

ASSESSING AFRICA'S RESPONSES TO ENVIRONMENTAL CHALLENGES

ABSTRACT

Climate change and other anthropogenic factors have aided in the degradation of the environment and this has affected the earth and life on earth. All regions of the world including Africa suffer from one form of environmental challenge or the other. The lack of infrastructure and under development in Africa however worsens the effect of such environmental challenges in Africa.

In accessing Africa's response to its environmental challenges, this presentation examined some of the natural and anthropogenic contribution to environmental degradation in Africa. The natural contributions to environmental challenges are caused by the variation in temperature and rainfall. Examples of such challenges include drought, flood, and desertification. The manmade environmental challenges are caused by urbanization and development. Examples of such manmade challenges include Emission of Greenhouse Gases (GHGs), Oil pollution, Land use changes, lack of proper town planning, Massive waste generation/flawed waste management and Land reclamation from sea.

The presentation therefore appraised some of the laws and policies some African countries like Nigeria, Sudan, Kenya, South Africa and Gambia have used to cope or combat the menace of environmental degradation. The presentation examined implementation of these laws and some decisions of courts in Africa that guide the improvement of the environment.

The presentation concludes with recommendations for better collaboration and effort by African countries for the protection of the environment.

1 INTRODUCTION

Before now, there was no data to show the exact extent of environmental degradation in Africa¹. Predictions of future climate change are inherently uncertain, and the future impacts are difficult to predict². This places emphasis on acting early and ensuring that systems are in place to deal with negative climate events. Recent environmental challenges have exposed the dangers of the environmental degradation in Africa. United Nation's Framework Convention on Climate Change estimates that poor countries will need nearly 60 billion dollars a year by 2030 to adapt to climate change³. The World Bank estimates the figure to be between 20 to 100 billion dollars.⁴ The situation therefore looks impossible.

¹ S.C. Nana, *Land and environmental degradation and desertification in Africa February 1995* <http://www.fao.org/docrep/X5318E/x5318e00.htm#Contents> (Accessed on 01/08/17)

² R. B. Monday, 'Confronting climate change: Africa's leadership on an increasingly urgent issue' *Foresight Africa 2017 Report* January 9, 2017 <https://www.brookings.edu/research/confronting-climate-change/>(Accessed on 01/08/17)

³ 'Africa must earn its climate change adaptation finance' By *ALLAFRICA Africa Progress Panel* on 27.07.2012 <http://www.africaprogresspanel.org/africa-must-earn-its-climate-change-adaptation-finance/> (Accessed on 01/08/17)

⁴ 'Africa must earn its climate change adaptation finance' By *ALLAFRICA Africa Progress Panel* on 27.07.2012 <http://www.africaprogresspanel.org/africa-must-earn-its-climate-change-adaptation-finance/>(Accessed on 01/08/17)

This presentation analysed the challenges from two perspectives. The challenges caused by nature and the challenges caused by human contribution. It is important to note that there are no clear division between challenges caused by nature and those caused by man. The challenges caused by nature can be exacerbated by man's activities. For instance, whereas prolonged drought causes desertification, deforestation increases the likelihood of desertification. It is also important to note that most environmental issues are correlated. While deforestation increases the likelihood of desertification, decay or burning of trees lead to emission of carbon dioxide into the atmosphere⁵. This presentation appraised laws, policies and initiatives that have helped African countries to cope with these environmental issues and points out areas where there are lapses

2 NATURAL CONTRIBUTIONS TO ENVIRONMENTAL CHALLENGES

Variation in temperature and rainfall is the main cause of natural environmental challenges. Examples of such challenges include drought, flood, erosion and desertification.

2.1 FLOOD –

Devastating flooding in costal Nigerian cities has been linked to the progressive increase in July/August rainfall over the region in the last five decades⁶. An increase in rainfall extremes has been observed for southern Africa and the Guinean coast⁷. Increase in frequency of rain days and heavy rains are often accompanied by severe floods⁸.

From January this year, the following incidences of flood in Africa countries have been reported:

1. After the rain in parts of South Africa between 5th January to 8th January, 2017, as many as 7 people died after being caught in the flood waters of swollen rivers in Limpopo and Mpumalanga⁹. At least three people died in floods after more than a week of heavy rain in northern and eastern parts of South Africa. Dam levels in the area are nearing full capacity as the rain continues¹⁰
2. Heavy rain from Thursday 05 January 2017 to 12th January 2017 was reported to have caused floods in parts of the province of Luanda, Angola.¹¹ The flood was reported to have damaged 1,800 homes in the municipality of Viana. This increased the risk of water- and vector-borne diseases in Angola.

⁵ 'Deforestation Adds More Atmospheric CO2 than the Sum Total of Cars & Trucks on the World's Roads' November 14, 2012 <https://scitechdaily.com/deforestation-adds-more-atmospheric-co2-than-the-sum-total-of-cars-trucks-on-the-worlds-roads/> Accessed on 18/07/2017

⁶ 'Prepare for heavier rainfall, Lagos warns residents' *Guardian Newspaper* of July 10, 2017 <https://guardian.ng/news/prepare-for-heavier-rainfall-lagos-warns-residents/> Accessed on 18/07/2017

⁷ *State of the World's Forests 2016. Forests and agriculture: land-use challenges and opportunities*. FAO. 2016. Rome. <http://www.fao.org/publications/sofo/2016/en/> (Accessed on 01/08/17)

⁸ *State of the World's Forests 2016. Forests and agriculture: land-use challenges and opportunities*. FAO. 2016. Rome. <http://www.fao.org/publications/sofo/2016/en/> (Accessed on 01/08/17)

⁹ 'South Africa – Deadly Flash Floods in Limpopo and Mpumalanga' 9 Jan., 2017 <http://floodlist.com/africa/south-africa-floods-limpopo-mpumalanga-january-2017> (Accessed on 01/08/17)

¹⁰ 'South Africa – Floods in North and East Leave 3 Dead, 2 Missing' 24 Feb., 2017 <http://floodlist.com/africa/south-africa-floods-february-2017> (Accessed on 01/08/17)

¹¹ 'Angola – 1,800 Homes Damaged by Floods in Luanda Province' 12 JANUARY, 2017 <http://floodlist.com/africa/angola-floods-luanda-province-january-2017> (Accessed on 01/08/17)

3. Flooding forced around 30 families to evacuate their homes near the Marimba River in Budiriro, a western suburb of Harare, Zimbabwe, on Friday 13 January, 2017. One person is believed to have been carried away by the flood.¹²
4. On 26 January 2017 Assessment Capacities Project (ACAPS) reported that Since the beginning of January 2017, heavy seasonal rains have been affecting central and southern provinces in Mozambique killing 44 people and affecting 79,000¹³. ACAPS estimates that as many as 8,162 houses have been destroyed and 21,000 damaged.¹⁴ There was another flood in Mozambique on February 15, 2017 following several hours of rain.¹⁵
5. There was flooding in Malawi capital Lilongwe on Friday 10 February 2017, after the Lingadzi River burst its banks following 6 hours of heavy rain on Thursday 09 February 2017¹⁶
6. A storm in Morocco on Thursday, 23 February 2017 dumped over 100 mm of rain in just a few hours, causing flooding in the neighbouring cities of Rabat and Salé.¹⁷
7. There was flood in Madagascar on 9th March 2017 during which about 50 persons were reported to have lost their lives¹⁸
8. Torrential rain that began during the evening of 16 March in Burundi caused flooding and landslides in northern and western areas of Burundi, including parts of the capital Bujumbura leaving about 6 persons dead and 160 homes destroyed.¹⁹
9. At least 11 people have died in the province of Luanda, Angola, after heavy rain and flooding on Tuesday 21 and Wednesday 22 March, 2017.²⁰
10. On 4th April 2017, four people died following floods in areas of Chief Kyungu, Wasambo, Kilupula and Mwirang'ombe in Karonga district of Malawi²¹
11. Heavy rain between 13 and 14 June, 2017 in Niger Republic caused severe damage and flooding in several parts of the country leaving at least 14 people dead and collapsing 395 homes.²²

¹² 'Zimbabwe – Evacuations After Floods in Harare' 16 Jan, 2017 <http://floodlist.com/africa/zimbabwe-floods-harare-january-2017> (Accessed on 01/08/17)

¹³ 'Mozambique – Heavy Rain Across South and Central Provinces, Flooding Affects Thousands in Sofala' 20 Jan, 2017 <http://floodlist.com/africa/mozambique-rainfall-flooding-january-2017> (Accessed on 01/08/17)

¹⁴ 'Mozambique – Heavy Rain Across South and Central Provinces, Flooding Affects Thousands in Sofala' 20 Jan, 2017 <http://floodlist.com/africa/mozambique-rainfall-flooding-january-2017> (Accessed on 01/08/17)

¹⁵ 'Mozambique – NASA Sees Tropical Cyclone Dineo Dump 132 Mm Rain Per Hour' 16 Feb, 2017 <http://floodlist.com/africa/mozambique-nasa-sees-tropical-cyclone-dineo-dump-132-mm-rain-per-hour> (Accessed on 01/08/17)

¹⁶ 'Malawi – Hundreds Displaced, 2 Missing as Floods Hit Lilongwe' 13 Feb, 2017 <http://floodlist.com/africa/malawi-hundreds-displaced-2-missing-floods-hit-lilongwe> (Accessed on 01/08/17)

¹⁷ 'Morocco – Streets of Rabat Flooded After 100mm of Rain in a Few Hours' 2 Mar, 2017 <http://floodlist.com/africa/morocco-rabat-sale-floods-february-2017> (Accessed on 01/08/17)

¹⁸ 'Madagascar – Tropical Storm Enawo Moves Closer (Updated)' 6 Mar, 2017 <http://floodlist.com/africa/madagascar-tropical-storm-enawo-march-2017> (Accessed on 01/08/17), 'Madagascar – Homes Destroyed, Deaths Reported as Cyclone Enawo Makes Landfall 8 Mar, 2017 <http://floodlist.com/africa/madagascar-cyclone-enawo-landfall-march-2017> (Accessed on 01/08/17)

¹⁹ 'Burundi – Floods and Landslides Leave 6 Dead, 160 Homes Destroyed' 19 Mar, 2017 <http://floodlist.com/africa/burundi-floods-cibitoke-bujumbura-march-2017> (Accessed on 01/08/17)

²⁰ Angola – 11 Dead After Floods and Heavy Rain in Luanda Province 24 Mar, 2017 <http://floodlist.com/africa/angola-floods-luanda-province-march-2017> (Accessed on 01/08/17)

²¹ 'Malawi – Floods in Karonga District Leave 4 Dead, Crops Destroyed' 7 Apr, 2017 <http://floodlist.com/africa/angola-floods-luanda-province-march-2017> (Accessed on 01/08/17)

²² 'Niger – Floods in Niamey and Tillabéri Leave 14 Dead, Hundreds of Homes Destroyed' Jun, 2017 <http://floodlist.com/africa/niger-floods-niamey-tillaberi-june-2017> (Accessed on 01/08/17)

12. Hours of heavy rain between 08 and 09 July 2017 caused severe flooding in Suleja in Niger State, Nigeria leaving nine people dead.²³ Heavy rain from 06 July caused flooding in parts of Lagos state and metropolitan area, in particular Victoria Island, Lekki and Oniru. There were no fatalities.

This natural disaster is sometimes worsened by failure of governments to take proactive steps in dealing with the environment. For example, in 2012, communities around the River Benue in Nigeria were flooded. This brought with it several loss of lives and properties. This flood could have been prevented if the appropriate infrastructure was put in place by government. The annual flood is caused by the release of excess water from the Lagdo Dam in Cameroon²⁴.

The Lagdo Dam was built in 1982 on Adamawa Plateau in the Northern Province of Cameroon along the course of the Benue River. Lowland communities in Nigeria especially those located down the River Benue drainage basin are always affected whenever water is released from the Lagdo Dam²⁵. This was the cause of the flooding in 2012 in Nigeria²⁶. Cameroon has a duty to warn Nigeria about a possible flood whenever they are to release water from Lagdo Dam. Nigerian authorities agree that Cameroon warned Nigeria before releasing the excess water through a letter to the Ministry of Foreign Affairs in Abuja²⁷. The Nigerian Government failed to make proper planning for the flood, most likely because no one expected it to be of such huge magnitude²⁸.

