

Uganda Country Climate Risk Assessment Report



The Uganda Carbon Bureau

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CARBON
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Emissions reductions:
Sustainable development



Irish Aid, Resilience and Economic Inclusion Team, Policy Unit

February, 2018

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Cover photo; EcoTrust interacts with community members during the monitoring of the trees for global benefit project

Photo (s) credit; Pauline Nantongo Kalunda, Executive Director, EcoTrust

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List of Acronyms

ADB	African Development Bank
CDKN	Climate and Development Knowledge Network
CDM	Clean Development mechanism
CFCN	Climate Friendly/Carbon Neutral
COFs	Climate Outlook Forums
CSO	Civil Society Organisations
CSP	Country Strategy Paper
DRR	Disaster Risk Reduction
FAO	Food and Agriculture Organisation of the United Nations
FEWSNET	Famine Early Warning Systems Network
GCF	Global Climate change Fund
GDP	Gross Domestic Product
GHGs	Green House Gases
GoU	Government of Uganda
HDI	Human Development Index
ICPAC	IGAD Climate Prediction and Application Centre
IGAD	Inter-Governmental Authority on Development
IIED	International Institute for Environment and Development
IITA	International Institute for Tropical Agriculture
INDC	Intended Nationally Determined Contribution
IPCC	Inter-governmental Panel in Climate change
LDCF	Least Developed Countries Fund
LUCF	Land use Change and Forestry
M&E	Monitoring and Evaluation
MDAs	Ministries, Departments and Agencies
MPI	Multi-dimensional Poverty Index
NAP	National Adaptation Plan
NAPA	The National Adaptation Programme of Action
NARO	National Agriculture Research Organisation
NDC	Nationally Determined Contribution
ND-GAIN	The Notre Dame Global Adaptation Initiative
NEMA	National Environment management Authority
NOAA	National Oceanic and Atmospheric Administration
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PPCR	Pilot Program for Climate Resilience
PS	Permanent Secretary
SACCO	Savings and Credit Cooperative Organization
SDG	Sustainable development goal
SP	Social Protection
SREP	Scaling Up of Renewable Energies Program
UBOS	Uganda Bureau of Statistics
UCB	Uganda Carbon Bureau
UDHS	Uganda Demographic health Survey
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNFCCC	United nations Framework Convention on Climate Change
UNMA	Uganda National Meteorology Agency
UWA	Uganda Wild life Authority
WMO	World Meteorological Organization
WRI	World Resource Institute's

Executive Summary

Uganda is already experiencing impacts of climate change manifesting through increased frequency and intensity of disasters including droughts, floods and landslides in recent years. The percentage of rainfall in form of heavy precipitation events is on the increase, and the hazards have reduced crop yields and caused loss in livestock, with negative implications for food security. Uganda has been ranked as high risk under the risk assessment for humanitarian crises and disasters with impacts on displaced people and vulnerable groups, increasing inequality and social economic vulnerability. The coping capacity is inadequate, vulnerability high and the country is least ready to cope with climate impacts. With projected increase in the frequency of extreme events, the exposure and vulnerability of the country is likely to increase, thus affecting the coping capacity further.

Uganda's rainfall trends indicate no significant change in average annual rainfall in the 60-year historical record, similarly, no significant change in average annual rainfall is projected for the 2015-2045 period. However, there is projection of an increase in rainfall in particular months which were initially dry with potential of significantly altering the seasons. This increase could have strong impacts on agriculture, with likely increase in the frequency of extreme events. Average annual temperatures between 1951-1980 and 1981-2010, shows a notable increase of approximately 0.5-1.2 °C for minimum temperatures and 0.6-0.9 °C for maximum temperatures. Climate projections developed for Uganda using the models used in the IPCC Fifth Assessment Report (IPCC AR5) however, indicate an increase in near-surface temperature for the country in the order of +2°C in the next 50 years, and in the order of +2.5°C in the next 80 years.

Over 70% of Uganda's population depend on subsistence farming, which is heavily dependent on rainfall seasons. Besides agriculture, many other sectors rely on weather and as such it is paramount that weather information delivery is done accurately and timely. Despite the efforts by the Uganda National Meteorology Authority in improving the weather and climate services, they are still facing challenges of insufficient capacity in terms of human resource and weather equipment which affect accuracy and reliability of data. Dissemination and access by users is also inadequate in terms of coverage and feedback.

Climate change is affecting all the sectors and the climatic factors are interlinked with other social economic factors making the conditions worse. Uganda has been experiencing an influx of refugees mostly from South Sudan and the DRC, as a result of armed conflict. Whereas climate change is not the driver of the conflicts, the refugee influx increase pressure on natural, social and economic resources of the country, which adds to other stresses including climate change, reducing the coping capacity of the country further. According to the Economic Assessment of the Impacts of Climate Change 2015, Climate change damage estimates in the agriculture, water, infrastructure and energy sectors will collectively amount to 2-4% of the GDP between 2010 and 2050. The national-level studies show that if no adaptive action is taken, annual costs could be in the range of US\$3.2 - 5.9 billion within a decade, with the biggest impacts being on water, followed by energy, agriculture, and infrastructure. Given the increase in population rates, pressure on resources is likely to increase.

Uganda has however put in place several policies and strategies to address climate change adaptation and mitigation. The Second National Development Plan (NDP II) 2015 – 2020 recognizes that climate change will affect most of its key economic sectors and that action on climate change is crucial if the country is to meet its goal to become a competitive, upper middle-income country by

2040 (Vision 2040). For development to be economically and socially sustainable, climate resilience must be at the heart of policies for growth and development.

