

GOVERNANCE OF GLOBAL ENVIRONMENT, CHALLENGES OF SUSTAINABLE DEVELOPMENT AND AFRICA'S SECURITY DILEMMA IN THE 21ST CENTURY

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ABSTRACT

This paper is a critical survey of the connections between weak sustainability and the environment-security nexus and a problematisation of the strong tension between ecology and economy in the conventional consensus on sustainable economic development. It asks whether the changing global security architecture helped in providing a humanistic view of security; whether the new non-traditional security threats that do not lend themselves to military response affect Africa; and whether there is a trade-off between discrete multilateral adaptive measures addressing environmental and human security and its practice. The paper observes that the change in the traditional realist paradigm of security has reconceptualised security away from human and environmental security as the ultimate referent object; and that there is no trade-off between discrete multilateral adaptive measures to climate change that addresses both environmental and human security and its practice because environmental issues touch on highly contentious issues which tend to interfere with economic and political interests in such a way that the principle common but differentiated responsibilities of fair burden-sharing according to responsibility was undermined by the developed nations. It also argues that environmental crisis is likely to be the main driver of conflict in world politics, and that Africa's vulnerability to threats that do not lend themselves to military response driven by global climate change poses security threats to Africa. As an alternative to a monolithic transnational framework for management of climate change, the paper suggests a hybrid of reactive-proactive and mitigation-adaptation measures for the management of climate change driven by the principle of national self-help pursued independently by nations in dealing with environmental security threats posed by global climate change.

Keywords: Sustainable development, climate change, environmentalism, security, Africa, ecological footprint, multilateral environmental adaptive measures (MEAN).

ENVIRONMENTAL SUSTAINABLE DEVELOPMENT PROBLEMATIQUE

That security threats to the sustainability of man and his environment does not fit into the mode of traditional threats to national security has become one of the key issues in the domestic and international politics around which an intellectual firestorm has been created among international policy works (Onuoha and Ezirim, 2010:225). At the heart of this debate that still rages today is precisely contrary to the mainstream "eco-efficiency" approach to development – how to link economic security with environmental sustainability in the face of a non-dematerializing global economy. This is a

quandary realizing that the greatest threat to environmental security emanates, not from poverty, but from the process of wealth creation on a global scale. Given the fact that economic growth relies upon exploitation of natural and social capital, on the one hand, and climate change results from human activity, rather than pure forces of nature, on the other hand, the strong tension between ecology (life) and economy (wealth) casts a serious doubt over the possibility of an environmentally sustainable capitalist economic development under the prevailing global capitalist model of development.

Efforts at addressing this problem abound, from the “limits to growth” debate of the 1970s, the Brandt Commission, the Brundtland Commission, the United Nations Conference on the Environment and Development of 1992, the international multilateral environmental agreements (IMEAs), the Intergovernmental Panel on Climate Change (IPCC), and the Kyoto Protocol. Critical reading of the above efforts, however, is at best the merger of environment and economics in decision-making, and an element of circularity in the mindset of international development policy experts between strong sustainability and weak sustainability. This is because the impact of the prevailing pattern of trade and investment in a historical perspective in the global economy is sustained through a vertical international division of labour which emphasizes the export of natural resources as a payoff of environmental sustainability. Thus, the logic of the World Bank’s innovative measure of wealth is still based on the weak model of sustainability that allows the total depletion of exhaustible resources as long as the derivative revenue is invested in tangible and intangible assets. It reinforces the old paradigm of trading which it purportedly claimed to be criticizing. For instance, contrary to the GDP-based assessment, the cannon of wealth of nations not only take manufactured capital into account but also consider natural and intangible assets in aggregating the wealth of nations. By implication, both the new measure of wealth of nations and the conventional measure of wealth are the same in the sense that both encourage the destruction of natural resources. This leads to an “unsustainable situation” which developing nations have been subjected to, in satisfying international demands by depleting its share of nature’s resources, its natural capital (Ohiaegbu, 2006:106).

In other words, one major flaw of the Environmentally Sustainable Development (ESD) model as practiced, is that it does not take into cognizance the past ecological footprint of economism nor factor in the ecological debt (a neutral index of the ecological (un)sustainability of man’s activities on the environment); whereas, there is a broad international scientific consensus that human actions are influencing the climate, that is, human induced climate change.

Understood this way, the internal security of the developing states arise not only from their newness and their particular problems of state-building, but also from the nature of their economic and class ties to the global economy. Indeed, one *leitmotif* of the extant model sustainability is economic growth on capitalist terms, a perpetuation an even older myth: the environment is something apart from humanity, humanity’s economy, and its social well-being. Such a woolly thinking contrived from neoclassical economic model places humanity outside the environment, and has no connectivity to the biosphere and thus places no value on biodiversity or the functions of the ecosystem that enable life itself. This model fails to encourage us to recognize our dependence on the biosphere: Human beings and their social and economic systems are intimately dependent upon the ecological systems now undergoing rapid changes. Ecological systems from wetlands, forests, coral reefs, and tundra, to grasslands, kelp beds, estuaries, and the open ocean provide a broad range of essential goods and services to humanity. They are the life-support systems for all of life on earth.

The fact that ecological interactions do not respect the boundaries and political jurisdiction of nation-states brings the climate-change-as-a-security-threat nexus to the fore especially in Africa (Onuoha and Ezirim, 2010). With specific reference to Africa, the non-violent and gradual dynamic manifestation of climate-change serve only to disguise its

impact on livelihoods, social order, peace, and stability. Viewed in a historical perspective, there is an organic relationship between the unsustainable environmental situation in Africa, Africa's eco-catastrophes, and the ecological footprints of economism which the original idea of sustainable development: meeting the needs of the present without compromising the ability of future generations to meet their own needs would suggest (Report of the World Commission on Environment and Development and the General Assembly Resolution 42/187, of 11 December 1987).

