

Article submitted to the Proceedings Book of the VI th . International Symposium– 2022, Theme: “Biosphere & Environmental Safety”	 Biosphere and Environmental Safety VIth International Symposium-2022	ISBN: 978-963-449-285-6 Online May 5-6, 2022 ICEEE, Óbuda University, Budapest, Hungary
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NATIONAL SECURITY: INTERPLAY OF ENVIRONMENTAL, HUMAN AND FOOD (IN)SECURITIES IN NIGERIA

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The recognition of safe biosphere and environment as critical elements in security architecture has received increased multidisciplinary attention in recent years. Issues of environmental security have deepened the depth and broadened the scope of security discourse. The security or otherwise of the Nigerian geopolitical construct is a reflection of its environmental security as well as the dynamic interplay of human security and food security. This paper examines human, food and environmental dimensions of security in Nigeria, with focus on how each dimension mutually reinforces the other and combines to impact national security. The study relied on secondary data from both quantitative and qualitative methods. Using content analysis, it is observed that environmental issues are central to the (in)security of Nigeria and its people. It argues that the environmental degradation resulting from extractive productions in the Niger-Delta region coupled with the continued desertification of the arid north cumulatively stresses the security balance of the country. The study reveals that environmental (in)security constitutes the remote cause of farmer-herders crises, kidnapping, cattle rustling, banditry and piracy in Nigeria. These insecurity indicators have also threatened food security in the country. The paper therefore recommends compliance with environmental safety protocols and resilient development practices in industrial and extractive sectors and divestment from non-renewable energy. It argues further for the government's effective management of ensuing competition over water resources in the middle-belt and southern parts asides provision of adequate water channels in the northern part of the country. The paper concludes that addressing man-made and nature induced environmental issues constitute the roadmap to a strengthened national security.

Keywords: environmental security, farmer-herder crises, food security, national security, sustainable development

INTRODUCTION

The security of lives, livelihoods and estates remain the primary essence of the modern state. In the face of shifting socioeconomic and political changes, all peoples across regions of the world continue to rely on the government, which is the principal agent of the state for protection. The state's provision of the feeling of safety of its citizens is hypothetically the security that the state is purposed to fulfill. The internationalisation of interactions beyond the micro level of private individuals to macro level inter-state relations makes the concept of security germane for the state. Each state pursues protection of itself via all means available from the predatory and anarchical actor nature of the international system.

National security encompasses the protection of a state's territorial integrity as well as deployment of all capabilities to wade off aggression or to discourage invasion from outside the state. Empirical evidence of guerrilla warfare, intra-state conflicts and civil wars has necessitated re-conceptualisation of security architecture which recognises formidable capability to suppress aggression from within the state as well. While dominant thinking on security has largely been

military in nature, there has emerged the prevalence of security threats traceable to non-military sources. This expansive view of security beyond the traditional conception which holds state as the primary referent has sparked

Barry Buzan, one of the foremost revisionists of “security” in the post-Cold War era espoused the multifaceted complexity of the concept. He argued that the extant conception of security was “too narrowly founded”, he thus propounded a broader framework which incorporates among others environmental, political, societal and economic sectors of security. While attempting an inquiry with this framework it is important to note that none of the sub-security concepts exhaustively address the issue of security. Each should not be addressed separately, “each one is intricately and complexly linked with the next forming a web of information that must detangle to understand each concept individually in order to be able to see how they affect each other on the whole” (Stone, 2009). The environment is an aggregate of all external conditions and influences affecting the life and development of an organism. Environmentalism is an expression of a more inclusive view of how the environment influences man, his livelihood and estate. All living creatures exist in a certain habitat and their interaction is interdependent and inextricably intertwined. The environment is made up of natural biophysical components and processes comprised primarily of land, water and air. The complexities of human interactions within and with the socio-ecological systems (SEs) are included. Attempts to understand the intricate relationship between a biological organism and the physical environment in which it survives dates back to discourses by social thinkers from Hippocrates, Thucydides and Plato in the ancient time to Bodin & Montesquieu in recent times (Johari, 2009). The investigation of these linkages was based on a better understanding of the environmental conditions that the organisms in question may face. Initial attempts at securitizing the environment on a global scale are traceable to the emergence of global environmental problems, such as global warming and depletion of ozone layer. While environmental issues began to gain relevance in political discourse in the 1970s, the depletion of stratospheric ozone or global warming among other environmental problems in the 1980s brought the debate on environmental security to the fore. With the publication of *Our common future* by the World Commission on Environment and Development in 1987, ‘environmental security’ gained entry into international debates (Trombetta, 2008). The limitation of earliest debates on environmental security to environmentally induced conflicts helped in two ways; (1) to frame environmental threats in more familiar terms to national security experts and (2) to consider the environment as a legitimate threat thus making it a national-security issue in the twenty-first century (Stone, 2009). The relationship between environmental change, stress, and environmental degradation relative to the issue of security has garnered increased importance since the end of the Cold War. The world is faced with environment-borne challenges ranging from climatic, biological and geological transformations of the Planet. There is the rapid depletion and degradation of ozone layer and soil resources in addition to biospheric pollution, ecocide, desertification, oil spills and toxic dung. These environmental challenges negatively affect the biosphere and impact on all aspects of human life in both developing and developed states across continents (Kurki, 2020; Bayoumi Hamuda, 2022).

This is for example explicated by the 24% of global deaths resulting from dearth of fresh water to drink, clean air to breathe and toxic-free places for man, animal and plants (WHO, 2016). As a result, the environment, human security and peace are inextricably interwoven. Conflicts can arise as a result of resource shortage, environmental degradation and change, leading to human insecurity. Human conflicts and security can also have a negative impact on environmental sustainability. In Nigeria and other regions of the world, this is a common occurrence.

The recognition of a safe biosphere and environment as critical elements in security architecture has received increased multidisciplinary attention in recent years. The question of the relationship between environment and security is now a common interest among both the scientific and policy communities. The fields of Security and Strategic Studies, Policy Studies, Political Science, Human/Urban Geography, Environmental and Natural Sciences, Engineering, and Public Health among others have identified niches which need cross fertilisation of ideas leading to worthy contributions in terms of research and innovations towards an improved national security. With these multidisciplinary intersections, issues of environmental security have deepened the depth and broadened the scope of security discourse. This development further acknowledges the

environment as a critical driver of economic growth, both which is essential to national security interest.

Globally, there is growing empirical evidence of establishing the linkage between environmental issues and national security balance (Burke et al., 2016; Kavalski, 2018). In the arid Central Asian region, the source waters of the Aral Sea diverted to irrigate water-intensive agricultural crops led to the destruction of the sea and its ecosystem. It resulted in the collapse of its fishing industry and the degradation of up to 7.9 million hectares of arable land. In another instance, the 1997/98 forest fires in Indonesia which resulted in the loss of at least 8000 square miles of tropical forest was not without its security implications.