In 1980, two years before Lagdo Dam was constructed, Nigeria and Cameroon had an agreement to build two dams in their countries. Nigeria was supposed to construct a similar buffer dam along the course of the river to contain the excess water released from Lagdo Dam. In 1981 Nigeria proposed to build a dam to be known as “Dansin Hausa Dam”. Apart from cushioning flooding, the proposed dam was supposed to generate about 300MW of electricity, and irrigate about 150,000 hectares of land. It was meant to provide employment for about 40,000 persons and make available navigable route to the Niger Delta region. This dam was never built and this caused the 2012 flooding. Even after the wanton loss of 2012, this dam has still not been built till today. As at January 2017, Nigerian Government was still considering whether the project will be carried out by a public private partnership (PPP) or not²⁹.

²³ ‘Nigeria – Deadly Floods Hit Niger State’ 11 Jul, 2017 <http://floodlist.com/africa/nigeria-deadly-floods-hit-niger-state> (Accessed on 01/08/17)

²⁴ ‘30 Years of Nigeria’s Failure to tackle Cameroon Dam Flooding’ <http://www.environsnewsnigeria.com/30-years-of-nigerias-failure-to-tackle-cameroon-dam-flooding/> (Accessed on 01/08/17)

²⁵ ‘Cameroon Warned Nigeria Days Ahead Of Flood: What Was Govt. Response?’ August 29, 2012 <http://newsrescue.com/cameroon-warned-nigeria-days-flood-govt-response/#ixzz4oZF19uSr> (Accessed on 01/08/17)

²⁶ ‘Cameroon Warned Nigeria Days Ahead Of Flood: What Was Govt. Response?’ August 29, 2012 <http://newsrescue.com/cameroon-warned-nigeria-days-flood-govt-response/#ixzz4oZF19uSr> (Accessed on 01/08/17)

²⁷ ‘Cameroon Warned Nigeria Days Ahead Of Flood: What Was Govt. Response?’ August 29, 2012 <http://newsrescue.com/cameroon-warned-nigeria-days-flood-govt-response/#ixzz4oZF19uSr> (Accessed on 01/08/17)

²⁸ ‘Cameroon did nothing wrong flooding Nigeria – FG official’ October 31, 2012 <http://www.premiumtimesng.com/news/105390-cameroon-did-nothing-wrong-flooding-nigeria-fg-official.html> (Accessed on 01/08/17)

²⁹ ‘Commission Identifies 77 PPP Projects’ *Dailytimes Newspaper* <https://www.google.com.ng/amp/s/dailytimes.ng/business/commission-identifies-77-ppp-projects/amp/> (Accessed on 01/08/17)

Another way government fail to plan for flooding is by failure to manage town planning to provide for good drainage systems³⁰. The Lagos 2017 flood is said to have been worsened by the lack of good drainage system in the state³¹.

Beyond government's irresponsible refusal to plan against these types of disasters, private individuals also contribute to flooding through improper garbage disposal despite government's efforts at cleaning up waterways and unclogging drainage canals.³²

2.2 DROUGHT

The United Nations Convention to Combat Desertification defines drought thus: "A drought can be defined in various ways. A meteorological drought, for example, is when the rains fail. A hydrological drought is when the lack of rainfall goes on long enough to empty rivers and lower water tables. Agricultural drought begins when the lack of water starts killing crops and livestock. After that, people may start dying too."³³

South Africa, Northern Ghana, Kenya, Sudan, Ethiopia and other African countries suffer persistent incessant droughts³⁴. The United Nations Food and Agriculture Organization (FAO) were said to have stated that many people in the Horn of Africa face food shortages due to drought³⁵. In the Central Africa and Sahel, droughts have become more frequent since the late 1960s³⁶. The East African drought of 2011 is proving to be one of the worst that Ethiopia has faced in 50 years³⁷. Drought is almost a yearly occurrence in these countries. In 2014³⁸, 2015³⁹ and in 2016⁴⁰ there were issues of famine and drought affecting communities in Africa. FAO predicted that owing to a persistent lack of rainfall between October and December 2016, as many as 12 million people across Ethiopia, Kenya and Somalia seriously need food

³⁰ 'How Poor Drainage Destroys Your Environment' *Innova Magazine* <http://russel-smithgroup.com/think-green/how-poor-drainage-destroys-your-environment/> (Accessed on 01/08/17)

³¹ 'First Heavy Lagos Rainfall in 2017 Causes Flooding, Gridlock' *Tribune Online* <https://www.google.com.ng/amp/tribuneonline.com/first-heavy-lagos-rainfall-gridlock/> (Accessed on 01/08/17)

³² 'Improper Garbage Disposal Remains Major Cause of Flooding.' www.gmanetwork.com/news/metro/567168/improper-garbage-disposal-remains-major-cause-of-flooding/story/ (Accessed on 01/08/17)

³³ 'The Ripple Effect: A fresh approach to reducing drought impacts and building resilience' United Nations Convention to Combat Desertification http://www2.unccd.int/sites/default/files/documents/27072016_The%20ripple%20effect_ENG.pdf (Accessed on 01/08/17)

³⁴ Central Investigation Agency's World Fact Book <https://www.cia.gov/library/publications/the-world-factbook/> (Accessed on 01/08/17)

³⁵ E. Ngumbi 'How to tackle repetitive droughts in the Horn of Africa' *Aljazeera* of 14 Feb 2017 www.aljazeera.com/amp/indepth/opinion/2017/02/tackle-repetitive-droughts-horn-africa-170214090108648.html (Accessed on 01/08/17)

³⁶ A. Taylor, *Famine in East Africa* <https://www.theatlantic.com/photo/2011/07/famine-in-east-africa/100115/> Accessed on 18/07/2017

³⁷ A. Taylor, *Famine in East Africa* <https://www.theatlantic.com/photo/2011/07/famine-in-east-africa/100115/> Accessed on 18/07/2017

³⁸ See 'Disaster 2014' <https://reliefweb.int/disaster/dr-2014-000131-ken> (Accessed on 01/08/17)

³⁹ See 'Disaster 2014' <https://reliefweb.int/disaster/dr-2015-000134-som> (Accessed on 01/08/17)

⁴⁰ *Drought and War Sparks Famine in East Africa* <https://www.dw.com/en/drought-and-war-spark-famine-across-horn-of-africa-and-south-sudan/a-19034165> (Accessed on 01/08/17)

assistance⁴¹. Last year, 2016 is said to be the hottest year in the modern global temperature record which dates to 1880⁴². The 2017 drought may become the worst drought faced by Kenya, Tanzania and Uganda in 70 years.⁴³ Out of Kenya's 47 counties, 23 are facing disastrous drought⁴⁴. Fadumo Mumin Hassan a pastoralist in Kenya was quoted to have said “If it continues this dry... the animals will die and then we will die too.”⁴⁵

The below statement summarises the impact of drought in 2016 in Africa:

Over 20 million people were facing food insecurity in Eastern Africa. Water shortages triggered water-borne and vector-borne diseases too. In Ethiopia alone, 10.2 million people required food aid. Droughts were causing children to drop out of school to fetch water from long distances. Sudan's drought cut cultivatable areas, reduced pastures prompting livestock migration and increased conflicts among farmers as well as reduced water availability which led to water-borne diseases and malnutrition. In Somalia, about 380,000 people were food insecure where pastures have been hit by drought⁴⁶

Drought has proved to be an unstoppable evil. The only question is how we can build better resilience to drought⁴⁷. Countries of the world therefore combat its effect and the damages that come with it to mitigate loss. Drought mitigation strategies in Africa include short-term and long-term approaches. Short-term approach includes distributing food to those affected as done in Kenya and long-term approach may include planting drought-tolerant crop varieties that can withstand insufficient rainfall, or diversifying one's crop and income base so that there is alternative source of income when there is drought.⁴⁸ Kenya is working on sustainable long-term solutions such as investing in community water sources so that they do not depend on rain-fed agriculture.⁴⁹

⁴¹ E. Ngumbi 'How to tackle repetitive droughts in the Horn of Africa' *Aljazeera* of 14 Feb 2017 www.aljazeera.com/amp/indepth/opinion/2017/02/tackle-repetitive-droughts-horn-africa-170214090108648.html (Accessed on 01/08/17)

⁴² '2016 Climate Trends Continue to Break Records' July 19, 2016 <https://www.nasa.gov/feature/goddard/2016/climate-trends-continue-to-break-records> (Accessed on 01/08/17)

⁴³ A. C. Kileo, 'Earth Day 2017: Drought and Resilience in East Africa' April 2017 <https://www.slowfood.com/earth-day-2017-drought-resilience-east-africa/> (Accessed on 01/08/17)

⁴⁴ 'Kenya declares drought a national disaster, appeals for local and international help' 11 Feb 2017 mobile.abc.net.au/news/2017-02-11/kenya-declares-drought-a-national-disaster/8261970 (Accessed on 01/08/17)

⁴⁵ 'Desperate For Rain' 3 October 2016 mobile.abc.net.au/news/2016-01-29/drought-stricken-african-communities-fear-death-before-rain/7124102?pfmredir=sm (Accessed on 01/08/17)

⁴⁶ http://www2.unccd.int/sites/default/files/documents/27072016_The%20ripple%20effect_ENG.pdf (Accessed on 01/08/17)

⁴⁷ 'Governments adopt Windhoek Declaration on Drought Resilience in Africa' <https://public.wmo.int/en/media/news/governments-adopt-windhoek-declaration-drought-resilience-africa> (Accessed on 01/08/17)

⁴⁸ E. Ngumbi 'How to tackle repetitive droughts in the Horn of Africa' *Aljazeera* of 14 Feb. 2017 www.aljazeera.com/amp/indepth/opinion/2017/02/tackle-repetitive-droughts-horn-africa-170214090108648.html (Accessed on 01/08/17)

⁴⁹ 'Water Supply and Sanitation in Kenya Turning Finance into Services for 2015 and Beyond' African Ministers' Council on Water (AMCOW) Country Status Overview <https://wsp.org/sites/wsp.org/files/publications/CSO-Kenya.pdf> (Accessed on 01/08/17)

Africa has responded to drought as a group through the African Drought Conference (ADC) on "Enhancing resilience to drought events on the African continent" which concluded on August 22 2016 in Windhoek, Namibia⁵⁰. The conference adopted the Windhoek Declaration for Enhancing Resilience to Drought in Africa on 19th August 2016⁵¹. The conference built on 11th Session of the Conference of Parties (COP-11) of the United Nations Convention to Combat Desertification, which was held in September 2013⁵².

During the conference, international and African experts delivered presentations on drought monitoring, drought preparedness and risk management, early warning systems, sand and dust storms, food security, innovative financing, and other relevant topics⁵³.

According to Elena Manaenkova, World Meteorological Organization Deputy-Secretary General "Drought preparedness and management plans are essential tools for mitigating drought events and building resilience to their impacts."⁵⁴

The Windhoek Declaration for Enhancing Resilience to Drought in Africa adopted the Strategic Framework for Drought Risk Management and Enhancing Resilience in Africa, which proposes a Drought Resilient and Prepared Africa (DRAPA) at the national level guided by the under listed principles :

1. Drought Policy and Governance for Drought Risk Management;
2. Drought Monitoring and early warning;
3. Drought vulnerability and impact assessment;
4. Drought mitigation, preparedness, and response;
5. Knowledge management and drought awareness,
6. Reducing underlying factors of drought risk.