The question would be why global environmental regulatory regimes and multilateral environmental agreements which are discrete policy initiatives that ought to be addressing both environmental and human security have remained highly eccentric and fragmented lacking a recognizable effective structure of governance. Another would be why certain states fully implement environmental agreements, while others do so incompletely or not at all. All these re-enforce an organic framework in which the prevailing economism is seen to be antithetical to national security interests, and environmental security intricately linked with economic security, and human security.

The Transition from Nuclear Security to Human and Environmental Security

The issue of survival remains the base value of global politics, indeed, of all human agencies. One feature common to conceptualisation of security framed in a traditional realist paradigm to 'security', is that the state is made the ontological referent object. Security being the primordial consideration of states was something which states are pre-occupied with as it is often equated with their existence. Such a vision of security predisposed states to prioritize their own national security interests over and above the interests of individuals who live both within their own territories, and within other states. With such a 'corporate-security state' framework, the government's imperative is to provide security for its corporate interests in order to fulfill its national interests. Such conception of security was never without its critics, a result of which in the wake of the end of the Cold War, the narrowly militarized understanding of security started becoming anachronistic. Thus, a new perspective of security beyond the traditional focus on states' political-military competition became a desideratum. From the matrix of security studies below, the subject matter of security has undergone both a "broadening" and a "deepening" as well as a revisioning (see Table 2) following the changing menus and priorities of world politics. Consequently, the pursuit of national security under the umbrella of a single actor, the nation-state has been replaced by a very different kind of collective and cooperative security, the human security. As a result, the idea of human security is now seen in terms of fivefold interwoven interaction between subsystems linked by specific bridges: environment and economy linked by resources; economy and society by social forces; society and polity by brokers and alliances; and politics and culture by ideology (Nef, 1985; UNDP, 1994).

Following the work of Willy Brandt's Independent Commission on International Development Issues in the 1970s, to the 1994 UN Development Programme report *Redefining Security: The Human Dimension*, and the creation of the Commission on Human Security, which published its report *Human Security Now* in 2003, the more complex, varied, and nuanced visions of security came to be appreciated. Thus, the security of the individual and safeguarding and expanding people's vital freedoms, shielding people from acute threats and empowering people to take charge of their own lives is now prioritized.

In contrast to the traditional realist approach to 'security' in which the security of the regime in power was made the ontological referent object of security, human security came to be appreciated only when it was realized that mankind was living in a world of mutual vulnerability. According to Ivan Head (1991), in an increasingly interconnected system, there is neither invulnerability nor developmental irreversibility; rather, the weakness of the periphery increases the exposure of the centre, making the entire configuration, including the centre, more unstable, the seemingly secure

societies of the world started realizing that they too were vulnerable to events in the less secure and hence underdeveloped regions of the globe; interconnectedness means that dysfunctions in the weaker components of the global fabric result in reciprocating. Given the retro-feeding nature of these trends, no region of the world can be immune to impending crises of potentially catastrophic proportions.

The fact that nature is systemic in terms of both its functions and dysfunctions, and ecological interactions do not respect the boundaries and political jurisdiction of nation-states makes the environment-security nexus an aspect of states' external sovereignty (as that concept refers to relations among states, and at the same time an aspect of internal sovereignty as it refers to a regulatory function of public policy. Thus, the interdependence between states, environmental issues, and national security cut across the domestic-international public policies at any level from the local to the global. This convergence of political and economic security interests is epitomized in the case of multilateral environmental agreements (IMEAs), which is a trade-off between discrete policy initiatives that addresses both environmental and human security.

Table 1: A Matrix of Security Studies

What is the Source of Security Threat?

Military,	non-military,	or both?
Cell 1: National Security (Conventional Realist approach to Security Studies)	Cell 2: Redefined Security e.g., Environment and economic security)	
Cell 3: Intra-state Security e.g., civil war ethnic conflict, and democide)	Cell 4: Human Security, e.g., environment and economic threats to the survival of societies, groups, and individuals)	

Table 2: Matrix of Possible Climate Change/Security Interactions over Time

	Direct impact	Indirect Consequences					Slow-onset
	Water	Food	Health	Mega-projects	Disasters	Bio-fuel	Sea level
Short term (2007-2020)	Local conflict over water	Failure to meet MDGs	Failure to meet MDGs	Long history of development-induced displacement from 1950s	Nation states begin to lose credibility due to inability to prevent large disasters	Isolated food - fuel competition and price spikes	Small number of displacements
Medium term (2021-2050)	Increased local & some international conflict over water	Significant displacement due to famine	Interacts with food production problems	Displacement of rural poor due to CDM & large scale dams & other state based mitigation & adaptation projects	Significant political unrest due to failure of DRR & inadequate recovery in many countries	Food-fuel competition increases & biodiversity erosion	Increasing displacement & national/international tension
Long term (2051-2100)	Major international conflict over water	Major displacement & political upheaval	Major displacement due to epidemics	Major urban upheaval and other political fallout from mega-project displacement	Major upheaval with international implications due to unattended weather catastrophes	Major discontent due to food-fuel competition	Major international tensions due to population displacement
All of these processes strongly interact with each other							

Both sides of security were recognized by the framework of the Rio principles when it states that a state’s sovereign right to exploit its own resources in accordance with its own policies, without harming the environment elsewhere (principle 2); environmental protection as an integral part of development (principle 4); and the polluter pays principles, including the internalization of costs and the use of economic instruments (principle 16).

As could be seen from the contours of the debate on security rethinking in security studies, the subject and the object of human security is now socially or environmentally constituted (see Cell 2 and Cell 4 in Table 1). Therefore, it is not only issues that pertain to military security (Cell 1 and Cell 3) that impinge upon individual’s security. The emergent shift in security construct now stands in direct opposition to the earlier state-centric conceptualisation. Hence, at least in theory; one can talk of a transition from nuclear security to human security or, the security of person. For example, in the case of

Britain, one can now distinguish between ‘defence policy’, which focuses exclusively on the military dimension, and ‘security policy’, which takes a broader view incorporating economic and trade issues.

