OUR COMMON FUTURE AND CLIMATIC CHANGE POLICY: WHOSE SECURITY?

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Abstract: The expansion of first generation biofuels as an alternative energy creates conflicting policy of reducing greenhouse gas emissions. While leading industrial economies are being urged to reduce industrial carbon emissions substantially by 2020, the expansion of first generation biofuels is influencing deforestation of pristine forests, being driven by the demand to respond to energy crisis and profitable frontier, which is characterized by the growing interest between transnational corporations and governments. The deforestation poises even more degradation of vulnerable ecosystems and livelihoods of vulnerable peoples in Sub Saharan Africa. African pristine forests are being deforested in favor of foreign interests mainly in forest-rich countries with potential fertile land and water resources. Consumer countries are willing to accept biofuels without sustainability and respect to areas of high biodiversity. This does not answer the concept of sustainability as traditional tree species having more carbon stocks are being destroyed. Cutting down pristine forests contradicts the misleading idea that first generation biofuels is grown on marginal lands.

Studies revealed that biofuels produced in tropical and a sub-tropical climate averagely yields higher productivity than biofuels grown in temperate climate regions. Africa location in a warmer climate and lower latitudes signifying comparative advantage in biofuels production and degraded land yields a much lower productivity as compared to the production on surplus agricultural land. These findings contradict assumptions that biofuels must be grown on marginal lands to protect untouched areas, biodiversity and avoid competing land uses. Whereas economic incentives to grow biofuels should concentrate on degraded, abandoned, or marginal lands, the potential use of degradable lands in Africa depends mainly on the suitability and availability. What is called 'marginal', 'idle', or 'abandoned' lands are owned and used by indigenous and local communities. The 'first generation' biofuels is more costly to our environment and generates more greenhouse gas emissions. It is less beneficial to Sub Saharan Africa because carbon-rich tropical forests are being cleared to create "biofuels carbon debt". It is associated with water scarcity and deforestation of native vegetation for monoculture in coastal areas and forestlands.

Our common future echoes the need to understand human security by asking at least these fundamental questions of security for whom and security for what values when answering the expansion of biofuels to meet foreign demand in Africa. This paper proposes the need for climatic policy that limits the probability of damage to one's acquired values of human security. The concept of human security is fundamental for achieving Millennium Development Goal of environmental sustainability. The security of indigenous and local communities in the era of climatic change is only realized when they can manage their own needs, resource rights and values. It is the African environment as the prime values; not the profit motives of investors, energy demand of

foreigners and the addition revenues, employment, infrastructure and income. African needs security from deforestation, which leads to increased green house emissions. The rural poor in Africa will bear the burden. They have carbon rights as form of property right. The vulnerability of the local populations to climatic change depends on the extent to which they depend on the natural resources and ecosystems, the sensitivity of the resources they depend on to climatic change, and their capacity to adapt to changes. They are vulnerable to climatic change because of low adaptive capacity. Forest resources play a critical role in achieving their environmental security being sources of food, medicine, cooking fuel, and ecosystem benefits such as climatic regulation. African can get its clean energy through hydro-power generations. It is blessed with the water resources. It is the first generation biofuels that is being commercialized, but negatively affects the environment.

Because of inadequate deforestation data linked to first generation biofuels expansion, this article reviews existing literature, documentation and case studies. It examines the hotspots of landscapes where first generation biofuels development has been linked to direct land use change, especially in government aided deforestation of pristine forests. The article explores the misconception of biofuels being grown on marginal lands and the deforestation of pristine forests in the era of climatic change, how consumer countries are willing to accept the products without sustainability and respect to biodiversity, and lastly discuss the concept of human security in the African context.

Keywords: Africa, biofuels, climatic change, deforestation and sustainability

INTRODUCTION

Recognizing "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987) is necessary. It 'improves on the quality of human life within the carrying capacity of supporting ecosystems' (WWF, IUCN and UNEP 1991). Green economy is defined as an "improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP 2010). In 2009, the UN General Assembly decided to hold a summit in Rio de Janeiro in 2012 to celebrate the 20th anniversary of the first Rio Summit in 1992. The agenda items for Rio+20 are "green economy in the context of sustainable development and poverty eradication" and "international environmental governance." The concept of green economy recognizes the goal of sustainable development in improving the quality of human life within the constraints of environment. However, it does not focus exclusively on eliminating environmental problems and scarcity (UNEP 2011b). The development path to a green economy should maintain, enhance and where necessary, rebuild natural capital as a critical economic asset as well as source of livelihoods and security for the poor rural people. A green economy is expected to reduce carbon dependency, promote resource and energy efficiency, and lessens environmental degradation.

The dilemma of conventional wisdom is that economic growth delivers prosperity for all. Yet in reality, whatever the case, economic growth is achieved at the expense of our environment. In the last half of the century, the global economy has expanded five times; with an estimated 60 percent of the world ecosystems being degraded. Global carbon emissions have also risen by 40 percent since 1990 (UNIDO 2009:10). Emissions from deforestation account approximately 20 percent of greenhouse gas emissions, and reducing deforestation is an effective way of reducing greenhouse gas emissions (UNIDO 2010:8). More so, greenhouse gas (GHG) emissions are expected to increase by 45 percent to 41 gigatonnes in 2030. As reported by the *Stern Review of the Economics of Climate Change*, with about 5-6 degree Celsius warning, the global economy could suffer losses equivalent to 5-10 percent of global GDP and poor countries will suffer costs in excess of 10 percent. Intergovernmental Panel on climatic change indicates that by 2020, rain-fed agricultural production in Sub Saharan could decline by over 50 percent and this exacerbates food insecurity (UNIDO 2009:20-21).

Under the previous climatic policy, avoiding deforestation was an unpopular climatic change policy. There were fears that reducing deforestation could disentangle poor communities to access to forests through fines and fencing by governments, emissions from deforestation were hard to measure, one may reduce emissions while others may not, and avoiding deforestation in developing countries may reduce on developed countries to cut carbon emissions. The Kyoto Protocol of United Nations Framework Convention on Climatic Change (UNFCC) provided few incentives for reforestation and none to maintain forests. Regulatory and voluntary measures were meant to offset carbon emissions. Today, REDD is becoming popular in the post Kyoto regime due to pressure from environmentalists. The Bali Action Plan adopted in December 2007 at the 13th Conference of the Parties calls for enhanced cooperation on 'policy approaches and positive incentives on issues relating to reducing emissions from deforestation and degradation in developing countries' (Cotula and Mayers 2009).