The Parties committed to the implementation of a Strategic Framework for Drought Risk Management and Enhancing Resilience in Africa, which proposes a Drought Resilient and Prepared Africa (DRAPA).⁵⁵

The DRAPA will be achieved by getting regional institutes that deal with drought mitigation together under African Union leadership, and enforcing their collaboration with the international

⁵⁰Governments adopt Windhoek Declaration on Drought Resilience in Africa' <https://public.wmo.int/en/media/news/governments-adopt-windhoek-declaration-drought-resilience-africa> (Accessed on 01/08/17)

⁵¹Governments adopt Windhoek Declaration on Drought Resilience in Africa' <https://public.wmo.int/en/media/news/governments-adopt-windhoek-declaration-drought-resilience-africa> (Accessed on 01/08/17)

⁵²Governments adopt Windhoek Declaration on Drought Resilience in Africa' <https://public.wmo.int/en/media/news/governments-adopt-windhoek-declaration-drought-resilience-africa> (Accessed on 01/08/17)

⁵³Governments adopt Windhoek Declaration on Drought Resilience in Africa' <https://public.wmo.int/en/media/news/governments-adopt-windhoek-declaration-drought-resilience-africa> (Accessed on 01/08/17)

⁵⁴Governments adopt Windhoek Declaration on Drought Resilience in Africa' <https://public.wmo.int/en/media/news/governments-adopt-windhoek-declaration-drought-resilience-africa> (Accessed on 01/08/17)

⁵⁵ The Windhoek Declaration for Enhancing Resilience to Drought in Africa

community, including United Nations (UN) agencies such as the FAO⁵⁶. When this collaboration on drought relief efforts has been implemented, the partners will find innovative ways to disseminate available information and solutions to farmers. This sort of information has to be widely available with open access, so that farmers and citizens can take action. For example, in Ethiopia, real-time maps generated through Satellite-Assisted Pastoral Resource Management initiative are relayed to pastoralists who use them in times of drought to find better pasture for their animals.⁵⁷

While these current efforts by governments, NGOs, Africans and the international community to avoid these repetitive cycles of drought will definitely make a difference, it is important to note that the success of these efforts will vary depending on the country and the commitment of their elected leaders.

To coordinate its efforts at ameliorating the effect of drought, Kenya has established a National Drought Management Authority⁵⁸ that oversees all matters related to drought management and advises citizens on incoming droughts. Ethiopia on its own has initiated some mitigation efforts against the scourge of drought. For example, the government launched The Productive Safety Net Programme (PSNP)⁵⁹. PSNP helps Ethiopia's poor rural dwellers "to resist shocks, create assets and become food self-sufficient" by giving some sort of insurance for produce⁶⁰. Antonio Guterres, the United Nations Secretary-General has noticed efforts by Ethiopia and commended the Ethiopian government for their response to the 2016 drought⁶¹.

There is therefore, need for strategic integration and coordination between governments and other agencies. The goal is to predict drought more accurately and show rural farmers how best to survive the drought. In Kenya, for example, there are many organisations that are investing significantly in building resilience to drought and climate change for farmers⁶². A coordinated effort by these organizations will better help Kenya solve the issue of drought in Kenya.

2.3 DESERTIFICATION –

⁵⁶ E. Ngumbi 'How to tackle repetitive droughts in the Horn of Africa' *Aljazeera* of 14 Feb. 2017 www.aljazeera.com/amp/indepth/opinion/2017/02/tackle-repetitive-droughts-horn-africa-170214090108648.html (Accessed on 01/08/17)

⁵⁷ E. Ngumbi 'How to tackle repetitive droughts in the Horn of Africa' *Aljazeera* of 14 Feb. 2017 www.aljazeera.com/amp/indepth/opinion/2017/02/tackle-repetitive-droughts-horn-africa-170214090108648.html (Accessed on 01/08/17)

⁵⁸ National Drought Management Authority Act No. 4 of 2016 *Laws of Kenya* published by National Council for Law Reporting www.kenyalaw.org (Accessed on 01/08/17)

⁵⁹ 'Productive Safety Net Programme in Ethiopia' M.wfp.org/content/protective-safety-net-programme-ethiopia (Accessed on 01/08/17)

⁶⁰ PSNP Factsheets M.wfp.org/content/protective-safety-net-programme-ethiopia (Accessed on 01/08/17)

⁶¹ www.un.org/apps/news/story.asp?NewsID=56063#.WX1sHnrTXqA (Accessed on 01/08/17)

⁶² E. Ngumbi 'How to tackle repetitive droughts in the Horn of Africa' *Aljazeera* of 14 Feb. 2017 www.aljazeera.com/amp/indepth/opinion/2017/02/tackle-repetitive-droughts-horn-africa-170214090108648.html (Accessed on 01/08/17)

Desertification is increased sand movements, desiccation, desert encroachment and manmade desert.⁶³ According to the United Nations Convention to Combat Desertification (UNCCD), desertification is land degradation in arid, semi-arid and humid areas resulting from various factors, including climatic variations and human activities⁶⁴ The International Fund for Agricultural Development however explains that desertification is not necessarily the movement of desert but the degradation of a fertile land.⁶⁵

Desert encroachment and desertification affects countries in the sahel region including Niger, Burkina Faso, Morocco, Tunisia, Sudan, Mauritania and states of northern Nigeria including Bauchi, Gombe, Jigawa, Bornu, Yobe, Kano, Kastina, Sokoto, Zamfara and Kebbi⁶⁶. This desert encroachment is as a result of variation in temperature in Africa. Desertification causes degradation of fertile lands through long-term changes in the soil, which results in desert-like conditions.

Desertification and drought are said to be twin global environmental challenges because most countries suffer them together⁶⁷. Two-thirds of the African continent is said to be desert or drylands and this affects agriculture and has implications for the economy of African countries⁶⁸. For many African countries, fighting land degradation and desertification and mitigating the effects of drought are prerequisites for economic growth and social progress. Increasing sustainable land management and building resilience to drought in Africa can have profound positive impacts that reach from the local to the global level.

Desertification reduces soil fertility. Desertification reduces vegetative productivity and leads to long-term declines in agricultural yields, livestock yields, plant standing biomass, and plant biodiversity⁶⁹. These changes reduce the ability of the land to support people and causes other issues as conflict⁷⁰, migration and surge in refugees. Banki Moon, the former UN Secretary-

⁶³ O.T. Ebenezer 'Drought, desertification and the Nigerian environment: A review' *Journal of Ecology and the Natural Environment* Vol. 7(7), pp. 196-209, July, 2015 <http://www.academicjournals.org/JENE> (Accessed on 01/08/17)

⁶⁴ United Nations Convention to Combat Desertification (UNCCD) <http://www.unccd.int/en/regional-access/Africa/Pages/alltext.aspx> (Accessed on 01/08/17)

⁶⁵ 'Desertification' <https://www.ifad.org/documents/10180/77105e91-6f72-44ff-aa87-eedb57d730ba> (Accessed on 01/08/17)

⁶⁶ See A. Eribake Special Report on Desertification in Nigeria: The Sun Eats our Land'. *Vanguard Newspaper* of 3 May 2010. www.vanguardngr.com/2010/05/special-report-on-desertification-in-nigeria-the-sun-eats-our-land/amp/. (Accessed on 01/08/17) J. Omijeh 'Strategies For the Control of Desertification in Northern Nigeria' *FUTY Journal of the Environment* Vol. 3, No. 1(2008).

⁶⁷ O.T. Ebenezer 'Drought, desertification and the Nigerian environment: A review' *Journal of Ecology and the Natural Environment* Vol. 7(7), pp. 196-209, July, 2015 <http://www.academicjournals.org/JENE> (Accessed on 01/08/17)

⁶⁸ <http://www.unccd.int/en/regional-access/Africa/Pages/alltext.aspx> (Accessed on 01/08/17)

⁶⁹ 'Intergovernmental Panel on Climate Change Report Assessment' <http://www.ipcc.ch/ipccreports/tar/wg2/index.php?idp=404> (Accessed on 01/08/17)

⁷⁰ V. Popovski 'Foresight Africa viewpoint: Does climate change cause conflict?' *Foresight Africa* 2017 Friday, January 20, 2017 <https://www.brookings.edu/blog/africa-in-focus/2017/01/20/does-climate-change-cause-conflict/> (Accessed on 01/08/17)

General opines that Darfur crises is the first recognized world conflict caused by climate change⁷¹.

2.4 Erosion –

Erosion is caused by loss of top soil due to increase in wind and rainfall⁷². Erosion is the effect of low soil quality, land topography, and low ground vegetation. Healthy top soil (like soil covered with plants) is less erodible because it sticks together better and can absorb more water.⁷³

G. E. K Ofomata suggests that erosion is caused by ‘Physical’ natural impact and human impact⁷⁴. He suggests that the physical impacts include rain, surface configuration of land and vegetation⁷⁵. Human impact on the other hand include agricultural activities, mining, urban development needs and other urbanization activities⁷⁶ For example, cash crops planted after clear cutting or burning can worsen soil erosion because their roots cannot hold onto the soil the way trees can⁷⁷. Without tree roots to anchor the soil and with increased exposure to sun, the soil can dry out, leading to problems like increased flooding and inability to farm. Currently 40% of soil in Africa is degraded⁷⁸.

The effects of erosion include loss of land fertility, loss of human life, loss of farmland, threat to vegetation, loss of infrastructure, properties and isolation of communities⁷⁹. The best way to prevent the degradation that causes soil erosion is by cooperating with farmers to plant erosion resilient plants.⁸⁰

3 HUMAN CONTRIBUTION TO ENVIRONMENTAL DEGRADATION

⁷¹V. Popovski ‘Foresight Africa viewpoint: Does climate change cause conflict?’ *Foresight Africa 2017* Friday, January 20, 2017 <https://www.brookings.edu/blog/africa-in-focus/2017/01/20/does-climate-change-cause-conflict/> (Accessed on 01/08/17)

⁷² *Soil Erosion – Causes and Effects* www.omafra.gov.on.ca/english/engineer/facts/12-053.htm (Accessed on 01/08/17)

⁷³ A. Thompsell ‘Soil Erosion in Africa: Causes and Efforts to Control’ <https://www.thoughtco.com/soil-erosion-in-africa-43352> (Accessed on 01/08/17)

⁷⁴ G. E. K Ofomata *Soil Erosion in Nigeria: Views of a Geomorphologist* www.unn.edu.ng/wp-content/uploads/2015/09/No-7-Inaugural-Lecture.pdf (Accessed on 01/08/17)

⁷⁵ G. E. K Ofomata *Soil Erosion in Nigeria: Views of a Geomorphologist* www.unn.edu.ng/wp-content/uploads/2015/09/No-7-Inaugural-Lecture.pdf (Accessed on 01/08/17)

⁷⁶ G. E. K Ofomata *Soil Erosion in Nigeria: Views of a Geomorphologist* www.unn.edu.ng/wp-content/uploads/2015/09/No-7-Inaugural-Lecture.pdf (Accessed on 01/08/17)

⁷⁷ ‘Soil Erosion: Effect and Prevention’ study.com/academy/lesson/soil-erosion-effects-prevention.html (Accessed on 01/08/17)

⁷⁸ A. Thompsell ‘Soil Erosion in Africa: Causes and Efforts to Control’ <https://www.thoughtco.com/soil-erosion-in-africa-43352> (Accessed on 01/08/17)

⁷⁹ Abdulfatai, I. A., et al. "Review of Gully Erosion in Nigeria: Causes, Impacts and Possible Solutions." *Journal of Geosciences and Geomatics* 2.3 (2014): 125-129 <http://pubs.sciepub.com/jgg/2/3/8/> (Accessed on 01/08/17)

⁸⁰ G. E. K Ofomata *Soil Erosion in Nigeria: Views of a Geomorphologist* www.unn.edu.ng/wp-content/uploads/2015/09/No-7-Inaugural-Lecture.pdf (Accessed on 01/08/17)

It has been reported that anthropogenic climate forcing is the main cause of climate change⁸¹. This includes greenhouse gases, aerosols, and land surface changes. The increase in the Green House Gases (GHG i.e. CO₂, Methane, etc) since industrialization in the 1900s is the major cause of the ongoing global warming⁸². The increase has been attributed to a rise in the burning of fossil fuels, high population growth rates, increasing reliance on fossil fuel-driven growth technologies, and land use effects (particularly urbanization, agriculture and deforestation)⁸³. More than 80% of the world-wide energy demand is currently supplied by the fossil fuel including coal, oil or gas. it is therefore impossible to find alternative energy source in the short or medium term⁸⁴. The energy demand is simply too high. Further increases in GHG levels are expected in future, particularly as developing countries also become more industrialized.