Though the dividing line or distinction between local, national, transnational (transboundary), and global environmental problems, defined in terms of the geographical scope of negative spillovers of environmental problems is difficult to draw, its direct and indirect threat to human sustenance introduces a whole new and more serious events that undermine human livelihood, safety, and survival. It is not surprising that the relationship between climate change and security has become a subject of growing public debate and academic inquiry, leading to the outpouring of scholarly literature. For instance, impact of climate change on peace and security was top on the agenda of the United Nations Security Council held debate on April 17, 2007. In other words, the international community now recognizes climate change as an environmental problem and a serious threat to national and international security, as the phrase “ecocatastrophes” or “environmental insecurity” cognitively conceptually suggests. Therefore there is need to look at the multifarious nature of environmental risks and the toll of the new non-traditional security threats that do not lend themselves to military response driven by global climate change on Africa.

AFRICA’S ECO-CATASTROPHES: THE BURDEN OF THE ECOLOGICAL FOOTPRINTS OF WEAK SUSTAINABILITY

Several climate regimes characterize the African continent; the wet tropical, dry tropical, and alternating wet and dry climates are the most common. Climate change has both intermittent but increasingly frequent, extreme impacts (such as large storms and heat waves) and slow on-set, pervasive, cumulative effects (such as extinction of life forms and sea level rise). Both kinds of effects may have a role in displacing human populations and disrupting their livelihoods. The complex interactions of the new security threats will be used to explain Africa’s portion of the global weather catastrophes. According to World Bank Commodity Risk Management Group (CRMG), the Global Index Insurance Facility (GIIF), it is estimated that the costs of climate change impacts in exposed developing countries could range from several percent to tens of percent of GDP, or up to \$100 billion a year (The World Bank, 2006). Changes in climate interact with the environment adding further stresses to a deteriorating situation (See Table 2).

From the above matrix of possible climate change/security interactions over time, in the short term (2007-2020); medium term (2021-2050) and long term (2051-2100) direct impact of global weather catastrophes will involve local and international conflicts over water. Many countries on the continent are prone to recurrent droughts, particularly in south-east Africa. In the short term (2007-2020), indirect consequences of global weather catastrophes will be failure to meet MDGs. Concerning the MDGs individually, UNDP states that climate change may pose a threat to food security through erratic rainfall patterns and decreasing crop yields, contributing to increased hunger (UNDP 2004). Furthermore, adverse climate change impacts on natural systems and resources, infrastructure, and labor productivity may lead to reduced economic growth, exacerbating poverty. These effects threaten the achievement of MDG 1. Loss of livelihood assets, displacement and migration may lead to reduced access to education opportunities, thus hampering the realization of MDG 2. Depletion of natural resources and decreasing agricultural productivity may place additional burdens on women’s health and reduce time for decision-making processes and income-generating activities, worsening gender equality and women’s empowerment (MDG 3). Increased incidence of vector-borne diseases, increases in heat-related mortality, and declining quantity and quality of drinking water will lead to adverse health effects threatening the

achievement of MDGs 4, 5, 6 and 7. In general terms, the realization of MDG 7 may be jeopardized through climate change negatively impacting quality and productivity of natural resources and ecosystems, possibly irreversibly, threatening environmental sustainability. Climate change, a global phenomenon, calls for a collective response in the form of global partnerships.

Climate change has the potential to cause powerful systemic shocks to human development across a large number of countries. Its threat potential in terms of human development impacts is likely to prove irreversible. The March 2008 European Council report provided a striking synopsis of the challenges that climate change poses to international peace and security. According to the E.U. Report, the immediate and devastating effects of global warming will be felt far away from Europe, with the poor suffering disproportionately in South Asia, the Middle East, Central Asia, Africa and Latin America, ultimately bearing the consequences. The fact that the consequences of climate change is disproportionately felt by the poorest who are least responsible for it, makes the issue of climate change one of justice as much as economic development.

Similarly, the Intergovernmental Panel on Climate Change (IPCC, 2007) in its Fourth Assessment Report noted that the poor of this planet are most likely to suffer the worst effects of climate change. The IPCC 2007 Report maintains that Africa is very likely to suffer very damaging impacts and at present commands the least resources for coping and adapting to these stresses: Africa is one of the most vulnerable continents to climate variability and change because of multiple stresses and low adaptive capacity. Some adaptation to current climate variability is taking place; however, this may be insufficient for future changes in climate.

Due to Africa's limited adaptive capacities, and dependence on climate-sensitive resources such as local water and food supplies, Africa is vulnerable the more to livelihood security and other aspects of human security which interact with geo-strategic (or "hard") security issues. The regional increase in temperature will be higher in Africa than the global mean, in some cases up to 50%. Desertification will advance significantly, especially along the Sahel zone, which stretches from Senegal in the West to Somalia in the East, as well as in southern Africa. These trends will lead to a decrease in the availability of water resources and agricultural land even as population increases and economic growth expands. This development will especially affect those states in which agriculture plays a significant role. 250-550 million people could be affected by hunger if there is a temperature increase of 3°C; it is likely that, by 2050, 75% of all undernourished people will be concentrated in Africa. Some countries' agricultural yields could decline by more than 50% by 2020 and incomes by more than 90% by 2100. In West Africa, about 500 km long metropolitan belt is developing between Accra and the Niger Delta, which will be highly vulnerable in the face of any rise in sea level.

Water is a critical resource for personal and national survival, and management of many of the world's 261 international rivers will face severe tests: many coastal freshwater aquifers will suffer salinisation as a result of sea level rise. In Africa alone, according to the IPCC 2007 report by 2020, between 75 and 250 million people are projected to be exposed to an increase of water stress due to climate change. If coupled with increased demand, this will adversely affect livelihoods and exacerbate water-related problems.

