A CONTENT ANALYSIS REPORTS ON CLIMATE CHANGE IMPACTS, VULNERABILITY AND ADAPTATION IN UGANDA.

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List of Acronyms

ENR	Environment and Natural Resources
GDP	Gross domestic product
GHG	Greenhouse gas
INC	Intergovernmental Negotiating Committee
IPCC	Intergovernmental Panel on Climate Change
LDC	Least Developed Country
LDCs	Least developed countries
LEG	Least Developed Countries Expert Group
MDGs	Millennium Development Goals
NAADS	National Agricultural Advisory Services
NAPA	National Adaptation Programme of Action
PEAP	Poverty Eradication Action Plan
PMA	Plan For Modernization Of Agriculture
PRSP	Poverty Reduction Strategy Paper
UNFCCC	United Nations Framework Convention on Climate Change

Definition of Key Concepts

Climate: Average weather or pattern of weather in a given period of time

Climate Change: The change in climate attributed directly or indirectly to human activity that alters the composition of global atmosphere and which is in addition to natural variability observed over comparable time periods. (**UNFCCC**)

Vulnerability: An indication of peoples' exposure to external risks, shocks and stress and their ability to cope with and recover from the impacts. **(DFID 2004)**

Adaptation: Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. (**IPCC 2001**)

Global warming: Greenhouse gases (GHGs) such as carbon dioxide, carbon monoxide and methane that are emitted into the atmosphere through human activities act like blanket to heat, which escape from the surface of the earth.

Biodiversity: The variety of living things on earth and their interactions with the environment. Scientists often categorise biodiversity into three components, i.e. species, genes and ecosystems.

Ecosystem: A dynamic complex of plants, animals and micro organisms and their non-living environment interacting as a unit.

Climate Change Policy Preview

The way man relates with nature has changed a great deal that climate is changing and coming up with adverse effects. The first climate change conference of 1979 at Geneva was a break through to the more realization of the dangers of humankind activities to the global climate system. Since then, series of international agreement have been observed with hope to maintain the really threaten earth planet. Nations are alarmed and they recognize that the climate system is a shared resource whose stability can be affected by Green house gases (GHGs) emissions from human activities. In sequence of efforts to meet the global climate challenge, the UN General Assembly in December 1990 at its 45th session responded by establishing the Intergovernmental Negotiating Committee (INC), which negotiated and adopted the United Nations Framework Convention on Climate Change (UNFCCC) on 9th of May 1992.

The UNFCCC was opened for signature at the Earth Summit held in Rio de Janeiro, Brazil in June 1992. Over 180 states signed and ratified the UNFCCC. Uganda signed and ratified the UNFCCC on 13th June 1992 and 8th September 1993 respectively. It is apparent that UNFCCC is a noteworthy international agreement through which countries around the global team in concert to tackle the challenge caused by climate change. This convention intends to stabilize the concentration of GHGs in the atmosphere at a level that does not threaten life.

Governments that ratify the convention are supposed to gather and share information on GHGs emissions, develop national policies and best practices, launch national strategies for addressing GHGs emissions and adapt to expected impacts. Developed countries are also expected to provide financial and technological support to developing countries and cooperate in preparing for adaptation to the impacts of climate change.

In recognition of the increasing threat posed by climate change, countries adopted the Kyoto Protocol to the UNFCCC in December 1997 to strengthen commitments of developed countries. The Kyoto Protocol was recently on 16th February 2005 put into force as a legal binding; about 149 countries hope to reduce their GHGs to 5.2% by 2012. Nevertheless, there seem challenges without USA, which is being indifferent yet she is responsible for at least 55% of GHGs emission.

1.0 Introduction

1.1 Uganda and Climate Change

Like any other LDCs, Uganda is Vulnerable to effects of climate change. According to 2002 report to UNFCCC, there is low capacity in both financial and human resources circles to acclimatize to climate change. Nevertheless, there is flicker of hope since Uganda has committed herself in the spirit of global cooperation to actively participate in the global climate change policy processes.