The large-scale acquisitions of forestlands in Africa for biofuels production take place either through purchases or leases ranging from 1,000 ha to 500,000 ha or even more (Cotulal et al. 2009:3), usually conducted by foreign governments and private investors (Daniel & Mittal 2009:2). These acquisitions are driven by the need for biofuels, food security and energy demand, climatic change and water scarcity as well as population growth (Daniel & Mittal 2009:2; Brittaine & Lutaladio 2010:4 and Smaller & Mann 2009:5). The expansion of biofuels is driven by government targets in energy security, concerns of high oil prices, and prospects for rural development, export opportunities and means to mitigate climate change (Cotula et al. 2008). The home consumption targets and financial incentives have been the key driving force. Also, the new carbon markets promote biofuels expansion, in addition, to the long term REDD scheme under the Kyoto climatic change regime; and the host country incentives. Under climatic change, there is need to reduce green house gas (GHG) emissions, particularly carbon dioxide emissions, which biofuels is reported to produce fewer particulates, hydrocarbons, nitrogen oxides and sulphur dioxide than mineral diesels Brittaine & Lutaladio 2010:6). Other than biofuels, other driving factors may include government-backed investment to secure food security and emerging opportunities such as rising rates of return in agriculture; particularly the rising commodity prices make the acquisition of land for agricultural production look like an increasingly attractive option. Even host country reforms have improved the attractiveness of investment climate in several countries (Cotula et al. 2008:5).

The central research question is on the suitability and availability of marginal and degraded lands in Africa. The production of first generation biofuels in Africa is justified on this basis. This study explores whether biofuels is a fundamental solution to Africa's energy problems and the economy? Whose security is promoted? Assumptions are made on the basis of marginal lands. That growing feed stocks on marginal could protect untouched areas, biodiversity and avoid competing land uses. That production in marginal lands could be economically competitive and helps in adaptation to change. Those economic incentives should concentrate on degraded, abandoned, or marginal lands. The article is centered on questioning the misleading proposition that first generation biofuels in Africa is grown on marginal lands under the context of deforestation and human security.

This article is divided into parts proceeding introduction. Part two highlights on the study methodology. Part three reviews the issues related to marginal lands and emerging hotspots for first biofuels in Africa. It points out politics and economics related to first biofuels investments in Africa. Part four examines issues related to sustainability and deforestation as a result of expansion of the first generation biofuels. Part five discusses security for whom? Part six introduces rethinking climatic change policy. Part seven is the conclusion.

METHODOLOGY

Most studies on biofuels review existing documentation and emerging literature and country case studies (Cotula et al. 2008; Cotula et al. 2009; Nhantumbo & Salomao 2010; Sulle & Nelson 2009). Because of the inadequate data on deforestation directly linked to first generation biofuels in Africa, this article used case studies on first generation biofuels in selected countries in Sub Saharan Africa. It examines the hotspots of landscapes where first generation biofuels development has been linked to direct land use change, especially in government aided deforestation. In order to understand the extent to which biofuels is grown on marginal lands in Africa, this article reviews the current literature and documentation on first generation biofuels and its impacts on pristine forests. In-depth investigations of selected cases of government backed investments in selected countries were also examined. The article is concerned with greenhouse gas emissions due to deforestation, issues of heritage and biodiversity in the era of climatic change in the context of whose security is being guaranteed?

THE QUESTION OF MARGINAL LANDS AND EMERGING HOTSPOTS FOR BIOFUELS IN AFRICA

This part examines issues related to marginal lands, politics and economics of biofuels production in Africa. Biofuels can be defined as first, second and third generation. It is the first generation biofuels that is now commonly used, which is derived mainly from food crops including maize, wheat, cassava, sugarcane, sorghum and sugar beet used for the extraction of sugars to produce bioethanol while Soybean, jatropha, coconut, castor, sunflower, rapeseed and palm oil are used to produce biodiesel (Brittaine & Lutaladio 2010:2-3; Dauvergne & Neville 2010:635). In fact, second and third generation biofuels, the technology remains under development.

Biofuels has been praised as not only a solution to climatic change and energy insecurity, but also as an option that can address the food insecurity. However, the food crisis of 2008 brought controversy regarding biofuels (ibid. 2010:10). Biofuels is an energy produced directly or indirectly from biomass (FAO 2010: IX; Cotula et al 2008:8). Liquid biofuels can be bioethanol, biodiesel or straight vegetable oil. Liquid

biofuels can replace petrol and diesel for transport and can be used in stationary engines to generate electricity, pump water and mill food grains as well for cooking and lighting.

Assumptions have been justified for biofuels production in marginal lands (Johnson and Roman 2008). The production of feed stocks in marginal lands could protect untouched areas, biodiversity and avoid competing land uses. Production in marginal lands could be economically competitive and helps in the restoration of abandoned areas. Production in degraded lands minimizes land use conflicts and biofuels crops could serve multiple uses. Economic incentives to grow biofuels should concentrate on degraded, abandoned, or marginal lands and lastly, where possible some energy crops could be grown in agricultural areas in order to maximize returns.

Yet, the potential use of degradable lands in Africa depends mainly on the suitability and availability of degraded landed area. The 'marginal', 'idle', or 'abandoned' lands are owned and used by indigenous and local communities. It is revealed that biofuels produced in tropical and sub-tropical climates averagely yields higher productivity of 5 times higher than biofuels grown in temperate climate regions of Europe and North America (Bassam 1998). Africa is located in a warmer climate and lower latitudes signifying comparative advantage in biofuels production. Hoogwijk et al. (2003) further note that degraded land yields a much lower productivity as compared to the production on surplus agricultural land. Hence, in Africa, there is relatively low productivity of growing biofuels crops on degraded land. Moreover, these degraded areas are not well developed especially in marginal areas. The degraded lands may be under customary land use systems.

To reduce import of fossil fuels and mitigate climatic change, there is increasing demand for biofuels as alternative energy. The challenge in biofuels in Africa is that it is not driven by open markets but by policy-inducement of incentive and support from both home and host government, not the market forces of demand and supply. The developed countries tend to reduce their dependence of fossil fuel imports and mitigate the climate change by targeting biofuels. However, biofuels production is conducted through acquisitions of land in Africa that has been used as source of food security. Pristine has been cleared for its production. It is the first generation biofuels (liquid biofuels) that is being commercialized. The more appropriate second generation biofuels (solid) is not yet commercially viable. So it is the first generation biofuels that is economically viable and has negatively affected pristine forests.

The political decisions made in Europe and in the United States have induced the demand for biofuels. In addition, the need to reduce greenhouse gas emissions and the global warming has increased the demand for biofuels. In a similar point, the unstable and rising fossil prices are another factor leading to the promotion of biofuels as energy alternatives. However, this rapid expansion of biofuels in Africa has been contested at varying levels, including concerns on food security impact on smaller farmers, competition for water, deforestation and so forth (Gao et al. 2011).