Similarly, from various UNDP reports, the threat of climate change and human development in countries in Africa is alarming as increased levels of water stress will have a significant impact on food security in some countries in Africa

with yields from rain fed agriculture being reduced by up to 50% by 2020. It added that drought affected areas in sub-Saharan Africa could expand by 60-90 million hectares, with dry land zones suffering losses of US \$26 billion by 2060 (2003 prices), a figure in excess of bilateral aid to the region. It is estimated, in addition, that an additional 1.8 billion people could be living in a water-scarce environment by 2080.

Climate change is expected to have significant impacts on water supplies creating or exacerbating chronic shortages and on water quality. There is already widespread acceleration of glacial retreat and in many areas stream flow is shifting from spring to winter peaks. If continued, these shifts could affect the availability of water for agriculture and other uses. Sea level rise will result in saltwater intrusion into coastal fresh water aquifers, potentially reducing water resource availability. Changes in quantity and intensity of precipitation are likely to result in more floods and droughts and increased demand for irrigation water. Water management often requires costly investment in infrastructure. Given the long economic and physical life of reservoirs, water withdrawal, treatment, delivery, and disposal systems, adaptive responses are generally slower in water management than in agriculture (Burton and May, 2004).

Africa's is not exempted from the exposure to sea level-displacement-security considering the fact that Africa consists of four major basins which are bordered on the ocean side by low-lying. Vulnerable Africa's coastal cities include Dakar, Senegal; Accra, Ghana; Lagos, Nigeria; Luanda, Angola; Cape Town and Durban, South Africa; Maputo, Mozambique; Dar-es-Salaam, Tanzania; and Mombasa, Kenya; and Mogadishu, Somalia. In Nigeria for instance, coastal flooding plagues parts of Lagos and Ogun. Although coastal flooding represents a threat to coastal communities worldwide, the threat is potentially acute for coastal cities, such as Lagos, which is already stressed to its limits by a population of 17 million. In the event of sudden rise of sea level of only 20cm, it is estimated that over 740,000 people would be displaced in Nigeria. A rise of 1 million would lead to 3.7 million internally displaced persons (IDPs), and 2m would render over 10 million homeless people in the country.

Several African coastal zones, many of which already are under stress from population pressure and conflicting uses, would be adversely affected by sea-level rise associated with climate change. The coastal nations of west and central Africa (e.g. Senegal, Gambia, Sierra Leone, Nigeria, Cameroon, Gabon, and Angola) have low-lying lagoonal coasts that are susceptible to erosion and hence are threatened by sea-level rise, particularly because most of the countries in this area have major and rapidly expanding cities on the coast. Flooding is a common environmental challenge in Lagos and its environs, and its impact would worsen in the years ahead as the sea-level rise interacts with other factors, like weak municipal waste disposal, poor drainage systems, demographic pressure, and collapse of social infrastructure. The west coast often is buffeted by storm surges and currently is at risk from erosion, inundation and extreme storm events. The coastal zone of east Africa also will be affected, although this area experiences calm conditions through much of the year. However, sea-level rise and climatic variation may reduce the buffer effect of coral and patch reefs along the east coast, increasing the potential for erosion. A number of studies indicate that a sizable proportion of the northern part of the Nile delta will be lost through a combination of inundation and erosion, with consequent loss of agricultural land and urban areas. Adaptation measures in African coastal zones are available but would be very costly, as a percentage of GDP, for many countries. These measures could include erection of sea walls and relocation of vulnerable human settlements and other socio-economic facilities.

The cost of dislocation which will include salinisation of coastal aquifers and other low-lying fresh water resources and loss of infrastructure will be difficult for poor countries to bear, especially in Africa. This observation is reinforced by the Intergovernmental Panel on Climate Change (2007) which states that towards the end of the 21st century, projected sea-level rise will affect low-lying coastal areas with large populations. The cost of adaptation could amount to at least 5-10% of GDP. Mangroves and coral reefs are projected to be further degraded, with additional consequences for fisheries and tourism.

Related to sea level rise is the issue of shortage of fresh water resources. Of the 19 countries around the world currently classified as water-stressed, more are in Africa than in any other region, and this number is likely to increase, independent of climate change, as a result of increases in demand resulting from population growth, degradation of watersheds caused by land use change and siltation of river basins. A reduction in precipitation projected for the Sahel and southern Africa, if accompanied by high inter-annual variability, could be detrimental to the hydrological balance of the continent and disrupt various water-dependent socio-economic activities. Variable climatic conditions may render the management of water resources more difficult both within and between countries. A drop in water level in dams and rivers could adversely affect the quality of water by increasing the concentrations of sewage waste and industrial effluents, thereby increasing the potential for the outbreak of diseases and reducing the quality and quantity of fresh water available for domestic use.

The relationships between South Africa and Lesotho and between Egypt and Ethiopia illustrates that conflict may erupt between downstream and upstream riparians. This situation is particularly dangerous if the downstream country also believes it has the military power to rectify the situation. A 2003 study on the causes of conflict in Darfur from 1930 to 2000 has exposed “very strong” linkages between the environment and conflict. In fact, competition for pastoral land and water has been a driving force behind the majority of local confrontations for the last 70 years in some African societies. On wider scale, the German Advisory Council on Global Change (2007) in its International Alert report identified 46 countries, home to 2.7 billion people, where climate change and water-related crises create a high risk of violent conflict. An additional 56 countries, representing another 1.2 billion people, are at high risk of political instability, according to the study.