So far, Uganda has embraced and ratified most of the climate change related international conventions. She signed and ratified the UNFCCC, on 13th June 1992 and 8th September 1993 respectively. Furthermore, Uganda has indeed participated and implemented some of the requirements of the COP 7 that adopted National Adaptation Programmes of Action (NAPA) as an additional channel of communicating urgent and immediately adaptation interventions required to minimize impacts of adverse effects of climate change.

There is discernible information as far as climate change adaptation is concerned. On papers strategies towards adaptation are stipulated and linked to relevant national policies despite the fact that implementation still remains a fairly tale.

1.2 Country Profile

Geographically, Uganda is a land-locked country that occupies 241,038 square kilometers, of which open water and swamps constitute 43,941 square kilometers, and land area, excluding open water and swamps constitutes 197,097 square kilometres.[1] Uganda's relief lies at an average height of 1,200 meters above sea level with the minimum altitude of 620 meters (within the Albert Nile) above sea level and the maximum altitude is 5110 meters (Mt. Rwenzori Peak). Uganda is well endowed with fresh water resources; among others, significant water features such as River Nile, the longest river in Africa has its sources at Lake Victoria, which is also, the largest lake in Africa. Uganda experiences moderate climatic conditions throughout the year with rainfall level ranging from 750 to 2000 mm per year. (Report to the UNFCC January 2002)

The vegetation is mainly composed of Savanna grassland, bush land and tropical high forests.

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[1] *State of the Environment Report of Uganda, 2000/01*

Uganda has a total population of 24.6 million persons and an increase of 7.9 million persons over a period of about 12 years is indicated in results of the national census of 2002, this is the highest intercensal increase ever registered in the post-independence period.[2]

Uganda is ranked 146th in the 2004 Human Development Report, with an HDI value of 0.493 and GDP per capita value of 1,390 US$. Uganda's Income poverty is on a downward trend since 1992 though absolute poverty still affects about 46% of the population[A]. Life expectancy at birth is estimated at 45.7, Total Literacy rate is 61.8%[3] though this figure will tremendously ascend since the inception of Universal Primary Education (UPE) programme. HIV prevalence rate has lowered from 30 % in 1990s to 4.1% in 2002[4].

Climate change is likely to have off-putting effects on economic growth in spite of the progress Uganda has registered in macro-economic stability and social conditions. The government recognizes the fact that a particularly important precondition for poverty reduction as current trends show is having an enabling climate conditions in place. Therefore, through PEAP and MDGs goals, transformation of Uganda's economy and sustainable reduction in poverty are directly dependent on the quantity and quality of Environment and Natural Resources (ENR). There are guidelines to mainstream ENR issues in other sectors and programmes.[5]

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[2] *Uganda Bureau of Statistics 2002: Uganda National Population and Housing Census from 13 to 19 September 2002.*

[A] *UNDP Poverty Assessment Report for Uganda, 2000*

[3] *UNDP Human Development Report 2004*

[4] *Report of a USAID Technical Meeting On Behavior Change Approaches To Primary Prevention of HIV/AIDS, September 17, 2002,3*

[5] *Ministry of Water, Land and Environment 2003: Guidelines for Mainstreaming Environment And Natural Resource Issues In other Sectors and Programmes, PEAP review 2003, Uganda.*

2.0 Climate Change Impacts on Uganda

Like elsewhere in the world, Uganda is vulnerable to adverse effects of climate change. It's important however to note that Uganda is ranked in the category of the poorer countries at 146th out 177 countries. (UNDP, 2004 Report). With wide spread poverty, is apparently more vulnerable because her low adaptive capacity to adverse effects of climate change. Common likely and already experienced Impacts of adverse effects of climate change in Uganda include: -

Droughts and floods

In the last few decades, Uganda has experienced an increase in the frequency and intensity of extreme weather events with serious socio-economic consequences. The most extreme event experienced being the El Nino of 1997/98. This El Nino is reported to have inflicted heavy losses perhaps the most severe. For instance, it swept bridges (many towns were cut off from commercial center causing heavy losses in goods and services), crops were destroyed, outbreak of water borne diseases such as cholera and other flood-related diseases.

