growth, these states or the inhabitants of the region have suffered wanton environmental degradation. Instead of engendering development, control of oil wealth by Nigeria’s Federal Government, paradoxically became an impediment to development and social wellbeing of the Niger Delta States. This chapter examines the politics associated with oil resource management and environmental degradation in Nigerias’ Niger Delta region with a focus on its impacts on sustainable development. Structurally, Nigeria is a heterogeneous society or multi-ethnic state comprising three major ethnic groups (Hausa, Yoruba and Igbo) and several minor ethnic groups with diverse belief systems, customs and institutions. The Niger Delta or what has become known in the Nigerian political vernacular as the South-South region is relatively not new. The Niger Delta acquired currency in the mid-1980s with the resurgence of identity politics in the wake of economic liberalization policies of a succession of military regimes (Cyril, 2001). For the purpose of this study, the Niger Delta could be defined from two broad perspectives.

On the one hand, the Niger Delta is part of Nigeria’s territory comprising six states of the federation, namely, Akwa Ibom, Bayelsa, Cross River, Delta, Edo and Rivers States. They constitute what has been referred to as the “South-

South” geo-political zone of Nigeria. The Niger Delta constitute nine out of the thirty six states (that is, the six States of the South-South, plus Abia, Imo and Ondo States which are also oil producing) and 185 out of the 774 Local Government Areas in the country, on the other (Oditah, 2008; Eminue, 2011). Located in the Southern part of Nigeria, the Niger Delta Region covers an area of 70,000 square kilometres with a population of about 32 million, sub-divided into about 40 ethnic groups. It is known for its sandy coastal barriers, brackish or saline mangroves, permanent and seasonal swamp forest as well as rain forest. The region is very rich in natural resources, said to be the world’s third largest wetland and the largest wetland in Africa (Akpan, 2005). With an estimated crude oil reserve of about 35 billion barrels and an estimated 4.5 trillion cubic meters of proven natural gas reserves (both onshore and offshore), Nigeria’s Niger Delta undisputedly inhabits Africa’s oil and gas reserves and it is Africa’s largest producer and the 7th largest exporter of Crude oil in the world – where oil accounts for about 95% of Nigeria’s export earnings and 80% of Federal Government revenue.

Admittedly, oil exploration and production is the major economic activity in the Niger Delta region. In the recent past, the region has been the subject of global attention owing to the impact of petroleum exploration and exploitation. Generally, oil development has culminated in the devastation of the natural environment of the region. As a consequence, there have been complaints about developmental challenges, water pollution, ecological and environmental problems arising from the production of oil and gas in the region. Thus, the region is confronted with a myriad of socio-economic, political, legal, environmental, infrastructural, security and defence problems. This chapter is divided into six parts. Part I is the general introduction. Part II attempts the conceptual and theoretical explications on key concepts. Part III traces the origin of oil exploration and exploitation by multinational oil firms and chronicles environmental problems associated with oil activities. Part IV examines the minority questions and agitations while Part V looks at the response of the Federal Government to the Niger Delta issues over the years. Part VI concludes the discussion by looking at the future of the Nigerian State in general and the Niger Delta region in particular.

Conceptual Issues:

This paper grapples with major concepts, namely, politics, environmental degradation, and sustainable development. Their foundational and definitional

conceptualizations are necessary for the purpose of clarity. Although the term ‘politics’ has been defined variously, the definition which connects politics to distributions of wealth of the state is relevant to this study. For instance, Lasswell (cited in Eminue, 2005) defined politics as an empirical science that studies the shaping and sharing of power about “who gets what, when and how”. Dudley (1975: 18) adds “why”, so that the question should be “who gets what, when, how and why? This, as Vande (2013) has noted implies that politics extend beyond the realm of state affairs and entails the making of decisions regarding what a society should do, when, how, and why it should do it and who should determine these things. It, therefore, borders on whether power – the main object of politics is obtained as an end in itself to ensure binding decisions or as a means to an end. To further buttress the above viewpoint, Easton (1965: 5) views politics as a “persistent pattern of human interaction in a society mainly oriented towards “authoritative allocation of values”. From the above bourgeois definition, it is clear that politics has to do with making authoritative or binding decisions concerning the distribution of State resources (in this case, oil revenue), failure of which would result in underdevelopment and crisis.

Similarly, the term “environment” is defined as a physical condition of the landscape, including the topography, drainage, climatic conditions and the vegetation of an area (territory or country). It is the physical or natural surroundings made up of the land, water, and air along with all the resources including the soil, plants, animals or minerals found in them. The second type of the tangible or material environment is the human-made environment, which is the natural environment that has been modified or transformed by man (Udo, 2012). In addition to these two types of the tangible environment, the third type of environment is, the socio-economic environment which includes the political environment. From the forgoing, therefore, pertinent questions are: what is environmental degradation? To what extent or under what conditions could it be said that the environment in the Niger Delta region is degraded? Johnson et al (1997: 581-589) defined environmental degradation broadly as “the deterioration of the environment through the disposal of toxic waste, soil erosion and pollution. It has to do with any change or disturbance of the environment perceived to be deleterious or undesirable, particularly the destruction of ecosystem and the extinction of wildlife. Therefore, when the environment becomes less valuable or damaged, environmental degradation is said to occur. When habitats are destroyed, biodiversity is lost, or natural

resources are depleted, the environment is hurt. It can occur naturally, or through human processes, such as forest clearing using machetes and engine powered grader and so on. Thus, environmental problems arising from oil production activities in the Niger Delta region degraded the environment.

Relating to the above is the explanation that oil exploration, environmental degradation and above all, management of resources, have far-reaching consequences on sustainable development. Brundtland Report (1987:8) defines sustainable development as “development that meet the needs of the present without compromising the ability of the future generations to meet their own needs”. The implication of the concept of sustainable development, as embraced by the Brundtland Commission is that “the present generation should leave to the next generation a stock of quality of life assets no less than those they inherited”. The above assertion, according to Holmberg and Sandbrook (1992) can be interpreted in three interrelated ways: First, that the next generation should inherit man made assets and environmental assets; second, that the next generation should inherit a stock of environmental assets no less than that inherited by the previous generation; and third, that the inherited stock should compromise man-made assets, natural assets and human capital. From this standpoint, Odukoya (2006) sees sustainable development as “consisting of policies, strategies, plans, production systems and technologies used in executing projects and programmes aimed at satisfying real human needs in perpetuity while maintaining environmental quality, biodiversity, the resilience of the ecosystems, and the welfare of all organisms by national, regional, and global levels”. From the above definition, sustainable development contains two key concepts: First, the concept of needs, in particular the essential needs of the poor, to which overriding priority should be given. Second, the idea of limitations imposed by the level of technology and social organization on the environment’s ability to meet present and future needs. It has, however, been argued that the present generation has been reckless and wasteful in both its exploitation and use of natural resources by pursuing a series of socio-economic and industrial policies which endanger global environmental society.

Theoretical Perspective

It is axiomatic that the discovery and exploitation of oil and gas resources in the world have brought different consequences to countries and regions (in this case, Nigeria in general and the Niger Delta region in particular) endowed with such resources. While these nations (centres) have become economically strong

and self-sustaining, the regions (peripheries) have been drawn into serious environmental degradations, economic hardships and conflicts simply referred to as 'Resource Curse'. Proponents of resource curse paradigm include M. L. Ross (1999); T. L. Karl (2005) and P. Collier (see Maass, 2009: 55). They argue that countries and regions that are richly blessed with an abundance of resources like oil and gas turn out to have poorer economic growth than countries and regions with fewer natural resources. Citizens of these areas rather suffer from abject poverty, environmental damages, pollutions, diseases and illiteracy. As Karl and Collier (2005) put it, in most countries, natural wealth (oil resource endowments) does not translate into prosperity for the majority of inhabitants, but instead leads to environmental and economic devastation and hampers development. Put differently, this perspective argues that abundance of resources rather than stimulate economic development, can act as an impediment to it. The reasons adduced for this negative relationship between resources and underdevelopment as well as conflict include corruption, decline in the competitiveness of other sectors, overdependence on one source of income (oil resources) and mismanagement of resources, etc.