3.1 GREENHOUSE GASES (GHGS)

Carbon dioxide (CO₂) constitutes 72% of the total greenhouse gas emitted, 18% Methane and 9% Nitrous oxide (N₂O)⁸⁵. Africa's contribution to the increase in GHGs is very small when compared to that of other more developed continents⁸⁶. Africa's contribution to increase in GHGs include the release of black carbon through gas flaring and bush burning, methane from waste (poor waste management), and many industrial activities⁸⁷. Deforestation also increases the amount of Carbon dioxide in the atmosphere, because when forests (which act as major carbon store) are cleared and the trees are either burnt or rot, the stored carbon is released as CO into the atmosphere.⁸⁸ Deforestation is considered to be one of the contributing factors to global climate change. Trees absorb greenhouse gases and carbon emissions⁸⁹. They produce oxygen and perpetuate the water cycle by releasing water vapour into the atmosphere⁹⁰.

The high volume of associated gas in Nigeria's light crude coupled with a poor history of investment in gas gathering and utilization infrastructure has made the elimination of gas flaring

⁸¹ IPCC 2007: Climate Change 2007; The Physical Science Basis Summary for Policymakers, Contribution of Working Group I to the Fourth Assessment Report of the IPCC

<https://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf> (Accessed on 01/08/17)

⁸² 'The main cause of global warming' <http://timeforchange.org/main-cause-of-global-warming-solutions> (Accessed on 01/08/17)

⁸³ 'The main cause of global warming' <http://timeforchange.org/main-cause-of-global-warming-solutions> (Accessed on 01/08/17)

⁸⁴ 'The main cause of global warming' <http://timeforchange.org/main-cause-of-global-warming-solutions> (Accessed on 01/08/17)

⁸⁵ *The major cause of global warming* <http://timeforchange.org/CO2-cause-of-global-warming> Accessed on 18/07/2017

⁸⁶ African Ministerial Council on the Environment (AMCEN), 2011: Addressing Climate Change Challenges in Africa; A Practical Guide Towards Sustainable Development
[archive.au.int/collect/oaucounc/import/.../EX%20CL%20471%20\(XIV\)%20_E.PDF](archive.au.int/collect/oaucounc/import/.../EX%20CL%20471%20(XIV)%20_E.PDF) (Accessed on 01/08/17)

⁸⁷ African Ministerial Council on the Environment (AMCEN), 2011: Addressing Climate Change Challenges in Africa; A Practical Guide Towards Sustainable Development
[archive.au.int/collect/oaucounc/import/.../EX%20CL%20471%20\(XIV\)%20_E.PDF](archive.au.int/collect/oaucounc/import/.../EX%20CL%20471%20(XIV)%20_E.PDF) (Accessed on 01/08/17)

⁸⁸ *Deforestation Adds More Atmospheric CO₂ than the Sum Total of Cars & Trucks on the World's Roads* November 14, 2012 <https://scitechdaily.com/deforestation-adds-more-atmospheric-co2-than-the-sum-total-of-cars-trucks-on-the-worlds-roads/> Accessed on 18/07/2017

⁸⁹ 'Americans are planting . . . TREES OF STRENGTH' <https://projects.ncsu.edu/project/treesofstrength/benefits.htm> (Accessed on 01/08/17)

⁹⁰ 'Americans are planting . . . TREES OF STRENGTH' <https://projects.ncsu.edu/project/treesofstrength/benefits.htm> (Accessed on 01/08/17)

difficult. The largest flaring operations occur in the Niger Delta region of Nigeria⁹¹. The entire Niger Delta area is therefore still covered with gas flares with the attendant pollution of our atmosphere by huge volumes of combustion gases.⁹²

The associated gas flared into the atmosphere contains Greenhouse gas, as well as other poisonous substances such as dioxins, benzene, toluene, nitrogen, and sulphur dioxide⁹³. These poisonous gases cause serious health problems such as cancer, asthma, blood disorder, chronic bronchitis, and respiratory illness to the people living near the gas flaring points.⁹⁴

The sulphur and nitrogen emitted from the flared gas cause acid rain, which adversely impact soil fertility, thereby reducing crop yield⁹⁵. The roofs of houses in the area are also susceptible to accelerated rusting because of the acid rain from the flared gas.⁹⁶ According to Nwankwo and Ogagarue,⁹⁷ waters in gas flaring environment contains higher concentration of harmful metals such as barium, cyanide, selenium, chromium, iron, manganese and copper, which have concentration levels above permissible limits by the World Health Organization.

Gas flaring negatively affects the human development of the people living near the flare points and exposes them to disease, low crop yield, environmental degradation and other socio-economic impacts.⁹⁸ Flaring of Carbon dioxide from oil companies and other industries is suspected to be the cause of black soot that took over Port Harcourt few months ago⁹⁹.

The problem of gas flaring is also an economic problem in Nigeria. Nigeria lost at least N217bn last year as oil and gas companies flared a total of 244.84 billion standard cubic feet of natural

⁹¹ Gas Flaring Emission Contributes to Global Warming Bruno GERVET Luleå University of Technology Luleå, https://www.ltu.se/cms_fs/1.5035!/gas%20flaring%20report%20-%20final.pdf (Accessed on 01/08/17)

⁹² Gas Flaring Emission Contributes to Global Warming Bruno GERVET Luleå University of Technology Luleå, https://www.ltu.se/cms_fs/1.5035!/gas%20flaring%20report%20-%20final.pdf (Accessed on 01/08/17)

⁹³ Gas Flaring Emission Contributes to Global Warming Bruno GERVET Luleå University of Technology Luleå, https://www.ltu.se/cms_fs/1.5035!/gas%20flaring%20report%20-%20final.pdf (Accessed on 01/08/17)

⁹⁴ C.N. Nwankwo and D.O. Ogagarue, “Effects of Gas Flaring on Surface and Groung Waters in Delta State Nigeria.” *Journal of Geology and Mining Research*. vol. 3 no.5, 131-136 (May 2011) . http://www.academicjournals.org/article/article1379761160_Nwankwo%20and%20Ogagarue.pdf (Accessed on 01/08/17)

⁹⁵ J. Ekpo & A. E. Obia ‘The role of gas flaring in the rapid corrosion of zinc roofs in the Niger Delta Region of Nigeria’ *The Environmentalist* December 2010, Volume 30, Issue 4, pp 347–352 <https://link.springer.com/article/10.1007/s10669-010-9292-7> (Accessed on 01/08/17)

⁹⁶ N., A. A. (2014). Impact of Gas-Flaring on the Quality of Rain Water, Groundwater and Surface Water in Parts of Eastern Niger Delta, Nigeria. *Journal of Geosciences and Geomatics*, 2(3), 114-119 <http://pubs.sciepub.com/jgg/2/3/6/> (Accessed on 01/08/17)

⁹⁷ C.N. Nwankwo and D.O. Ogagarue, “Effects of Gas Flaring on Surface and Groung Waters in Delta State Nigeria.” *Journal of Geology and Mining Research*. vol. 3 no.5, 131-136 (May 2011) . http://www.academicjournals.org/article/article1379761160_Nwankwo%20and%20Ogagarue.pdf (Accessed on 01/08/17)

⁹⁸ Friends of the Earth, “Gas Flaring in Nigeria” Media Briefing. 4. (October, 2004) <http://www.foei.org/resources/publications/publications-by-subject/climate-justice-energy-publications/gas-flaring-in-nigeria> (Accessed on 01/08/17)

⁹⁹ ‘Black Soot: Rivers Government Seals 3 Companies’ *Daily Post Nigeria* <https://www.dailypost.ng/2017/02/11/black-soot-rivers-government-seals-3-companies/> (Accessed on 01/08/17)

gas in that period, data from the Nigerian National Petroleum Corporation have shown.¹⁰⁰ Nigeria flares the second highest number of gas¹⁰¹.

3.2 LANDUSE CHANGES (DEFORESTATION)

Deforestation occurs when the tree and plant cover that binds the soil is removed or when trees and bushes are stripped away for fuelwood and timber or to clear land for cultivation¹⁰². It occurs when animals eat all grasses and erode topsoil with their cover¹⁰³. It occurs when intensive farming depletes the nutrients in the soil. Prolonged drought can also lead to desertification¹⁰⁴. Wind and water erosion aggravate the damage, carrying away topsoil and leaving behind a highly infertile mix of dust and sand. It is the combination of these factors that transforms degraded land into desert.

Rapid growth in population and urban sprawl are two of the major causes of deforestation. Apart from that, use of forest land for agriculture, animal grazing, harvest for fuelwood and logging are some of the other causes of deforestation. Deforestation contributes to global warming as decreased forest size puts carbon back into the environment. The World Wide Fund for Nature states that scientists estimate that a third of the world's arable land has been lost to deforestation since 1960¹⁰⁵

Deforestation, desertification, and urbanization remove the vegetative cover that absorbs the shortwave radiation, thereby, leading to global warming¹⁰⁶. Urbanization and Development is a main cause of these land-use changes in Africa. Drivers of deforestation include population growth, agricultural development, land-tenure security, and the governance of land-use change¹⁰⁷. People cut down trees for economic purpose: to expand cities, build houses, and create large-scale farming. According to the United Nations Environment Program (UNEP), firewood and charcoal alone provide more than 40 percent of energy used in Africa. The band of West African forests that once extended from Guinea to Cameroon is virtually gone¹⁰⁸. Deforestation has been most severe in Nigeria, where more than 410,000 hectares of forest are

¹⁰⁰ Nigeria lost N217bn to gas flaring in 2016 – NNPC *Punch Newspaper* <http://punchng.com/nigeria-lost-n217bn-gas-flaring-2016-nnpc/> (Accessed on 01/08/17)

¹⁰¹ U. Omoregie 'Sixty years of gas flaring in Nigeria: Flare-reduction implementation deficit' *Business Day Online* <https://www.businessdayonline.com/sixty-years-gas-flaring-nigeria-flare-reduction-implementation-deficit/> (Accessed on 01/08/17)

¹⁰² 'Desertification' <https://www.ifad.org/documents/10180/77105e91-6f72-44ff-aa87-eedb57d730ba> (Accessed on 01/08/17)

¹⁰³ 'Desertification' <https://www.ifad.org/documents/10180/77105e91-6f72-44ff-aa87-eedb57d730ba> (Accessed on 01/08/17)

¹⁰⁴ 'Desertification' <https://www.ifad.org/documents/10180/77105e91-6f72-44ff-aa87-eedb57d730ba> (Accessed on 01/08/17)

¹⁰⁵ <http://www.worldwidelife.org/threats/deforestation/> (Accessed on 01/08/17)

¹⁰⁶ K. Maynard & J.-F. Royer 'Effects of "realistic" land-cover change on a greenhouse-warmed African climate' *Climate Dynamics* April 2004, Volume 22, Issue 4, pp 343–358 <https://link.springer.com/article/10.1007/s00382-003-0371-z> Accessed on 18/07/2017

¹⁰⁷ State of the World's Forests 2016. Forests and agriculture: land-use challenges and opportunities. FAO. 2016. Rome. <http://www.fao.org/publications/sofo/2016/en/> (Accessed on 01/08/17)

¹⁰⁸ African Ministerial Council on the Environment (AMCEN), 2011: Addressing Climate Change Challenges in Africa; A Practical Guide Towards Sustainable Development [archive.auc.int/collect/oaucounc/import/.../EX%20CL%20471%20\(XIV\)%20_E.PDF](http://archive.auc.int/collect/oaucounc/import/.../EX%20CL%20471%20(XIV)%20_E.PDF) (Accessed on 01/08/17)

lost to desertification annually¹⁰⁹. The annual deforestation rate has increased from 2.7 percent of Nigeria's land from 1990-2000 to 3.3 percent in 2000-2005; and currently, less than 12.2 percent of Nigeria's land is forested¹¹⁰. In Tunisia, annual wood removals averaged 0.23 million m³ per year from 1990 to 2010 (varying from 0.11 million to 0.37 million m³ per year), about half of which was wood fuel¹¹¹. In Ghana, average annual wood removals increased from 17.1 million m³ in 1990–1994 to 25.2 million m³ per year in 1995–1999 and declined to 13.8 million m³ in 2007–2011¹¹². Most removals are for woodfuel. Ghana lost an average of 115,000 hectares of forest per year, which amount to 2 percent of the country's land¹¹³. In general, over the last 15 years, West Africa has lost almost 12 million hectares (two times the size of Togo) of tropical forest¹¹⁴; the annual deforestation rate is 1.17 percent of the total land per annum¹¹⁵. Even though, African forests constitute only 16 percent of the world's total, the deforestation rate in Africa is more than six times the world's average¹¹⁶. Changes in land-use may be major contributors to the persistence of the observed drought over the West African sub-region¹¹⁷.