Indebted governments in the south compete for biofuels investments finance as Northern governments champion this 'green fuel,' in which the social and ecological resources are converted for profit frontier in the disguise of environmentalism, an attempt to internalize externalities (McMichaiel 2010:609-610). It reduces environmental degradation without affecting economic growth, and is normally described as "win-win" by the new corporate North-South corporate partners (Borras et al. 2010:577), including foreign and local investors, foreign and home governments (Dauvergne & Neville 2010:635).

However, these corporate partnerships increase pressure on the ecological integrity of tropical forest and further wrest of resources from subsistence farmers, indigenous people and people with insecure land rights (Borras et al 2010: 581). The production of 'green fuels' requires large intensive crops, mono-crop plantations and or contracted smallholder, impoverishing plantation workers and contract farmers:

With new consumer countries willing to accept products without sustainability of guarantees, governments unable or unwilling to enforce environmental regulations, and corporate interests becoming further entrenched, agrofuels seem poised to lead to even more degradation of vulnerable ecosystems in some of the world's poorest places (Dauvergne & Neville 2009: in White & Dasqupta 2010: 596).

Recent research also found that 'first generation' biofuels is more costly environmentally than fossil fuels and yield less energy, and generate more greenhouse gas than the use of fossil fuels (White & Dasqupta 2010 citing Scharlemann & Laurance 2008; Fargione et al. 2008 & Edie 2008). The 'first generation' bio-fuels are not suitable for reducing global warning.

Reducing Emissions from Deforested and Degraded (REDD) land is an incentive program to facilitate the production of biofuels on marginal lands. The production of feedstocks from marginal lands could prevent the extension of biofuels production into the

untouched areas that protect biodiversity and at the same time adapting to climate change through a restoration of abandoned land areas. It could also avoid completion between food and biofuels production. The underlying assumption is that biofuels production will find its way to the already abandoned areas as the technology for the second generation ethanol, generated from lignocelluloses crops is being developed. In fact, biofuels production should have been economically competitive in the marginal lands (Johnson and Roman: 26).

The GHG savings for liquid biofuels tend to be less than that of fossils. It is directly related to the yield and energy balance of feedstocks. However, if land that stores a significant amount of carbon is being cleared to grow biofuels, this creates "carbon debt" (Fargione et al. 2008). Clearing forests has been preferred because biofuels produced in tropical and sub-tropical climates averagely yield higher productivity of 5 times higher than biofuels grown in temperate climate regions of Europe and North America (Bassam 1998). The predominant location of Africa in warmer climates and lower latitudes signify comparative advantage in biofuels production. Because biofuels is more demanded in Europe and North America, they have large financial capital from both private speculators and government support for technological and infrastructural development.

Biofuels proponents often point to abandoned croplands and other "marginal lands" can be made available for feedstock production, especially uncultivated or low grade lands. Biofuels is a valuable contribution to climatic change and the transition to sustainable energy. It can help restore degraded lands. However, the production of feedstock is associated with many environmental impacts such as loss of ecosystems, deforestation, loss of biodiversity, depletion of soil nutrients, and excessive use of water (Johnson and Roman 2008:1). Because the second generation biofuels is produced at high conversion efficiency using biochemical and thermo-chemical pathways; the first generation biofuels include oil crops esterified into biodiesel and direct fermentation of sugar and starch crops into bio-ethanol (ibid. p.4).

The expansion of first generation biofuels in Africa has been praised on several grounds – including employment, generating incomes, improving food security and above all energy security. However, biofuels production may compete with food crops and negatively affect the food security of local people. In addition, its production leads to competing resource claims and uses with the local resource users, governments and biofuels producers, hence, leading to loss of access to land by the poorer groups. This could have negative effects on local food security and the economic, social and cultural dimensions of land use (Cotula et al 2008:13). Food security exists when all people, at all times, have physical, social and economic access to sufficient amounts of safe and nutritious food that meets their dietary needs and food preferences to an active and healthy life. The four dimensions of food security that relate to biofuels expansion include: availability (either through domestic production or imported), access (access to adequate resources for acquiring appropriate foods), stability (having food at all times) and utilization (FAO 2010: X). A key determinant of all these is how access to land is distributed and controlled within society (FAO 2007 in Cotula et al. 2008:6).

By offering numerous opportunities such as increased energy security; creating new markets, employment, poverty reduction and economic growth; and reduction of green house gas emissions (FAO 2010), biofuels can also have negative social, economic and environmental consequences. It could have potential negative impacts on food security and on the environment through depletion of natural forests and land use change (ibid. p.3). It also, negatively affects water resources and biodiversity (Brittain & Lutaladio 2009), leading to declining availability of water for irrigation while biodiversity is threatened by monoculture plantations (ibid 2010:9).

As reported by UNIDO (2010); biofuels does not represent an environmental panacea whether 'green' or offering carbon savings, but depends on how they are produced. For example, sugarcane production for bioethanol becomes less beneficial if carbon-rich tropical forests are being cleared, causing vast increases in greenhouse gas emissions. Furthermore, it is reported that converting rainforests, peatland, savannas, or grasslands into fields to produce biofuels creates a "biofuels carbon debt". It creates up to 420 times more carbon dioxide than the annual greenhouse gas emissions. Large-scale plantations (palm oil and sugar), are associated with water waste and pollution, overuse of fertilizers, soil erosion, localized air pollution due to chemical spraying, and burning of the land after the harvest are all major problems. Biofuels production also affects the right to food to millions of people in the medium and long term, especially to groups that need access to fertile soil and clean water to grow their food (ibid. p. 10).

Although biofuels plays an important role in poverty reduction, it negatively affects the vulnerable groups, violating their rights to local resources such as smallholders, forest dwellers, and women as land concentration deepens in rural economy. Empirical studies further revealed that where there has been expansion of biofuels production, employment in farming appears to have reduced, and the growing

trend for seasonal jobs is observable. The increasing mechanization means long term employment predictions must be negative. Many reports have also pointed the catastrophic wages and horrific working conditions in palm oil and sugarcane plantations as the equivalent of modern slavery (UNIDO 2010:11).