Most of the literature on the resource curse has regarded Nigeria as a quintessential example of a resource cursed country (see for instance, Collier & Hoeffler 2001; Sachs & Warner 2001; Auty 1993; Mähler, 2010). The nation has witnessed a significant decrease in living standards, environmental degradation, unfathomable corruption, and societal strife' (Radon in Humphreys et al. 2007: 94). Shaxson (2007: 18) argues that the 'crowding out' effect in Nigeria during the oil-boom years produced a 60 per cent decline in agricultural output and 'plunged tens of millions of people into poverty'. In a similar vein, studies by Leite & Weidmann (1999), Mehlum et al. (2006), Robinson et al. (2006), Kolstad & Søreide (2009) and Le Billion (2011, 2014) have confirmed that corruption is frequently recognized as a major contributor to poor development outcomes from natural resources and resource management. According to them, natural resource sectors not only provide fertile ground for various forms of corrupt practices; corruption is often embedded in natural resource management systems themselves. From this perspective, as argued by Williams & Le Billion (2017), activities within the resource sectors can motivate and facilitate corrupt practices, especially given the vast revenues usually involved, the remoteness of many operations, the confidentiality of most contractual arrangements and the discretionary power of government officials exercised over 'national' resources. Corrupt practices, in turn, can undermine

resource management policies, reduce revenue collection, damage the environment, erode trust in the State, and exacerbate socio-economic inequalities. Thus, oil has become a curse, rather than a blessing for the Niger Delta region because instead of yielding foreign exchange for development of the area, its proceeds have led to greater impoverishment of the masses and degradation of its environment.

It has been suggested by Ogbogbo (2006: 562) that, rather than the fortunes of the people increasing with crude oil exploration, exploitation and production, their situations become worse. Similarly, Dode (2011) notes that the Niger Delta condition has become increasingly complex as a consequence of the constant degradation of the environment by the activities of the Nigerian (rent taking) Federal Government and the multinational oil exploring and producing companies. As a result of the pollution of the environment, farmers and fishermen can no longer engage in their legitimate sources of livelihood. This is owing to the fact that the land has been destroyed, aquatic and marine life are now almost empty and rain dust - a direct consequence of gas flaring at oil location and rig sites, is a regular occurrence. These have in turn destroyed and dislocated the basic economic life of the people.

Historical Trajectory of Oil Exploration and Environmental Degradation

Oil was first discovered in Nigeria by the Shell British Petroleum Company in 1956 at Oloibiri village, Bayelsa State of the Niger Delta after half a century of exploration. However, commercial production began in 1958 when its first oil field came on stream producing 5,100 barrel per day. Thus, Nigeria joined the ranks of oil producers that same year. In 1960, exploration rights in onshore and offshore areas adjoining the Niger Delta were extended to other foreign companies, and in 1965 another oil field was discovered by Shell in shallow water southeast of Warri in the present Delta State. Consequently, in 1970, the end of the Biafra war coincided with the period of the oil boom - rise in the world oil price, and Nigeria had attained a production level of over two million barrel per day and was able to reap instant riches from its oil production. Nigeria joined the Organisation of Petroleum Exporting Countries (OPEC) in 1971, and established the Nigerian National Petroleum Company (NNPC) in 1977, a state owned and controlled company which is a major player in both the upstream and downstream sectors (Uyigue & Ogbeibu, 2007; Anifowose, 2008; NNPC, 2010). From the above historical facts, it is established that for the past ten decades, oil and gas activities concentrated in the Niger Delta region or

South South zone. Thus, Niger Delta has emerged as one of the most affected/damaged and degraded regions in Nigeria. Since the discovery of oil in the region, oil has dominated the country's economy. The fact that the region is an extensive wetland makes water a more important reason that climate change occurs. Conclusive reports have stated that due to oil exploration and exploitation activities, the area has become devastated.

The exploration and exploitation of crude oil in the Niger Delta region have resulted in a number of environmental problems for the region. The environmental problems related to oil operations in the region examined in this section include pollution, oil spillage, gas flaring, mining waste and land degradation and deforestation.

Pollution:

Literally, pollution means to defile, make unwholesome or unclean. Therefore, any activities that result in defiling or making unwholesome or unclean any medium of environment (water, land and air) are pollution. Pollution occurs whenever potentially harmful substances are released into the environment and is caused principally by human activities, though it can also be a natural process. It is usually classed according to the receiving agents of, air as emission, water as effluent, and land as dumps and disposal (Ukpong, 1994). Although many types of pollution have been identified, for the purpose of this study, two types – environmental and industrial pollution, identified by Osibanjo (2008), are adopted. On the one hand, typology of environmental pollution includes sewage and domestic pollution; waste pollution; gas and oil pollution; mining pollution; land pollution, air pollution; coastal and marine pollution, chemical pollution etc. On the other hand, types of industrial pollution include (i) noise pollution (e.g noise from industrial machines turbines, generators, etc); (ii) thermal pollution (e.g hot effluent from thermal power stations and manufacturing industries such as gas flaring in the oil and gas sector, etc); (iii) air pollution (e.g. dust/particulate matter, soot, smoke, etc, from factory chimneys, gas flaring, etc.); (iv) surface and ground water pollution (e.g. from untreated or partially treated industrial effluents, oil spill from leaking underground storage tanks from petrol stations and tank farms); (v) hazardous waste pollution from manufacturing and the oil and gas sector. Evidently, pollution has had far-reaching consequences on the traditional economy and animal life in the region. For instance, the destruction of

mangroves, fish, etc. Birds are no longer found in the air between Yenegoa and Brass Local Government of Bayelsa State.

Oil Spillage:

This is another potential environmental hazard suffered from time to time by the people of the Niger Delta as a result of oil and gas exploration and production in the area. While this generates billions of dollars for the Nigerian economy, it causes major environmental problems for the inhabitants and the ecosystem. Oil facilities and operations are located in key ecological areas, including important fishing grounds, mangroves and tropical rainforest. These ecosystems are often heavily damaged by the oil leaks. Drinking water is polluted, people become ill and farmers lose their income because they can no longer cultivate the soil. Oil spill incidents have occurred in various parts and at different times along the Niger Delta coast. According to the Department of Petroleum Resources (DPR), between 1976 and 1996 a total of 4647 incidents resulted in the spill of approximately 2,369,470 barrels of oil into the environment. Of this quantity, an estimated 1,820,410.5 barrels (77%) were lost to the environment. A total of 549,060 barrels of oil representing 23.17% of the total oil spilt into the environment was recovered. The heaviest recorded spill so far occurred in 1979 and 1980 with a net volume of 694,117.13 barrels and 600,511.02 barrels respectively. Available records show that a total of 6, 817 oil spills occurred between 1976 to 2001 with loss of approximately three million barrels of oil in the Niger Delta region and the total oil spilt in the Niger Delta area, was in land, swamp and offshore environments (UNDP Report, 2006). Out of these, Akwa Ibom State with about 25 billion barrels of crude oil, and gas reserves of about 130 trillion cubic feet, often suffered the oil spillage. Communities in Ibeno, Esit Eket, Onna, Eastern Obolo, Mbo, Oron, Urue Offong Oruko, Udung Uko, Mkpato Enin, Ikot Abasi Local Government Areas have on many occasions experienced oil spillage.