3.3 MASSIVE WASTE GENERATION AND FLAWED WASTE MANAGEMENT:

A negative impact of high urbanization is massive waste generation (liquid, gaseous, industrial and domestic) and attendant management problems. This results in a threat to the quality of air for breathing and water for consumption. In general, there is a clear vicious circle linking high population growth, poverty and environmental degradation. S. Ahmed and S. Isaac¹¹⁸ attributes this problem to the lack of technological equipment to handle the high rate of waste generation. This makes poor waste management a serious problem in Africa. Most African cities and towns are bad examples of unplanned population growth¹¹⁹. Population growth has also put a lot of pressure on forests as the rising farming population seek for more land for survival.

¹⁰⁹ State of the World's Forests 2009. Forests and agriculture: Society, forests and forestry: adapting for the future FAO. 2009 Rome www.fao.org/docrep/011/i0350e/i0350e00.htm (Accessed on 01/08/17)

¹¹⁰ State of the World's Forests 2016. Forests and agriculture: land-use challenges and opportunities. FAO. 2016. Rome. <http://www.fao.org/publications/sofo/2016/en/> (Accessed on 01/08/17)

¹¹¹ State of the World's Forests 2016. Forests and agriculture: land-use challenges and opportunities. FAO. 2016. Rome. <http://www.fao.org/publications/sofo/2016/en/> (Accessed on 01/08/17)

¹¹² State of the World's Forests 2016. Forests and agriculture: land-use challenges and opportunities. FAO. 2016. Rome. <http://www.fao.org/publications/sofo/2016/en/> (Accessed on 01/08/17).

¹¹³ State of the World's Forests 2009. Forests and agriculture: Society, forests and forestry: adapting for the future FAO. 2009 Rome www.fao.org/docrep/011/i0350e/i0350e00.htm (Accessed on 01/08/17)

¹¹⁴ State of the World's Forests 2009. Forests and agriculture: Society, forests and forestry: adapting for the future FAO. 2009 Rome www.fao.org/docrep/011/i0350e/i0350e00.htm (Accessed on 01/08/17)

¹¹⁵ State of the World's Forests 2009. Forests and agriculture: Society, forests and forestry: adapting for the future FAO. 2009 Rome www.fao.org/docrep/011/i0350e/i0350e00.htm (Accessed on 01/08/17)

¹¹⁶ State of the World's Forests 2009. Forests and agriculture: Society, forests and forestry: adapting for the future FAO. 2009 Rome www.fao.org/docrep/011/i0350e/i0350e00.htm (Accessed on 01/08/17)

¹¹⁷ J. A. Omotosho and B. J. Abiodun, *A numerical study of moisture build-up and rainfall over West Africa. Meteorological Applications* 14: 209–225 cited in African Ministerial Council on the Environment (AMCEN), 2011: Addressing Climate Change Challenges in Africa; A Practical Guide Towards Sustainable Development [archive.au.int/collect/oaucounc/import/.../EX%20CL%20471%20\(XIV\)%20_E.PDF](http://archive.au.int/collect/oaucounc/import/.../EX%20CL%20471%20(XIV)%20_E.PDF) (Accessed on 01/08/17)

¹¹⁸ Ahmed and Isaac 'Assessing the Effects of Indiscriminate Disposal of Waste: A Case Study of the Keta Lagoon in the Volta Region of Ghana' *Journal of Biodiversity & Endangered Species* 2016, 4:2 DOI: 10.4172/2332-2543.1000170 Volume 4 • Issue 2 www.jd.com/wassessing-the-effects-of-indiscriminate-disposal-of-waste-a-case-study-of-the-keta-lagoon-in-the-volta-region-of-ghana-.pdf (Accessed on 01/08/17)

¹¹⁹ J. Chenal 'Capitalizing on Urbanization: The Importance of Planning, Infrastructure, and Finance for Africa's Growing Cities' Chapter 4 *Foresight Africa* 2016 https://www.brookings.edu/wp-content/uploads/2016/05/foresightafrica2016_ch4-1.pdf (Accessed on 01/08/17)

According to a World Bank Urban Development Series report, Africa currently produces just about 70 million tons of waste every year and with its rapid urbanization and growing economies, waste production in Africa will exceed 160 million tons by the year 2025.¹²⁰

Some of the wastes are very toxic to the environment. For instance, nylon and waste nylon decays very slowly and can take many years to biodegrade¹²¹. According to Biofina, plastic bottle spends 450 years in the ocean, before decomposition, while it can even take some bottles 1000 years to biodegrade¹²². It is estimated that by 2050, there will be more plastic in the sea than there are fishes¹²³. The methods of breaking nylon down in fire forms hazardous smoke and toxic fumes¹²⁴. Incinerating nylons to recover the high energy used to create them is not done very often because it is expensive, so they usually store up in oceans and land for the next generation to suffer their effect.

As the world's demand for plastic materials continues to grow, management of plastic waste will remain a global challenge. It has been estimated that between 4.8 and 12.7 million tons ended up in the ocean as a result of inadequate solid waste management.¹²⁵ These nylons increase risk of flooding when it blocks drainages.

Most forward-thinking countries have started thinking of how best to curb this waste issues. For instance, in the United Kingdom, every shop customer who wants a nylon pays 5 pence for it¹²⁶. This method has reduced the use of nylon in the United Kingdom and has made people more willing to recycle used nylon. Many African countries including Nigeria has not implemented such brilliant measures.

¹²⁰ Making Money From Trash – Meet Africa's Top 5 Entrepreneurs in the Waste Recycling Business <http://www.smallstarter.com/get-inspired/africa-top-5-entrepreneurs-in-the-waste-recycling-business/> (Accessed on 01/08/17)

¹²¹ B. Nwannekanma and V. Gbonegun 'Used plastics, nylon as Nigeria's environmental albatross' *Guardian Newspaper* 10 June 2017 <https://guardian.ng/saturday-magazine/used-plastics-nylon-as-nigerias-environmental-albatross/> (Accessed on 01/08/17)

¹²² B. Nwannekanma and V. Gbonegun 'Used plastics, nylon as Nigeria's environmental albatross' *Guardian Newspaper* 10 June 2017 <https://guardian.ng/saturday-magazine/used-plastics-nylon-as-nigerias-environmental-albatross/> (Accessed on 01/08/17)

¹²³ · J. Aldred 'Photographer Turns 10,000 Plastic Bottles Into An Ocean For This Mermaid Shoot' December 12, 2016 <http://www.diyphotography.net/photographer-turns-10000-plastic-bottles-ocean-mermaid-shoot/> (Accessed on 01/08/17)

¹²⁴ B. Nwannekanma and V. Gbonegun 'Used plastics, nylon as Nigeria's environmental albatross' *Guardian Newspaper* 10 June 2017 <https://guardian.ng/saturday-magazine/used-plastics-nylon-as-nigerias-environmental-albatross/> (Accessed on 01/08/17)

¹²⁵ J. Jambeck, et. el. 'Plastic waste inputs from land into the ocean'. *Science*, 347(6223), 768-771. <http://science.sciencemag.org/content/347/6223/768.full-text.pdf+html> Cited in UNEP (2016). (Accessed on 01/08/17) UNEP Frontiers 2016 Report: Emerging Issues of Environmental Concern. United Nations Environment Programme, Nairobi. http://www.unep.org/frontiers/sites/unep.org.frontiers/files/documents/unep_frontiers_2016.pdf (Accessed on 01/08/17)

¹²⁶ 'England's plastic bag usage drops 85% since 5p charge introduced' <https://www.theguardian.com/environment/2016/jul/30/england-plastic-bag-usage-drops-85-per-cent-since-5p-charged-introduced> (Accessed on 01/08/17)

3.4 LAND RECLAMATION FROM SEA¹²⁷ -

Development and urbanization in African has gotten to the level where African states are taking up high risk developmental projects that affect the environment. In Lagos State in Nigeria, land reclamation is generally practiced¹²⁸. There is still disagreement as to whether this government land reclamation caused the recent flood in Lagos, or other environmental impact of such reclamation.¹²⁹

O, Irabor, an environmentalist, said he saw nothing wrong with the exercise. He said this: ‘I see nothing wrong in sand filling or perhaps reclaiming land from the sea. If done in an organised manner, I believe no body will complain. But when it becomes rampant and reckless, the people must resist it because usurping natural settings could be disastrous in the long run,’¹³⁰

Kaine Amikpume, a professor of Geography was quoted to have said thus:

I understand what the state government is going through in trying to meet up with population explosion, but the future of those you are trying to cater for should not be endangered by the same process. What I am saying here is that if there are alternatives to sand filling, they should be explored so as to prevent the long term effect.¹³¹

3.5 POLLUTION FROM OIL EXPLORATION

Exploration and production of petroleum in Nigeria leads to massive pollution. There is the recurring threat of pollution from normal exploration and production activities such as leakages from pipelines and production platforms¹³². Militancy in the Niger Delta region has further aggravated this threat as oil thieves now burst into pipelines leaving thousands of barrels of crude oil to flow into the swamps and creeks¹³³. The rickety and leaking barges with which the thieves transport their loot also spill huge volumes of crude oil in their trail.

The Nigerian economy is largely dependent on the oil and gas sector, which accounts for about 95% of its foreign exchange earnings, 40% of its GDP, and 75% of federal government total

¹²⁷ ‘Land Reclamation Safety Concerns Sand Filled Lagos’ *Vanguard Newspaper* of 16th July 2014 <http://www.vanguardngr.com/2014/07/land-reclamation-safety-concerns-sand-filled-lagos/> Accessed on 18/07/2017(Accessed on 01/08/17)

¹²⁸ ‘Lagos Land Reclamation Reforms Yield Positive Results’ <https://lagosstate.gov.ng/blog/2017/05/23/lagos-land-reclamation-reforms-yield-positive-results/> (Accessed on 01/08/17)

¹²⁹ ‘Land Reclamation Safety Concerns Sand Filled Lagos’ *Vanguard Newspaper* of 16th July 2017 <http://www.vanguardngr.com/2014/07/land-reclamation-safety-concerns-sand-filled-lagos/> (Accessed on 01/08/17)

¹³⁰ ‘Lagos Flooding Environmentalists Call Urgent Intervention’ *Vanguard Newspaper* of 10th July 2017 <http://www.vanguardngr.com/2017/07/lagos-flooding-environmentalists-call-urgent-intervention/> (Accessed on 01/08/17)

¹³¹ ‘Land Reclamation Safety Concerns Sand Filled Lagos’ *Vanguard Newspaper* of 16th July 2014 <http://www.vanguardngr.com/2014/07/land-reclamation-safety-concerns-sand-filled-lagos/> Accessed on 18/07/2017(Accessed on 01/08/17)

¹³² See S. Ogundipe ‘Rivers Government Probes Source of Toxic Smog’ *Premium Times* <https://www.google.com.ng/amp/www.premiumtimesng.com/regional/south-south-regional/223088-rivers-govt-probes-sources-toxic-smog.html/amp> (Accessed on 01/08/17)

¹³³ ‘ANALYSIS: Niger Delta bomb attacks: The search for motives’ *Premium Times* of November 27, 2016 <http://www.premiumtimesng.com/business/business-data/216485-analysis-niger-delta-bomb-attacks-search-motives.html> (Accessed on 01/08/17)

revenue.¹³⁴ This has made government to initiate policies and regulatory framework to attract more investment, guarantee increased production and ensure increase in revenue. This has also made the government of Nigeria condone gas flaring.

Oil pollution can be caused by human error, breakdown of equipment, Natural disasters, Deliberate Acts, Illegal dumping etc¹³⁵This year alone, Shell Nigeria has recorded oil spill in its facilities more than 20 times, the latest being the oil spill on 15th June 2017 at Imo River 3 Well 22S Flowline at Igiriukwu Owaza¹³⁶.