SUSTAINABILITY OR DEFORESTATION

Land degradation refers to the temporary or permanent decline in the productive capacity of the land (UNEP 1992). It is an "expression of a persistent decline in the ability of a dry land ecosystem to provide goods and services associated with primary production" (Millennium Ecosystem Assessment 2005). The focus on land therefore includes natural resources such as water and vegetable and deforestation is considered as a form of degradation (Johnson and Roman 2008:18). A significant proportion of carbon is within the tropical ecosystems. Carbon stocks are divided into high, medium and low carbon density. According to the global datasets on carbon storage in terrestrial ecosystems and areas of high priority for diversity conservation, the Congo basin has high carbon stock (UNEP-WCMC 2000). In fact, the magnitude of REDD impact depends on the precise nature of mechanism adopted and how countries to implement it: *a)* countries identify high carbon and high diversity areas; and b) identify areas of high diversity but with lower carbon stocks, which could risk being displaced by after REDD interventions.

According to Renewable Fuel Standard (RFS), upgrading is needed into the advanced biofuels and cellulosic biofuels. This document identifies three types of fuels: a) renewable fuel, which is derived from renewable feedstocks such as agricultural crops, forest slash and thinnings, algae, animal waste, and yard and food waste; b) advanced biofuels mainly from any renewable other than corn ethanol; c) cellulosic biofuels derives from cellulose, hemicellulose or lignin. Each fuel category must meet the minimum GHG requirements with an equal quantity of the fossil fuel it substitutes. The renewable minimally must reduce GHG by 20 percent; advanced biofuels and biomass-based diesel by 50 percent; and cellulose biofuels by 60 percent (U.S 2007).

The European Union intends to meet 10 percent of biofuels in the transport sector by 2020. The use of the first generation biofuels is land-intensive and technically inefficient. The use of green house gas reduction criteria has provided incentives for producers to source for biofuels for the European Union market. Member states have provided financial incentives to encourage green house gas reduction capabilities, and in most cases linked to Development Corporation in Africa. Accordingly, it is believed that biofuels is grown on degradable lands. Unfortunately, the production of feedstock favors high quality land (Johnson and Roman 2008:1).

It is very important to have standards on biofuels with respect to greenhouse gas emissions, conversation of biodiversity, soils, water, promotion of good agricultural practice in the degraded and mitigation of indirect land use change (Pachebo et al. 2011). The EU Renewable Energy Directive (EU-RED) on environmental criteria include: a minimum 35 percent GHG emission savings; and that biofuels not be made from raw materials produced from land with high biodiversity values such as natural forests and native woodlands. The responsible investment instruments can be grouped in twofolds: a) intentional statements of goodwill but without well defined criteria; b) responsible investment policies without compliance with defined criteria (Pachebo et al. 2011).

The EU sustainability criteria are very specific on: a) minimum rate of GHG savings by 35 percent in 2008, 50 percent in 2017, and 60 percent in 2018; b) restraining from exploiting areas of high biodiversity; c) respecting areas of high carbon stocks; and ensuring social responsibility (Kerckow 2010). Biofuels production should respect areas of high biodiversity (Pachebo et al. 2011).

Unfortunately, article 15 of European Union directive excludes the production of biofuels production from the 'continuously forested areas' defined as land with a canopy cover >30% and height >5m and provides carbon stock values for 'lightly forested areas' defined simply as not continuously forest areas (Johnson and Roman 2008:13). While article 15 of the proposed directive prohibits conversion of natural ecosystems for biofuels production, no similar restrictions limit conversion of natural ecosystems to agricultural production that result from indirect land use change from increased biofuels production (ibid. p. 14). For example, shifting corn-soybean production to only corn for ethanol may induce soybean into forest and the expansion may be linear.

With regards to deforestation, factors such as population growth, consumption growth, increase in agricultural trade and demand for forest products, expansion of human settlements and infrastructure and climatic change are the key drivers to loss of forest diversity in Africa (UNEP 2011:48). Most economic development and growth strategies encouraged rapid accumulation of physical, financial and human capital, but are achieved at the expense of excessive depletion and degradation of natural capital (natural resources and ecosystems).

Table 1: Forest area in Africa, 1990 – 2010

Sub region	Area (1 000 ha)			Annual change (1 000 ha)		Annual change rate (%)	
	1990	2000	2010	1990-2000	2000-2010	1990-2000	2000-2010
Central Africa	268 214	261 455	254 854	-676	-660	-.0.25	**-0.26**
East Africa	88 865	81 027	73 197	-784	-783	-0.92	**-1.01**
North Africa	85 123	79 224	78 814	-590	-41	-0.72	**-0.05**
South Africa	215 447	204 879	194 320	-1 057	-1 056	-0.50	**-0.53**
West Africa	91 589	81 979	73 234	-961	-875	-1.10	**-1.12**
Total Africa	749 238	708 564	674 419	-4 067	-3 414	-0.56	**-0.49**
World	**4 618 399**	**4 085 063**	**4 032 905**	**-8 334**	**-5 216**	**-0.20**	**-0.13**

Source: FAO 2011 state of the World's forest pp.3
**The annual change rate is the gain or loss in percent of the remaining forest area each year within the given period. *Information on trends was based on countries which provided information for all the points in time.*

Even the existing policies and market incentives have contributed to capital misallocation as they allow businesses to run significant, largely unaccounted for, and unchecked social and environmental externalities (UNEP 2011b:14). These drivers therefore have resulted into biodiversity loss from pressures such as deforestation for agriculture and development as well as forest degradation. The major challenges facing forests include: loss of forest, competing land uses and the market, policy and governing failures. The competing land uses, especially from agriculture are the immediate causes of forest loss, which in turn, is driven by market, policy and governance failure, which leads to forest appropriation by powerful outsiders (UNEP 2011b). The UNEP (2011) report also analyses the current emerging issues in our global environment, recognizing the importance of forests in climatic change mitigation. The report also recognizes the loss of forest biodiversity due to climatic change and encourages the need for better governance and financial incentives as one the new approaches to managing forests.

The economic growth does not always sustain a healthy environment. FAO data (2006) revealed an estimate of 11.8 million ha per year were lost between 2000 and 2005 and 80 percent of the total deforestation took place in tropical Africa and America (FAO 2006). Within this period, countries with important biofuels production such as Brazil, Argentina and Indonesia represented large deforested rates. Tropical deforestation currently contributes about 15-35 percent of the annual global carbon dioxide emissions, in which 350 billion tons of carbon currently sequestered in tropical forests and this could be release through deforestation and degradation (Laporte et. 2011:4).

The rate of forest coverage in Africa since the 1990 has been decreasing basically due to economic growth and increasing population as illustrated in table 1.