Gas Flaring:

Gas flaring refers to the release of excess gas, liquids associated with oil and gas production pipelines and refineries along with other by-products into the atmosphere in order to protect the pipelines and infrastructure from over pressuring. Gas flaring is rampant and has been an on-going daily occurrence in the Niger Delta region where Nigeria's current large oil and gas resources are exploited. Overall, Nigeria flares the second largest amount of natural gas in the world (after Russia) and accounts for 10% of the total amount flared globally

(Nriagu, Udofia, Ekong & Ebuk, 2016) According to Ajugwo (2013), Nigeria flares 17.2 billion m³ of natural gas per year in conjunction with the exploration of crude oil in the Niger Delta. The World Bank estimates that 87% of all associated gas is flared in the Niger Delta atmosphere by oil companies operating in Nigeria, compared to 21% in Libya and 0.6% in the United States of America. ...80 billion cubic feet of gas is flared in the Niger Delta yearly. This high level of gas flaring is equal to approximately one quarter of the current power consumption of the African continent. Gas flaring has devastated the communities in the Niger Delta region, with attendant environmental, economic and health challenges. Environmentally, gas flaring contributes to climate change by emission of carbon dioxide and the main greenhouse gas. The burning of fossil fuel, mainly coal, oil and gas - greenhouse gases has led to global warming. This has serious implications for the Niger Delta region, Nigeria and the rest of the world. Also, acid rains have been linked to the activities of gas flaring. Corrugated roofs in the Delta region have been corroded by the composition of the rain that falls as a result of flaring. Acid rain acidifies lakes and streams and damages vegetation. For instance, streams known as *udim uteghe*, *udim nwad akai*, and *udim okpo*, which serve as sources of drinking water for the people of Ubodung group of villages in Urue Offong Oruko Local Government Area of Akwa Ibom State have been acidified and contaminated.

Aside from the environmental implications of gas flaring, human health is also exposed to those hazardous air pollutants emitted during incomplete combustion of gas flare. More gas is flared in Nigeria than anywhere else in the world. The smoke released is damaging to people who live nearby where such gases are flared. The flares affect their livelihood and expose them to an increased risk of premature death, child respiratory illnesses, asthma and cancer. Economically, the nation loses billions of dollars' worth of gas which is literally burnt off daily in the atmosphere (Ajugwo, 2013). These have impacted on the development aspirations of the Niger Delta region in particular and the nation in general.

Mining Waste:

Mining waste is the high-volume material that originates from the processes of excavation, dressing and further physical and chemical processing of wide range of metalliferous and non-metalliferous minerals by opencast and deep shaft methods. It comprises overburden, run-of-mine rock as well as discard, slurry and tailings from the preparation/beneficiation or extraction plants

(Twardowska & Szczepanska, 2004:346). Ever since the discovery, exploration and exploitation of oil resources in the Nigeria Delta region, mining waste has become one of the serious environmental problems facing the country in general and the region in particular. Mining waste disposal brought about contamination threat to groundwater of unprotected aquifers and surface water in dumping sites. For instance, in oil producing areas such as Ogoni in Rivers State, Eket, Ibeno and Mbo in Akwa Ibom State, and Yenegoa and Brass in Bayelsa State as well as Warri in Delta State, mining or toxic wastes disposal have led to pollution of wetland, destruction of vegetation and alteration of soil conditions causing acidification.

Land Degradation and Deforestation:

The Niger Delta is comprised of extensive mangrove forests, brackish swamp forests and rainforests. The large expanses of mangrove forests are estimated to cover approximately 5,000 to 8,580 km² of land (Oil Spill Intelligent report, 1978). Mangroves remain very important to the indigenous people of Nigeria as well as to the various organisms that inhabit these ecosystems. Sadly, oil activities have destroyed the extensive mangrove forests in the area. Apart from the illegal logging brought on by increased accessibility to forests, oil exploitation itself has depleted biodiversity, especially at ramp sites, flow stations and terminals. A lot of land degradation and deforestation were caused by oil induced fire and pollution on the environment. A number of oil induced fire outbreak has occurred in the Niger-Delta leading to deforestation and destruction of farmland such as the Jesse fire incident that occurred on October 17, 1998. The unfortunate thing was that this fire incident did not only destroy farm lands or natural ecology but also killed more than 1,000 people of the community (Ofehe, 1999). Another fire incident occurred in September, 2004 in Okirika community, Rivers State that lasted for 3 days and destroyed the plants and animals inhabiting the affected area (Zabbey, 2004). Another fire scourge occurred in Ugbomro community and a study was carried out to ascertain the effect on the soil and it was discovered that contrary to the popular opinion that fire improves bush fallowing for cropping, the site witnessed severe impoverishment not only from the fire incidence but also from the oil spill on the site (Osuji & Ukale 2000). Other sources of land degradation and loss of biodiversity as well as forest and crops destruction in the region are acid rain from gas flaring.

Oil Resource Management: Minority Questions and Agitations

For sometime now, states, different ethnic and social organizations dissatisfied with the structure of power sharing and politics associated with oil resource allocation in the federation have made a series of agitations under the “national question”. For the oil producing states and ethnic minorities of the Niger Delta region, the foremost is that although the bulk of crude oil, the country’s main source of revenue, is derived from their lands, their area is the most economically backward, underdeveloped and politically marginalized. This, as noted by Osaghae (1995:325-344), could be gleaned from a number of areas. The first is that leaders of the Niger Delta region attribute this injustice to the fact that they are minorities, and accuse the ethnic majority groups of using oil wealth to develop their areas at the expense of the areas from which the oil is derived. The second is that several years of oil exploration, the hazards of oil spillage and gas flaring which accompany it have degraded their environments and left communities desolate. Not only having farming and fishing, the major occupations of these mostly riverine minorities been decimated, their territories have continuously lacked basic infrastructure and amenities such as electricity, roads, schools, hospitals, portable water and so on. These grievances, according to Osaghae have been directed against both the State and the oil companies which have been accused of contributing too little in return for the huge profits they get from oil exploration.

In a related development, a number of local minority ethnic groups started feeling exploited by the foreign oil corporations who are largely responsible for oil production in the region in partnership with the Federal Government. They felt side-lined because the gains of oil production, which the country's economy grew to be dependent on, was not being felt by the citizens in those areas. For instance, citizens of the region are rarely allocated oil blocks. According to the Department of Petroleum Resources, Nigeria currently has a total of 393 oil blocks that have been discovered in the country, and only 185 of them have been awarded to individuals and corporations, while 208 blocks are yet to be awarded. Out of the 173 oil blocks awarded, 90 belong to Nigerians (mostly non-Niger Deltans), while the remaining blocks are owned by foreigners (Odufade, 2018). Curiously, an important piece of legislation which outlines exploration activities - the Petroleum Act 1969, which provides the framework for the licensing of exploration rights to oil and gas companies engaging in exploration, production and transportation of crude oil has not been implemented. Despite being an oil producing state, Nigeria spent a huge amount

on importation of petroleum products. For instance, N2.068 trillion was recently spent on the importation of petroleum products within a nine-month period, from January to September 2017, a rise of 14.32 per cent from N1.809 trillion recorded in the same period in 2016. This has impacted negatively on the local politics. The Niger Delta people have suffered untold deprivation and disinheritance, leading to agitation for resource control. It is important to point out that the agitations by the minority group in the Niger Delta, over the control of oil revenue, compensation for environmental degradation arising from oil exploration appear to be the greatest challenge to nation-building and national stability in Nigeria in recent times (Dickson & Asua, 2016).