A June 2007 report by the United Nations Environmental Programme (UNEP) identified drought cycles, desertification, and land degradation as important contributing factors to the current crisis. A 2008 Oxfam report noted that seven droughts between 1991 and 2000 have increased food insecurity, and prompted animal losses conflict, and cattle rustling. Water demand by, and water supply to crop plant will be modified to the detriment of crop yield as rainfall pattern progresses. This is very critical to the production of food crops in most climate-dependent economic activity. Though, agriculture has proven to be one of the most adaptable human activities to varied climate conditions, and crops and cultivars can be quickly changed to suit new conditions, however, changes in climate have significant impacts upon crop yields through changes in both temperature and moisture. As climate patterns shift, changes in the distribution of plant diseases and pests may also have adverse effects on agriculture (Gitay *et al*, 2001).

The above scenario affect primary productivity, which is achieved through photosynthesis, a biochemical process in which atmosphere carbon dioxide in the presence of sunlight is combined with water to produce simple carbohydrates

from which organic substance, whether in plants or animals are fabricated. An increase in rainfall facilitates increased intake of carbon dioxide and therefore an increase rate of photosynthesis. The diminishing rate of organic matter content of the soil is a result of very high rate of chemical and biochemical action as well as the abundance of micro organic activity. As soon as any dead part of a plant or an animal falls on the ground, it is attacked by myriads of insects and worms which bring about an initial break down. Later decomposition takes place, producing soluble minerals, which are easily carried away by percolating water due to rainfall. The fertility of the soil depends on the organic matter it contains. An expected increase in convective rainfall results in heavier rainfall when and where it does occur. Such “extreme precipitation events” causes increased soil erosion (Adejuwon, 2004). As rainfall affects the crops yield of an ecosystem, this leads low yield of agricultural products for industries that depends on it. This is the case in Cocoa farming in Okitipupa, Ondo State, Nigeria, where changes in rainfall pattern leads to change in the yield of cash crops like cocoa and rubber, palm oil. This has affected cocoa grower scheme and contract farming for supply of cocoa beans (*Nigerian Tribune*, 23 April, 2008:26).

The above mentioned environmental trends affect security in Nigeria by exacerbating the effects of other security stressors, like poverty and disease. For instance, agriculture is the main source of food, industrial raw materials, and employment (about 70%) in Nigeria. However, agricultural productivity in Nigeria is highly vulnerable to climate change because it depends heavily on rainfall. Hence, the shifts in rainfall patterns in various parts of the country, due to climate change, have lead to crop and livestock failures, leading to food insecurity and worsening poverty.

Another way of seeing “Extinction Risk from Climate Change” is to look at ecosystems and biodiversity. Changes in natural ecosystems are among the first observable impacts of climate change. Changes in plant flowering dates and bird migrations and distributions have already been widely recorded. While some of the more mobile species (birds and larger animals) may be able to migrate rapidly enough in response to changing climate patterns, many ecosystem components, including many tree species, have much lower mobility. In Africa today, tropical forests and rangelands are under threat from population pressures and systems of land use. Generally, apparent effects of these threats include loss of biodiversity, rapid deterioration in land cover and depletion of water availability through destruction of catchments and aquifers.

Arid to semi-arid sub-regions and the grassland areas of eastern and southern Africa, as well as areas currently under threat from land degradation and desertification, are particularly vulnerable. Were rainfall to increase as projected by some GCMs in the highlands of east Africa and equatorial central Africa, marginal lands would become more productive than they are now? These effects are likely to be negated, however, by population pressure on marginal forests and rangelands. The combined effects of human development and the slow rate of natural adaptation suggest that considerable ecosystem disruption will take place as the climate changes, and that substantial loss in the diversity of species is likely to occur with serious implication for implication for disaster risk management.

With reference to Nigeria, about 61 active erosion sites in the 177 communities in Anambra State, estimated to cost over N17 billion (naira) has been documented. One of such erosion sites in Umuchiana-Ekwulobia has submerged 75 buildings and displaced about 437 families. In 2008, for instance, erosion washed off the rail line linking Aba and Port Harcourt, leading to a decline in economic activities in Aba, Abia State. Soil erosion has destroyed many communities

and rendered about 200,000 homeless as internally displaced persons in Abia, Enugu, and Anambra states of southeastern Nigeria. Climate change-related flooding has already had immediate impacts on food production, livelihood assets, and human survival, in both rural and urban areas in Nigeria. Heavy rainfall and perennial flooding in some states, like Adamawa, Bauchi, Borno, Kebbi, Lagos, Nassarawa, Niger, Ogun, Plateau, Sokoto, and Yobe, in 2007 affected about 50,000 people, and killed about 63 persons. In Bauchi State, no fewer than 24 persons were reported dead, while 5,787 farmlands and 13,609 houses, worth over N717.3 million (naira), were destroyed by the flood. In Gombe state, similar floods induced about a 50% hike in prices of grains. Consequently, prices of foodstuff have increased astronomically, which is attributed to global warming.

West Africa accounted for 15% of cumulative disaster events in Africa between 1975 and 2002 but the number of disasters in the sub-region rose by 94% from the 1970s to the 1990s. Already 154 disasters have occurred during the first five years of this decade, compared to 136 during the past two decades. Epidemics accounted for 40% of disasters in the sub-region during 1975 to 2003, compared to 20% by flood and drought, and cause most human fatalities and debilitation. However, the most pervasive disasters in terms of the numbers of people affected and disruption to livelihood support systems are those due to flood, drought, and famine. Also, changes in temperature and humidity provide or extend a favorable habitat for insects, such as mosquitoes, tsetse fly, tick, and other pests in areas where they hitherto existed. There has been a reported increase in the prevalence or outbreak of diseases, such as malaria, cerebral-spinal meningitis, and heat strokes in Nigeria.

For instance, the World Health Organization (WHO) reported there were about 17,500 cases of “serious” outbreaks of meningitis in the northern part of Nigeria in early 2009. No fewer than 960 people died of the disease, especially in Bauchi, Gombe, Taraba, Yobe, and Zamfara States. Obviously, in an environment of worsening poverty and falling health standards, citizen’s expectation from the government increases. Consequently, unfulfilled promises and expectations could interact with other security and governance deficits to precipitate social disorders and violent conflicts. A key factor in reducing future risks in developing countries lies in strengthening the development of effective adaptation measures (Tol and Dowlatabadi, 2002).