The impacts during the ElNino of 1997-98 included the following: -

- An estimated 525 people died and over 11,000 were hospitalised and treated for cholera triggered by the El Nino induced floods and land slides.
- An estimated 1,000 people were reported to have died in flood related accidents.
- About 150,000 people were displaced from their homes.
- Damage to trunk and rural roads infrastructure was estimated at US 400Million.
- In Kapchorwa district about 300 hectares of wheat were destroyed.
- Tea estates were flooded making tea picking difficult
- Coffee exports dropped by 60% between October and November (accruing from disrupted transport system).
- Infiltration of water resources and flooding of some pumping stations (submerging of pumping stations).
- Monetary value of the losses in the agricultural sector and inaccessible markets were not estimated. The total cost could run into hundreds of millions of US dollars.

(Source: January 2002 Uganda's Report to UNFCCC).

3.0 Vulnerability

"*poor countries, and particularly the poorest people within them are critically vulnerable to shocks that disrupt their lives and livelihoods. Their poverty increases their vulnerability…and it limits their ability to cope with and recover from the shocks..*"[6]

With rampant poverty, weak institutional capacity, lack of skills on Climate change adaptability and inadequate skills in disaster management, lack of equipment for disaster management, limited financial resources and above all an economy which depends entirely on exploitation of its natural resources, Uganda is most vulnerable to adverse effects of climate change.

3.1 Agriculture and Food Security

Agriculture, which is the backbone of Ugandan economy constitutes about 42% of GDP, over 90% of export earnings and employs about 81% of the labourforce. Agricultural performance fluctuates with changes in weather conditions thus far, Ugandans lives and livelihoods dependent on agricultural production, which is sensitive to climate variability, and climate change. Climate variability and climate change in spheres of long-term droughts and heavy rains have so far characterized reduced agriculture production. Poor climate conditions are likely to reduce Uganda's agricultural sector performance, which results into higher food prices, lower domestic revenues and lower export earnings among others.

Productivity of Uganda's grasslands and livestock is dependent on climate and will therefore be affected by climate variability and climate change. There is also high uncertainty in onset and cessation of rainfall seasons. This coupled with high evaporation rates, particularly in northern Uganda affects agricultural production[7].

The increased frequency and intensity of droughts or floods are likely to affect food security and household incomes. There is already some predicted increase in temperature by an average of 2°C, which would drastically reduce production of Robusta coffee that is a major export crop for Uganda therefore limiting it to highlands[8]. (Simmot 1998)

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[6] *DFID 2004: Climate Change and Poverty; the impact of climate change on vulnerability of the poor. 3'*

[7] *Draft Initial Report to the UNFCCC-Uganda, January 2002.*

[8] *Simonett, O. 1998: Potential Impacts of Global Warming. Case studies on climate change GRID-UNEP Geneva.*

3.2 Health

Climate change has already had a direct impact on people's health in Uganda. Water crisis is prevalent during long-term droughts. Changes in temperatures and precipitation, supports spread of malaria epidemic. Malaria has escalated in southwestern Uganda particularly Kabale district, where temperatures have changed and increased in the recent time. It should be noted that as back as 1980s malaria was rare in Kabale district. More to this, poor agriculture production has led to inadequate nutrition (2226 daily calorie intake per person compared to 2663 average for developing countries), which is likely to result into malnutrition. Heavy rainfalls as especially identified in the El Nino event of 1997/98 have triggered water-borne diseases such as malaria, cholera, and dysentery among others.

3.3 Energy

The energy sector is predominantly dependent on wood fuel, which accounts for up to 93% of the country's total energy needs. The high demand for fuel wood has resulted into depletion of forests and exacerbates land degradation. The other sources of energy are petroleum and hydro-electricity accounting for 5% and 1.5% respectively. Though, Uganda is endowed with renewable energy resources, which include biomass supplies, hydropower potential (over 2000 MW), solar and biomass residues from agricultural production, they (renewable resources) are not fully exploited which is swelling high demand for wood fuel. The transport sector is the major consumer of fossil fuels. According to the report to UNFCCC, It accounts for about 75% of the fossil fuel import bill.