There is a closed link between forests and biofuels expansion in Africa as observed in the current literature and media report. Biofuels projects in Africa are most likely to concentrate in tropical rich countries like Tanzania, Mozambique, Madagascar, Ethiopia, Republic of Congo, Democratic Republic of Congo, Angola and a few to mentioned. Also, averagely tropical rich countries such as Uganda, Kenya, and Benin among a few compete favorably because of the water resources advantage. Table 2 presents forest area and change in the regions and selected countries in Africa

Land acquisitions for biofuels production have been reported mostly in countries such as DRC, Ethiopia, Tanzania, and Mozambique and Madagascar. China alone has a contract to grow 2.8m ha of forestlands for palm oil in DRC. Biofuels only thrive well in fertile soil and humid tropical climates contrary to the popular believe that biofuels in Africa are grown on marginal land. Most of the projects on poor soils and dry lands have been abandoned as evidenced in Madagascar and Mozambique. It can also be argued that investors value forestlands to reduce costs on fertilizers, in addition to the presence of inadequate environmental governance.

Although Uganda has little forest coverage compared to other Sub Saharan countries, it is interested to study because of its richness in cultural biodiversity and also the way in which government – policy makers have brazenly pushed for forest allocation for palm oil plantation. Uganda has got tropical high forests, and woodlands. Forests and woodlands cover a total of 4.9 million ha, about 24 percent of the total land area.

Table 2: Forest Area and Area Change in Africa 1990- 2010

Country/ Area	*Extent of Forest 2010*			Annual change rate			
	Forest area	**% of land area**	**Area per 1 000 people**	**1990-2000**		**2000-2010**	
	(1 000 ha)	%	(ha)	(1 000 ha)	%	(1 000 ha)	(%)
Total East Africa	**73 197**	**18**	**317**	**-784**	**-0.9**	**-783**	**-1.0**
Ethiopia	12 296	11	152	-141	-1.0	-141	-1.1
Kenya	3 467	6	89	-13	-0.3	-12	-0.3
Madagascar	12 553	22	657	-57	-0.4	-57	-0.4
Tanzania	33 428	38	787	-403	-1.0	-403	-1.1
Uganda	2 988	15	94	-88	-2.0	-88	-2.6
Total North Africa	**78 818**	**8**	**377**	**-590**	**-0.7**	**-41**	**-0.1**
Sudan	69 949	29	1 692	-589	-0.8	-54	-0.1
Morocco	5 151	11	162	-3	-0.1	11	0.2
Total South Africa	**194 320**	**33**	**1 416**	**-1 057**	**-0.5**	**-1 056**	**-0.5**
Angola	58 480	47	3 245	-125	-0.2	-125	-0.2
Botswana	11 351	20	5 909	-118	-0.9	-118	-1.0
Mozambique	39 022	50	1 743	-219	-0.5	-217	-0.5
Zambia	49 468	67	3 920	-167	-0.3	-167	-0.3
Zimbabwe	15 624	40	1 254	-327	-1.6	-327	-1.9
Total central Africa	**254 854**	**48**	**2 084**	**-676**	**-0.3**	**-660**	**-0.3**
Cameroon	19 916	42	1 043	-220	-0.9	-220	-1.0
Central Africa Republic	22 605	36	5 210	-30	-0.1	-30	-0.1
Chad	11 525	9	1 056	-79	-0.6	-79	-0.7
Republic of Congo	22 411	66	6 199	-17	-0.1	-15	-0.1
Democratic Republic of Congo	154 135	68	2 399	-311	-0.2	-311	-0.2
Gabon	22 000	85	15 193	0	0	0	0
Total West Africa	**73 234**	**15**	**254**	**-961**	**-1.1**	**-875**	**-1.1**
Ivory Coast	10 403	33	505	11	0.1	8	0.1
Mali	12 490	10	983	-79	-0.6	-79	-0.6
Nigeria	9 041	10	60	-410	-2.7	-410	-3.7
Total Africa	**674 419**	**23**	**683**	**-4 067**	**-0.6**	**-3. 414**	**-0.5**

Source: FAO 2011 State of the World's forest pp.110

**Firstly, these countries were selected based on average level of forest coverage per region. Secondly, the selection was based on the intensity of media report on bio-fuels deals.*

Table 3: Forests cover and change in Uganda: 1990-2005

Vegetation	Forest cover in (ha)		
	1990	2000	2005
Plantations – broadleaved	18,682	15,326	13,881
Plantations – Pines	16,384	13,441	12,174
Tropical High Forest normal	*650,151*	*533,350*	*483,072*
Tropical High Forest depleted	*274,057*	*224,822*	*203,628*
Woodlands	*3,974,090*	*3,260,138*	*2,952,807*
Total	4,933,364	4,047,076	3,665,562

Source NFA 2006; NEMA 2006/07 Report pp.79

Tropical high forests cover 924 208 ha, plantation cover 35 066 ha and woodlands cover 3 974 102 ha. Of the 4.9 million ha, 30 percent are in protected areas (forest reserves, national parks and wild life reserves) and 70 percent are found on private land (NEMA Report 2006/07:78).

Uganda's forest cover declined from about 5 million ha in 1990 to 3.7 million ha in 2005. This was attributed due to the encroachment of agricultural production, deforestation, urbanization, industrial growth, migration and problems of internally displaced persons. This has been the case for Namanve, Wabisi-Wajala (in Nakasonga district), Butamira forest reserve and more recently the intention to allocate part of Mabira central reserve to sugar growing (NEMA Report 2006/07: V).

The size of Uganda's forest cover has reduced significantly by 25.7 percent between 1990 and 2000 and by 9.4 percent since 2000. These declines were mainly in woodlands, broadleaved and pine plantations. These declines have been in all forms of forests cover and the decline is expected to increase as illustrated in table 3.

Palm oil production in Africa is the greatest induced enemy to African Forests. Its production is highly promoted by indebted African governments. A case of point is in Uganda, leapfrogging from the Malaysian companies and Indonesia. Land-use change through converting forestlands to monoculture palm oil plantations can release large amounts of greenhouse gas emissions. Yet, African governments can do much to manage these forest resources for their populations.

Palm oil provides multiple purposes such as in margarine, chocolates, bakery products, sauces, chips, cream cheese, sweets, and ready meals (Baily 2011:20). The demand for palm oil is expected to double from 2010 t0 2025, signifying implications for the rainforests and ecosystems. About 80 percent of palm oil is used as food (Cheng Hai 2010), but growing number is used for biodiesel due to demand in European Union, USA and other developed nations. European Union expects to meet its 10 percent target of its energy need from biofuels by 2020.