The actual extent of the ecological disaster in the Niger Delta used to be uncertain¹³⁷. A 2006 assessment by the Nigeria Government through the Federal Ministry of Environment assisted by non-governmental organizations estimates that oil spilled in the Niger Delta over the past fifty years is in the range of nine million to thirteen million barrels¹³⁸. Nigerian government thereafter commissioned the United Nations Environment Programme (UNEP) to carry out an Environmental Assessment Study of the oil-impacted sites in Ogoniland¹³⁹. UNEP eventually commenced the Environmental Assessment of Ogoniland, which lasted from 2009-2011.¹⁴⁰ The report recommended collaboration with government and oil companies to clean up Ogoni Land.

In 2014 Nigerian government initiated steps towards implementing the UNEP Report¹⁴¹. The Federal Government then launched the clean up exercise on June 2nd 2016¹⁴². However, Ogoni people have stated that a year after this launching, no work is going on towards cleaning the land.¹⁴³

¹³⁴ ‘Nigeria Oil Income dips’ *Vanguard Newspaper* <http://www.vanguardngr.com/2016/04/nigeria-oil-income-dips-44-n3-8trn/> (Accessed on 01/08/17)

¹³⁵ ‘Oil Spillage in Nigeria: Causes and Solution’ March 11, 2017 <http://educacinfo.com/oil-spillage-nigeria-2/>

¹³⁶ <http://www.shell.com.ng/sustainability/environment/oil-spills/july-2017.html> (Accessed on 01/08/17)

¹³⁷ Amb. John Campbell ‘Oil Pollution in the Niger Delta: Whose Fault?’ *The World Post HuffPost* (undated) http://www.huffingtonpost.com/amb-john-campbell/oil-pollution-in-the-nige_b_684608.html (Accessed on 01/08/17)

¹³⁸ Amb. John Campbell ‘Oil Pollution in the Niger Delta: Whose Fault? The World Post HuffPost (undated) http://www.huffingtonpost.com/amb-john-campbell/oil-pollution-in-the-nige_b_684608.html(Accessed on 01/08/17)

¹³⁹ ‘Ogoniland Cleanup’ Federal Ministry of Environment Website <http://environment.gov.ng/ogoni.html> (Accessed on 01/08/17)

¹⁴⁰ ‘Ogoniland Cleanup’ Federal Ministry of Environment Website <http://environment.gov.ng/ogoni.html> (Accessed on 01/08/17)

¹⁴¹ ‘Ogoniland Cleanup’ Federal Ministry of Environment Website <http://environment.gov.ng/ogoni.html> (Accessed on 01/08/17)

¹⁴² ‘Osinbajo flags off Ogoni cleanup after Buhari cancelled trip’ *Premium Times* June 2, 2016 <http://www.premiumtimesng.com/news/headlines/204564-osinbajo-flags-off-ogoni-cleanup-after-buhari-cancelled-trip.html> <http://environment.gov.ng/ogoni.html> (Accessed on 01/08/17)

¹⁴³ ‘Ogoni cleanup: We’re disappointed, nothing’s happening – Ken Saro-Wiwa Associates’ *Vanguard Newspaper* of June 13, 2017 <http://www.vanguardngr.com/2017/06/ogoni-cleanup-disappointed-nothings-happening-ken-saro-wiwa-associates/> (Accessed on 01/08/17)

3. RESPONSE BY AFRICAN COUNTRIES

At the regional level, such initiatives include African Ministerial Conference on Environment (AMCEN)¹⁴⁴, the Framework of Southern and Northern Africa Climate Change Programmes¹⁴⁵, and the East African Community Climate Change Policy. A few countries in Africa have also developed frameworks and strategies to address national climate change challenges. At the same time, there are four main climate related centres in Africa. These centres include the African Centre for Meteorological Applications for Development (ACMAD), the Agro-serving as WMO Regional Climate Centres (RCCs) for Africa for down scaling of products from WMO Global Producing Centres (GPCs) in the developing regional specific areas¹⁴⁶.

These policies and collaborations notwithstanding, the main things that have helped the protection of the environment in Africa is not really the participation of government but the attitude and participation of private individuals in environmental protection through innovations. Furthermore, the constitutional right to the environment has been protected by courts through various decisions thereby making it impossible for government in some African countries to carry out acts that degrade the environment.

4.1 ROLE OF COURTS AND CONSTITUTIONAL RIGHT TO CLEAN ENVIRONMENT

Most African countries have enshrined in their Constitutions, the right to good environment. Section 24 of the Constitution of the Republic of South Africa provides thus:

Everyone has the right:

- (a) To an environment that is not harmful to their health or wellbeing; and
- (b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: (i) Prevent pollution and ecological degradation; (ii) Promote conservation; and (iii) Secure ecologically-sustainable development and use of natural resources while promoting justifiable economic and social development.

Section 36(9) of Constitution of the Republic of Ghana 1992 provides that one of the Directive Principle of State Policy in Ghana includes taking appropriate measures needed to protect and safeguard the national environment for posterity and to seek cooperation with other states and bodies for purpose of protecting wide environment for mankind. Section 41 of the Constitution makes it the duty on citizens of Ghana to protect and safeguard the environment.¹⁴⁷

In interpreting these sections of the various constitutions, the courts have leaned towards the preservation of the environment and protection of right of individuals to a clean environment.

¹⁴⁴ <http://amcen.eaaa.gov.eg/en-us/home.aspx> (Accessed on 01/08/17)

¹⁴⁵ http://www.sadc.int/files/4813/5293/3518/Southern_Africa_Framework_of_Subregional_Climate_Change_Programmes.pdf. (Accessed on 01/08/17)

¹⁴⁶ <https://www.uneca.org/acpc> (Accessed on 01/08/17)

¹⁴⁷ See also, Section 73 Zimbabwe Constitution, Section 42 of Kenyan Constitution, Section 20 of the Nigerian Constitution among others.

In *Jonah Gbemre v Shell Petroleum Development Company Nigeria Limited (SPDC) LTD & ORS*¹⁴⁸ the Federal High Court held that the actions of the SPDC and other respondents in continuing to flare gas in the course of their oil exploration and production activities in the applicants' community is a gross violation of the applicant's fundamental right to life (including healthy environment) and dignity of human person as guaranteed by sections 33 and 34 of the Constitution of the Federal Republic of Nigeria, 1999. The court held that these constitutionally guaranteed rights inevitably include the right to clean, poison-free, pollution-free healthy environment.

The court further held that failure of the SPDC and other respondents to carry out environmental impact assessment in the applicants' community concerning the effects of their gas flaring activities is a clear violation of section 2(2) of the Environmental Impact Assessment Act¹⁴⁹ and has contributed to a further violation of the said fundamental rights.

In *Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province and Others*,¹⁵⁰ the South African Constitutional Court dealt with the nature and scope of the environmental authority's obligation to consider the social, economic and environmental impact of a proposed project. The court held that socio-economic development had to be balanced against environmental protection. The court stated thus: "Promotion of development requires the protection of the environment. Yet the environment cannot be protected if development does not pay attention to the costs of environmental destruction. The environment and development are thus inexorably linked"¹⁵¹.

*BP Southern Africa (Pty) Limited v Mec for Agriculture, Conservation, Environment & Land Affair*¹⁵² concerns the refusal of a provincial authority to authorise the construction of a filling station in terms of the Environment Conservation Act¹⁵³. After considering the statutorily prescribed environmental impact assessment procedure, the environmental authority turned down the application by BP Southern Africa (Pty) Limited. The Environmental authority based its decision on various decision-making guidelines some of which were of a socio-economic nature as opposed to a strictly environmental nature. The applicant was of the view that the authority's mandate was limited to a consideration of environmental issues. The authority, on the other hand, relied on the constitutional environmental right and National Environmental Management Act (NEMA) to argue that its mandate extended to cover both socioeconomic and environmental issues. In deciding this case, the court confirmed that environmental authorities had a constitutional duty to give effect to section 24 and this duty included the 'taking of reasonable

¹⁴⁸ *Gbemre v Shell Petroleum Development Company Nigeria Limited and Others* (2005) AHRLR 151 (NgHC 2005) <http://www.chr.up.ac.za/index.php/browse-by-subject/418-nigeria-gbemre-v-shell-petroleum-development-company-nigeria-limited-and-others-2005-ahrlr-151-nghc-2005.html> (Accessed on 01/08/17)

¹⁴⁹ Cap E12 vol 6, Laws of the Federation of Nigeria 2004

¹⁵⁰ (CCT67/06) [2007] ZACC 13; 2007 (10) BCLR 1059 (CC); ; 2007 (6) SA 4 (CC) (7 June 2007) <http://www.saflii.org/za/cases/ZACC/2007/13.html> (Accessed on 01/08/17)

¹⁵¹ (CCT67/06) [2007] ZACC 13; 2007 (10) BCLR 1059 (CC); ; 2007 (6) SA 4 (CC) (7 June 2007) <http://www.saflii.org/za/cases/ZACC/2007/13.html> (Accessed on 01/08/17)

¹⁵² (03/16337) [2004] ZAGPHC 18 (31 March 2004) <http://www.saflii.org/za/cases/ZAGPHC/2004/18.html> . (Accessed on 01/08/17)

¹⁵³ 73 of 1989 ('the ECA')

legislative and other measures' — in the design and application of decision-making guidelines¹⁵⁴. The court reiterated that apart from being reasonable, these measures must also contribute to the sustainable development in South Africa. Accordingly, the court approved of the environmental authority's decision to refuse the environmental authorization sought in this matter.

In *HTF Developers v Minister of Environmental Affairs and Tourism and Others*¹⁵⁵, the applicant had secured approval from the local government for the subdivision and development of residential units on an untransformed ridge comprising of a sensitive environment. The applicant commenced with the clearing and conducting of earthworks on the site in preparation for the proposed development. In response to complaints received from the public, the provincial authority directed that the applicant should immediately cease its clearing/construction activities on the site, and design and implement a plan for the land's rehabilitation. The authority argued that the applicant's activities on the site were illegal, since it had failed to secure the necessary provincial authorization prior to commencing its activities on a virgin land. The applicant challenged the legality of the directive, inter alia, on the basis that the activity was not covered by existing regulations. In interpreting and applying the relevant legislation and policies, the court explained that the environmental right consists of two parts. In relation to section 24(a), the court stated that it guarantees the fundamental right of everyone to an environment that is not harmful to their health or well-being. The court also stated that section 24(b) imposes a positive obligation on the state to protect the environment. According to the court, section 24(b) of South African Constitution confers in authorities a stewardship role while the present generation is the custodian or trustee of the environment for future generations

4.2 POLICY ON DEFORESTATION AND FORESTATION –

In Africa, 13 countries experienced a net increase in forest area in the period 1990–2015¹⁵⁶. Policy documents on deforestation provide for protection of the environment, active forestation and funding research on forestry. The most interesting thing about forestation and other efforts at combating desertification/deforestation in Africa is that private individuals are now leading the efforts without waiting for government input. For example, The New York Times reported thus about Niger Republic:

Better conservation and improved rainfall have led to at least 7.4 million newly tree-covered acres in Niger, researchers have found, achieved largely without relying on the large-scale planting of trees or other expensive methods often advocated by African politicians and aid groups for halting desertification, the process by which soil loses its fertility¹⁵⁷.