Therefore, aside from resource control agitation, demand for more equitable and privileged treatment by oil producing minority communities, as well as struggle by them and other minorities, to redress power imbalances in the federation which make them subordinate to the majority groups are not new. Beginning from agitations for separate states in the 1950s and 1960s which led to the setting of Minorities Commission in 1956, right down to attempts by politicians from the minority groups in the Second Republic to organize to wrestle power, minority question and agitation have been a recurrent decimal. Consequently, the minorities of the Niger Delta region have continued to agitate and articulate demands for greater autonomy and control of the area's petroleum resources. This has led to increased rate of militancy in the Niger Delta region.

Government Responses to the Niger Delta Problem

As earlier indicated, since 1957 when oil was first discovered in commercial quantities in the Niger Delta, the environmental impact of oil and gas production has been disastrous resulting to agitation for state creation, increase in revenue allocation to the region, resource control as well as conflict, violence and militancy, have been persistent in the region. This has also created a climate of rebellion and insecurity, culminating recently with the frequent kidnapping of foreign oil workers, a threat to the sustainability of industrial investment. The questions here are: What is the role of the Federal, State and Local Governments in the oil industry? What are the government's responses to these problems? Unlike what obtains in the United States of America where the Federal, State, and Local Governments each regulate various aspects of oil and gas operations, who regulates what depends on land ownership and whether federal regulations or state laws apply. In general, most drilling and production

is regulated by the states. Federal regulations primarily safeguard water and air quality and worker safety, as well as exploration and production on Native American lands, federal lands, and the Outer Continental Shelf (Robeck et al, 2018). According to the Constitution of the Federal Republic of Nigeria, 1999 (as Amended), the Federal Government owns all minerals, oil, and gas reserves in Nigeria, and thus has pre-eminence over the oil in the Niger Delta. However, licences are granted to oil companies for exploration and production, and a contractual arrangement is entered into. This can take the form of a production sharing contract between, for example, private companies and the Federal Government (through the State-owned entity, the Nigerian National Petroleum Corporation). Since 1970, when Nigeria began large-scale exportation of crude oil, a long string of corrupt military dictators, politicians and government officials, both domestic and international, have profited from bribery, kickbacks, and other dishonest means, on a relentless march of exploitation that has consistently sunk the oil-rich country into the list of the poorest countries in the world (Hector, 2004).

In response to the problems associated with oil and gas exploration in the Niger Delta region, the government of Federal Republic of Nigeria took a number of steps. First, industrial policies were formulated to guide and ensure adherence of oil companies to their Corporate Social Responsibilities (CSR), quota system in staffing, contribution of a certain percentage of revenue to Education Trust Fund (ETF), control of pollution, encouragement of dialogue between oil companies and host communities. It is pertinent to note promptly that corporate social responsibility is essentially a concept whereby companies decide voluntarily to contribute to a better society and a cleaner environment (Hond, Frank, Bakker, Neergard, 2007:1-14). Under the CSR, the people of the Niger Delta region are seeking employment for the youths, reduction in environmental damage to their farmlands (livelihoods), and economic and social development of the entire region. These expectations have not been met and this has resulted in a conflicting relationship with the Multinational Corporations (MNCs). The hostilities between the oil companies operating in the region and host communities are also linked to the inherent discontent with the governance system of Nigeria. The government is perceived to support the MNCs operation at the expense of the host communities (Enuoh & Eneh, 2015:74-84).

Second, the following Boards and Commission were set up to invest in the development of the people and landscape of Niger Delta region – the Niger

Delta Development Board (NDDB) 1959; Niger Delta Development Authority (NDDA); Oil Minerals Producing Area Development Commission (OMPADEC), Niger Delta Development Commission (NDDC) and Ministry for Niger Delta Affairs. It is important to state from the outset that despite these efforts, there had been insincerity and lip service paid on the part of the Federal government towards solving the problem and the development of Niger Delta. The various institutions set up to invest in the development of Niger Delta region seem to be ineffective or have not lived up to expectations. Evidence abounds to prove the point that these institutions were either deliberately starved of funds, or contracts awards as well as appointment to the Boards are highly politicized. For instance, between 1992 and 1995, going by the 30% derivation formula, the OMPADEC was supposed to have received #72 billion but it only received #11 billion. Similarly, in the period 1995 to 1996, the Commission received just #2 billion far below what was budgeted (Eminue, 2011). In the area of contract award, the case in point is contract for the construction of Okossi-Mbokpu Eyokan-Ubodung-Etebi (20km) road. On October 28, 2009, Federal Executive Council approved, among others, contract for the construction of the aforementioned road to Messrs. Jafaar Ltd at the cost of #2, 974, 553, 864. 20 (FEC, 2009).

Investigation by this author reveals that up till date, the project, which was to be completed in 24 months with NDDC as implementation agency is not executed one quarter. Reasons for the delay are obvious. First, the contract was awarded on political considerations to a former Member of House of Representatives, a Medical doctor who incidentally knows nothing about road construction. Second, with the emergence of All Progressives Congress (APC) government at the national, and subsequent appointment of Obong Nsima Ekere and other party loyalist as the Managing Director as well as Board members, it became impossible for the body to patronize the contractor for political reasons. Consequently, the people of the area have been thrown into untold hardship as a result of abandonment of the road project.

On the whole, all the intervention outfits established ostensibly for the development of the Niger Delta region have become subterfuges or conduits for awarding contracts to political supporters. Glaringly, project and contracts are awarded as political patronage and through these contractors, allocations made to such outfits are siphoned. As Alli (cited in Eminue, 2011) has noted, the story of OMPADEC (and other intervention agencies) is a futile journey to looting,

thievery, mismanagement, and misapplication of funds of unprecedented, sordid proportions and of minimal benefits to the Niger Delta people. Most glaringly, under the administration of President Olusegun Obasanjo, the appointment of Honourable Minister for the Ministry of Niger Delta Affairs established as a politico-administrative response to the Niger Delta crisis was politicised. Rilwani Lukman (a non-Niger Deltan) was appointed Minister for Petroleum Resources. Currently, President Muhammadu Buhari from Katsina State appointed himself Minister of Petroleum in which Justice Ahmed Mohammed of the Federal High Court, Abuja, held that the appointment did not contravene provisions of the country's Constitution (Enumah, 2018). These few instances points to the politics and quests for oil resource management in Nigeria in recent times.

Concluding Remarks

In the present circumstances, the Niger Delta can best be described as a region beset with environmental problems as well as sustainable development issues which have arisen as a consequence of the operations of oil and gas sector. Put differently, the Niger Delta is one of the world's most severely petroleum-impacted ecosystems. Consequently, the quests for development in the region have been constrained owing to the environmental challenges as well as corruption, insincerity on the part of the Federal Government and the politics of the Nigerian state. As Osibanjo (2008) has noted, the unsustainable development practices of the past which focus on economic and social elements to the neglect of the environment have caused serious ecological and human health problems and worsened poverty in the country, particularly in the NDDC area. Consequently, the severity of poverty and the country's poor environmental conditions impact negatively and obstruct the nation's attempt to achieve the Millennium Development Goals (MDGs), as well as the important goal of the 2002 World Summit on Sustainable Development (WSSD) of reducing by 50% the number of people lacking access to basic sanitation. While the nation pursues vigorously, the task of promoting development that meets the needs of its population, it must ensure that the environmental systems and services on which the person depends are not damaged or destroyed. In all, the development of a legal framework to promote environmental protection generally is a *desideratum*.

This would help in securing for all Nigerians quality environment adequate for their health and well-being of all. The Federal, State and Local Governments

must ensure that environment and natural resources are properly utilized for the benefit of the present generation without compromising the future.. Finally, there is a need to put in place an environmental remediation framework to oversee the effect of the activities of oil companies on environment and how such negative effects could be compensated. It is only through this, among other measures, that sustainable environment for the future generation can be ensured.