The BIDCO project located in Kalangala district has destroyed pristine forests on the islands of Lake Victoria through conversion for monoculture palm oil plantation. The Buggala Island is one of the homes to unique eco-systems in the world is being destroyed. The pristine forest disappearance has serious impacts on local flora, fauna, soil, and water resources. Over 10,000 ha are being destroyed on the Buggala Island and this has created competition for land use and the violation of indigenous land rights. This is because the local people in the district do not have formal land ownership. Some are squatters on mailo land owned by few rich landlords and the Buganda kingdom. Instead land titles are preferable given to the plantation companies and they also receive government support to repress whatever opposition they may face from the local communities. Tenants were not compensated for their land as a case in point of Bwendero. In addition to forest disappearing, the project has also affected the livelihoods of the local people who used to obtain large number of forest products and services from the forests. Many communities have been displaced from the areas they were cultivating and grazing their animals. Even the community social center at Kasenyi were grabbed due to the increasing quest for land by BIDCO and converted into palm oil plantation. The BIDCO project is corporate partners between government of Uganda, IFAD and BIDCO and farmers in Kalangala on Buggala with the plans to expand the project to other neighboring islands in the district.

Table 4: Global emissions, per capita emissions and action announcements of selected countries

Ranking world's largest emitter	Percent of global emissions	Million Metric Tons of Carbon emissions (MMTCO2e)	Per capita emissions in metric tons of C02e	Action commitment by 2020
1. China	17 %	7,187	5.5	China has committed to reduce carbon emissions per unit of GDP by 40 to 45 percent from 2005 and use non-fossil fuels for about 15 percent of its energy. China has also committed to increase cover by 40 million ha and forest stock volume by 1.3 billion cubic meters by 2020 (from 2005 levels).
2. Unites States	16 %	6,814	23.1	Announced a target to reduce emissions in a range of 17 % below 2005 levels by 2020, 42 % below 2005 by 2030, and 83 % by below 2005 by 2050. These targets are aligned with the energy and climate legislation passed by the House of Representatives
3. European Union	12 %	5,049	10.3	Announced a target to reduce emissions to 20 percent below 1990levels by 2020 and ready to increase commitment their commitment to 30 percent if other countries commit to ambitious efforts
4. Brazil	7%	2,842	15.3	Announced a target to reduce emissions growth by 36 to 39 below by 2020 to emissions levels to 1994. Also pledged to cut deforestation by 80 % from the historic levels by 2020
5. Indonesia	5%	2,042	9.3	Announced a target to reduce emissions by 26 % by 2020 from business-as-usual levels.
7. India	4%	1,866	1.7	India has committed to reduce its emissions per unit of GDP 20 to 25 % below 2005 levels by 2020. Adopting building energy codes by 2012; increasing forest cover to sequester 10 percent of its annual emissions; increasing its energy sources from wind, solar, and small hydro from 8% to 20% by 2020.
11. Mexico	2%	683	6.6	Announced a target to reduce its greenhouse gas emissions up to 30 percent by 2020 and 50 percent by 2050, provided there is adequate financial and technological support. Also committed to cut carbon emissions by 15 million tons by 2012.
13. South Korea	1%	569	11.8	Announced to reduce to 30 percent below projected levels by 2020, approximately 4 percent below 2005 levels.
23. South Africa	1%	423	9.0	Announced to a target to reduce emissions growth 34 percent by 2020 and 42 percent by 2025 with finance, technology and capacity-building support from the developed world.

Source: Adopted from the Natural Resources Defense Council[3]

While the project might have indicated a positive impact in terms of employment and infrastructure development, it has worsen the environmental situation of the islanders through disruption and destruction of forest resources, depletion of lake resources, and silting of the lake. In a bid to acquire additional land, the project violated the initial environmental regulation not to clear the 200 meter strip of the land along the lakeshore, which was supposed to act as a buffer zone for the lake, leaving some areas such as Buguzi, Kitoke and Bwendero less than 100 meter from the shoreline. The conditions of workers in this project are also appalling especially at worker's quarters at Buyoga, Bwendero and Mulabana. They also receive meager pay per day ranging 1000 to 2500 Ugandan shillings which is less than one US dollar (Kalanga District NGO Forum 2009).

As an indication of expansion of Palm oil plantation on the Islands, the Government of Uganda received a loan of $53 million from the International Fund for Agricultural Development (IFAD) to start up palm oil project on Buvuma Islands in Buvuma District[1]. The government will contribute $14 million, while BIDCO is expected to raise $70 million into the project, which is expected to start in 2012 and will run for eight years. The government will acquire 6,500 ha of land for the nucleus estate while out grower farmers will be required to plant 3,500 ha of land.

In Tanzania, the environmental impact of biofuels plantations could involve water scarcity and deforestation, particularly in coastal areas. For the local communities, it is associated with loss of rights over customary lands, and this could negatively impact on their livelihoods (Sulle & Nelson 2009:3). In addition, land acquisitions for biofuels target forests which economic activities that villagers depend heavily on (ibid: 4). In addition, 400,000 ha of land in the Wami basin has become the target for sugarcane plantations (ABN 2007 in Cotula et al. 2008:23). In Benin, industrial groups from Malaysia and South Africa have proposed the conversation of 300,000 – 400,000 ha of wetlands in the south for the production of palm oil (ibid. p. 36). In Northern Ghana, the Norwegian agro-fuel company in search for 'green fuel' destroyed 2,300 ha of sheanut trees for Jatropha plantation. This forest was located on communal land, and people lost their incomes from forest products (Nyari 2006 in White & Dasqupta 2010: 601-602).

In Mozambique, the government intends to meet the energy demand through biofuels. However, the skepticism lies on land access to poorer groups who depend on land for food security, economic, social and culturally. It is further revealed that 'claim often made that feedstock for biofuels can be commercially grown on marginal land is misleading'. The study further admits that land allocations to biofuels projects are very likely to affect areas with high suitability for crops or with forestland. The impact on biodiversity and local livelihoods will therefore be substantial (Nhantumbo & Salomao 2010). The production of biofuels has the potential to compete with the production of food crops and might reduce access to land for small holder farmers. Biofuels projects normally involve land use change through removing the tree cover and substituting with diverse local species with monoculture as for the case of Dondo in Mozambique, the major contributor of greenhouse gas emissions (ibid. p.20). Principle Energy in Manica has been on the "degraded" forest, substituting the native vegetation by monocultures (ibid: 2010:29). The government has signed a contract with Procana for a large-scale bioethanol project, involving the allocation of 30,000 ha of land in Masingir district, the southern province of Gaza, a sugarcane plantation and a factory to produce 120 million litres of ethanol a year. However, concerns have been raised with regards to the effects of Procana on access to both land and water for local groups. The project is supposed to use water from a dam, fed by a tributary of Limpopo River, which also supports irrigated smallholder agriculture. Farmers downstream have expressed concerns that the project will absorb the available water, leaving little for local farmers (Cotula et al 2008: 35).