¹⁵⁴ (03/16337) [2004] ZAGPHC 18 (31 March 2004) <http://www.saflii.org/za/cases/ZAGPHC/2004/18.html> . (Accessed on 01/08/17)

¹⁵⁵ (337/06) [2007] ZASCA 37; [2007] 4 All SA 1108 (SCA); 2007 (11) BCLR 1230 (SCA) (28 March 2007) <http://www.saflii.org/za/cases/ZASCA/2007/37.html> (Accessed on 01/08/17)

¹⁵⁶ Global Forest Resources Assessment 2015 How are the world's forests changing? Second edition Food And Agriculture Organization Of The United Nations Rome, 2016 www.fao.org/3/a-i4793e.pdf (Accessed on 01/08/17)

¹⁵⁷ L. Polgreen 'In Niger, Trees and Crops Turn Back the Desert' FEB. 11, 2007 <http://www.nytimes.com/2007/02/11/world/africa/11niger.html> (Accessed on 01/08/17)

It was discovered that this increase in afforestation in Niger Republic was caused by implementation of the 2004 Forest Code¹⁵⁸. The 2014 Code emphasised rights of individuals to forest produce and removed the former penal consequence of use of forest resources by individuals. This made Nigeriens more interested in guarding the forest and planting to increase the forest resources.¹⁵⁹

In Kenya Forested areas, comprising forest reserves, national parks and sanctuaries are all state-owned and represent less than three percent of the territory¹⁶⁰. According to Kenya Forest Act¹⁶¹ Forest land is a designated and legally gazetted forest estate governed by the provisions of the Act. All other land comes under the regulations and usages of either customary law (e.g. communally owned forests), or private tenure regimes (e.g. privately owned forests). The Kenya Forestry Master Plan (KFMP) stressed the on-farm contribution of trees, which provide wood and poles for construction, fence posts, fuelwood and charcoal, not to mention fruit, fodder, medicines, gums and resin, all for home consumption and/or sale¹⁶². This made individuals more interested in reaping resources from trees on the farm than in felling the trees for economic purpose.

In 2013, the Lembus Council of Elders in Kenya sued the Kenya Forest Services challenging the permission to fell trees given to a timber merchant in *Joseph Leboo & 2 Ors v. Director Kenya Forest Services & Anor*¹⁶³. The challenge was because there was no environmental impact assessment done before the grant and the grant did not follow due process¹⁶⁴. On an application for an injunction in the matter, the Environment and Land Court sitting at Eldoret Kenya presided over by Justice Munyao Sila, on October 1st 2013 held that private citizens in Kenya have the right to a clean environment¹⁶⁵. The court granted an injunction restraining the Kenya Forest Services from permitting the harvesting of trees from certain Blocks of Forests because the permission did not follow due procedure and no environmental impact assessment was done before granting it.

Lagos State in Nigeria has a law/policy on flower and tree planting. The Lagos State Parks and Garden agency (LASPARK) Law¹⁶⁶ makes it mandatory for Lagos residents to beautify the perimeters of their houses. It also stipulates a fine of N250,000 or six months imprisonment or other non-custodian sentences for violators¹⁶⁷. Similarly, the law provides a N50,000 fine against

¹⁵⁸ ‘Rights To Trees And Livelihoods In Niger – Niger’ Focus on Land in Africa <https://agriknowledge.org/downloads/x346d4190> (Accessed on 01/08/17)

¹⁵⁹ ‘Rights to Trees and Livelihoods in Niger’ <http://www.focusonland.com/countries/rights-to-trees-and-livelihoods-in-niger/> (Accessed on 01/08/17)

¹⁶⁰ ‘Trees outside forests: Kenya’ J. Legilisho-Kiyapi <http://www.fao.org/docrep/005/Y2328E/y2328e19.htm> (Accessed on 01/08/17)

¹⁶¹ Forests Act No. 7 Laws of Kenya of 2005

¹⁶² ‘Trees outside forests: Kenya’ J. Legilisho-Kiyapi <http://www.fao.org/docrep/005/Y2328E/y2328e19.htm> (Accessed on 01/08/17)

¹⁶³ [2013] eKLR <http://kenyalaw.org/caselaw/cases/view/92434/> (Accessed on 01/08/17)

¹⁶⁴ [2013] eKLR <http://kenyalaw.org/caselaw/cases/view/92434/> (Accessed on 01/08/17)

¹⁶⁵ [2013] eKLR <http://kenyalaw.org/caselaw/cases/view/92434/> (Accessed on 01/08/17)

¹⁶⁶ Ch. L. 51 Laws of Lagos State of Nigeria 2015 Read more at: <http://www.vanguardngr.com/2012/10/new-environmental-law-lagosians-say-its-good-and-bad/> (Accessed on 01/08/17)

¹⁶⁷ Section 24 and Payment Schedule for Penalty LASPARK

felling of trees without permission¹⁶⁸. Federal Government of Nigeria is considering making the law a federal law¹⁶⁹.

4.3 BETTER TOWN PLANNING AND WASTE MANAGEMENT- URBANIZATION BRINGS DEFORESTATION, WASTE MANAGEMENT ISSUES, EMISSION OF GREENHOUSE GAS ETC.

In Nigeria, the constitutional competence to make laws on town planning is vested in the State Governments¹⁷⁰. This means that the different states in Nigeria make various plans for their urban city development. Experts have continued to call on Nigerian governments to make laws on town planning bearing in mind the problems of environmental degradation in Nigeria¹⁷¹. This has remained a discussion in Nigeria, but no meaningful progress has been shown to follow this statements.¹⁷²

The constitutional competence on waste disposal rests on the Local Governments in line with item 1(h) of the fourth schedule to the Constitution.¹⁷³ In *Chrinan Investment Limited(Suing on Behalf of IPMAN Aba Branch) v Abia State Environmental Protection Agency And Hon. Attorney-General & Commissioner for Justice Abia State*¹⁷⁴ the court declared some parts of the Abia State Basic Environmental Law, 2004 unconstitutional because they were inconsistent with Section 7 and schedule 4 of the Constitution. The Court also declared that: “The constitutional responsibility of carrying out the function of the refuse and sewage disposal resides in the Local Government Council and not in Abia State Government.”

Apart from recent efforts by federal government in Nigeria to recycle waste, there is no clear programme or policy on how to manage the waste¹⁷⁵. Currently, Bauchi State is the only state in Nigeria reported to have recycle plant for plastic and nylon.¹⁷⁶

¹⁶⁸ Section 24 LASPARK

¹⁶⁹ ‘FG To Ban Felling Of Trees To Avert Desertification’ *Channels Tv* October 26, 2016 <http://www.channelstv.com/2016/10/26/fg-to-ban-felling-of-trees-to-avert-desertification/> (Accessed on 01/08/17)

¹⁷⁰ See *Attorney-General of Lagos State v Attorney General of the Federation* (2003) LPELR – 620(SC)

¹⁷¹ ‘Comply with Climate Change Laws in Town Planning’ *The Nations* of 18 Feb. 2014 <http://thenationonline.net/comply-with-climate-change-laws-in-town-planning/> (Accessed on 01/08/17)

¹⁷² ‘Climate change can be managed through Town Planning Laws – Ayade’ *Vanguard Newspaper* of November 24, 2016 <http://www.vanguardngr.com/2016/11/climate-change-can-be-managed-through-town-planning-laws-ayade/> (Accessed on 01/08/17)

¹⁷³ *Jude Nwabuzor & 24 Ors V Nnaemeka Orji & 3 Ors* (UNREPORTED) SUIT NO: A/194/2011 delivered on January 22, 2013. *Chrinan Investment Limited(Suing on Behalf of IPMAN Aba Branch) V. Abia State Environmental Protection Agency And Hon. Attorney-General & Commissioner for Justice Abia State* (UNREPORTED) SUIT NO H8B/10/2008 delivered on July 22, 2008

¹⁷⁴ (UNREPORTED) SUIT NO H8B/10/2008 delivered on July 22, 2008

¹⁷⁵ Federal Government Launches A National Waste - To- Wealth Programme June 2017 <http://www.scienceandtech.gov.ng/index.php/about-us/80-departments/323-federal-government-launches-a-national-waste-to-wealth-programme> (Accessed on 01/08/17)

‘FG To Establish Waste Management Plant In Benue – Minister’ *Leadership Newspaper* of June 19, 2017 <http://leadership.ng/2017/06/19/fg-establish-waste-management-plant-benue-minister/> (Accessed on 01/08/17)

¹⁷⁶ *Guardian Newspaper* <https://guardian.ng/saturday-magazine/used-plastics-nylon-as-nigerias-environmental-albatross/> Accessed on 18/07/2017

This lack of policy on waste management has however created African entrepreneurs who convert the waste to wealth for profits. Bilikiss Adebisi Abiola, a Nigerian, is the CEO and co-founder of Wecyclers, a for-profit social enterprise that uses low-cost cargo bicycles called “wecycles” to provide convenient recycling services to households in Lagos by using an SMS-based incentives system.¹⁷⁷

Thato Kgathanye & Rea Ngwane founded Repurpose School bags which provides recycled and low-cost school bags from recycled plastic waste¹⁷⁸. These “upcycled” plastic bags have a solar panel, which charges as the children walk to and back from school and provides lightening at night for students to do their homework without candles. The bags also have strips of reflective material, an added safety design to make the children more visible to traffic in the early hours.¹⁷⁹ This helps students to do more school work, saves the environment and saves money which could have been spent on candles.

Andrew Mupuya from Uganda founded YELI, Uganda’s first paper bag production company in 2008 when the Ugandan government put a ban on the use of plastic bags in order to reduce the environmental damage it was causing.¹⁸⁰

Bethlehem Tilahun Alemu of Ethiopia through his business outfit SoleRebels makes footwear using locally-sourced and recycled materials like old car tyres, discarded clothes and hand-loomed organic fabrics¹⁸¹. She uses experienced and highly-skilled local craftsmen to transform these recycled products into world-class footwear products.¹⁸²

Lorna Rutto from Kenya uses her business outfit EcoPost, to recycle plastic waste collected from dumpsites and garbage cans across Nairobi to manufacture fencing posts¹⁸³. These posts, which

¹⁷⁷ *Making Money From Trash – Meet Africa’s Top 5 Entrepreneurs in the Waste Recycling Business* <http://www.smallstarter.com/get-inspired/africa-top-5-entrepreneurs-in-the-waste-recycling-business/> (Accessed on 01/08/17)

¹⁷⁸ *Making Money From Trash – Meet Africa’s Top 5 Entrepreneurs in the Waste Recycling Business* <http://www.smallstarter.com/get-inspired/africa-top-5-entrepreneurs-in-the-waste-recycling-business/>

¹⁷⁹ *Making Money From Trash – Meet Africa’s Top 5 Entrepreneurs in the Waste Recycling Business* <http://www.smallstarter.com/get-inspired/africa-top-5-entrepreneurs-in-the-waste-recycling-business/> (Accessed on 01/08/17)

¹⁸⁰ *Making Money From Trash – Meet Africa’s Top 5 Entrepreneurs in the Waste Recycling Business* <http://www.smallstarter.com/get-inspired/africa-top-5-entrepreneurs-in-the-waste-recycling-business/> (Accessed on 01/08/17)

¹⁸¹ *Making Money From Trash – Meet Africa’s Top 5 Entrepreneurs in the Waste Recycling Business* <http://www.smallstarter.com/get-inspired/africa-top-5-entrepreneurs-in-the-waste-recycling-business/> (Accessed on 01/08/17)

¹⁸² *Making Money From Trash – Meet Africa’s Top 5 Entrepreneurs in the Waste Recycling Business* <http://www.smallstarter.com/get-inspired/africa-top-5-entrepreneurs-in-the-waste-recycling-business/> (Accessed on 01/08/17)

¹⁸³ *Making Money From Trash – Meet Africa’s Top 5 Entrepreneurs in the Waste Recycling Business* <http://www.smallstarter.com/get-inspired/africa-top-5-entrepreneurs-in-the-waste-recycling-business/> (Accessed on 01/08/17)

are used to fence houses and forest reserves, are fast becoming a preferred alternative to timber.¹⁸⁴

4.4 GAS UTILIZATION POLICY-

This is best explained with Nigeria's efforts at curbing gas flaring. The Petroleum (Drilling and Production) Regulations,¹⁸⁵ made pursuant to the Petroleum Act 1969 provides that the Licensee or lessee of an Oil Mining License (OML) shall not later than five years after the commencement of production, submit to the Minister of Petroleum Resources, a feasibility study, program, or proposals that it may have for the utilization of any natural gas that has been discovered in the relevant area.¹⁸⁶ Although the regulation require oil companies to submit their strategies for gas utilization, the provision was not seen to be mandatory and no penalty was provided for defaulters¹⁸⁷. The regulation also allowed producers to flare gas for a period of five years before submitting the feasibility study.