A similar case was the destruction of the forests of Haiti and erosion of agricultural topsoil which resulted in untenable economic conditions and an increased number of refugees fleeing to the United States (United States Environmental Protection Agency [USEPA], 1999). The environment has also been an important component of the peace process in crisis ridden regions such as the Middle East. Multilateral working groups in the region developed regional projects dealing with desertification, water conservation and oil spill contingency planning involving scientists, governmental officials, community leaders and business people. In Africa, preponderant environmental problems are exemplified in water scarcity, desertification, air, water and land pollution as a result of industrialisation, poor land use practices, intense population pressure and urbanisation. This is reflective of Nigeria. It has been estimated that between 50 and 75% of Bauchi, Borno, Gombe, Jigawa, Kano, Katsina, Kebbi, Sokoto, Yobe and Zamfara States in Nigeria are being affected by varying degrees of desertification (Olagunju, 2015; Audu & Adie, 2017).

The resulting pressure of human and livestock migration from these areas are felt in buffer states such as Adamawa, Kwara, Kaduna, Niger, Plateau, Taraba and the Federal Capital Territory. This forced movement has not only intensified use of fragile and marginal ecosystems resulting in progressive degradation but also occasioned crises of food, human and national insecurity. The biospheric pollution and environmental degradation of the Niger-Delta region in Nigeria's south also have far-reaching security implications for the ordinary citizen, the Nigerian State as well as regional stability of the Gulf of Guinea. There is a plethora of studies examining Nigeria's national security question.

Most of these studies are statist in nature, with copious volumes focusing on non-state actors such as bandits, terrorists, Boko Haram, militants, farmer-herders among others. There is, however, a dearth of studies that looked at the national security puzzle from an environmental standpoint. As a result, this paper therefore, seeks to establish the security import of the "environment" as underlining to addressing (in)security challenges in Nigeria. The paper examines the development of security concept from purely military thinking to the post-Cold War thoughts on security. It presents Nigeria within its geopolitical and strategic environment with focus on desertification in the north and biospheric pollution in the south (among others) as instances of environmental degradation which constitute Nigeria's environmental challenges. The paper examines the linkage between these environmental insecurities impacting other factors to accentuate communal crises, such as farmer-herder crises, banditry, cattle rustling and the cumulative of these on food and human security.

Engaging the Security Concept

New thinking on security has evolved from the preponderant threats in the post-Cold-war period. These differing sources of non-military threats have come to be acknowledged domain of security-what needs be secured. These include; food security, human security, environmental security, national security, economic security, political security, regional security among others. With the multiplicity of these sub-security concepts, the imperative to clarify meanings of key concepts in order to identify limitations becomes compelling. Two broad conceptions of security have emerged in the literature; the military conception of security and the non-military conception of security. The classic definitions of security fits into the military category while the non-military domain of security is comprised of the expanded post-Cold War sub-security concepts.

Military Conception

National Security

National security is the safekeeping of the nation as a whole. Its highest order of business is the protection of the nation and its people from attack and other external dangers by maintaining armed forces and guarding state secrets. National security entails both national defence and the protection of a series of geopolitical, economic, and other interests, which affects not only defence policy, but foreign and other policies as well. Since the end of the Cold-War, an expanded definition of national security has emerged. National security concerns encompass focus on military threats to national interest as well as those of non-military sources. Key among these are concerns about the environment; its (mis)management, degradation, natural resources depletion, overpopulation as well as the environmental consequences of previous wars.

Non-military Conception

The concept of national security was for most of the 20th century military biased. The concept has, however, expanded over time beyond what armed forces could do (or not do as the case may be). Today, there are all kinds of “national securities.” They include economic security; energy security; environmental security; and even health, women, and food security. This proliferation of definitions has not always been for the good (Holmes, 2015).

Food security

Physical and economic access to food for all people at all times. Hundreds of millions of people in the world remain hungry either through local unavailability of food or, more often, through lack of entitlements or resources to purchase food.

Human security

It broadly encompasses peoples’ safety from hunger, disease, and repression, including harmful disruptions of daily life. Human security is characterized by the absence of particular deprivations as well as the absence of specific imagined fears (United Nations Trust Fund for Human Security, 2009). The evolution of the concept is traceable to the efforts of the United Nations to better human life in the wake of the Cold War. Its basic assumptions are that (1) protection of individuals is a strategic concern for national as well as international security and (2) security conditions for people’s development are not bound to traditional matters of national defence, law and order, but rather encompass all political, economic and social issues enabling a life free from risk and fear. Despite the consensus on the foundations of this concept, there is no single generally accepted definition of human security. While realists have focused attention on the state as the prime referent object of security, idealists have argued that people, that is, individuals, are what really matters in the final analysis. Accordingly, seeking the security of the state is worth striving for, only to the extent that it contributes to the survival and well-being of people (Olaniyi, 2019).

Human security concept has expanded to include economic security, environmental security, food security, health security, personal security, community security, political security, and the protection of women and minorities. Its distinguishing feature is to focus on social and economic causes of insecurities and an assumed international “responsibility to protect” peoples from violence. The concept of human security challenges the traditional scope of security and insecurity noting that it is by no means limited to violent conflict or its absence but includes the roots of sustainable livelihoods, health, and well-being. Human security is a critical component of the global political and development agenda.

Environmental security

Environmental security (ES) constitutes the body of process and solutions to environmental problems within the national security objectives. The environment, according to Bayode et al., (2011), is made up of biophysical components and processes of the natural environment of land, water and air. It encompasses all layers of the atmosphere, inorganic and organic matter, socio-economic components and processes of human endeavours as well as the symbiotic relationship among these elements which could affect economic activities. Environmental commons such as water sources, community forests, and village pasture areas, among others, are also vital components of the environment. Any deficiency, deprivation, or destabilization in one or more of these areas could result in unrest and conflict, increasing insecurity. ES is thus a means of

responding to conflicts caused by imbalance in the environment (USEPA, 1999). These include problems such as desertification, water shortages, energy disruptions, biospheric pollution, severe climate changes and ecocide. Environmental security views ecological processes and natural resources as sources or catalysts for conflict and as barriers or limits to human well-being, environmental impacts of conflict, environmental recovery and post-conflict peace building and conversely as a means to mitigate or resolve insecurity. This has required the need to maintain the earth's life-supporting ecosystems generating water, food, and clean air, improving resource governance and social resilience to natural resource shocks and stresses (Scientific and Technical Advisory Panel [STAP], 2018). Environmental security has been classified into four major dimensions; these dimensions aid better understanding of the role of the environment in preventing, managing and resolving violent conflicts and boost cooperation among groups and stakeholders in relation to resources available. STAP, (2018) highlights four dimensions of ES which were particular to the Global Environment Facility (GEF);