DRC has the largest forest estate in Africa of about 1.1 million kilometer containing 17 million tons of carbon. It has the largest carbon stocks in Africa (Laporte et al. 2011). The estimated rate of deforestation in the Congo Basin is 0.6 percent per year (approximately 1,142,000 ha yr^{1}) (FAO 2007). The Woods Hole Research Centre has estimated that 61 percent (approximately 47 million ha) of the dense humid forest in the DRC is suitable for palm oil plantation (Laporte 2011:10). China alone has acquired 2.8 million ha of land for palm oil plantation, driven by the humid forests and climatic conditions that are favorable for palm oil plantations. These are not marginal, degraded or abandoned land. These forestlands are used by the pigmy hunter-gatherers.

The current increasing oil prices in the world have increased the demand for biofuels. Palm oil plantations in forest-rich countries have become a viable option for the finance rich resource-poor countries. Why should individual countries target DRC if they are committed to climatic change policy? Does DRC need biofuels for its path

dependency? Whose security is being promoted? Instead of promoting strong institutional capacity in forest governance in Africa to reduce emissions from households and timber industry, biofuels is being seen as the alternative to climatic change. This is a great challenge to REDD scheme. With all the absorptive capacity in terms of carbon stocks, can biofuels be the best solution to DRC climatic policy?

SECURITY FOR WHOM? SECURITY FOR WHICH VALUES?

While every nation is striving for energy security, the impact of climatic change has generated completion for natural resources in Africa, in which security strategy in the energy sector is being used alongside the mitigation policy by promoting first generation biofuels. These higher energy consumers are looking at Africa pristine forests as strategic destination for biofuels investments. Human security is fundamental for achieving Millennium Development Goals. The security of indigenous and local communities is era of climatic change is only realize when they can manages their own needs, resource rights and values they have in these forest resources rather than meeting the induced path dependence development being promoted by their governments. In Africa, forest resources play a critical role in achieving human security. Forests are livelihoods resources such as food, medicine, cooking fuel as well as ecosystem benefits such as climatic regulation. Africa does not need biofuels that leads to deforestation. Africa has low adaptive capacity to climatic change. Why should we cut forests because sufficient employment is going to be created? It is noted that biofuels expansion in Africa is externally induced both in terms of incentives and support. It is also evidenced that the idea of biofuels being grown on marginal lands is misleading. In fact, pristine forests have been cleared by biofuels investors.

Atmospheric concentrations of greenhouse gases are already above sustainable levels and continue to rise alarmingly (Baily 2011). Land is running out and fresh water is also drying up. As resource pressure mount and climate change gathers pace, poor and vulnerable people will suffer first ranging from extreme weather, spiraling food prices, scramble for land and water. Climate change poses a grave threat to food production. With the growing warning signs of surging and unstable international food prices, growing conflicts over water, the increased exposure of vulnerable populations to droughts and floods. Food prices are forecast to increase between 70 to 90 percent by 2030 before the effects of climatic change, which will roughly double the price rises again (Baily 2011:12). Climatic change affects on the yield growth. It is estimated that Sub Saharan Africa could experience catastrophic declines in yield of 20-30 percent by 2080, rising to up to 50 percent in countries such as Sudan and Senegal (Cline 2007). Climate change will increase the frequency and severity of extreme weather events such heat waves, droughts, and floods which can negatively affect harvests (Baily 2011:19). What about people without incomes, savings, and access to health care? Industrial countries have good social insurance, incomes and savings which can make them adapt to climate change. While a growing number of countries such as USA and Europe are adopting greenhouse gas reduction targets by using technologies such as wind and solar. African states cannot afford those.

The vulnerability of the local populations to climatic change depends on the extent to which they depend on the natural resources and ecosystems, the sensitivity of the resources they depend on to climatic change, and their capacity to adapt to changes (Barnett and Adger 2007:641).

This is the extension of carbon intensive production in Africa, in which the products are exported to home countries. The global environment is deteriorating on several fronts including greenhouse gas emissions, water use and deforestation. These three key factors determine environmental relations in terms of sustainability in Africa especially in the regions where millions of people depend on natural resources for their livelihoods. The burden of climatic change and degradation depends on several reasons in the region including depending of the majority of rural people on natural resources for their livelihoods and incomes and dependence of net producers and net consumers of natural resources. Many indigenous peoples rely heavily on natural resources and live in the ecosystems which now vulnerable to climatic change (UNDP 2011:6). Furthermore, environmental disaster will affect poor people and will continue to affect negatively by 2050 even if they don't or contribute little to the problem. While three-quarters of emissions since 1970 comes from low, medium and high HDI countries, the overall levels of greenhouse gas emission remain much greater in very high HDI countries. Emissions per capita are much greater in very high HDI countries than in low and medium HDI countries combined because of more energy intensive activities such as driving cars, cooling and heating homes and businesses, consuming processed and packaged food. In addition to economic growth, rising HDI has been associated with environmental degradation. Countries with higher incomes generally have higher carbon emissions per capita, hence, a strong positive correlation between carbon emissions and incomes.

Given the increasing levels of greenhouse gas emissions, water scarcity and deforestation, the

question that remains unanswered is how secured are we in our common neighborhood? How secured are we environmentally, economically and culturally? We need to know what constitutes our security problems. Due to the growing double standards in climatic change policy, the security concept is used to describe human security in the context of climatic change in Africa. The concept of human security is fundamental for achieving the seventh item of environmental sustainability of Millennium Development Goals. The security of indigenous and local communities in the era of climatic change is only realized when they can manage their own needs, resource rights and values. To investigate whose security is being promoted, this study uses Baldwin Schema. Baldwin (1997) developed the concept on "human security," pointing out series of questions to be investigated: Security for whom? Security for which values? Security from what threats? Security by what means?

After knowing what constitutes our security problems, security can be discussed in terms of "absence of threat to acquired values" or "a low probability of damage to acquired values". This study mainly focuses on the first two fundamental security questions: security for whom and security for what values?

To answer 'security for whom,' human security is not about the state or meeting the demand of foreign governments, or foreign investors, but it is all about ensuring sustainable environment for its local populations. On what values will we seek to protect? It is the African environment as the prime values; not the profit motives of investors, energy demand of foreigners and the addition revenues, employment, infrastructure and income.

On security from what threats? It is the security from deforestation, which leads to increased green house emissions. The rural poor in Africa will bear the burden. Carbon rights are form of property right to the local populations. On security by what means? It is the through clean energy development such hydro-power generations. Africa is blessed with the water resources. It is the first generation biofuels that is being commercialized, but negatively affects the environment.