3.4 Water Resources

Water, which is important for household and community socio-economic activities and production, covers up to 15% of Uganda's total area. Uganda's populations derive considerable economic benefits from water resources in the form of fishing, water supply, transport, hydro-energy and tourism, among others. However, the distribution of water resources is not even such that large parts of Uganda (especially to the North East) are partly semi-arid and face severe water crisis especially during drought periods. Therefore increasingly frequent periods of drought have had an adverse effect on both the quantity and quality of water resources. More so, problems of flooding from flashy mountain streams are common particularly in Kilembe district where cholera associated with flooding is common. According the report to UNFCCC, problems of flooding, droughts, soil erosion and siltation are expected to become

more frequent and more severe with the impending climate change and that water demand may not be met especially in the semi-arid regions.

3.5 Forestry and biodiversity

It is noted that energy sector in Uganda is typified by a heavy dependence on biomass resources. Thus, forest industry has undergone changes attributed to population pressure. Imagine most of Bio-diversity can be found in Natural Forests, although a considerable amount is found in open waters, wetlands, and dry/moist savannahs, which are all, threatened. Households and small-scale agro-based industries like tea, tobacco and fishing depend on wood fuel. The natural forests are experiencing over exploitation due to increased demand for timber and fuel wood. Also, farmers are encroaching on gazetted forests for crops production. Over exploitation of forests' raw material poses a big threat to environment and climate.

As already predicted that in east Africa, "reduced precipitation or increased evapotranspiration may threaten wetlands and that African nature reserves will become less effective as vegetation and animal they seek to protect will no longer be living in their preferred bio-climatic region. The exodus of flora and fauna will also be constrained by ecosystem fragmentation and the potential hostility of certain landscapes"[9]. Uganda's ecosystems and biodiversity is likely to succumb to the above state of affairs.

4. 0 Adaptation to Climate Change

Adaptation to climate change is important to Uganda and some bit of action has yet taken course. As predetermined at the Conference of the Parties (COP) at its seventh session, Uganda has so far adopted National Adaptation Programmes of Action (NAPAs). Uganda has developed national inventory of GHGs as one step forward to mitigate GHG emissions in her national priorities and aspirations. However, there is limited vulnerability assessment done in a few sectors such as agriculture, water resources and forestry. A lot has been done to communicate urgent and immediate adaptation interventions required to minimize adverse effects of climate change. In addition, Uganda has signed and ratified many climate change international policies. Also, national policies have also been developed and up dated to acclimatize adverse effects of climate change.

Some of the significant adaptation intervention so far: -

[9] *Saleemul et al 2004:Mainstreaming Adaptation to Climate Change in LDCs. Earthscan, London Page 29*

- In agricultural Sector, Plan for Modernization of Agriculture (PMA) is an important adaptation element which ensures development of drought resistant cultivars, provision of water for production, agricultural information dissemination, training and research among others.

- In the forestry Sector, a fully-fledged Forestry Action Plan was developed to check afforestation, reforestation, conservation and protection of the existing forest estate.

- Water Resources Sector adaptation measures call for improved water management systems throughout the country through strict implementation of the Water Statute. Remarkable work can be traced in strict protection of wetlands.

- Grassland and livestock: - Reduction of animal, Improve pastures and rangelands management, reduce silting of riverbanks and lakeshores, water harvesting.

4.1.0 Implementation of the UNFCCC in Uganda.

Uganda as a concerned party about the implications of climate change on sustainable development signed and ratified the convention on June 13, 1992 and September 8, 1993 respectively. Department of Meteorology (DoM) is the focal point for the UNFCCC.

4.1.1 Activities/Achievements in the Implementation of UNFCCC[10]

- Uganda has carried out country study on sources and sinks of green house gases.
- Uganda is also implementing the following projects; Project on incremental costs on green house gases and their elimination, Forests absorbing Carbon dioxide Emissions (FACE) project has been -launched to re-afforest and undertake enrichment planting of the two degraded forest protected areas of Mt. Elgon and Kibale National Parks.
- Training is on going to improve skills and capacity in Meteorological monitoring and services.