- First, ecosystem goods and services fundamentally underpin human well-being and human security. Human beings depend on the earth's ecosystems and the services they provide. The degradation of these services often causes significant harm to human well-being.
- Second, conflict, irrespective of its source, affects the viability or sustainability of investments in environmental protection and their outcomes. Violent conflict often results in direct and indirect environmental damage, with associated risks for human health, livelihoods and ecosystem services.
- Third, ecosystem degradation, resource competition, or inequitable distribution of benefits increases vulnerability and conflict risk. Environmental degradation is a cause of human insecurity and can aggravate other sources of social division based on ethnicity, class, religion, or economic position. While rarely the simple or sole cause of conflict and insecurity, environmental change (including climate change) is increasingly characterised as a "risk multiplier."
- Fourth, environmental cooperation can increase capacity for conflict management, prevention, and recovery. Managing shared natural resources sustainably and equitably can motivate greater cooperation, and can also help build institutions that moderate and reduce the disruptive impacts of conflict, or aid post-conflict reconciliation and rebuilding.

ES apologists combine the theory of environmental determinism with the promises of integration cooperation theory as advanced by Robert Keohane, Ernst Haas and Thomas Franck among others (Olson, 1965; Ostrom, 1990 2010; Roemer, 2015; Carattini et al., 2019). They argue that solutions proffered by ES are predicated on the idea that cooperation among nations and regions via treaties and international governance can effectively address environmental problems. It is cooperative institutional networks that advance political stability, economic development and global peace. In addition, by addressing the environmental components of potential security 'hot spots,' threats to international security can be prevented before they become a threat to political or economic stability or peace. Environmental security mutually reinforcing other critical non-military spheres of security. It is broadly a foundation for food security which is also essential to human security, sustainable livelihoods, health, and well-being among households and communities (GEF).

The relationship between the environment and security is complicated. Environmental disputes have a wide range of causes and expressions all around the world. The links of physical scarcity of resources, environmental deterioration and human-made environment change with destabilizing intervention in the ecosystem's balance can be interpreted as the causality conflicts and insecurity (Dalby, 2006; Okon & Ojokorotu, 2021). Greenhouse warming, stratospheric ozone depletion, acid deposition, deforestation, deterioration of agricultural land, overuse and contamination of water supplies, and loss of fish stocks are just some of the environmental issues that developing countries face (Yıldız, 2015; Dalby, 2022). People require land, water, energy sources such as coal and oil, wood, and so on in order to survive. Absolute shortage of any of these resources, as well as unequal distribution across distinct groups of people and places, frequently leads to disputes and insecurity. As a result, impoverishment spreads across groups and areas, disparities widen, and unrest and conflict loom on the horizon. For example, a substantial number of Nigerians rely on land and agriculture for a living and for their well-being. Inequitable distribution among farmers and herders

not only results in impoverishment, but also in the concentration of better lands in the hands of a few, making many poorer and more vulnerable.

Environmental (in)security in Nigeria

The Nigerian state has a geo-political definition which is strategic for political, economic and military purposes in the Gulf of Guinea, Lake Chad Basin, Sub-Saharan Africa and the African Continent as a whole. Olaniyi (forthcoming) aptly captures the country's strategic position:

Nigeria is on the western coast of Africa, geographically lying between latitude 40N and 140N and longitude 30E and 150E meridian. Also officially known as the Federal Republic of Nigeria, the country occupies a total land area of about 910,000 km². It is bordered on the North by Niger with an area extending into the Sudano-Sahelian belt and Chad in the northeast. It is flanked on the west by the Republic of Benin and Cameroon in the southeast. Nigeria being a littoral has its coast in the south located in the Gulf of Guinea along the Atlantic Ocean.

The Nigerian enjoys a warm tropical climatic condition influenced by the interaction of two air masses: the relatively warm and moist tropical marine air mass (mT) which originates from the Atlantic Ocean and is associated with Southwest winds in Nigeria; and the relatively cool, dry and relatively stable tropical continental air mass (cTs) from the Sahara Desert and is associated with the dry, cool and dusty North-East Trades (Harmattan). Its environment is an admixture of mangrove and freshwater swamps, rain forest, Sudan Savanna, Guinea Savanna and the Sahel. Between the rainforest and the Guinea Savanna is a modified vegetation transition consisting of light deciduous forest and derived savanna (Federal Ministry of Environment [FMENV], n.d.). Unfortunately, Nigeria continues to face serious environmental degradation which is damaging not only to its environment but its people- the security of their lives, livelihoods and estates as well as national security. Environmental degradation is an undesirable disturbance or change in the natural balance of the ecosystem. It is noted for 3 Ds namely; deterioration, depletion and destruction of the environment and its resources. Environmental degradation broadly covers environmental issues such as biodiversity loss, animal extinction, climate change, biospheric pollution, deforestation, desertification and global warming. The degradation of the Nigerian environment is evident in desertification, drought, biospheric pollution (air, water and land) as well as ecocide. These environmental concerns are partly products of counterproductive human interactions (especially urbanisation, industrialisation and development) with the environment. The dynamic interplay of these ES indexes has implications on human and food security, while the trio dimensions mutually reinforce one another and combine to impact on national security. This interconnectedness makes the security or otherwise of Nigerian geopolitical construct is a reflection of its environmental security.

The Northern Region

Nigeria's northern region is situated in the semi-arid areas bordering the Sahara Desert and is characterised by desertification and drought, which are not exclusive to the region. The duo are environmental threats to security which affect the region. The rapid and expansive desert encroachment in Nigeria has been accentuated by a combination of climatic variability of an average annual rainfall of less than 600 mm, urbanisation and anthropogenic activities. Continued deforestation (for agricultural purposes, urbanisation and fuel wood extraction), indiscriminate bush burning, extensive cultivation (especially of marginal land) and overgrazing have been identified as causes of desertification in the region (Figure 1). Out of the 909,890 Km² of the country's land area, desertification has claimed about 580,841 Km² accounting for 63.83% of total land. This statistics accounts for less than fifteen northernmost states in Nigeria, almost one-fifth of the country's total land area (Medugu et al., 2008; Olagunju, 2015).