Despite the existence of the policies and strategies, the country is still experiencing challenges in regard to policy implementation due to poor enforcement of regulations, financing, coordination between local governments, ministries and agencies. Resource allocation for climate change adaptation at the sub national levels is inadequate, worsened by short term planning for adaptation. This is likely to undermine effective mainstreaming of climate change in the short and long term, as much as emphasis is being made at national level. The local institutions to enhance climate change adaptation and disaster risk reduction are also not functioning adequately at different levels thus affecting local climate action at planning and policy implementation.

The Irish Aid Uganda Country strategy 2016-2020 recognises the impacts of climate change on rural households making them more vulnerable to falling into poverty, thus highlighting the need for building resilience at different levels. The strategy notes that climate change impacts on agriculture and rural poverty may cause increased rural-urban migration as people suffering the impacts of climate change in rural areas seek (perceived) opportunities in towns and cities. Contribution to climate change adaptation financing is done through the bilateral aid programme and its civil society programme. The Embassy also has a carbon neutral programme where it offsets its emissions and the funds go to communities and supports social, economic and environmental projects.

To improve programming and reduce vulnerability of the country and communities to climate change impacts, the following is recommended;

- Strengthen the nexus between climate change, disaster risk reduction, humanitarian response and development to reduce vulnerability and build resilience for sustainable development, given Uganda's high vulnerability.
- Integration of climate change into development planning and budgeting at the national and subnational levels focusing on inclusive economic models that will spur the country to the aspiration for vision 2040 of being an upper middle income country.
- Capacity building and strengthening of Government structures at national and sub national levels will be key to improve sustainable development, planning for uncertainties, managing risks and reducing vulnerabilities resulting from climate change and disaster impacts.
- Investment in generating and disseminating accurate, timely and reliable weather and climate information will be important to inform different sector adaptation and climate risk management plans and decisions regarding changes in climate.
- Climate risk management and strengthening of food systems approaches will be important across all development programmes to improve food security, nutrition, but also enhance economic development for the poor.
- Enforcement of natural resource management policies and regulations as well as regulating oil and gas production to cater for clean development will be important in reducing emissions.
- Gender analysis and systematic integration of gender and social protection mechanisms into development programmes should be done to address capacities and vulnerabilities of vulnerable groups to shocks and stresses and design suitable adaptation options.
- The youth should be targeted and engaged around environment conservation and climate action from sub national to national levels. Seventy eight percent (78%) of Uganda's population is between 18-30 years and the youth between 18-30 years constitute 23% of its population. The future trajectories lie with the youth engagement in productive sectors of the economy.

1.0. Country Context

Uganda is located on the East African plateau and lies almost completely within the Nile basin. Although situated close to the equator, it has diverse climate patterns due to the country's unique bio-physical characteristics influenced by several large rivers, bodies of water, and mountain ranges to the east and west. According to the national housing and population census 2014, Uganda had a total population of 34.6 million persons in 2014 with a growth rate of 3.0%, representing an increase of 10.4 million persons from the 2002 census¹. The World population review put the Uganda population figures at 41,632,807 as at 2017, with a growth rate of 3.23%. The Uganda Demographic Health Survey (UDHS) 2016 data indicated that fertility in Uganda has been declining since the 1980s. The total fertility rate declined from 7.4 children per woman in 1988-89 to 5.4 children per woman in 2016. Fertility is notably higher among rural women than among urban women. On average, rural women will give birth to nearly two more children during their reproductive years than urban women (5.9 and 4.0, respectively).² Uganda's highest population is young, the population category under 30 years accounts for 78 % of the total population with 23% being youth between 18-30 years. This causes a high dependency ratio, but also a need to focus on the youth in development interventions.



Total Population in 2014 – 34.6 million

Population density – 173 persons per sq km

Children below 18 years – 55%

Youth (18-30 years) – 23%

Age dependency ratio – 103%

Total fertility rate - 5.3 children per woman

Households that use firewood for cooking – 94%

Households involved in agriculture – 80 %

Households depending on subsistence agriculture for their livelihood – 69%

Uganda's Human Development Index value for 2015 was at 0.493, which put the country in the low human development category, positioning it at 163 out of 188 countries and territories. Uganda's 2015 HDI is below the average of 0.497 for countries in the low human development group and below the average of 0.523 for countries in Sub-Saharan Africa. Using the multidimensional poverty index (MPI)³ which identified multiple household deprivations in education, health, and general living standards noted that 70.3 percent of the population are multi-dimensionally poor while an additional 20.6 percent live near multidimensional poverty. The breadth of deprivation

(intensity) in Uganda, which is the average deprivation score experienced by people in multidimensional poverty, is 51.1 percent. The multidimensional poverty headcount is 35.7 percentage points higher than income poverty. This implies that individuals living above the income poverty line may still suffer deprivations in education, health and other living conditions.⁴

Environment and natural resources are under threat from both natural and manmade drivers of change including; poverty, rapid population growth, unplanned urbanization, expansion of informal settlements, industrialization and the impacts of climate change and variability among

¹ The National Population and Housing Census 2014 – Main Report

² Uganda Demographic health survey (UDHS) 2016

³ MPI complements monetary measures of poverty by considering overlapping deprivations suffered by people at the same time.

⁴ UNDP Human development report 2016

others. The deforestation rate in Uganda is very high (2.3 %), well above world and sub-Saharan average (0.6 %)⁵. The growing population puts high pressure on the forests. The largest cause of deforestation is transformation of forestland into other land uses, mainly agricultural expansion. The high demand for fuel wood is also a driver of deforestation. Uganda depends on fuel wood for over 90 per cent of its energy consumption. Forest cover decline is most noticeable in privately and communally owned forests. Climate change will make these threats worse if adaptation and mitigation plans are not implemented.