[10] *NEMA 2002: Localizing Global Environmental Conventions: A Simple Guide for Uganda*

4.1.2 Major Constraints in the Implementation of UNFCCC in Uganda

- Lack of and/or un affordability of alternative energy sources

- Inadequate institutional and manpower capacity in meteorology and other issues related to climate monitoring.
- Lack of implementation action plan for the UNFCCC.
- Uncertainty of indicators for decision-making. There is inadequate data and equipment for meteorological monitoring.
- Low of awareness in relation to climate change global issues.
- In adequate resources and funding towards implementation.
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4.1.3 Areas for Implementation

- Establishment of international and national financial mechanisms for providing resources.
- Programmes and activities, and commitment to provide alternative sources of energy.
- Enhanced global cooperation more especially, for the fact that issues of climate transcend boundaries.
- Research and capacity building need to be undertaken

4.1.4 Recommendations

- An awareness strategy on the convention and implications of climate change should be developed and funds need to be allocated.
- Emphasis should be placed on mitigation and response strategy for effects of the climate change.
- Adequate attention should be placed on developing and establishment of indicators of climate change.

4.2 Climate Change Related National Policies and Measures

Having signed and ratified the UNFCCC, Uganda has in place the relevant policies and measures which are hoped to effectively address issues of climate change. The major goal of these policies is to achieve poverty reduction through environmentally sustainable development as enshrined in the country Vision for 2025 which mandates Poverty Eradication Action Plan (PEAP).

4.2.1 Vision 2025: - Uganda's Vision 2025 constitutes a strategic framework for national development in the long-term. A highly productive and modernized agricultural sector, widely distributed, technological proficient, innovative and competitive industries, Maximum utilisation of information technology, expanded research capacity, an adequate well trained number of scientists and technologists in all fields of, production and other human activities.

We can specifically look at different National sectoral policies that climate change adaptability is ought to be mainstreamed, which include:-

4.2.2 Poverty Eradication Action Plan (PEAP): - Poverty Eradication Action Plan (PEAP) is Uganda's Comprehensive Development framework, which has guided the formulation of government policies since 1997. Under PEAP Uganda is being transformed into a modern economy in which agents of all sectors can participate in economic growth. The government envisages that poor people can benefit from economic growth only if the following conditions are met under PEAP

4.2.3 Plan for Modernisation of Agriculture (PMA): - The PMA is part of the government's broader strategy of poverty eradication contained in the Poverty Eradication Action Plan (PEAP). It is perceived that modernising agriculture will contribute to increasing incomes of the poor by raising farm productivity, increasing the share of agricultural production that is marketed, and creating on-farm and off-farm employment. The poverty focus of the PMA is based on poor people's perspectives that are contained in various poverty studies in Uganda.

4.2.4 Population Policy: - The Population Policy for Uganda was developed in 1994 with overall goal to influence the future demographic trends and patterns in desirable directions in order to improve the quality of life and standard of living of the people. This policy is for the encouragement of sustainable development through, the harmonisation of population growth with the country's natural resources such as water, land, forests and climate.

4.2.5 Health Policy: - The Health Policy and Sector Strategic Plan were developed within the context of the provisions of the Constitution of the Republic of Uganda (1995) and the Local Government Act (1997). The overall policy goal is the attainment of a good standard of health by all the people in Uganda, in order to promote a healthy and productive life. Malaria accounts for over 15.4% deaths.

4.2.6 Disaster Management and Preparedness Policy: - Uganda has put in place a comprehensive policy that details an arrangement for the

effective and practical management of disasters. The overall policy goal is to promote, in relation to disasters, prevention, preparedness, mitigation, response and recovery.

4.2.3 Forestry Policy (2001): - The current trend in Uganda has been one of loss of forest cover and degradation of the remaining forest resource base. The new policy (2001) sets out the goal and objectives. The Policy Goal of the Uganda Forestry Policy (2001) is to establish an integrated forest sector that achieves sustainable increases in the economic, social and environmental benefits from forests and trees by all the people of Uganda, especially the poor and vulnerable. Forest biodiversity will be conserved and managed in support of local and national socio-economic development and international obligations. There is also National Forest Plan (NFP) that was formulated in 2003 to harmonize community exploitation of forests[11]

4.2.4 Environment Policy: - The National Environment Management Policy promotes the use of economic instruments, public participation and environment information and education. The overall policy goal is sustainable social and economic development, which maintains or enhances environmental quality and resource productivity on a long-term basis that meets the need of the present generations without compromising the ability of future generations to meet their own needs.