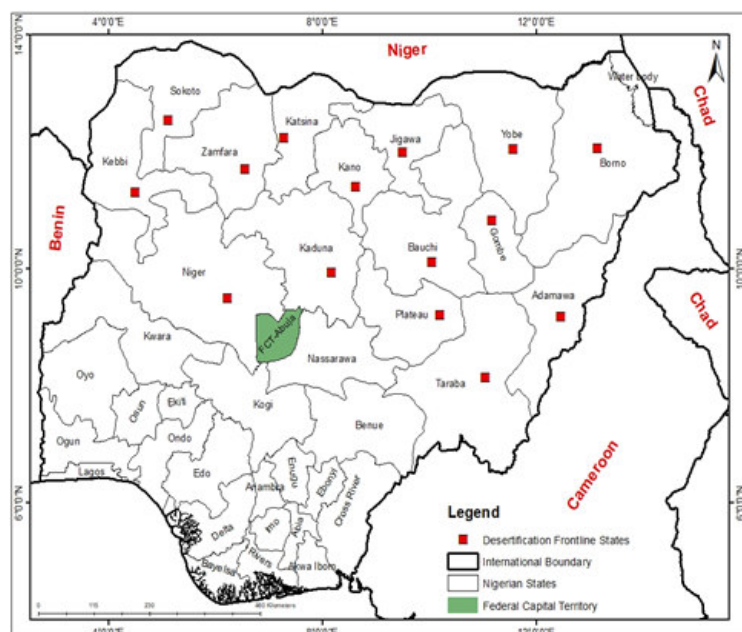


Figure 1. Political Map of Nigeria showing desert encroachment in the frontline states
Source: GIS Lab, Nigerian Army College of Education, Ilorin

Desertification involves the degradation of fertile land through long term changes in soil, climate and biota resulting in reduction in the natural potential of the land and depletion of its surface and groundwater. Despite the recognition that desertification is a global issue gaining attention like climate change and loss of biodiversity, the degree of its impacts varies from one part of the world to another. Nigeria is one of the countries south of the Sahara faced with a rapid desert encroachment, with notable effects on the northern part of the country (Brottem, 2021). Earliest report of this environmental issue in northern Nigeria dates back to the 1920s. It however was not recognised as an issue of national concern until the famine of 1971 to 1973 which was a direct effect of the desert encroachment (Medugu et al., 2008). Desertification has impacts across socio-economic and health aspects of human life as well as the ecological, geo-chemical, hydrological facets of the environment (Emodi, 2013; Jibunor 2014; Olagunju, 2015). It is thus a non-military threat to National security but with negative impacts on human security, economic security and food security.

The Niger Delta Region

Nigeria's south popularly named the Niger-Delta region is located at the apex of the Gulf of Guinea on the west coast of Africa with a population of about 31 million people occupying a total land area of about 75,000 which accounts for 7.5% of Nigeria's land mass (Bodo & Gimah, 2020; Aniefiok, et al., 2013). The region stretches from Ondo in the west to Cross River in the East, comprising 6 other oil-producing states; Edo, Rivers, Abia, Akwa Ibom, Bayelsa, Delta and Imo which account for a total of 185 LGAs. The formation of the Niger Delta is as a result of the breaking away of the 4,100km-long Niger River connecting estuaries from where it flows into the Atlantic Ocean at the Gulf of Guinea (Fagbeja et al., 2008). Table 1 reveals that 43% of natural gas was flared into the biospheric environment over a period of 25 years (1990-2014). Gas flaring involves the burning of natural gas which could be refined into other usable petroleum products usually via towering pipes. Nigeria held the record of flaring over 14% of gas that was flared globally in 2004 ranking the country as the second to Russia which accounted for 16% of global gas flared (Federal Ministry of Environment, 2006; Otene, Murray & Enongene, 2016; Oka, 2017). While the economic loss associated with the gas flaring is roughly put at 4.9 million USD/day, also important in its damaging effects of the flaring on human and animal health, safety and livelihoods of the people. Over two decades, gas flaring alone has contributed to emission of greenhouse gases leading to increasing

incidence of global warming and heat waves. Gas flaring is also linked to acid rain in the Niger Delta, which is harmful to both vegetation and crops.

Table 1. Comparative data on crude oil production, oil spillage, natural gas production and gas flared

Year	Total Crude Oil Produced (Barrels)	Oil Spillage (Barrels)	Total Gas Produced	Gas Flared	Percentage of Gas Flared
1990	630,245,500	14,940.816	1,004,385,817	791,708,975	78.8
1991	630,245,500	106,827.98	1,111,430,806	871,197,828	78.4
1992	716,262,000	51,131.91	1,133,475,714	868,194,916	76.6
1993	695,398,000	9,752.22	1,189,859,807	910,412,329	76.6
1994	664,628,500	30,282.67	1,189,859,807	950,686,680	79.9
1995	672,549,000	63,677.17	1,240,026,105	953,371,638	75.0
1996	681,894,600	46,353.12	1,252,391,038	939,381,599	65.2
1997	855,736,287	59,272.30	1,312,449,282	856,147,988	63
1998	806,443,999	98,345.00	1,308,527,832	834,880,254	8
1999	774,703,222	20,000.00	1,541,589,148	790,013,212	51.3
2000	828,547,638	30,100.00	1,509,652,294	856,889,834	56.8
2001	865,173,584	76,960.00	1,853,079,467	945,352,096	51.0
2002	729,190,940	19,980.00	1,651,591,488	753,801,906	45.6
2003	831,775,504	9,916.00	1,828,541,855	844,978,886	42.2
2004	910,156,489	8,317.00	2,082,283,189	886,540,196	42.6
2005	918,966,736	11,921.00	2,093,628,859	811,315,777	38.8
2006	869,196,506		2,182,432,084	803,661,823	36.8
2007	803,000,708	32,000.00	2,415,649,041	759,688,726	31.5
2008	768,745,932	100,000.00*	2,287,547,344	619,398,854	27.1
2009	780,347,940	104,000.00*	1,837,278,307	509,351,905	27.7
2010	896,043,406	17,658.19*	2,392,838,898	581,568,354	24.3
2011	866,245,232	67,906.84	2,400,402,880	619,032,858	25.8
2012	852,776,653	17,526.37	2,580,165,626	588,666,724	22.8
2013	800,488,096	4,066.20	2,325,137,449	409,311,430	17.6
2014	798,514,589	10,302.16	2,524,268,444	289,600,014	11.5
TOTAL	19,731,884,225	775,236.95	44,218,335,225.00	19,045,154,752.00	43.0

Source: Oka (2017)

The region with its over 800 oil-producing communities and over 900 producing oil wells, is significant in two ways; (1) it is classified as tropical rain forest and it is the largest mangrove forests in Africa and the third largest in the world (2) it is Nigeria's maritime domain with about 84, 000sq nm containing strategic natural resources located in the heart of the Gulf of Guinea (GoG) (Asanebi, 2016; Aniefiok, et al, 2019; Bodo & Gimah, 2020; Olaniyi, forthcoming). It is no gain saying that a significant portion of Nigeria's economic mainstay is in the Niger-Delta. A descriptive statistic of this fact is given by the President, Muhammadu Buhari when he noted that the region together with its adjoining exclusive economic zone (EEZ) houses the 'country's hydrocarbon resources which remain the mainstay of the nation's economy account[ing] for 55% of the Gross Domestic Product (GDP), 95% of export earnings and about 70% of government revenue' (Ndidi, 2021). Nigeria's Niger Delta remains the best known, most exploited, and richest hydrocarbon basin in the GoG region, with proven reserves of 36.8 million barrels of crude oil (Etuonovbe, 2009; Campbell, 2019).