Uganda's Second National Development Plan (NDP II) 2015 – 2020 recognizes that climate change will affect most of its key economic sectors and that action on climate change is crucial if the country is to meet its goal to become a competitive, upper middle-income country by 2040 (Vision 2040). The Plan recognizes that, for development to be economically and socially sustainable, climate resilience must be at the heart of policies for growth and development, energy access and security, education and health, and agricultural production.

2.0 Current and future Climate scenarios in Uganda

Uganda lies within a relatively humid equatorial climate zone, and the topography, prevailing winds, and lakes and rivers cause large differences in rainfall patterns across the country. Changes in sea surface temperatures in the distant tropical Pacific, Indian and, to a lesser extent, Atlantic Oceans strongly influence annual rainfall amounts and timing⁶. The annual temperature and rainfall range between 12°C to 32°C and 800 to 1,800 mm, respectively.⁷ Highest temperatures of over 30 °C are experienced in the north and northeast of the country while temperatures as low as 4° C experienced in the highlands of the southwest. The Central, Western and Eastern regions have two rainy seasons, from March to May for the first rains, and the second rains from September to November. The Northern region receives one rainy season from April to October, and the period from November to March has minimal rain. Most of the areas in the country receives between 750 mm and 2,100 mm of rain annually.

2.1. Current Climate Trends

Rainfall

Observed annual rainfall totals for Uganda vary from 500 mm to 2800 mm, with an average of 1180 mm. Observed seasonal rainfall totals for Uganda are characterised by a bimodal cycle (two rainy seasons) in the south with higher rainfall during the rainy seasons MAM (March–April–May) and SON (September–October–November). In the north and north east, a unimodal cycle (one rainy season) becomes more obvious with a longer single rainy season that extends across the seasons MAM, JJA (June–July–August) and SON, while the DJF (December–January–February) season is drier. .⁸

However, current and past trends indicate that the timing of rainfall can vary considerably; the onset of rainy seasons can shift by 15 to 30 days (earlier or later), while the length of the rainy season can change by 20 to 40 days from year to year. The USAID 2013 vulnerability study found out that no significant change in average annual rainfall could be detected in the 60-year historical record, similarly, no significant change in average annual rainfall is projected for the 2015-2045 period. However, projection of an increase in rainfall in the months of December, January, and February, which is typically a dry season is predicted in all locations. This increase could have

⁵ SIDA, 2013

⁶ USAID, 2013

⁷ NEMA 2009

⁸ CDKN, 2015. Economic Assessment of the Impacts of Climate Change in Uganda

strong impacts on agriculture, and there is potential for an increase in the frequency of extreme events (e.g., heavy rainstorms, flooding, etc.)

Temperature

Average annual temperature has increased by 1.3 degrees C since 1960 and there is a projected increase between 1.0 degrees C and 3.1 degrees C and increases in annual rainfall by the 2060s. The average number of 'hot' days and 'hot' nights per year in Uganda have increased since 1960. (McSweeney et al. 2010). Recent reports from the Famine Early Warning Systems Network (FEWS NET) indicate that there has been an increase in seasonal mean temperature in many areas of Uganda over the last 50 years. Observations to date show that annual rainfall has been decreasing.⁹

USAID analysis of average annual temperatures between 1951-1980 and 1981-2010, shows a notable increase of approximately 0.5-1.2 °C for minimum temperatures and 0.6-0.9 °C for maximum temperatures. This warming trend is projected to continue, with some models projecting an increase of more than 2 °C by 2030.

2.2. Future Climate projections

Rainfall

Climate projections developed for Uganda using the models used in the IPCC Fifth Assessment Report (IPCC AR5) predict a slight decrease in total annual rainfall in most of the country, with slightly wetter conditions over the west and north-west under both Representative Concentration Pathways (RCPs)¹⁰ RCP 4.5 and RCP 8.5. Rainfall totals might drop significantly over Lake Victoria (-20% from present)¹¹. The short-rain season of October-November-December shows the largest projected increase of up to 35%. The UNDP study also consistently projected a greater proportion of rainfall occurring in heavy events (McSweeney et al, 2010).

Temperature

Regional climate model studies suggest drying over most parts of Uganda in the months of August and September by the end of the 21st Century as a result of a weakening Somali jet and Indian monsoon (IPCC, 2014). The United Nations Development Programme (UNDP) study found that mean annual temperature is projected to increase by 1.0 – 3.1°C by the 2060s. Climate projections developed for Uganda using the models used in the IPCC Fifth Assessment Report (IPCC AR5) indicate an increase in near-surface temperature for the country in the order of +2°C in the next 50 years, and in the order of +2.5°C in the next 80 years under Representative Concentration Pathway (RCP) 4.5; and in the order of +2.5°C in the next 50 years, and in the order of +4.5°C in the next 80 years under RCP 8.5.

2.3. Green House Gas (GHG) Emissions for Uganda

According to the WRI CAIT climate data explorer for Uganda for the years 1990-2013, latest emission values (2013) excluding Land Use Change and Forestry (LUCF) were 33.35 with per capita GHG emissions of 0.91tCO₂ presenting 134.25% absolute Change from earliest to latest value.¹² Total emissions values including LUCF were at 60.66 with per capita emissions of 1.66tCO₂ and 73.7% as absolute change from earliest to latest value. The highest emission

⁹ Irish Aid 2016; Climate Action report for Uganda

¹⁰ Scenarios that include time series of emissions and concentrations of the full suite of greenhouse gases (GHGs) and aerosols and chemically active gases, as well as land use/land cover (Moss et al., 2008). The word representative signifies that each RCP provides only one of many possible scenarios that would lead to the specific radiative forcing characteristics. The term pathway emphasises that not only the long-term concentration levels are of interest, but also the trajectory taken over time to reach that outcome (Moss et al., 2010).