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CHAPTER 11

CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT IN AFRICA

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INTRODUCTION:

Climate change occurs when the earth's average temperature changes dramatically over time. The climatic condition of the earth has experienced significant changes over the years, and these could be warmer or very much colder over a longer time frame of either a century

or more. Since the earth's climate is dynamic and constantly changing, there is a consensus amongst scientists that greenhouse gases released through human activities are the main factors causing climate change and the primary sources of these greenhouse gas emissions are the burning of fossil fuel with the clearing of forest and agricultural practices being a major contributor. The effects of these greenhouse gases upon the weather are complex and vary widely, depending on your location on earth and studies have shown that human society has experienced diverse challenges as a result of climate change (Fischer *et al.*, 2002).

Global warming is causing local and regional climates to change in many ways, thereby increasing climate risks. These changes have many different impacts on the human habitat and livelihood conditions. The larger and faster the changes, the more likely it is that adverse effects will dominate.

THE MAIN ADVERSE EFFECTS INCLUDE:

- i. Increase in local mean temperature and extremes – both land and water;
- ii. Change in rainfall - its onset, seasonal distribution and extremes;
- iii. Increase in frequency and intensity of large storms and tropical cyclones
- iv. Increase in evaporation losses from plants and water surfaces;
- v. Increased melting of glaciers and other ice bodies.

ASSOCIATED EFFECTS INCLUDE:

- i. Sea level rise and ocean acidification;
- ii. More severe droughts and floods;
- iii. More damage from high winds / storms;
- iv. Disrupted crop calendars, with different pests, diseases and water requirements;
- v. Heat waves and spread of disease to new areas (e.g. malaria); and
- vi. Increased water demand and reduced water availability.

Developing countries have contributed least to climatic changes, yet they are most vulnerable to climate change impacts because they have fewer resources to adapt: and are socially, technologically and

financially at risk from its effects, and if left unmanaged, climate change will reverse developmental progress and compromise the well-being of current and future generations (Alderman *et al.*, 2006).

Climate change and development interact in a circular fashion. Alternative development paths will certainly affect future climate change, and in turn, climate change will have an impact on prospects for sustainable development (Houghton *et al.*, 2001). In the same context, climate change may endanger the success of some development co-operation efforts and vice versa, *i.e.*, some development assistance efforts could (unintentionally) have repercussions for a country's emission levels or mitigation options, as well as exacerbate its vulnerability to climate change (Klein, 2001). Climate change adds to the list of stressors that challenge the ability of countries in Africa to achieve the ecologic, economic and social objectives that define sustainable development.

Broadly speaking, sustainable development may be described as “a process for improving the range of opportunities that will enable individual human beings and communities to achieve their aspirations and full potential over a sustained period of time, while maintaining the resilience of economic, social and environmental systems” (Munasinghe, 1994). In other words, sustainable development requires;

- (i) opportunities for improving economic, social and ecological systems; and
- (ii) increases in adaptive capacity (Gunderson and Holling, 2001).

Also consistent with the Bruntland Commission (Brundtland *et al.*, 1987), the Third Assessment Report (TAR) defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Houghton *et al.*, 2001). Goals, indicators, values and practices can also frame examinations of sustainable development (Kates *et al.*, 2005). The essence of sustainable development is meeting fundamental human needs in ways that preserve the life support systems of the planet (Kates *et al.*, 2000). Its strength lies in reconciling real and perceived conflicts between the economy and the environment and between the present and the future (NRC, 1999).

THE RELATIONSHIP BETWEEN CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

According to Houghton *et al.* (2001) socio-economic development path (driven by the forces of population, economy, technology, and governance) gives rise to different levels of greenhouse gas emissions. These emissions accumulate in the atmosphere, increasing the greenhouse gas concentrations and disturbing the natural balance between incident solar radiation and energy re-radiated from the earth. Such changes give rise to the enhanced greenhouse effect that increases radiative forces of the climate system. The resultant changes in climate will persist well into the future, and impose stresses on the human and natural systems. Such impacts will ultimately have effects on the socio-economic development paths, thus completing the cycle. The development paths also have direct effects on the natural systems, in the form of non-climate stresses such as changes in land use leading to deforestation and land degradation.

Climate change impacts are part of the larger question of how complex social, economic, and environmental sub-systems interact and shape prospects for sustainable development. Economic development affects the ecosystem balance and, in turn, is affected by the state of the ecosystem and this is because there are multiple links, while poverty can be both a result and a cause of environmental degradation. Material- and energy-intensive life styles and continued high levels of consumption supported by non-renewable resources, as well as rapid population growth are not likely to be consistent with sustainable development paths. Similarly, extreme socio-economic inequality within communities and between nations may undermine the social cohesion that would promote sustainability and make policy responses more effective.

IMPACTS AND VULNERABILITIES OF CLIMATE CHANGE IN AFRICA

Africa is already under pressure from climate stresses and is highly vulnerable to the impacts of climate change. Many areas in Africa are recognized as having climates that are among the most variable in the world on seasonal and decadal time scales. Floods and droughts can

occur in the same area within months of each other. These events can lead to famine and widespread disruption of socio-economic well-being.

The many factors that contribute to and compound the impacts of current climate variability in Africa and will have negative effects on the continent's ability to cope with climate change include;

- i. Poverty
- ii. Illiteracy and lack of skills
- iii. Weak institutions
- iv. Limited infrastructure
- v. Lack of technology and information
- vi. Low levels of primary education and health care
- vii. Poor access to resources
- viii. Low management capabilities and armed conflicts.

The overexploitation of land resources including forests, increases in population, desertification and land degradation also pose additional threats (UNDP, 2006). In northern Sudan and Sahel, dust and sand storms have negative impacts on agriculture, infrastructure and health. As a result of global warming, the climate in Africa is predicted to become more variable, and extreme weather events are expected to be more frequent and severe, with increasing risk to health and life. This includes increasing risk of drought and flooding in new areas (Few *et al.*, 2004, Christensen *et al.*, 2007) and inundation due to sea-level rise in the continent's coastal areas (Nicholls, 2004, McMichael *et al.*, 2006).

According to De Wit and Jacek (2006), Africa will face increasing water scarcity and stress with a subsequent potential increase of water conflicts as almost all of the 50 river basins in Africa are transboundary. Due to climate change, much agricultural land will be lost and there would be shorter growing seasons and lower yields. Fischer *et al.* (2002) reported that climate change will cause a general decline in yields of most of the subsistent crops such as, sorghum in Sudan, Ethiopia, Eritrea and Zambia; maize in Ghana; Millet in Sudan; and groundnuts in Gambia.

Africa is already vulnerable to a number of climate sensitive diseases including malaria, meningitis, tuberculosis and diarrhea (Guernier *et al.*, 2004). As temperatures rise, the number of people exposed to malaria

and dengue will increase, with the burden most pronounced in developing countries such as Nigeria (Chomitz and Meisner, 2008). The incidence of drought, projected to increase in the Sahel and elsewhere, is strongly correlated with past meningitis epidemics in Sub-Saharan Africa (Confalonieri *et al.*, 2007). Declining agricultural yields in some regions will increase malnutrition and reduce people's resistance to illness. Climate change, according to Boko *et al.* (2007) is an added stress to already threatened habitats, ecosystems and species in Africa, and is likely to trigger species' migration and lead to habitat reduction.

CLIMATE CHANGE: A THREAT TO DEVELOPMENT GAINS IN AFRICA

Climate change imposes an added burden on development. Its impacts are already visible, and the most recent scientific evidence shows the problem is worsening fast, with current trajectories of greenhouse gas (GHG) emissions and sea-level rise outpacing previous projections (Benitez *et al.*, 2008). Changing temperature and precipitation averages and a more variable, unpredictable, or extreme climate can alter today's yields, earnings, health, and physical safety and ultimately the paths and levels of future development.