Despite the economic and strategic importance of the region to Nigeria, its environment is heavily degraded with air, water and land pollution in the area reaching unbearable heights. The Niger-Delta faces environmental degradation which is the deterioration of the environment through human activities resulting in the depletion of resources, contamination of air, water and soil, destruction of ecosystems and the extinction of flora and fauna (wildlife). Environmental degradation in the context of the Niger Delta is viewed as involving the high rate of oil exploration and other human activities in the oil rich Niger Delta beyond the carrying capacity of the ecosystem. Most of the exploratory activities have less regard for human health and welfare of the inhabitants which has also caused damage to the flora and fauna of the region. The ND environment is

continuously being depleted with pollution which destroys arable lands, water resources and vegetation supporting an immediate population of 25.1million (Oka, 2017). The repeated incidence of oil spillage and leakages, toxic waste dumping and gas flaring has put the environmental security of the region in jeopardy. A combination of these ancillary exploratory activities constitutes a threatening burden of biospheric (air, water and land) pollution which is as heavy as nuclear holocaust (Kadafa, 2012; Ugboma, 2015).

Oil spillage and leakages constitute a major threat to environmental security in the region. It was reported that 546 million gallons of crude oil were spilled from 1958-2010, averaging about 300 spills or nearly 10.8 million barrels per annum (Kalejaiye, 2015). During exploration, oil is transported through pipelines in the refineries some of which are corroded and worn-out valves. Rusted pipelines occasion oil leakage.

Asides equipment failure during either conventional or local process of drilling and refining, these spillages are also due to human error and sabotage or theft (pipeline vandalism, oil bunkering and smuggling). Bodo (2020) revealed that oil spillage caused by sabotage and theft rank highest accounting for more than half (59.7%) of total oil spillage between 1998 and 2007. The FMENV (n.d.) observed that oil spill is experienced weekly in the Niger Delta region which has grave damage in the environment. Oil spillage has led to the destruction of about 50,000 acres of mangrove forest between 1986 and 2003.

Counterproductive oil exploratory activities have led to the damage of mangroves, fishing grounds and tropical rainforest of the ecologically rich Niger-Delta. Through oil leaks and spillages drinking water is directly contaminated which often accounts for water-borne illnesses among the people (Ogbija et al., 2015). It is also linked to instant death of aquatic life and terrestrial life as well as of human persons especially when there is explosion and fire incidents. Its immediate effect is also seen in depletion of soil nutrients and general damage of the ecosystem. Farmers are thus forced to abandon their farms which could barely support crop cultivation as a result of oil spillage and leakages.

The direct and indirect effect of this on food security has largely been negative. These dire consequences have been long standing everyday life realities of the Ogoni community and many others in the Niger Delta. Oka (2017) aptly captures the ripple effects of oil spillage and leakages of oil pipelines in the region:

leaking pipelines, running through villages, farms, creeks and rivers in the Niger Delta, are a major source of pollution, sickness and economic ruin for the people of the Niger Delta. Farmland polluted by oil is rarely rehabilitated, [thereby] destroying livelihoods. Fish contaminated by oil cause sickness among the people and further economic ruin as fish stocks decline. The spillages are a regular feature of life in the Delta. They are rarely dealt with promptly. In some cases, minor leaks are left for months; resulting in major pollution... oil spillage has implications for marine life and coastal vegetation. In some cases, the groundwater supply of the local inhabitants becomes polluted.

The chemical compound from industrial polluted areas causes respiratory and chromosome damage in women. Moreover, it causes stillbirths and cancer in women...There is also the problem of tremendous heat as a result of continuous flaring of natural gas, which produces gaseous emission and contaminants.

Toxic waste is the third force (after gas flaring and oil spillage) against environmental security in the Niger-Delta. These wastes contain radioactive components such as mercury, cadmium, and arsenic lead which cause severe health complications to human and animal life when exposed to the atmosphere and inhaled, ingested or absorbed through the skin. In addition, such wastes are capable of polluting underground water as a result of waste permeation of the ground especially in a tropical region of high rainfall.

Toxic waste dumping manifests in two ways namely; (1) from industries sited within the country and (2) from transnational waste merchants. Industrial wastes channelled or dumped into water bodies are injurious to the immediate aquatic lives and then terrestrial lives that depend on such water and resources in them (Etuonovbe, 2009). The effective enforcement of environmental safety frameworks in Europe and North America vis-a-vis poorly administered frameworks and under-protected shores in West Africa, positioned the ND for risks of hazardous radioactive wastes.

It was reported that toxic wastes in large quantities were dumped in some remote Africa communities which included; Koko, Kssa & Annobon. Witnessed dumping of tens of thousands of tons of toxic waste in quick successions as a result of the penalty on industrial waste (Bodo & Gimah, 2020). Koko which is an isolated Nigerian port town with a population of about 5,000 people who are predominantly fishermen and farmers, suffered untold environmental stress as a result of the toxic waste.

This raises the need to safeguard Nigeria's territorial waters from the waste merchants of Europe and any other part of the world. The intense exploration, exploitation and consumption of these non-renewable energy resources have gone above the carrying capacity of the environment and its renewable potential.

Additionally, population increase and the use of sophisticated technology coupled with spillages, leakages and gas flaring, the environment is threatened and ecocide is imminent. Nigeria from the north to the south is no doubt in a state of imbalance with the safety of its environment threatened. As discussed in the foregoing section, desertification and drought are peculiar environmental challenges in the north while the biospheric pollution resulting from oil spillage and leakage, gas flaring and toxic waste dumping are perennial environmental problems in the Niger Delta which is Nigeria's southern region. These environmental crises cannot be divorced from the increasing unrest, farmer-herder crises, kidnapping, banditry, militancy and other illicit maritime crimes termed "blue crime" which embodies piracy, armed robbery, hijacking and kidnapping.

Impacts of Environmental Insecurity

The issues of the environment have entered the agenda-setting domain of public policy with policy outputs in the form of legal framework, institutions and policy. The Nigerian government via Decree 58 of 1988 established the Federal Environment Protection Agency (FEPA) with the mandate to protect the Nigerian environment and address its multifaceted environmental problems. FEPA was replicated as State Environmental Protection Agencies (SEPAs) in the 36 states of the Federation and the Federal Capital Territory (FCT) to manage environmental issues at state level. Nigeria is also signatory to a number of international conventions and protocols in this regard, such as the Desertification Convention. In same year the Wastes Criminal Provision Acts was enacted by the federal government to criminalise the indiscriminate disposal of toxic wastes.