¹¹ http://sedac.ipcc-data.org/ddc/ar5_scenario_process/RCPs.html for an overview of the four RCPs.

¹² CAIT data explorer 2015

contributions are from industrial processes, waste, agriculture and LUCF. Emissions from energy are mainly through other fuel combustions whose latest values are 4.89 with per capita emission of 0.13 tCO₂ and 4,501.5% as absolute change from earliest (1990) to latest value. (2013)¹³

In terms of energy approximately 93% of Uganda's energy needs are met by biomass, which is used by households and small-scale industries. With 12% of the population connected to the power grid, electricity consumption accounts for only 1% of energy use, and the remaining 6% of energy needs are met by oil. The second national communication in 2010 projected that transportation would be the largest driver of growth in energy sector emissions through 2035, followed by residential, then manufacturing and construction.

The LUCF sector is expected to remain a net emitter through the 2030s, although the second national communication noted that with interventions, the sector could become a major sink as early as 2025. Its 2010 analysis of land use trends showed forested land to be decreasing while crop land and bush increasing. Forest degradation was highest outside of protected areas and in areas where agriculture expanded. Fires were also a major source of degradation of land cover, with fires commonly seen in central and northern Uganda. Direct drivers of deforestation and forest degradation are subsistence agriculture and biomass extraction for timber and charcoal.

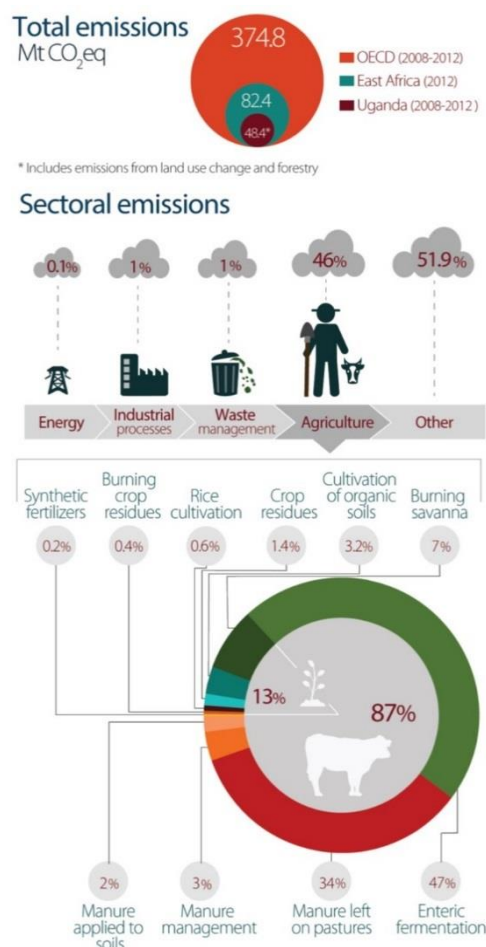
Uganda launched the national greenhouse gas inventory in 2016. The GHG Inventory System is one of the first country wide with digital platforms to track and report on emissions. The GHG Inventory System, which has been in development since 2013, was created through a collaborative process involving all key stakeholders. This process was supported by UNDP's Low Emission Capacity Building (LECB) project in Uganda and one of its key areas of work was to strengthen the country's technical and institutional capacity to develop a National Greenhouse Gas (GHG) Inventory System and will be useful to inform the third national communication

The Uganda's Nationally Determined Contribution (NDC) pledges to reduce emissions by 22 percent below projected 2030 business-as-usual emissions. Additional mitigation actions are contingent upon international finance, technology and capacity building support.

2.4. Uganda's climate and weather information generation and management

Uganda National Meteorological Authority (UNMA), under Ministry of Water and Environment is a semi-autonomous government institution for weather and climate services (UNMA Act. 2012) and a focal institution to the Inter-Governmental Panel on Climate Change (IPCC), an international body of experts mandated to analyze scientific research findings on climate change. The Government of Uganda (GoU) recognises natural resources (including weather and climate)

Uganda's Green House Gas Emissions



Sources; CLAT; BFS/USAID, 2017.

¹³ ©OECD/IEA, 2014.

as a basic factor in the country's national development process. Weather and climate is therefore, an important factor in the social and economic development of the country as it has major influences on the developments of all sectors of the economy.

The UNMA is responsible for establishing and maintaining weather and climate observing stations network, collection, analysis and production of weather and climate information, (including warnings/advisories) to support social and economic development. The key sectors served by UNMA include; transport (mainly aviation and marine), defense, agriculture, disaster preparedness, environmental and water resources management, tourism and construction industry. UNMA accomplishes these responsibilities in collaboration and coordination with the World Meteorological Organization (WMO) and its Member States and other global and regional meteorological centres.

The Uganda National Meteorological Authority maintains a partnership with World Meteorological Organisation (WMO), UK Met Office, Ericson International, MTN, Lake rescue (fishing industry and lake users), Grameen farmers' foundation, Uganda Broadcasting Corporation (UBC), Uganda media centre and Uganda media link for the application of weather and climate information and its integration into National Planning activities. The Authority provides weather and climate information that is disseminated by the several partners in the country¹⁴.