Amidst uncertainty, food scarcity in developing countries is emerging as the most profound and immediate consequence of global environmental degradation, one already affecting the welfare of millions. All the principal changes in the earth’s physical conditions, eroding soils, shrinking forests, deteriorating rangelands, expanding deserts, acid rain, stratospheric ozone depletion, the buildup of greenhouse gases, air pollution (Brown 1993).

THE POLITICIZATION OF INTERNATIONAL ADAPTATIVE MEASURES TO CLIMATE CHANGE

As climate change developed into an important international issue attracting increasing attention from the public, media, scientists and policymakers around the world, the Intergovernmental Negotiating Committee (INC) initiated its work on drafting an effective convention on climate change in 1991, two issues emerged as especially critical in order to successfully create a convention. First, whether a convention should give specific targets and timetables for emission reductions, and second, to what degree and extent the developing countries should participate (Economy, 1994:18-19). Together, the developing countries emphasized the historical responsibility of developed countries for climate change, and agreed to participate in the climate negotiations only on the condition that they should not be required to take any

substantial commitments of their own (Harris, 2003: 27). The developing countries (G77) actually managed to influence the structure of the Convention in several areas, something which is especially evident in Article 3 on general principles to guide the parties in their action to achieve the objective of the Convention (Chayes and Charlotte, 1998:509). Article 3.1 calls on the Parties to protect the climate system ‘on the basis of equity and in accordance with their *common but differentiated responsibilities* and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof. Although the developing countries (G77 and China) repeatedly advocated differentiated obligations for industrialized and developing countries, they strongly opposed any differentiation among developing countries based on their different levels of development (Chayes and Charlotte, 1998:525).

From Rio to Kyoto (1992-1997) six more Intergovernmental Negotiating Committee (INC) meetings were held between Rio and the first Conference of the Parties (COP-1) preparing for the Convention’s entry into force. The most central issue discussed at COP-1 was the adequacy of the commitments of the Convention including the proposal of a follow-up protocol. The implementation of the existing commitments was stressed by G77 and the Alliance of Small Island States (AOSIS) declared the current commitments inadequate and called for industrialized countries to address the problem. This led to establishment of the Ad Hoc Group on the Berlin Mandate (AGBM). There was very definite refusal to accept any new commitments for developing countries in the next round of negotiations, i.e., the AGBM. In fact, the U.S. and Australia threaten to drop their insistence if developing countries were not to get involved in new commitments. Contrary to what was promised in the Berlin Mandate, some developed countries and the US in particular continued to push for commitments for developing countries which culminated in a call for ‘meaningful participation’ from developing countries at the eighth and final session of the AGBM in Bonn, October 1997, by former US President, Bill Clinton.

The third stage (1997-), the post-Kyoto agenda evolved around how to make the Protocol ready to enter into force and its rules of procedure. To a large degree, it was a matter of how to make the agreement acceptable for certain developed countries and thereby secure their ratification. Despite the developing countries’ successful effort to remove the proposed article on voluntary commitments for non-Annex I countries from the Protocol, the issue was brought up once again by the US at COP-4 in Buenos Aires. China and India (and other developing countries) recalled that the debate at Kyoto had rejected the idea of voluntary commitments, because it was an idea not implied in the principle of ‘common but differentiated responsibilities’. The idea of voluntary commitments for developing countries also raised the concern that developing countries risked losing financial assistance and technology transfer as stipulated in the Convention if they agreed to take on commitments voluntarily. The G77 negotiators remarked that developed country emissions were projected to be 5% above 1990 levels by 2000, and 13% above 1990 levels by 2010. Consequently developing countries’ ‘survival emissions’ should be distinguished from developed countries ‘luxury emissions’ Rather than forcing developing countries to ‘remove food from people’s tables’, developed countries should change patterns of production and consumption.

At COP-6 the CDM was adopted as a ‘win-win’ mechanism benefiting both developed and developing countries. It was only after some compromises have been made that the EU together with ‘G77 and China’ were eager to negotiate an agreement that could ensure an entry into force of the Kyoto Protocol at COP-7 in Marrakech. This led to the Marrakesh Accords and the Bonn Agreements which completed three years of negotiations on the operational details of the Kyoto

Protocol. However, the division between developed and developing countries' positions was as usual evident when the Parties gathered in New Delhi for COP-8.

In the opening session the developing countries represented by 'G77 and China' expressed their disappointment at the low level of financial resources provided by Annex I Parties and stressed that action so far had been symbolic. Emphasizing the need for continued economic development, the rising energy demands that will occur as the quality of life in developing countries improves was stressed.

Thus, the Delhi Ministerial Declaration on Climate Change and Sustainable Development adopted at COP-8 reflected a strong developing country perspective, focusing on issues such as sustainable development, poverty eradication, adaptation and developed countries' implementation of their commitments under the Convention. Though the developing countries' view unexpectedly gained support from the US, which earlier had called for more action from developing countries repeatedly, at COP-9 in Milan, the Parties remained deadlocked on the broader issues of how to continue the effort to prevent climate change, and progress was limited only to a few primarily technical issues such as rules for sink projects in the CDM. The Parties tried their best to avoid the rancorous debates that had arisen at COP-8 when the EU and other developed countries had brought up the issue of steps beyond the first commitment period. As a result, developing countries expressed their frustration over the Annex I Parties' failures to fulfill their own commitments, their limited transfer of technologies and insufficient financial support. Based on this the '...developing countries held firmly to preventing negotiations turning towards mitigation activities by non-Annex I countries in the future' (ENB 2003). In other words, instead of starting a dialogue about future mitigation commitments for developing countries, some of the more powerful developing countries wanted to focus on *adaptation*.