In the wake of the 21st century, emerging environmental issues necessitated the creation of Federal Ministry of Environment (FMENV) by former President, Olusegun Obasanjo. The ministry was to fill Nigeria's environmental objective according to the provisions of section 20 of the 1999 Constitution. However, the positive impacts of these remain minimal as the Nigerian people continue to bear the brunt of environmental, human and food insecurity in the country (Figure 2).

Impact on Human Security

Extant studies have explored the influence of environmental factors on human security (Umar et al., 2015; Daukere et al., 2020; Daukere et al., 2021). Here the discourse is taken further by examining the impacts of environmental (in)security on human security. At the core of human security is safety from violence and every form of disruption to human development. These are, however, fairly impossible in events of intra and inter-conflicts and violence within the country. A good number of conflicts that erupted in the north and middle belt of Nigeria can be linked to environmental issues.

Desertification and the attendant drought play a major role in forced migration of a group to the domain of another in search for resources such as water for herds and cultivation, forage for herd and land for cultivation. The objects of the search have made most of the ensuing conflicts mainly between farmers and herders. Struggles and rivalry over the limited available land and water resources had triggered communal clashes. This has been well established in the literature with the evolution of debate about environmentally induced conflicts (Trombetta, 2008). Findings of these studies have pointed that such conflicts are often subnational, low intensity but recurrent.

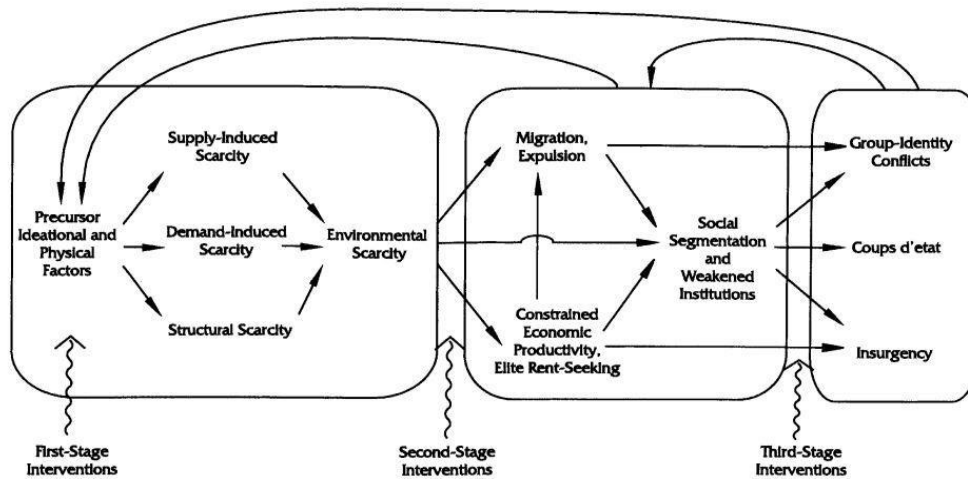


Figure 2. Homer-Dixon's model of environmental insecurity and conflict

Desert encroachment affects not only pastoralists and crop farmers but also hunters and fishermen. These livelihood activities, save hunting to a greater extent, are water-intensive. This demand for water resources becomes intense whenever alternations in annual rainfall are experienced as rainy season continues to shrink. In the last three decades, rainy season has reduced from 150 to 120 days on average owing to climate change (CDD, 2022). Studies by Arifalo (2005) and William (2007) independently found that the absence of organic matter to bind the desert soil and its vulnerability to wind erosion make the dessert area less appealing for agricultural activities. Since plants hardly grow in deserts, its implication is farmers engaged in crop farming have to turn southwards where viable/arable lands can be assessed. Incidentally, nomads also turn southward where they can access forages and water for their herds. This supposed forced southwards migration has further implications. While the host population together with the immigrant farmers (plant and animals) depend on the limited water resources available, conflict often ensues when a group arises to disadvantage the other. These may be for reasons such as; entitlement of indigeneship, population ratio and/or capability to fight which often leads to violent problems?

The southwards movement of herders from the north in search for forages and grazing land for their cattle are often accompanied by encroachment on other people's farms which also often call for reprisal attacks. This is underlining to Benue State's recurring conflict between the Agatu and Fulani, the Biroms and Hausas in Plateau state, Ngamo Maitatsine and Boko-Haram over farm lands and grazing areas in Yobe State, the Okeogun and Fulani in Oyo State (Olagunju 2015; Olaniyi, 2019; Brottem, 2021). Some of the herders of sub-Saharan origin having migrated southwards and having been accommodated by different communities had cohabited for decades with significant mutual benefits. However, this settler population also do cause damage to crops of their hosts by grazing their cattle on farmlands. The reprisal attacks that follow are in most cases, to register displeasure over injustice the host communities feel after seeking redress through traditional and state institutions with no reprimand. This is what Olaniyi (2019) has argued as "herdsmenism in the SouthWest". This is in tandem with the position of USEPA (1999).

Conflicts also evolve as a result of rapid changes occasioned by urbanisation and development processes that negate sustainability of the environment and its people. This is environmental insecurity arising from the conflictual dimension of the development process. Activities of oil and gas exploration resulting in environmental insecurity such as biospheric have necessitated involuntary complete resettlement of some communities in the ND. This becomes necessary owing to the loss of ecological resources with the attendant loss of livelihood, occupational uncertainties and sociocultural effects of displacement of ancestral homes, religious and cultural artefacts (Trombetta, 2008; Oka, 2017).

This environment-conflict perspective partly explains the trajectory of insecurities in the oil-rich Niger Delta.

Studies have also established relationships between environmental and socioeconomic factors and insecurity. For example, Daukere et al., (2021) found that the resulting loss of livelihoods from environmental insecurity in the ND accounts for involvement of young people in a wide range of criminal acts. These included theft, assault, false pretense, forgery, cheating, kidnapping, armed robbery, murder, burglary, rape, vandalization of oil pipelines, bunkering, bombing, thuggery, killing, destruction of property and suicide.

The situation has also led to the formation of armed groups among competing groups. The formation and intervention of such self-help groups evolved because of official corruption, ineptitude in the criminal justice system, unprofessional conduct of security agents and breakdown of traditional conflict resolution mechanisms among other factors (Centre for Democracy and Development, 2022). This accounts for the attacks and reprisal attacks herders armed with guns are resisted by farmers groups with similar weapons. The farmer-herders conflict which is often denoted as ethnic conflict is largely rooted in disputes over use of land and water resources. The designation of Fulani in many studies as generic herdsman while there are herders of other origin such as the Kanuri and the Tuaregs affirm this ethnic colouration of the conflicts.