The Authority has 12 Synoptic stations 10 Hydrometeorology stations 10 Agro meteorology stations and 325 rain gauges. Though there are 325 rain gauges in place, there are only 52 districts with functional rain gauge stations out of the 112 districts in the country, with the Central Region having 13 rain gauge stations, Western Region having 15 rain gauge stations, Northern Region having 14 rain gauge stations and Eastern Region having 22 rain gauge stations, which adds up to 64 stations. However, there are also 31 major stations with rain gauges including the agro-meteorology, hydrometeorology and synoptic stations spread across the country making a total of 95 rainfall stations in Uganda. UNMA provides Seasonal climate outlook plus monthly reviews and updates, Agro-meteorological bulletins on dekadal (10-days) basis, Climatological data for different users and Clients, User tailored information is also generated mainly for construction and insurance companies. Due to insufficient coverage of the country by weather stations and other challenges, various institutions whose operations rely on weather information have resorted to installing their own stations. These include, among others, agricultural organizations, such as the National Agriculture Research Organisation (NARO), state authorities such as Uganda Wild life Authority (UWA), private sector lime sugar companies and Academic institutions.¹⁵

Down scaling of information, which includes interpretation and downscaling the seasonal climate forecasts is done at national level, and seasonal post Climate Outlook Forum (COF) stakeholder workshops to develop advisories based on downscaled forecast are held. The forecast is then translated into local languages. Audio and text translations are disseminated using community FM radios, local language print media and through civil society organisations who disseminate to the community groups where they work.

UNMA gets continuous support from Inter Governmental Agency on Development (IGAD) Climate Prediction and Application Centre (ICPAC) in preparation of seasonal forecasts during pre-Climate Outlook Forums (COFs) and the main forums. The agency also uses information from regional hub for access to climate products and data from international forecast centres. Capacity building support from the National Oceanic and Atmospheric Administration (NOAA) climate Centre was given for training two staff in Numerical Weather Prediction and provided a work station for running the Weather Research and Forecasting (WRF) Model for short range forecasting. Other agencies that support the Authority include UNDP, USAID, Africa Climate

¹⁴ <https://www.unma.go.ug/>

¹⁵ Report on the status of weather stations in Uganda

Change Resilience Alliance and GiZ who are supporting UNMA to strengthen Climate Information and Early Warning Systems for Climate Resilient Development and Adaptation to Climate Change.

In order to adapt to the impacts of climate change, individuals and communities at risk must have access to timely and meaningful information. Access to climate information services enables households to plan, prepare for and act appropriately to reduce the possibility of harm or loss or take advantage of opportunities that may arise. Climate information services including weather forecast production and management offer a powerful tool to help farmers adapt to the impacts of climate change. Access to information empowers individuals and communities, developing capacities from the bottom up. A study conducted in Karamoja (North Eastern Uganda) found out that respondents who received climate information were more likely to make adaptation changes¹⁶.

Key Challenges

There is insufficient capacity in terms of human resource and weather equipment. The weather infrastructure is not enough to cover the whole country, and some that are in place are either partially or completely non-operational. This affects the quality of data received. Accuracy of forecasts is between 70-80% which leaves a 20% uncertainty. Skilled personnel especially in data analysis are not adequate which makes it difficult to analyse data in time so that it's available to the users.

Access and utilisation of weather and climate services in Karamoja

- Access is low across Karamoja; however utilisation of such information if received is high
- There is a decline in access to and utilisation of seasonal climate forecasts from the March, April, May period to the September, October, November period
- Community meetings were regarded as important sources of information and were suggested in the FGDs as an entry point for the dissemination of weather forecasts
- Local indigenous knowledge information systems (elders/traditional forecasters) were regarded as important sources of weather and climate information

CGIAR, CCAFS and WFP, 2017

UNMA is centralised with no structures at the local level, save for a few main stations in some of the regions. However, some personnel in the field are not always on site to read off the data from the manual weather stations where automated weather stations do not exist. This makes it difficult to obtain area specific forecasts, so most times proximity to the next functional station is used and yet due to micro climates, the weather conditions are not the same.

Coordination is also a challenge. GoU has three key organisations working separately, these include UNMA, NARO agro meteorology department which provides forecasts for agricultural purposes and has stations in the different agro ecological zones, and then the hydro meteorology department under the directorate of water development. These are independent organisations producing separate data sets, yet using different dissemination channels. Harmony between the three would avail users with a complete package. Efforts are underway to bring them together for better information management. The other challenge is that data from weather stations unknown to UNMA is only accessed by the respective organizations, and may not be used since UNMA uses standard protocols which the organisations might not have considered. Working with them to assess the quality of data would improve access by the users in the county¹⁷.

¹⁶ CGIAR, CCAFS and WFP, 2017. <https://reliefweb.int/sites/reliefweb.int/files/resources/wfp289992.pdf>

¹⁷ Baseline report for the ACCRA and USAID project supporting NMA to improve access and dissemination of seasonal weather forecasts

Gendered access to information is also a challenge within the dissemination mechanisms. Radio (local FM) is a common source of access to information for households. However, the July 2016 Food Security and Nutrition Assessment report indicated that only 9% of female headed households owned a radio, compared to 14% among male headed households¹²⁰. This suggests that female headed households are at a considerable disadvantage and are less likely to receive weather information inhibiting their ability to adapt to climate change.

In Uganda, over 70% of the population depend on subsistence farming, which is heavily dependent on rainfall seasons and need the forecasts for early warning, planning and decision making for their cropping seasons. (Uganda Bureau of Statistics, 2014). Besides agriculture, many other sectors rely on weather and climate information and as such it is paramount that weather information delivery is done accurately and timely.