An examination of year-to-year variations in temperature (relative to a country's average) shows that anomalously warm years reduce both the current level and subsequent growth rate of GDP (gross domestic product) in developing countries (Brinsley and Christie, 2009). Evidence as reported by Bruckner *et al.* (1999), from Sub-Saharan Africa indicates that rainfall variability, projected to increase substantially, also reduces GDP and increases poverty. The impacts of climate change on health also add to human and economic losses, especially in developing countries.

The impact of climate change on achieving sustainable development in Africa can be vast. In Nigeria for example, this means that some stable ecosystems such as the Sahel Savanna may become vulnerable because warming will reinforce existing patterns of water scarcity and increase the risk of drought in the country. As well as the country's aquatic

ecosystems, wetlands and other habitats will create overwhelming problems for an already impoverished populace.

The sectors evaluated were based on seven natural and human systems identified by Houghton *et al.* (2001), and condensed into five. They are:

1. Human settlements and health
2. Water resources, wetlands, and freshwater ecosystems
3. Energy, industry, commerce, and financial services
4. Agriculture, food security, land degradation, forestry, and biodiversity; and
5. Coastal zone and marine ecosystems.

TABLE 1: REGIONAL IMPACTS AND VULNERABILITIES TO CLIMATE CHANGE IN AFRICA

Impacts	Sectoral vulnerabilities	Adaptive capacity
<p><u>Temperature</u></p> <ul style="list-style-type: none"> – Higher warming (x1.5) throughout the continent and in all seasons compared with global average. – Drier subtropical regions may become warmer than the moister tropics. <p><u>Precipitation</u></p> <ul style="list-style-type: none"> – Decrease in annual rainfall in much of Mediterranean Africa and the northern Sahara, with a greater 	<p><u>Water</u></p> <ul style="list-style-type: none"> – Increasing water stress for many countries. – 75–220 million people face more severe water shortages by 2020. <p><u>Agriculture and food security</u></p> <ul style="list-style-type: none"> – Agricultural production severely compromised due to loss of land, shorter growing seasons, more uncertainty about what and 	<p>Africa has a low adaptive capacity to both climate variability and climate change exacerbated by existing developmental challenges including:</p> <ul style="list-style-type: none"> – low GDP per capita – widespread, endemic poverty – weak institutions – low levels of education – low levels of primary health care – little consideration of women and gender balance in policy planning

<p>likelihood of decreasing rainfall as the Mediterranean coast is approached.</p> <ul style="list-style-type: none"> – Decrease in rainfall in southern Africa and western margins. – Increase in annual mean rainfall in East Africa. – Increase in rainfall in the dry Sahel may be counteracted through evaporation. <p><u>Extreme Events</u></p> <ul style="list-style-type: none"> – Increase in frequency and intensity of extreme events, including droughts and floods, as well as events occurring in new areas. 	<p>when to plant.</p> <ul style="list-style-type: none"> – Worsening of food insecurity and increase in the number of people at risk from hunger. – Yields from rain-fed crops could be halved by 2020 in some countries. Net revenues from crops could fall by 90% by 2100. – Already compromised fish stocks depleted further by rising water temperatures. <p><u>Health</u></p> <ul style="list-style-type: none"> – Alteration of spatial and temporal transmission of disease vectors, including malaria, dengue fever, meningitis, cholera, etc. <p><u>Terrestrial Ecosystems</u></p> <ul style="list-style-type: none"> – Drying and desertification in many areas particularly the Sahel and Southern Africa. 	<ul style="list-style-type: none"> – limited access to capital, including markets, infrastructure and technology – ecosystems degradation – complex disasters – conflicts
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	<ul style="list-style-type: none"> – Deforestation and forest fires. – Degradation of grasslands. – 25–40% of animal species in national parks in sub-Saharan Africa expected to become endangered. <p><u>Coastal Zones</u></p> <ul style="list-style-type: none"> – Threat of inundation along coasts in eastern Africa and coastal deltas, such as the Nile delta and in many major cities due to sea level rise, coastal erosion and extreme events. – Degradation of marine ecosystems including coral reefs off the East African coast. – Cost of adaptation to sea level rise could amount to at least 5–10% GDP. 	
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Source: Boko et al. (2007), Christensen et al. (2007).

NIGERIA, CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT OBJECTIVES

Nigeria has many policies, strategies and plans that can address general solution measures in some climate change vulnerable sectors such as

agriculture, water resources, forests and ecosystems, coastal marine environment and education. However, the policy framework to align human development and climate change response efforts through adaptation is largely undeveloped in the country. The country's institutional capacity to respond effectively to climate change is weak.

Unlike Ghana, Nigeria has not been able to develop a structured approach to climate change adaptation. Ghana was able to do this through the implementation of the Netherland assisted Climate Adaptation Programme (NCAP) that enabled the country to undertake detailed vulnerability assessment of various sectors. The implementation of NCAP has also enabled Ghana to develop a National Climate Change Adaptation Strategy to enable them to tackle sustainable development goals very well. Nigeria has no national climate change policy and strategy that should have presented Nigeria's current and future efforts to address climate change vulnerability and adaptation and this therefore makes risk management difficult.

The first National Communication was produced in November, 2003. The closest Nigeria is to having an acceptable adaptation response framework is a working document on Adaptation Strategies of Action prepared by HBS for the Special Climate Change Unit (SCCU) of the Federal Ministry of Environment (Department of Climate Change), the nationally designated authority for climate change in Nigeria.

Climate change is surely one phenomenon that has tested the Nigerian government in relation to sustainable development goal policies and so far, the government has failed the test considering the low level preparedness of the country in tackling the imminent dangers of climate change.

Apart from various workshops and seminars to pay lip services to the many problems climate change poses to the nation, some experts have said Nigeria still has no structure or any coordinated mechanism in place to tackle the challenge of climate change in the country. The International Centre for Energy, Environment and Development (ICEED) and Non-Governmental Organizations (NGOs), have continued to call on the Federal Government to put in place mechanisms

that would enable Nigeria to mitigate and adapt to climate change difficulties but little has been done in that regard (Ogbo *et al.*, 2013).

THE FEDERAL MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

The various efforts of the Federal Ministry of Environment towards ensuring environmental protection and sustainable development include the following initiatives and actions in form of strategies, programmes, activities and interventions:

- i. The Establishment of National Committee on Wetlands and Aquatic Resources and identification of fourteen more wetlands sites of international importance under the Wetlands Convention (RAMSAR).
- ii. The Pilot Studies on Community-based Forest Management.
- iii. The Monitoring and evaluation of agro-forestry component of the Special Programme on Food Security.
- iv. The Execution of relevant forestry research projects through the activities of the Forestry Research Institute of Nigeria (FRIN).
- v. The Execution of relevant park development and management projects through the activities of the National Parks Service.
- vi. The Development and implementation of the Great Green Wall for Sahara initiative (Nigeria Programme) to green the desert.
- vii. The Integrated Ecosystem Management Project in the Transboundary Areas between Nigeria and Niger Republic.
- viii. The Millennium Development Goals (MDGs) projects Rehabilitation of ten oases and provision of potable water to communities for drinking and farming.
- ix. The Intensified implementation of the National Policy on Erosion, Flood Control and Coastal Zone Management.
- x. The Phase out of the use of CFCs in the Refrigeration and Foam Sectors.
- xi. The Community based waste management pilot projects in 5 Nigerian cities-private-sector driven and MDG supported.
- xii. The Community based waste management pilot projects in Maiduguri and Otta-private-sector driven and MDG supported.
- xiii. The Establishment of a National Expert Committee on Mercury to provide guidance on appropriate strategies to address the mercury challenge.