Armed groups from the Agbekoya, Vigilante in South-west to Movement for the Emancipation of the Niger Delta (MEND) in the South, efforts have been made to resist intruding groups while the state remained largely indifferent. A corollary to the evolution of such armed groups is the proliferation of small arms and light weapons (SALW) across the country (Olaniyi, 2021). This also explains the increased radicalisation and violent extremism that constitute major security challenge to the Nigerian state.

Environmental insecurity has also negatively impacted on human development index in the country. The rapid surge of rural banditry in the northwestern region for instance has affected the education of children in the region. The region has been reported to have a higher poverty rate than the national average of 40.1%, it also accounts for three of the four states with the lowest literacy rates in the country (Amzat, 2017; National Bureau of Statistics [NBS], 2014; 2019). Environment-induced insecurity continues to exacerbate this low human development index in the area as about a million Nigerian children are out of school due to insecurity in the northwest (CDD, 2022).

Impacts on Food Security

From the north to the middle belt and the down south of Nigeria, agricultural activities in form of crop cultivation, fishing and animal production are common. Agriculture remains the economic mainstay of most households in Nigeria and a significant sector of Nigeria's economy. Availability of food and the access of all to it constitute a basic requirement for a healthy and productive human population. Food security is thus all efforts at guaranteeing availability and access of all people to the food needed for healthy life at all times. Climate, land and water resources as well as labour and capital are primary factors in food production and their scarcity leads to food shortages.

Environmental security is critical to strengthening the nation's food security system (FMEN n.d.). A combination of factors rooted in environmental issues and human (in)security affect agricultural production especially in regions hitherto known for large scale active participation in the value chain of staple food and other agricultural products such as the north east and north central (Olaniyi, 2021). This insecurity complex heightens reliance on importation as a result of reduced national food production. Establishing the linkage between human (in)security and food (in)security is no doubt compelling after giving an exhaustive trajectory of how environmental (in)security translates to human (in)security. Such will however, be a too ambitious effort if the immediate impact of environment on food security is disregarded. Desertification and drought have direct impact on food production. A report of the situation is aptly captured by Audu & Adie (2018);

Farmers have complained that their low crop production and versatility in crops produced have been hampered by ebbing water supply caused by the encroaching desert. They spend a lot of money on water and farm inputs and at the end incur losses. The frustrations in farming have made many peasant farmers to abandon farming...activities like commercial motorcycling. Some of the farmers in the border areas have moved into the neighbouring country of Niger [Republic] where they claim that government provides water for farmers and they pay a token after harvest.

As Figure 3 reveals, food insecurity has become a reality with twelve (12) states in Nigeria facing acute food crises ranging from stressed to famine. It also shows that states with notable insecurity

challenges are the most affected as there is evident food insecurity at emergency and famine levels. The northeast which has in over a decade been under the siege of Boko Haram insurgency is the most affected as Borno and Yobe states rank worst in food security matrix in the country.

Similarly, bandits' activities in the northwest have affected food production and distribution within the region. Especial mention is Zamfara and Sokoto states which studies have also established as sanctuaries for a greater number of bandits in the country (Rufai, 2021; CDD, 2022). This further confirms that insecurity negatively affect food security.

Audu & Adie (2018) argued the inextricable nexus between environmental degradation (especially, desert encroachment) and food insecurity.

Deforestation for industrial and agricultural activities on marginal lands has stressed the ecological capacity of the arid regions. It has been reported that the annual land loss of Nigeria to desertification stands at about 350,000 ha (Emodi, 2013; Olagunju, 2015).

Desertification is associated with perennial features such as loss of biological diversity, alterations in geochemical composition of the soil, soil salinization, worsens water scarcity and over-exploitation of groundwater (Olagunju, 2015; FAO, 2016). The overdependence of Nigeria's agro-economy on rainfall has also compounded issues as rainfall recedes. It has also been reported that some farming communities have been displaced as a result of dunes covering their farms and homes.

It is estimated that about 50,000 farmers in at least 100 villages in Yobe State alone are likely to abandon their farms due to meagre agricultural output caused by dunes. With these it becomes difficult to have substantial agricultural output which will first cater for the subsistent need of the producing population, thereby contributing to food insecurity (Figure 4).

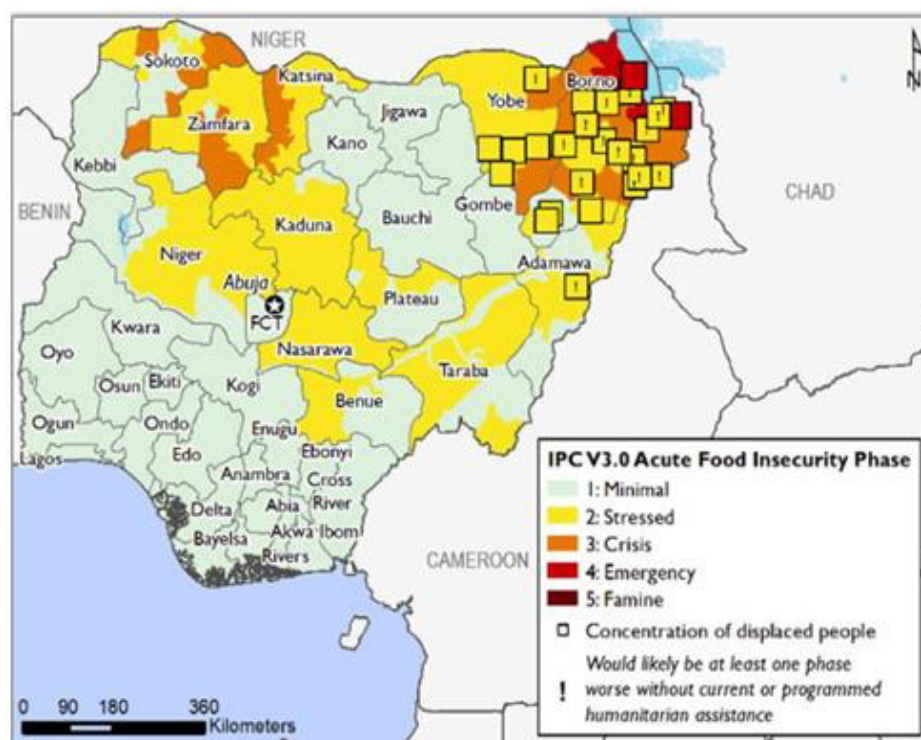


Figure 3. Political Map of Nigeria showing level of food insecurity

Source: <https://fews.net/west-africa/nigeria/food-security-outlook/february-2021>