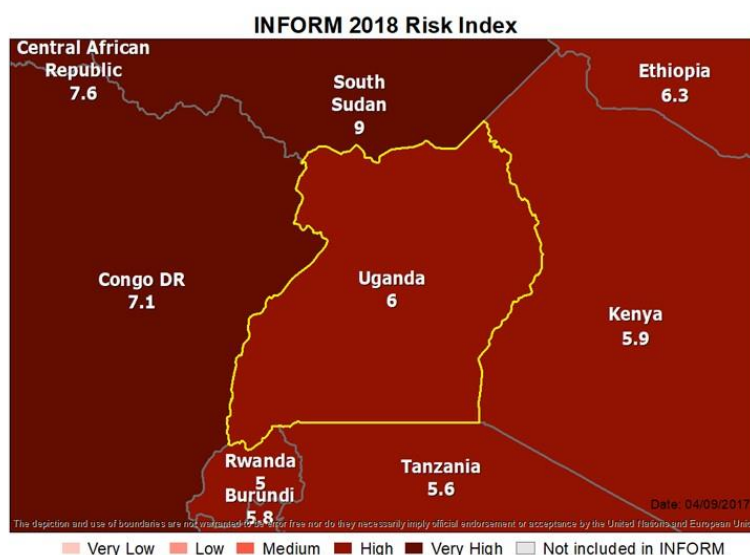
3.0. Climate Hazards, Impacts, and Vulnerability

This section review the climate hazards affecting the country, the impacts and vulnerability of different sectors and categories of people.

3.1. Climate Hazards and Vulnerability

Uganda has experienced an increase in the frequency and intensity of droughts and floods in recent years. The percentage of rainfall coming in form of heavy precipitation events is anticipated to increase, which would escalate the risk of disasters such as floods and landslides. The hazards will reduce crop yields and cause loss in livestock, which will have important implications for food security. The national Environment management Authority (NEMA) state of environment report (NEMA, 2012) estimates losses and damage to the tune of US\$47 million to crops, which is equal to about 3 per cent of the value of all cash and food crops in that year.

According to the United Nations Office for Disaster Risk Reduction (UNISDR) Index for Risk Management (INFORM)¹⁸ statistics for 2018 rank Uganda as high risk. Out of 191 countries, Uganda ranks as the 21st most at risk country, the 52nd in terms of hazard and exposure, the 12th in terms of vulnerability, and the 24th in terms of lack of coping capacity. The INFORM model adopts the three aspects of vulnerability reflected in the UNISDR definition.



The aspects of physical exposure and physical vulnerability are integrated in the hazard & exposure dimension, the aspect of fragility of the socio-economic system becomes INFORM's vulnerability dimension while lack of resilience to cope and recover is treated under the lack of coping capacity dimension. The highest hazard and exposure elements include conflict risk, human exposure especially to floods, droughts and earthquakes. The highest contributors of vulnerability ranking

¹⁸ <http://www.inform-index.org/Countries/Country-profiles>

include; displaced people, vulnerable groups, inequality, impacts on development and social economic vulnerability. The coping capacity is inadequate in areas of communication, access to health, governance, institutional capacity and infrastructure development. With projected increase in the frequency of extreme events like heavy rainstorms, flooding, droughts and landslides, the exposure and vulnerability of the country is likely to increase, thus affecting the coping capacity further.

The Government of Uganda under the Directorate of Relief, Disaster Preparedness and Refugees, Office of the Prime Minister, initiated a comprehensive process to develop a disaster risk management policy that details mechanisms and structures for the effective and practical management of disasters. The policy covers the broad subjects of vulnerability assessment, mitigation, preparedness, response and recovery, which constitute “comprehensive disaster management”. It networks all the lead sectors, local governments, international development and humanitarian partners, the private sector and the NGOs under the principle of a multi-disciplinary and multi-skilled consultative approach. It also presents an institutional framework under which the partners coordinate their operations. It further recognizes the need to place emphasis on the vulnerable groups and persons with special needs.

The Office of the Prime Minister’s Department for Disaster Preparedness and Management also established the National Emergency Coordination and Operations Centre (NECOC) in October 2014, with the support of United Nations Development Programme (UNDP). Uganda's National Emergency Coordination and Operations Centre (NECOC) is a 24 hour, 7-days a week central facility for early warning and the coordination of emergency and crisis response and recovery action. The NECOC is established under the National Policy for Disaster Preparedness and Management (NPDPM) with the purpose of contributing towards the functionality and characteristics that make creation of an integrated and multi-sectoral system approach to planning, preparedness and management of disasters that is fundamental to sustained productivity and socio-economic growth. The primary purpose of the NECOC is to provide and disseminate early warning information, establish mechanisms for the effective coordination and networking emergency response and recovery assets and resources, support the assignment of responsibilities and establishment of procedures to safe guard the lives and properties of the population in-case of emergencies or disasters through organizational, planning, training activities designed to enhance the countries preparedness and response capabilities¹⁹. The Uganda NECOC is the third such centre in Africa with the other two located in Ethiopia and South Africa.

3.2 Social Economic Vulnerability due to climate change impacts

Risk and vulnerability to drought, floods and other kinds of natural and man-made disasters can have devastating impact on the abilities of households and communities to respond to and cope with risks and shocks posed by climate hazards. Effective risk management is critical in the fight against poverty as it unlocks opportunities, mitigates crises, and protects the poor in times of disaster and shock. Building people's resilience and reducing the effects of adverse events and allowing them to take advantage of development opportunities is important. A resilience approach will be required to empower countries, communities, institutions, women, and men to anticipate, absorb, adapt to or transform shocks and stresses.²⁰

¹⁹ <http://www.necoc-opm.go.ug/about.html> accessed 16/08/017

²⁰ Irish Aid, 2016. Briefing note; Building resilience

3.2.1 Country Social Economic Statistics

Population 2017: 41,632,807²¹

Total Fertility Rate 2014²²; 5.8 (no. of children per woman)

GDP per capita, PPP²³ (international \$) 2015: 1,851.0

HDI 2015: 163 out of 187 countries²⁴

Gender Inequality Index 2016; 163 of 187 countries²⁵

Vulnerability Rank 2016; 171 out of 178 countries²⁶

Climate Risk Index 2016; 92 out of 187 countries²⁷

3.2.2 Climate change and Extreme Events

Climate variability, floods, droughts and changes in seasonal rainfall in Uganda have had significant socio-economic impacts in the past. Floods in 1961/62, 97/98 and in 2007 saw widespread infrastructure damage, displacement and destruction of livelihood assets. Droughts have also taken a significant toll with for example, 1.8 million people affected through increased malnutrition, poverty, illness, asset loss and migration in the 93/94 event. Uganda also faces inland river flood risk as a result of climate change. It is projected, that by 2030, an additional 34,600 people may be at risk of river floods annually as a result of climate change and 21,600 due to socio-economic change above the estimated 15,500 annually affected population in 2010. Towards 2070, under both high and low emissions scenarios about 108 million people are projected to be at risk of malaria annually.