RETHINKING CLIMATIC CHANGE POLICY

As world leaders will gather in June 2012 in Rio de Janeiro to seek a common consensus on global actions to safeguard the future of the planet and the right of the future generations everywhere to live healthy and fulfilling lives, it is very important to address the growing environmental insecurity in Africa due to deforestation. Innovative policy is necessary as we progress towards the eve of the UN Conference on Sustainable Development and the post 2015 era. There is need for preserving natural resources and the participation of poor countries and groups in accessing finance. Rio + 20 provides a very good opportunity to share the understanding sustainability and social justice in development process. African environmental sustainability should mainly focus on preserving basic natural resources and the associated ecological services through restricting access to forests.

The new idea of green economy is a crucial flavor to sustainable development because it gives more attention to environmental issues of energy use and reduction in carbon emissions. It helps in policy reconciliation by seeking growth from pro-poor investments and respect for the nature. It exhibits growth in income and employment, and investments driven by reduced carbon emissions and also preventing loss of biodiversity for improving wellbeing. The goal of development is recognized in improving the quality of human life within the constraints of environment, including combating global climatic change, energy insecurity, and ecological scarcity. However, the relevance of liquid biofuels has been questioned as it degrades the ecosystems and increases deforestation which leads to increases in greenhouse gas emissions and affects rain-fed agricultural production and exacerbates food insecurity in Africa.

The green economy has now become a powerful political apparatus and its role in promoting sustainable development is questionable, especially in developing countries where the majority of people depend on natural resources for their livelihoods. In fact, protecting ecosystems, reducing climatic change risks, improving energy security, and at the same time improving on livelihoods of the poor are big challenges. The most controversial issues are in increasing economic activities without putting more pressure on the environment. Whether converting forests into palm plantations is more viable than conservation and whether promoters of green economy remain within the limits set by the government in respecting nature and social wellbeing of all generations in Africa. It is argued that although biofuels contributes to green economy through offering green fuels and improving on wellbeing through employment, incomes, rural infrastructure; biofuels also have potential negative impacts on environment in terms of depletion of natural forests, food security and land use change. Converting forests to monoculture plantations however does not lead to green economy instead creates 'biofuels carbon debt'. It is also associated with competing claims with the local resource users such as forests, land and water resources, hence, affecting local livelihood of vulnerable groups.

The rhetoric of global leaders on respecting biodiversity and climate change and promoting green economy should not be a big surprise in sustainable transition. Global leaders can only determine success to our common future through political will to climate change, biodiversity and green economy. This has been witnessed from the UNFCC forum, Kyoto protocol, and Copenhagen Accord, as we prepared for the new prospect of Rio+ 20 to make a breakthrough in investments in clean energy and financial support for developing countries. It should be remembered that the Kyoto Protocol excludes developing countries. It should also be noted that none of the major emitters are interested in reducing carbon emissions. They are only interested in instituting global climatic norms rather than being pragmatic on climatic change policy.

The Kyoto Protocol, Initiated in 1997, entered into force until 2005 after the ratification by Iceland (in 2002) and Russia (in 2004). It was delayed because of the fact that ratifying nations must be representing 55 percent of the world's total carbon emissions for 1990. The purpose of Kyoto Protocol is to reduce worldwide greenhouse gas emissions to 5.2 percent below levels between 2008 and 2012. The Kyoto Protocol specifies reduction targets for each industrial country, but excludes developing countries. Ratifying nations are supposed to: *a)* place restrictions on their biggest polluters; *b)* reduce carbon emissions in the transport sector such as automobiles; and c) use of renewable energy sources such as solar power, wind power and biodiesel – in the place of fossil fuels.

The provisions of the Kyoto Protocol are only binding on ratifying nations that agree to reduce greenhouse gas emissions. They are allowed to use emissions trading to meet their obligations in case they maintain or increase carbon gas emissions. With the exception of United States, does not politically support Kyoto protocol including Australia which also decline; most industrial industrialized countries support Kyoto Protocol. During Bush's administration, United States believes in voluntary reduction in carbon emissions to 4.5 percent by 2010. Even before the Kyoto Protocol, the U.S senate passed a resolution, stipulating that U.S should not sign any protocol that failed to include binding targets and time tables for both developing and industrialized nations and that "would result in serious harm to the economy of the United States."[2]

The 2009 Copenhagen climatic change summit represented more than 80 percent of the world's global warming polluters. Both developed and developing countries leaders agreed for the first time to place commitments by the end of January 2010. Developed countries also committed to support developing countries financially to assist developing countries in deploying clean energy technologies, reducing forest-related emissions, and adapting to the impact of global warming. These promises for the first steps on a new pathway to progress in reducing emissions and moving to a low-carbon global economy as illustrated in the table 4.

Sustainability is more than an environmental issue, but it is fundamentally how we choose to lead our lives today as well as for the future generations. Africa is more vulnerable to the effects of degradation and climatic change due to low copying capacity. They also have weak governance arrangements in which voices of elites are promoted at the expense of the weaker ones, excluding the marginalized groups such as indigenous forest communities and women.

CONCLUSION

Reducing tropical deforestation remains one of the most fundamental change policies to stabilize the greenhouse gas concentrations. African forests play critical role in the conservation of biodiversity and water resources. The large quantity of carbon should be sequestered in the tropical forests. The security of local communities in Africa could be enshrined in carbon rights.

While biofuels is a valuable contribution to climatic change and transition to sustainable energy, the production of first generation biofuels generates contestations on reducing carbon emissions. Africa, among other developing countries was excluded in the Kyoto Protocol in cutting carbon emissions. Developed countries therefore should not justify their commitments to reduce carbon emissions by promoting first generation in Africa. This resembles exporting emissions to Africa, which is not excluded from the Kyoto conditionalities. The Clean Development Mechanism of the Kyoto Protocol excluded the issue of carbon credits to reduce the rate of deforestation, the new REDD initiative should receive adequate attention in carbon markets in reducing national deforestation.

The first generation biofuels is not a fundamental to Africa's energy crisis as it negatively impacts on pristine forests and ecosystems through conversion into monoculture plantations creating 'biofuels carbon debt'. Whereas Africa has a comparative advantage in producing first generation biofuels yielding higher productivity than the production in the temperate climate, the decisions to produce first generation biofuels on commercial basis are externally induced with specific targets to meet home demand while Africa, if not very few countries, have no policy on biofuels. To meet foreign energy security, land in Africa is being called as 'marginal', 'abandoned' or 'degraded', but biofuels production

has targeted pristine forests that are valuable security to poor communities as source of livelihoods.

END NOTES

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