Since the first Conference of the Parties (COP) to the Convention in 1995, the framework for addressing adaptation is a Three-Stage Process: Stage I, to be carried out in the "short term," focus on identifying the most vulnerable countries or regions and adaptation options. Stage II involves measures, including capacity building, to prepare for adaptation. Stage III entails implementing measures to facilitate adaptation. While the latter two stages were to be implemented over the "medium and long term", the effort to date has centered primarily on Stage I- and Stage II-type activities, more often simultaneously than sequentially.

Multilateral and bilateral support has focused on building the capacity of developing countries to assess their vulnerability to climate change and examine adaptation needs and options. Also there are more than 180 Multilateral Environmental Agreements (MEAs) that cover different geographical areas and types of environmental problems. Of these, 20 to 25 include stipulations on trade, and among them provisions on trade have a prominent role in three: the 1973 Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer (with later adjustments); and the 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal.

Through such Multilateral and bilateral support, with assistance provided under the Convention, Bangladesh and small island states in the Caribbean and the Pacific have examined their vulnerabilities to climate change and are assessing options for adaptation. The U.N. Environment Programme has worked with about half a dozen countries on in-depth

assessments of vulnerability, while the U.N. Development Programme is assisting scores of countries in assessing adaptation needs. In addition, several countries, including the United States, Britain, the Netherlands, Japan, Germany, and Canada, have provided bilateral assistance. By one recent accounting, bilateral programs have committed \$110 million to more than 50 adaptation projects in 29 countries (Frankel-Reed, 2006). Recently, the emphasis has shifted to setting priorities among adaptation options. More than 40 least developed countries have received funding under the Convention through the Global Environment Facility (GEF) established in 1992 to channel financing to developing countries establish prepare National Adaptation Programmes of Action (NAPAs) addressing urgent needs environmental problems.

The most recent round of climate change negotiations was COP-10 in Buenos Aires in December 2004. The Russian ratification created a certain optimism, after the uncertainty that had surrounded the fate of the Kyoto Protocol since the US withdrawal in 2001. The optimism soon faded away when the discussion on the post-Kyoto period started. An issue that was central in Buenos Aires was 'whether countries were prepared to create a space within the formal process to even begin considering the question of next steps'. This issue of a Seminar of Governmental Experts discussing future commitments brought up highly tempered debates and even led to a split in the 'G77 and China' coalition which to this point had maintained a more or less unified front in their refusal to discuss anything that could lead to new commitments. It is expected that developing country commitments will become an even more central issue in the upcoming negotiations for the post-2012 period. Nearly 15 years after the Convention's negotiation, however, the international adaptation effort is more an irregularly funded patchwork of multilateral and bilateral initiatives than a fully conceived and functioning regime. Considering the panoply of United Nations environmental treaties and ongoing conferences, it is difficult to evaluate the effectiveness of many of these conferences, in part because of weaknesses and gaps in our ability to monitor progress in achieving conference goals. The record is generally mixed, at best, in terms of achieving the targets and aspirations expressed in the action plans and declarations of the conferences, according to Peter Haas. The question is, why do certain states comply fully and some incompletely or not at all enforce their legal obligations by implementing multilateral environmental agreements (MEAs)? Bound up with other social and economic issues facing nations that are fundamentally related to inequality and injustice, social justice has intimate environmental components.

The consequences of environmental degradation are often borne disproportionately by racially and economically disadvantaged groups. Wealthier individuals or countries can afford to buy bottled water, move away from degraded and contaminated sites, access information about alternative choices, influence the political process, cope with environmental disasters, and buy better food, and purchase quality medical services and treatments. The gaping chasm still dividing countries on crucial questions on climate change are: Who is responsible? Who should have to reduce emissions? How much? When? Who should pay for adaptation to the impacts of climate change and how much should they pay? The importance of equity related to climate change has a close connection to the deep North-South divide that has characterized cooperation on climate change from the beginning. For example, most of the "greenhouse gases" (GHGs) of which the most important are carbon dioxide (CO₂), nitrous oxide (N₂O) and methane (CH₄) working as a 'greenhouse' surrounding the earth were discharged by developed countries over the past few centuries. However, toward the end of the last century, some populous nations, such as China and India, finally joined the global economic system, which means these countries will soon find themselves in the ranks of major greenhouse gas-discharging nations. A fact that must be remembered is that Western countries and industrialized Asian nations like Japan and the Republic of Korea

have moved many of their factories to developing countries such as China and India, where cheap labour allows them to manufacture at lower costs than at home. This globalization of production has resulted in the discharge of much more waste in poor nations that otherwise would have been released in developed countries.

Thus, the equity question, referred to as fair burden-sharing according to responsibility in the light of international justice, “cannot be avoided if all countries are to co-operate to tackle international environmental problems, particularly climate change. For the developing world equity is about getting a fair share of the global common, and climate change is above all a development issue for the developing nations. One way of considering equity in terms of burden-sharing is by looking multilateral funding of adaptation efforts. Arguably, one significant constraint in this regards to date has been limited funding. Not all funds pledged by developed countries have yet been made available, and some developing countries cite difficulties in accessing what funds are available.

By one recent accounting, bilateral programmes have committed \$110 million to more than 50 adaptation projects in 29 countries (Frankel-Reed, 2006). The Global Environment Facility (GEF), which operates through three implementing agencies, the World Bank, the U.N. Environment Programme, and the U.N. Development Programme recently approved the first allocations for implementation projects through a \$50 million Strategic Priority on Adaptation (SPA) initiative. The World Bank reported in 2006 that its support for adaptation had been “on the order of approximately \$50 million over about five years,” mainly through the Gifted World Bank GEF (2006). In addition, the GEF has provided approximately \$170 million for the preparation of national communications, which address both mitigation and adaptation. Parties decided at COP 7 that, to supplement donor country contributions, one of the three new funds (Least Developed Countries Fund, the Special Climate Change Fund, and the Adaptation Fund). The first two are supported by voluntary contributions from donor countries; the third by a share of the proceeds from credits generated through the Kyoto Protocol’s Clean Development Mechanism will be supported by a levy of two percent on proceeds from emission credits generated through the Kyoto Protocol’s Clean Development Mechanism (CDM).