The general impacts of climate change include; increased food insecurity; elevated rates of erosion and land degradation because of increased mean rainfall or higher intensity events; Greater risks of flood damage to infrastructure, property and settlements; Shifts in the viable area for coffee cultivation with increased temperature; Reduced output of the maize crop; Reduction in grazing potential within the cattle corridor; Biodiversity loss and extinctions as niches are closed out by temperature increases and pressure on natural resources; Implications for Lake Victoria levels and Nile flows (OPM, 2017; Hepworth and Goulden, 2008; USAID, 2012)

Uganda ranks 155 out of 192 countries in the ND-GAIN index (2016), and the trend has been worsening since 1995 where it was ranked 147 out of 192. The high vulnerability and low readiness scores calls for a great need for investment and innovations to improve readiness and a great urgency for action. Uganda is the 14th most vulnerable country and the 48th least ready country. Since 1995, there is a negative trend in terms of vulnerability, agriculture capacity, projected change in cereal yields and medical staff under the health sector, which have the worst scores. Vulnerability measures the exposure, sensitivity, and ability to cope with climate related hazards as well as accounting for the overall status of food, water, environment, health and infrastructure within a country. Readiness targets those portions of the economy, governance and society that affect the speed and efficiency of adaptation. In terms of readiness, the worst scores are reported in failure to control corruption,

²¹ World Population review

²² National population and housing census, 2014

²³ World Bank Data – GDP per capita, PPP <http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD>

²⁴ UNDP 2016; Human development Index report

²⁵ <http://hdr.undp.org/en/composite/GII>

²⁶ ND GAIN country index

²⁷ Global climate risk Index 2016

education sector and low innovation. The Global Climate Risk Index 2016 analysis reconfirms that least developed countries are generally more affected than industrialised countries. Regarding future climate change, the Climate Risk Index may serve as a red flag for already existing vulnerability that may further increase in regions where extreme events will become more frequent or more severe due to climate change

It is important to note that climatic factors are very difficult to separate from other social economic factors. Uganda has been experiencing an influx of refugees mostly from South Sudan and the DRC, as a result of armed conflict. Whereas climate change is not the driver of the conflicts, the refugees increase pressure on natural, social and economic resources of the country, which adds to other stresses including climate change, reducing the coping capacity of the country further.

Since July 2016, Uganda has experienced an influx of refugees from South Sudan. The country has received a historic single largest refugee influx from South Sudan with a total of 674,033 new refugee arrivals in Uganda in 2016 until the end of March 2017. The South Sudan refugee population hosted by Uganda has more than tripled in comparison with the end-2015 population, reaching a total of 898,864 South Sudan refugees in the country as of April 2017. A total of 1,025,000 South Sudanese refugees are expected by 31 December 2017. In addition, the country is hosting refugees from Burundi who have been flowing in since 2014. On average some 30 Burundi refugees entered Uganda per day in September 2016, or 937 per month. In 2017, it is expected that Uganda will continue to receive a steady trickle of Burundi refugee arrivals of up to 20,000 new refugees, unless significant changes take place either in Burundi, or in countries of passage to Uganda such as Tanzania, Rwanda and the DRC. Refugees from Congo have also been hosted in the country for years given the protracted conflict situation. It is also anticipated that some 60,000 new DRC refugees will flee to Uganda in 2017. In total, 1,381,207 refugees and asylum-seekers have been reported to be in country as of 30 September 2017.²⁸

Refugee settlements often occur in environmentally sensitive areas which include semi-arid, agriculturally marginal areas, near national parks or forest reserves, which is a case for the Uganda sites. The refugee camps tend to be large for both logistical and political reasons. These large camps have a more negative impact on the environment than would be the case if several considerably smaller camps, catering for the same total numbers, were set up. Furthermore, refugees often have to stay in their countries of asylum for extended periods, and the impact on the environment around camps may be prolonged. Host populations also experience a similar deterioration in the quality of their environment, so that normally available materials and supplies for construction, consumption and fuel are short, and prices for fuel and food in local markets rise. Tensions inevitably result, since host populations are currently made to bear many of the costs of the arrival of refugees in their area without immediate compensation (Shepherd, 1995)

Whereas the above is true, a study on the economic effects of refugee settlements in Uganda found out that there are economic gains for host communities. Uganda's refugee policy is unique in that it supports refugees through providing them with land to farm. Refugee farmers, like host-country farmers, create income spill overs when they hire labor from other households and purchase inputs from local businesses. They also contribute to the local food supply and potentially influence food prices. Most of the food that refugees produce is consumed within the house hold or else sold to other refugees (Taylor, Zhu, Gupta, et al, 2016). However, these are short term gains compared to the social and environmental costs in the long term. Climate change and large movements of people clearly present major societal and governance challenges. Governments, international organizations,

²⁸ Government of Uganda and UNHCR, 2017

and civil society are being asked to respond, whether they are prepared or not, sometimes diverting resources meant for development to humanitarian response.