- xiv. The Implementation of the ozone-depleting substances phase-out programme for all relevant sectors in Nigeria.
- xv. The Biosphere and heritage of Lake Chad project (BIOPALT) funded by African Development Bank
- xvi. The Lake Chad Basin Sustainable Development programme (PRODEBALT) funded by African Development Bank

MANAGING THE CLIMATE CHANGE EFFECTS ON ACHIEVING SUSTAINABLE DEVELOPMENT OBJECTIVES

Generally, the methods to manage climate change effects so as to achieve sustainable development in Africa are presented in table 2. Nevertheless, the Government of each country in the continent should regard the challenge of climate change as inimical to national sustainable development and should therefore address the issues. Thus, various efforts should be put in place at all levels of governance to promote climate resilient environmental sustainability in the context of national development. These efforts can be captured under:

- (i) Institutional and capacity building;
- (ii) Promoting an enabling climate change policy environment;
- (iii) Political and legal;
- (iv) Participation in global initiatives;
- (v) Partnership building for climate change;
- (vi) Climate change financing;
- (vii) Climate change information; and
- (viii) Other climate change related initiatives.

TABLE 2. ADAPTATION MEASURES IN KEY VULNERABLE SECTORS HIGHLIGHTED IN NATIONAL COMMUNICATIONS OF DEVELOPING COUNTRIES

Vulnerable Sectors	Reactive Adaptation	Anticipatory Adaptation
Water Resources	<ul style="list-style-type: none"> – Protection of groundwater resources – Improved management and maintenance of existing water supply systems – Protection of water 	<ul style="list-style-type: none"> Better use of recycled water – Conservation of water catchment areas – Improved system of water management – Water policy reform

	<p>catchment areas</p> <ul style="list-style-type: none"> – Improved water supply – Groundwater and rainwater harvesting and desalination 	<p>including pricing and irrigation policies</p> <ul style="list-style-type: none"> – Development of flood controls and drought Monitoring
Agriculture and food Security	<ul style="list-style-type: none"> – Erosion control – Dam construction for irrigation – Changes in fertilizer use and application – Introduction of new crops – Soil fertility maintenance – Changes in planting and harvesting times – Switch to different cultivations – Educational and outreach programmes on conservation and management of soil and water 	<ul style="list-style-type: none"> – Development of tolerant/resistant crops (to drought, salt, insect/pests) – Research and development – Soil-water management – Diversification and intensification of food and plantation crops – Policy measures, tax incentives/subsidies, free market – Development of early warning systems
Human health	<ul style="list-style-type: none"> – Public health management reform – Improved housing and living conditions – Improved emergency response 	<ul style="list-style-type: none"> – Development of early warning system – Better and /or improved disease /vector surveillance and monitoring – Improvement of environmental quality – Changes in urban and housing design
Terrestrial ecosystems	<ul style="list-style-type: none"> – Improvement of management systems including control of deforestation, reforestation and afforestation 	<ul style="list-style-type: none"> – Creation of parks/reserves, protected areas and biodiversity corridors –

	<ul style="list-style-type: none"> – Promoting agroforestry to improve forest goods and services – Development/improvement of national forest fire management plans – Improvement of carbon storage in forests 	<ul style="list-style-type: none"> Identification/development of species resistant to climate change – Better assessment of the vulnerability of ecosystems – Monitoring of species – Development and maintenance of seed banks – Including socioeconomic factors in management Policy
Coastal zones and marine Ecosystems	<ul style="list-style-type: none"> – Protection of economic infrastructure – Public awareness to enhance protection of coastal and marine ecosystems – Building sea walls and beach reinforcement – Protection and conservation of coral reefs, mangroves, sea grass and littoral vegetation 	<ul style="list-style-type: none"> –Integrated coastal zone management – Better coastal planning and zoning – Development of legislation for coastal protection – Research and monitoring of coasts and coastal Ecosystems

Source: National communications of non-Annex I Parties 24 and UNFCCC Sixth compilation and synthesis of initial national communications from Parties not included in Annex I to the Convention. Note by the secretariat. Addendum 5. Climate change impacts, adaptation measures and response strategies 2



Fig 1: Sub-Saharan Africa is expected to suffer the most from climate change in terms of reduced agricultural productivity and increased water insecurity (FAO/CFU000352/R.)



Fig 2. Flooding in a community in Africa *Red Cross Society 2017*



Fig 3: A raised water level in Lokoja City (Kogi State, Nigeria). *Red Cross Society 2016*

CONCLUSION

Climate-related problems are increasing across the African continent, and extreme weather events are becoming more frequent and this makes the continent more vulnerable to the powerful impact of climate change. However, with increasing human populace, land-use practices, and industrialization, climate change has become a global concern and it requires a concerted global effort to enact systematic change

Achieving the sustainable development goals require adequate funding as well as advances in technology development transfer and dissemination. Sustainable development prospects in Africa are influenced by the direct impact of climate change thus implementation of sustainable development policies is of great importance if we must save our world.

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CHAPTER 12

ENVIRONMENTAL ACCOUNTING INFORMATION SYSTEM

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INTRODUCTION:

Accounting systems take economic events and transactions, such as sales, purchases and processing of data, into information helpful to managers for decision making process. But previous researches have shown that the current accounting system maybe ill-equipped to address environmental matters. The existing accounting systems do not put any environmental costs on the organizations operation. The operating costs in traditional accounting may include many costs that are a product and process in nature but not on the environmental corollary. Environmental accounting cost is hidden in the overhead account of the traditional accounting system. The evaluation of the significance of environment costs and cost drivers of different processes and product lines can assist

a firm determine whether or not the cost allocation bases being used are appropriate for those cost (Sulaiman & Ahmad, 2006). So, incorporating environmental accounting cost into traditional accounting is vital for every organisation. Environmental accounting information system would enable managers to report on all the environmental emissions and make more informed decisions. The system would increase revenues such as the recycling of waste and better manufacturing processes. This study centres on environmental accounting information system as a link that assists in connecting the environment and economic performance of a firm. The perspective on hand is to make out and explore the environmental processes of business and reporting of all environmental impact in the financial reports of companies.

ISSUES:

Companies' neglect and avoidance of environmental cost leave gaps in financial reporting of organizations. If the fundamentals of environmental pollution (emissions) and activities are not disclosed, financial reports cannot be said to tell the state of the true and fair view of affairs (Enahoro, 2009). The sensation of environmental accounting is subject to accurate sorting of all environmental costs applied in the industry, but the absence of a clear definition of environmental cost makes it difficult to calculate the environmental liability, and it also hinders the process of implementing environmental accounting and the decision making process. In the words of Rob and Jan (2000), financial reporting has afforded a dais for a growing number of firms in combination of their environmental events with economic measures in expressing their accountability for environmental stewardship. Environmental accounting system has been advocated (made mandatory) in developed nations like United Kingdom and the United States by the Governments and companies operating in these nations are encouraged to provide information on the impact of their economic activities on the environment in their financial reports. But this is not so in some developing countries like Nigeria, where environmental accounting system is operated in a voluntary manner. Companies in Nigeria have abused the voluntary pattern of reporting environmental impacts. Some companies do not disclose their environmental fines and penalties, environmental restorations and environmental waste

management in their financial reports (Caraiani, 2005). If these environmental components are not disclosed by firms, then there is a problem in terms of the quality of financial reports. Besides, due to the lack of general criteria established as well as the complexities of environmental information, auditing a sustainability relationship is much more difficult compared to audit of financial statement, which makes the accounting profession not to get involved in environmental auditing. Therefore, the environmental accounting system is a modern aspect in accounting that helps companies that are involved in environment pollution to produce information on environmental performance and environmental cost accounting. Environmental performance here means an indicator of the ecological effect generated by business activities.