In 1979 Nigeria enacted the Associated Gas Re-Injection Act (AGRA)¹⁸⁸. The Act imposes a duty on oil and gas companies to submit, not later than April 1st 1980, a preliminary program providing for schemes for the viable utilization of all associated gas produced from a field, and projects to re-inject all non- utilized associated gas in an industrial project, notwithstanding the provisions of Regulation 42.¹⁸⁹ Thus, this section transformed Regulation 42 into a mandatory provision. The Act also makes it illegal for any oil and gas company to flare gas after January 1st 1984, without the written permission of the Minister.¹⁹⁰ The penalty was forfeiture of concession and the Minister's discretion to order the withholding of all or part of any entitlement of an offender.¹⁹¹ The Act however also empowers the Minister to issue a certificate specifying such terms and conditions for the continued flaring of gas in a particular field, if the Minister is satisfied that gas re-injection is not feasible.¹⁹² In addition, this reserves the right of the Government to take gas at the flare free of cost¹⁹³.

The huge financial resources required for gas re-injection and the inability of the Government to meet their financial obligations in the various joint ventures, coupled with the lack of required infrastructural facility, and the insistence by the oil and gas companies of their inability to meet

¹⁸⁴ *Making Money From Trash – Meet Africa's Top 5 Entrepreneurs in the Waste Recycling Business* <http://www.smallstarter.com/get-inspired/africa-top-5-entrepreneurs-in-the-waste-recycling-business/> (Accessed on 01/08/17)

¹⁸⁵ The Regulations are made pursuant to Section 9 of the Petroleum Act.

¹⁸⁶ Regulation 42.

¹⁸⁷ D. Otiotio 'Gas Flaring Regulation In The Oil And Gas Industry: A Comparative Analysis of Nigeria and Texas Regulations'. https://www.academia.edu/3615407/GAS_FLARING_REGULATION_IN_THE_OIL_AND_GAS_INDUSTRY_A_Comparative_Analysis_of_Nigeria_and_Texas_Regulations (Accessed on 01/08/17)

¹⁸⁸ Decree No. 99 of 1979. (Cap. A.25 LFN 2004)

¹⁸⁹ Section 1(a) & (b) Associated Gas Re-Injection Act (AGRA) .

¹⁹⁰ Section3(1) Associated Gas Re-Injection Act (AGRA).

¹⁹¹ Section4(1) & (2) Associated Gas Re-Injection Act (AGRA).

¹⁹² Section 3(2) Associated Gas Re-Injection Act (AGRA).

¹⁹³ D. Otiotio 'Gas Flaring Regulation In The Oil And Gas Industry: A Comparative Analysis of Nigeria and Texas Regulations'. https://www.academia.edu/3615407/GAS_FLARING_REGULATION_IN_THE_OIL_AND_GAS_INDUSTRY_A_Comparative_Analysis_of_Nigeria_and_Texas_Regulations (Accessed on 01/08/17)

the 1984 deadline,¹⁹⁴ led to the promulgation of the Associated Gas Re-Injection (Continued Flaring of Gas) Regulation.¹⁹⁵ The Associated Gas Re-Injection (Continued Flaring Of Gas) Regulations 1985, which commenced on January 1st, 1985, gave more powers to the Minister under certain conditions to issue a certificate to oil companies for continue flaring of gas under section 3(2) of the Associated Gas Re-Injection Act.

The Act and the attendant regulations could not be enforced, and gas flaring continued unabated in the country, thus prompting the government to amend the Act by resorting to an economic enforcement mechanism.¹⁹⁶ The Associated Gas Re-Injection (Amendment) Act,¹⁹⁷ introduced a penalty of two kobo per 1000 standard cubic feet (scf) of gas flared at any place authority to flare was not granted¹⁹⁸. This amount was increased to fifty kobo per 1000 standard cubic feet of gas in 1990, and the amount was further increased in 1998 to ten Naira per 1000 standard cubic feet of gas¹⁹⁹. The penalty amount has been further increased in 2008 to \$3.50 per 1000 standard cubic feet of gas flared²⁰⁰. The international oil companies are disposed to paying the meager penalty to flare the gas which is comparatively cheaper than utilizing the gas.²⁰¹

In 1991 /1992, the Government, in consultation with international oil companies, introduced the Associated Gas Framework Agreement (AGFA),²⁰² which served as a broad based fiscal

¹⁹⁴ Akaakar, F.O., "The Law and Natural Gas Development in Nigeria," in Natural Gas: The Energy for the Next Millennium. Proceeding of the 29th Annual Conference of the Nigerian Society of Chemical Engineers, 201-210 (November, 1999). Cited in D. Otiotio 'Gas Flaring Regulation In The Oil And Gas Industry: A Comparative Analysis of Nigeria and Texas Regulations'. https://www.academia.edu/3615407/GAS_FLARING_REGULATION_IN_THE_OIL_AND_GAS_INDUSTRY_A_Comparative_Analysis_of_Nigeria_and_Texas_Regulations (Accessed on 01/08/17)

¹⁹⁵ S.I. 43 of 1984.

¹⁹⁶ D. Otiotio 'Gas Flaring Regulation In The Oil And Gas Industry: A Comparative Analysis of Nigeria and Texas Regulations'. https://www.academia.edu/3615407/GAS_FLARING_REGULATION_IN_THE_OIL_AND_GAS_INDUSTRY_A_Comparative_Analysis_of_Nigeria_and_Texas_Regulations (Accessed on 01/08/17)

¹⁹⁷ Decree No. 7 of 1985.

¹⁹⁸ D. Otiotio 'Gas Flaring Regulation In The Oil And Gas Industry: A Comparative Analysis of Nigeria and Texas Regulations'. https://www.academia.edu/3615407/GAS_FLARING_REGULATION_IN_THE_OIL_AND_GAS_INDUSTRY_A_Comparative_Analysis_of_Nigeria_and_Texas_Regulations (Accessed on 01/08/17)

¹⁹⁹ D. Otiotio 'Gas Flaring Regulation In The Oil And Gas Industry: A Comparative Analysis of Nigeria and Texas Regulations'. https://www.academia.edu/3615407/GAS_FLARING_REGULATION_IN_THE_OIL_AND_GAS_INDUSTRY_A_Comparative_Analysis_of_Nigeria_and_Texas_Regulations (Accessed on 01/08/17)

²⁰⁰ D. Otiotio 'Gas Flaring Regulation In The Oil And Gas Industry: A Comparative Analysis of Nigeria and Texas Regulations'. https://www.academia.edu/3615407/GAS_FLARING_REGULATION_IN_THE_OIL_AND_GAS_INDUSTRY_A_Comparative_Analysis_of_Nigeria_and_Texas_Regulations (Accessed on 01/08/17)

²⁰¹ D. Otiotio 'Gas Flaring Regulation In The Oil And Gas Industry: A Comparative Analysis of Nigeria and Texas Regulations'. https://www.academia.edu/3615407/GAS_FLARING_REGULATION_IN_THE_OIL_AND_GAS_INDUSTRY_A_Comparative_Analysis_of_Nigeria_and_Texas_Regulations (Accessed on 01/08/17)

²⁰² AGFA is incorporated into Section 11 of the Petroleum Profit Tax Act.

incentive for natural gas utilization in regard to its processing, production, transmission, and supply to NLNG and other facilities.²⁰³

The government also enacted the Nigeria LNG (Fiscal Incentive Guarantee and Assurances) Decree (FIGAD),²⁰⁴ as incentive to encourage and facilitate the development of the Nigerian Liquefied Natural Gas Project (NLNG), which in turn will reduce gas flaring. The Act grants ten years tax holidays to the NLNG companies and also exempts the companies involved in the NLNG project from import duties and certain taxes.²⁰⁵

The government in furtherance of its policy to encourage investment on projects that will facilitate the utilization of gas, entered into a treaty with three west African countries for the West African gas Pipeline Project in January 31, 2003, and the treaty was domesticated into national law by the National Assembly in the Treaty on West African Gas Pipeline Project (Ratification and Enforcement) Act.²⁰⁶ The Treaty established the West African Gas Project Authority (WAGP Authority)²⁰⁷, an international institution having legal personality and financial autonomy with powers to implement the project on behalf of member states. The Petroleum Profit Tax Act²⁰⁸ also provides some tax incentives to companies engaged in gas utilization projects.²⁰⁹

Currently, the Petroleum Industrial Bill still at the National Assembly has provisions for the utilization of gas²¹⁰. Until this bill is passed and fully implemented, Nigeria continues to flare its gas, causing serious environmental issues that affect the life of Nigerians.

4.5 ENVIRONMENTAL IMPACT ASSESSMENT STUDIES FOR PROJECT.

The government also enacted the Environmental Impact Assessment (EIA) Act,²¹¹ which requires the developers of major development projects to subject their projects to the provisions of the EIA Act by conducting an environmental impact assessment before commencing work.

The National Environmental Standard and Regulations Enforcement Agency (NESREA), and the Department of Environmental Assessment (DEA) in Nigeria handles issues relating to environmental impact assessment in Nigeria.

5. CONCLUSION

²⁰³ Omeke Chukwuebuka, A Critique on the Legal Regime Governing Gas Flaring in Nigeria. University of Nigeria (2011) cited in D. Otiotio 'Gas Flaring Regulation In The Oil And Gas Industry: A Comparative Analysis of Nigeria and Texas Regulations'. https://www.academia.edu/3615407/GAS_FLARING_REGULATION_IN_THE_OIL_AND_GAS_INDUSTRY_A_Comparative_Analysis_of_Nigeria_and_Texas_Regulations (Accessed on 01/08/17)

²⁰⁴ Cap N84 LFN 2004

²⁰⁵ Section 2 & 7 Nigeria LNG (Fiscal Incentive Guarantee and Assurances) Decree (FIGAD) Cap N84 LFN 2004

²⁰⁶ Act of Cap W8 LFN 2004.

²⁰⁷ <http://www.wagpa.org/> (Accessed on 01/08/17)

²⁰⁸ Cap. P13 L.F.N. 2004.

²⁰⁹ Section 10A & 11 Petroleum Profit Tax Act Cap. P13 L.F.N. 2004.

²¹⁰ D. Otiotio 'Gas Flaring Regulation In The Oil And Gas Industry: A Comparative Analysis of Nigeria and Texas Regulations'. https://www.academia.edu/3615407/GAS_FLARING_REGULATION_IN_THE_OIL_AND_GAS_INDUSTRY_A_Comparative_Analysis_of_Nigeria_and_Texas_Regulations (Accessed on 01/08/17)

²¹¹ Act No. 86 of 1992.

Africa has indeed responded to the current environmental challenges in its little way. The area of law is still developing²¹². This response is mainly through development initiatives, policies and laws. The policies and laws have in most times ended up at paper level with little efforts or success at implementation. O. Nakoulima likens African's effort at combating environmental degradation to the efforts of a Kiwi bird, which in an effort to put out a raging firestorm was flying back and forth bringing water in its little beak and pouring it into the flames²¹³. The Kiwi is said to have answered "I am doing what I can" to those who inquired whether such an effort could make an impact²¹⁴.

However, from the assessment of Africa's response to environmental challenges, it is obvious that the real solutions lie in African ingenuity. The ideas to change Africa can be harnessed from its people. African countries must take steps to identify such innovations in laws, innovation in technology and management of crises that will improve environmental standard in Africa. One can only imagine the achievement that will be made in waste management if private enterprises carrying out waste management are supported with laws from government.

African countries must therefore continue to look inward for solutions to the present environmental challenges.

²¹²Climate change can be managed through Town Planning Laws – Ayade' ON NOVEMBER 24, 2016 <http://www.vanguardngr.com/2016/11/climate-change-can-be-managed-through-town-planning-laws-ayade/> (Accessed on 01/08/17)

²¹³O. Nakoulima, 'Africa embraces new climate order with leadership and ambition' *Africa In Focus* Monday, December 14, 2015 <https://www.brookings.edu/blog/africa-in-focus/2015/12/14/africa-embraces-new-climate-order-with-leadership-and-ambition/> (Accessed on 01/08/17)

²¹⁴ O. Nakoulima, 'Africa embraces new climate order with leadership and ambition' *Africa In Focus* Monday, December 14, 2015 <https://www.brookings.edu/blog/africa-in-focus/2015/12/14/africa-embraces-new-climate-order-with-leadership-and-ambition/> (Accessed on 01/08/17)