4.2.5 National Water Policy: - The National Water Policy of 1995 sets out water supply and sanitation polices as well as sustainable provision of accessible clean safe water and hygienic sanitation. The policy promotes a new integrated approach to manage the water resources in ways that are sustainable and most beneficial to the people of Uganda. It is implemented in accordance with the Water Action Plan (1995). The overall policy objective for the Water Resources Management is: to manage and develop the water resources of Uganda in an integrated and sustainable manner so as to secure and provide water of adequate quantity and quality for all social and economic needs of the present and future generations with full participation of all stakeholders.

4.2.6 Energy Policy: - The main policy goal in the energy sector is "to meet the energy needs of Uganda's population for social and economic development in an environmentally sustainable manner".

4.2.7 Waste Management: - The policy issues relevant to waste management are addressed through the existing National Environment Policy framework, which provides information for appropriate methods and technologies to be provided to stakeholders. This is further

[11] *National Forest Plan (NFP) 2003; Ministry of Water, Lands and Environment*

strengthening by the Action plan for Municipal Solid Waste Management and National Environment (Waste Management) Regulations.

4.2.8 National Wetlands Policy (1995): - The overall goal of the policy is to promote the conservation of Uganda's wetlands in order to sustain their ecological and socio-economic functions for the present and future well being of the people.

4.2.9 Climate Monitoring: - The Department of Meteorology is the institution mandated to implement policies related to climate and climate change. The policy goal in this sector is "to maintain a well developed weather and climate monitoring system that provides necessary information and advisories to support sustainable socio economic development. In the light of the UNFCCC, there are proposals to put in place a National Climate Change Secretariat. The major function of the Secretariat is to coordinate implement of the UNFCCC and the Kyoto Protocol.

4.3 Policy Gaps

- Policies linked to were not designed to address climate change issues thus climate change issues are down played.
- There is no holistic policy to govern climate change issues and there is a lot of policy politics in natural resource management.
- In many ways climate change is downplayed and is thought of in the face of disaster.
- Lack of policy awareness at various echelons of Ugandan society.

5. 0 Challenges to Adaptation of Climate Change

The factors, which contribute to Uganda's low capacity to cope with impact of adverse effects of climate change, include the following:

- Low level of income reflected in per capita income and revenue/GDP ratio of about 11.3%.
- Heavy dependency on Natural resource and rain-fed agriculture
- Inadequate human resources capacity for the enhancement of climate management systems.
- Lack of a clear and holistic policy to address climate change issues.
- Low levels of awareness on climate change issues; and insufficient information dissemination on the existing indigenous adaptation knowledge/options.
- National sectoral policies fall short of specifying the linkages with the UNFCCC and the modalities for exploiting the opportunities therein.

- Lack of integrated vulnerability and adaptation assessment, climate change country study programme (1996) covered agriculture (crop and livestock), water resources and forestry sectors only.[12]

6.0 Way Forward

- Strengthen climate change monitoring; early warning systems should be enhanced.
- Enhancement of Adaptation Action Plan. (Legal and institutional framework)
- Apply participatory and consultative approach that will involve all stakeholders at all levels (CSOs and local communities)
- Promote alternative sources of renewable energy.
- Strengthening of the early warning information capacity, especially for food security and short-term climate prediction.
- Incorporation of climate change and variability information and projections into long-term development plans.

[12] *US Climate Change Country Study Programme (1996), Uganda*

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DFID 2004: *Climate Change and Poverty, Making Development Resilient to Climate Change*. Development for International Development. Gov. UK,

Ministry of Water, Lands, and Environment 2003; *Guidelines for Mainstreaming Environment and Natural Resource Issues In Other Sectors And Programmes*. PEAP Review 2003, MWLE, Republic of Uganda.

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