Future CDM flows, however, are highly uncertain: the World Bank projects it could generate from “a few tens of millions” to \$1 billion for adaptation purposes by 2012. Funding remains highly contentious, with many developing countries maintaining that as the funds are not from donor countries, they should be managed by an entity other than the GEF. The principle of ‘common but differentiated responsibilities’ has become a key principle for the developing nations in the climate change negotiations. While developed countries tend to stress that responsibilities to combat climate change are *common*, most developing countries stress that they are *differentiated*. If the developed nations were to be good stewards of the global environment and committed efforts at sustainable development, they have to realize that the developing nations’ ‘common but differentiated responsibilities’ lays the principle of fair burden-sharing according to responsibility in the light of international justice.

TOWARD A SYNTHESIS

In the foregoing analyses, we have highlighted some of the current environmental trends that serve as the transmission belts of the security threats posed by climate change to Africa. Contrary to the mainstream “eco-efficiency” approach to development, we have shown that the challenge today remains how to link economic security with environmental

sustainability in a non-dematerializing global economy. How the changing global security architecture helped in providing a humanistic view of security that integrates both human and environmental security was demonstrated.

In framing the environmental social impacts of weak sustainability and how this impinged on human security in Africa, we were able to problematise the strong tension between ecology (life), and economy (wealth) in the conventional consensus on sustainable economic development. In our discussion of the political economy of the politicization of international adaptative measures to climate change, we showed that the lack trade-off between discrete multilateral adaptative measures to climate change and its practice derives by the fact that environmental issues touches on highly contentious issues which tend to interfere with a number of economic and political interests of states in such a way that the principle 'common but differentiated responsibilities' of fair burden-sharing according to responsibility was undermined by the developed nations.

The conclusion, drawn from this exposé, is on the one hand, that sustainable development is basically economic growth on capitalist terms and the possibility of an environmentally sustainable capitalist economic development is questionable because the greatest threat to environmental security comes not from poverty, but from the process of wealth creation on a global scale. It was observed that the security impact of environmental problems are expected to increase vis-à-vis climate change which makes Africa one of the most vulnerable continents to climate variability and change due to multiple stresses and low adaptive capacity.

Contingent upon the above observations, the following recommendations are proffered as police options for the management of climate change: the African political leadership should securitize the issue of climate change by prioritizing a revisioning of security which sees individual security (human security) as the ultimate referent object in any attempt to understand the theory and practice of security. National security should be viewed increasingly as an environmental issue, with multiple, complex connections among population growth, environmental quality, and security, including human migrations, war, disease, social disruption, political fragmentation, competition for scarce resources, and eco-terrorism. In framing a bold, new perspective on national security, it must be realized that the environment has a profound impact on African national interest in two ways. First, environmental forces transcend borders and oceans to threaten directly the health, prosperity and jobs of African citizens.

Since the fight against climate change is fundamentally a question about the future of energy, to transform the global energy systems in ways which could prevent irreversible effects of climate change within the next 10 to 15 years which is the benchmark given by a formidable body of scientists, there is need to move nations from predominantly a fossil fuel nations the clean energy nations. In this regards, Iceland, is an inspiration, as an example of how to battle climate change through comprehensive transformation of energy systems by a conscious strategic commitment to development of domestic geothermal energy resources. Now 100% of Iceland's electricity is produced from clean energy resources, and over 75% of its total energy needs, including cars and shipping, are met by either hydro or geothermal power. Global warming could clearly be slowed down, or even averted completely, if, the Icelandic model were to be followed on a global scale, by utilizing the variety of clean energy resources which are available to every country in the world.

In view of the above, it seems prudent to follow two simultaneous and parallel courses of action. One involves the transformation of African energy systems, our lifestyles, our societies, our economies, in order to minimize, and preferably prevent, climate change. The second course of action consists of preparing for the disastrous consequences of the global warming which is already on the horizon, to engage in a comprehensive and profound dialogue on the new security challenges facing us, on how to map out the global and the regional institutions, and how they could tackle the task ahead. Thus, contrary to the consensus that the problem and solutions of climate change lies in transnational management framework, rather, a national self-help reactive-proactive approach to reducing or coping with climate risks should be a complementary elements of a comprehensive international effort. This is the only to balance the mitigation and adaptation side of the climate change response equation.

As defined by the Brundtland Report (1989), sustainable development involves the satisfaction of basic human needs and the opportunity for everyone to aspire to a better life. It must therefore meet the needs of today without compromising the ability of future generations to meet their own needs. This involves avoiding certain types of debt capable of foreclosing the prospects of future generations. Such “debts” can take several forms, including: social debts, incurred by failure to invest in human development; and ecological debts, resulting from the overexploitation of natural resources or pollution of the soil, water, and atmosphere. These “bad debts” should be avoided at all costs.

The concept of sustainable development argues in favour of greater integration of both economic and environmental policies at the national level and that of ecological zones, irrespective of political boundaries. It seems to us important, in dealing with regional aspects of the environmental challenge in Africa, to argue for the incorporation of environmental issues in current efforts at African integration and cooperation.

There is need to factor adaptation into development assistance through measures such as mandatory climate risk assessments for projects financed by multilateral and bilateral lenders. Also, funds should be committed to support climate relief. Such a climate “insurance” can serve to promote proactive climate risk management. In traditional property insurance, risky behaviour is discouraged by requiring the insured to retain some risk in the form of a deductible. Finally, the security consequences of climate change should be fully integrated in the national security and national development plans of African nation-states so as to provide for proactive measures for responding to climate shocks that may come from within or outside Africa’s territorial borders.

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