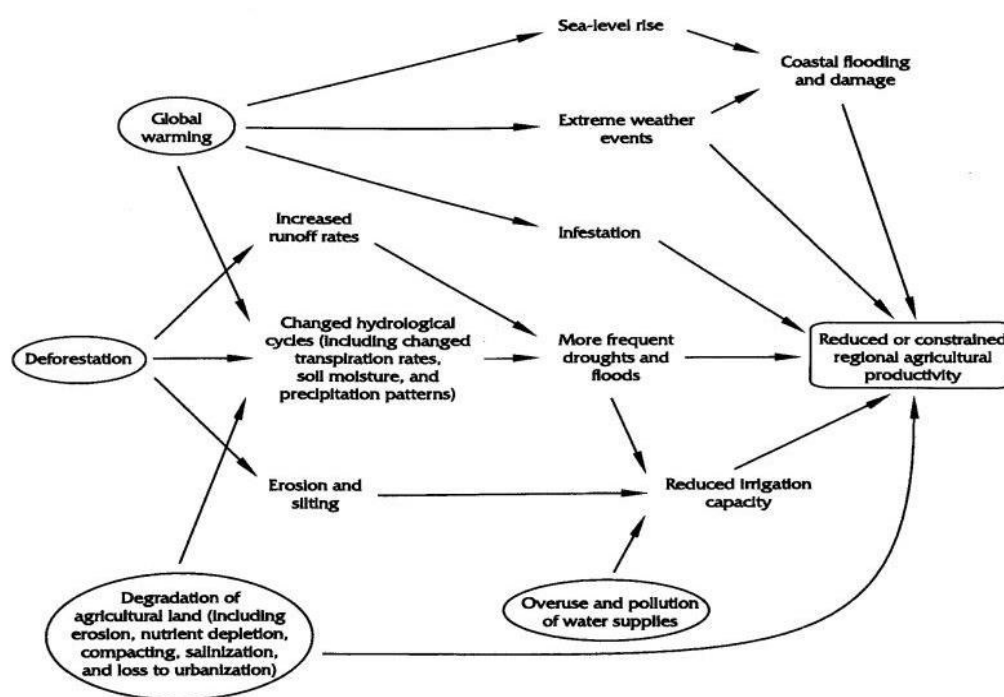


Figure 4. Impacts of environmental factors on food production

Source: Homer-Dixon, T. F. (1999) *Environment, scarcity, and violence*. Princeton University Press

Food and Agriculture Organisation (2021) reported Nigeria alongside Burkina Faso and South Sudan as countries where sharp conflict related increases in acute food insecurity have been observed. This confirms conflict and insecurity constitute primary driver of food crises which degenerates into food insecurity. While these factors are not exclusively responsible for food insecurity, conflict and insecurity frequently interlink with – and sometimes exacerbate – other factors such as environmental and political situation.

In the northeast alone, about 8.7 million people face food insecurity. This is due to the Boko Haram insurgency leading to massive population displacement in Adamawa, Borno and Yobe especially. These staggering statistics of food insecurity in Nigeria is a consequence of both immediate impacts of environmental insecurity as well as the second order impacts of the environmental issues.

Nigerians have become vulnerable to food insecurity as a result of forced migration from farming area as well as human insecurity evident in violent clashes between rival groups in the struggle for control of land and water resources, banditry, insurgency and militancy.

In the ND, oil spills and leaks often lead to explosion which also becomes bush fire in vegetated areas. Such fires disrupt the ecosystem and destroy some elements such as the organic matter content of the soil, plants as well as animals.

Okoli & Ifeakor (2014) reported that 25% of carbon dioxide emission in Nigeria owes to bush burning which contribute greenhouse gases. These all have serious implications for food security in the region. Loss of arable land resulting from bush burning hampers crop production and farmers are forced to abandon farming for other livelihood activities. Also, oil spills has had a significant influence on the Niger Delta's mangrove forests and fisheries resources. This loss of arable land and fishing grounds has increased criminal engagements.

Similar consequence of bush fire results from gas flaring. The burning thick smoke that billow from the different flaring sites constitute environment-damaging components capable of destroying vegetation, suppressing plants' growth and flowering (Oka, 2017). An area of such becomes inhabitable for farmers, fishermen and hunters just as other dwellers owing to excessive perspiration and increased temperature of human metabolism caused by excessive heat. This means, food production is threatened as more people change job from farming which is the bedrock

of food security. Gas flaring also makes the environment less productive for food production ventures, especially farming and fishing.

Gases flared into the biosphere contains carbon dioxide and chlorofluorocarbon which cause greenhouse effect and also cause acidic rain which pollutes water resources needed for lucrative farming and fishing activities. It needs no reiteration that fishing in the Niger Delta has also been affected by air and water pollution which is not unconnected to oil spillage and leaks as well as toxic waste dumping in water bodies in the area. Agricultural output is thereby reduced due to loss of arable lands and water resources to toxic wastes.

CONCLUSION

The security or otherwise of the Nigerian geopolitical construct is a reflection of its environmental security. Underlining most insecurity challenges such as banditry, farmer-herders crisis, cattle rustling, oil theft and bunkering are unaddressed environmental issues. Desertification in the north is claiming arable lands and shrinking water resources for pastoralism. It has occasioned migration down south and heightened competition for limited land and water resources in the middle belt and southern regions. Biospheric pollution in the oil-rich Niger Delta has also led many into criminal activities that threaten human security. The intricate interconnectedness of environmental security with human and food security cannot be overemphasised. Hence, addressing the man-made and nature induced environmental issues constitute the roadmap to a strengthened national security as well as global peace.

RECOMMENDATIONS

This study recommends that;

- a. ministries of environment and defence should collaborate to develop an environmental security concept within the larger debate that redefines traditional conception of national security
- b. government agencies and private sector should keep to the goal 8 of Sustainable development
- c. government should provide water resources through irrigation and dam system for competing pastoralists and farmer groups in the north, middle-belt and south of the country
- d. relevant agencies should ensure industrial and extractive activities especially oil exploration is carried out within the carrying capacity of the environment to enable renewal
- e. protection of buffer states from desert encroachment
- f. policing of territorial waters to prevent access to transnational merchants of waste
- g. enforce environmental protection protocols
- h. government should see to the due compensation of Niger-delta people by oil multinationals owing to loss of livelihood from degraded environment
- i. government should divestment from non-renewable energy and invest heavily in renewable energy
- j. people should contribute to *global* efforts in abating environmental challenges such as climate change and loss of biodiversity through environmental protection and sustainable practices.
- k. people should embrace alternative sources of energy for domestic use especially in dessert prone areas so as to conserve forest resources and reduce biospheric pollution.

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