ENVIRONMENTAL ACCOUNTING INFORMATION SYSTEM:

Environmental accounting is a field that identifies resource use, measures and communicates company's costs or national economic impact on the environment. Costs include costs to clean up or remediate contaminated sites, environmental fines, penalties and taxes, purchase of pollution prevention technologies and waste management costs. Also, environmental accounting information system consists of environmentally differentiated conventional accounting and ecological accounting. Environmental accounting is a management tool that integrates the financial implications of environmental issues in the financial management systems of organisations. This enhances more effective decision-making in order to promote environmental and economic sustainability. Environmentally differentiated accounting measures effects of the natural environment on a company in monetary terms. Ecological accounting measures the influence a company has on the environment, but in physical measurements.

In creating environmental accounting information system three (3) factors are important namely; environmental, operational and financial factors of the organization. And the framework that combines environmental and financial aspects will help management to deal with business processes needs and manage existing links between environmental, financial and operational factors (Pohjola, 1999). But, this environmental accounting system entails challenges to management and accounting systems. The first challenge is to identify and analyse the

environmental factors of business operations and manage them using environmental management system integrated into the total management system. The second challenge is to define and analyse internal environmental cost factors in relation to internal environmental costs of an organisation. The final challenge is to report environmental aspects and financial factors for developing the decision-making processes. The aim of the environmental accounting system is to produce cost information on environmental and financial performance. The system enables decision-making to inculcate environmental impact in the reports.

The Environmental accounting information system is a collection of processes and policies which determine how a firm will manage the possible effects in natural environment, health and prosperity of citizens. The programme creates a system that evaluates, registers and expresses in quantitative terms the environmental impacts on all aspects of an enterprise. The adoption of environmental accounting information systems by enterprises can generally change the relationship between the economic performance and environmental yield. The enterprise that applies environmental accounting information system has the ability to redesign its organization, in order to reduce its unfavorable impacts on the environment. Moreover, with the adoption of high quality environmental accounting information system, it is likely that the enterprise discovers cases of reduction of the use of natural and monetary resources. The Total Environmental Accounting and Management System (T.E.A.M.S.) is an application of database on recording, handling and confirming quality and reporting environmental elements. The significance of this programme is to establish the balance of each individual chemical substance. The elements are registered in a database, for further environmental submission of reporting and handling. Thus, the environmental reports can be presented at any moment. These used sums portray the quantity of waste emitted. From the entry of consumed sums of chemical substance the programme calculates the sums that are removed. The T.E.A.M.S. programme has been developed in accordance with the international models for the environmental management (ISO 14001). By this programme, the manager of an enterprise has the complete control of the collection, recording and the use of environmental elements, qualitative assurance

and access to all the levels of production and distribution of environmental reports. Creating environmental accounting information system within companies is an important tool to create awareness amongst the general management on the importance to have quantified information for decision making processes regarding environmental management in Nigeria

COMPONENTS OF ENVIRONMENTAL ACCOUNTING

Environmental accounting includes the following components:

- i. Environmental Management Accounting (EMA)
- ii. Environmental Cost Modelling and Resource Economics
- iii. Environmental Financial Accounting (EFA)
- iv. Environmental Reporting
- v. Assurance and Auditing for Environmental Aspects in the Financial Statements.

i. ENVIRONMENTAL MANAGEMENT ACCOUNTING (EMA)

Environmental Management Accounting (EMA) is broadly defined as the identification, collection, analysis and use of two types of information for internal decision-making: Physical information on the use, flows, and fates of energy, water and materials (including wastes) and monetary information on environment-related costs, earnings, and savings. This management tool identifies the environmental footprint of an organisation, as well as the financial implications thereof. EMA is becoming increasingly relevant as international experience shows that by applying EMA methodology, companies can track close to 20% of total annual operating costs not currently recognised as environmental costs, and realise the large embedded savings potential and revenue gains.

Currently, most of these environmental costs are hidden in 'overhead' accounts. This prevents proper attention being given to these costs, while it may also lead to incorrect product and pricing decisions.

The potential of EMA as a company-level decision-making tool should not be underestimated. An EMA system should preferably be linked to the organisation's accounting and/or other information system to optimise available information and avoid duplication and confusion. The International Federation of Accountants (IFAC) recently issued an International Guidance Document on Environmental Management Accounting, which serves as a useful tool for implementing EMA. EMA can be used in combination with cleaner production and material flow cost accounting. This can result in powerful synergies.

ii. **ENVIRONMENTAL COST MODELLING AND RESOURCE ECONOMICS**

Environmental cost information can be used to develop environmental cost models to predict costs of various environmental options or liabilities for environmental cleanup. Environmental cost models can be powerful tools to help identify areas of wastage and potential savings.

On a regional or national level, such models can incorporate monetary values for ecosystem services and assets to serve as decision-support tools.

iii. **ENVIRONMENTAL FINANCIAL ACCOUNTING (EFA)**

Refers to the way in which environmental issues impact on the financial reports of companies and the accounting rules that govern the recognition and disclosure of these issues in the statement of financial position, income statement and related aspects of the annual financial report. This enables financial analysts and users of financial statements to understand the financial and other business impacts of environmental issues on the company. There are no specific accounting standards for EFA, although several of the International Accounting Standards refer to environmental aspects in passing.

iv. **ENVIRONMENTAL REPORTING**

Environmental reporting is the public disclosure of information concerning an entity's environmental performance. Environmental reporting makes organisations appear more accountable for the economic, environmental and social consequences of their activities. The reports may include information such as: 1 The company's profile – e.g., its size, its industry, the markets in which it operates.

The need for organisations to report on their environmental performance is widely recognised. The purpose of environmental reporting is to provide information beneficial to stakeholders in their decision-making. This also includes communities and environmental stakeholders. Environmental reporting is a component of triple-bottom-line, addressing economic, environmental and social performance. The most widely used method for environmental reporting is the global reporting initiative (GRI) guidelines for sustainability reporting.

v. **AUDITING FOR ENVIRONMENTAL ASPECTS IN THE FINANCIAL STATEMENTS AND EXTERNAL ASSURANCE OF SUSTAINABILITY REPORTS**

The consideration of environmental matters in the audit of financial statements is a logical consequence of EFA. International Audit Practice Statement 1010 covers this component of environmental accounting. The external assurance can be indicator-based (assessing the accuracy of the data reported and the systems generating these data) or content-based (focusing on whether the material issues have been included, all significant stakeholders have been consulted and how the report has responded to the concerns raised by stakeholders). Environmental accounting contributes to enhance environmental performance by organisations, while simultaneously improving operational and financial efficiency, thereby promoting sustainable development.

CONCLUSION

In conclusion, the main issues in environmental accounting information system in Nigeria are: abuse of voluntary pattern of reporting by

organizations, lack of standardized requirement for reporting and improper allocation of environmental cost. Thus, the concept is valuable but appears insufficient in fulfilling the intended purposes. It is vital that all stakeholders in environmental protection should be consulted when there are proposals to implement development that will intrude on or detract from the environmental store. These consultations can take many forms but should be undertaken well in advance of any implementations of development projects, to allow proper time to consider and evaluate opposition and alternative strategies. Finally, although many information systems of environmental accounting have been developed, no significant progress was made on the growth of environmental accounting information systems due to the inherent difficulty for the monetary expression of environmental accumulated costs and related natural resources. That is, future developments should not be evaluated, solely, in economic terms but in a more holistic manner which includes the effects upon the local environment. This will move towards the fact that environmental impacts should become a way of life for business organisation. Once the environmental consequences of organizations' actions are recognised, environmental information can easily be incorporated at every decision-making level to ensure the effective use of the planet's finite resources. Environmental awareness during the production and consumption processes may, also, bring long-term economic and social benefits. On the other hand, the careless or reckless use of natural resources during either the production or consumption process can add to social resentment of environmental development. This may hinder future development and will certainly detract from the effective use of resources.

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