3.2.3 Impacts of Agriculture, Nutrition and Food security

Agriculture remains the backbone of Uganda's economy. In 2012/13, the sector accounted for 25.3 percent of the country's GDP from 24.7 percent in 2010/11. It employs about 72 percent of the total labour force (formal and informal), 77 percent of whom are women, and 63 per cent are youth, mostly residing in the rural areas. Farming is still dominated by smallholder farmers who depend on rain fed agriculture. If adaptation actions are not integrated into development planning and budgeting, the national economy will be affected, undermining progress towards the 2040 aspiration of becoming a middle income country.

Climate change, through higher temperatures, land and water scarcity, flooding, drought and displacement, negatively impacts agricultural production and causes breakdown in food systems. These disproportionately affect those most vulnerable people at risk to hunger and can lead to food insecurity. Vulnerable groups risk further deterioration into food and nutrition crises if exposed to extreme climate events. According to the Global Hunger Index 2015, a score of 27.6 suggests that Uganda is not yet self-sufficient in food production and the food security projections indicate that the number of food-insecure people will grow from 7 million (20%) in 2015 to 30 million (60%) in 2025 (USDA, 2015). Many households and specific segments of the

Integration of climate risk management through a focus on how Small Holder Farmers (SHF) can be enabled to embark upon trajectories that move from hanging-in and coping with climate risks to stepping-up and adapting to climate risks are important. Options for integrating climate risk management into development programming can include: participatory and gender sensitive development of climate resilient agricultural technologies; engagement of farmers' organizations, particularly for women farmers, in local climate adaptation processes; and, innovative financial services in support of climate adaptation. The recognition that for some SHF households that face beyond threshold climate risks but have a sufficient resource stepping out of SHF may be the most climate smart strategy to take.

Irish Aid & IIED, 2017

population suffer from food insecurity and high levels of malnutrition. Without considerable efforts made to improve climate resilience, it has been estimated that the global risk of hunger and malnutrition could increase by up to 20 percent by 2050. In Uganda, the prevalence of stunting in children under age 5 was 34.2% in 2012, the prevalence of underweight children and wasting in children under 5 was 12.0% and 4.3%, respectively, in 2012 (WHO/UNFCCC).

The study on the economic impacts of climate change, 2015, notes that extreme events, which have been increasing are negatively affecting the agriculture sector. The risks are likely to increase in the future in large parts of Uganda. The damage figure of US\$47 million to crops (NEMA, 2008) is equal to about 3 per cent of the value of all cash and food crops in that year. It should also be stressed that current and future increased risks from flooding and droughts are in areas of existing poverty and therefore these events have serious consequences for local economies and food security.

Agricultural exports are a key area of concern in regard to climate impacts. Significant impacts on the Arabica coffee growing area to 2050 are predicted due to climate change. A study conducted by

OXFAM, 2012 noted that areas suitable for growing Arabica coffee will reduce drastically in the future. Future production losses induced by climate change are estimated to reach tens of millions of US\$ annually. Adaptation strategies will be necessary if coffee is still to be grown in the areas where suitability has declined. The lower altitude areas (<1300m) appear completely unsuitable in the future under the current practices. These will have major implications for production and export value, particularly in the Eastern and western regions. Climate induced yield losses for coffee could be in the order of 50-75% by 2050, as a result of a combination of yield reductions and shift in agro ecological zones where coffee can be grown.

These would represent a major impact on the economy, which is currently deriving 18% of its export earnings from coffee. Estimates of impacts on tea growing areas also indicate significant losses. Estimates consider a 50% fall in production by 2050 as plausible. Finally the IFPRI modelling shows some potential losses of cotton production due to yield impacts in the range of 60-77% of the no climate change scenario by 2050. Taken together these results indicate the potential for Ugandan agricultural export production and value to be strongly hit by climate change in the period to 2050 and beyond in the absence of adaptation actions (Markandya, Cabot, & Beucher, 2015).

Uganda has made progress on integrating climate change into national development plans, as well as agricultural policies and programmes. This has included the development of a National Climate Smart Agriculture (CSA) Framework Programme, the agriculture sector National Adaptation Plan, and the formulation of a national Climate Change Policy. National and international finance (public and private) as well as technical support will be crucial in ensuring that these plans and policies achieve their desired objectives. Although there are numerous examples of national and project finance for agricultural climate change adaptation and mitigation efforts, financial services and risk transfer mechanisms are limited at farmer level, presenting a significant barrier for CSA adoption. Initiatives such as crop and livestock index-based insurance have been introduced aimed at offsetting losses due to climate-related conditions, and more could be done to scale up access.

The Government of Uganda flags agriculture as a key sector, but over the years, financing has not matched the attached prioritisation. The Government increased the Agricultural Sector's budget from Shs. 343.46 billion to Shs. 823.42 billion in the FY2017/2018, an increase of 65% compared to the Financial Year 2015/16 to fund rural development interventions including rural electrification and feeder roads. However, it was also noted that the agricultural sector which exhibited a recessionary trend (negative growth for two consecutive quarters) largely due to drought, accounted for only 3.8% of the total budget for FY 2017/18. Though there is increment in nominal terms, the percentage allocated is small compared to other sectors, yet agriculture contributes 23% of the country's GDP as of 2016 and employs 80% of the population. There is need therefore to focus on commercialisation of agriculture and increasing investment in adaptation activities to support the agriculture sector.

3.2.4 Climate change Impacts on Health

Climate change has significant direct and indirect health implications for Ugandans. The predicted change in weather events especially heavier rainfall is expected to increase the frequency of extreme events such as floods and landslides. These are anticipated to exacerbate diseases and other health-related factors. Several diseases that are currently endemic in Uganda will likely increase in prevalence and distribution due to climate change. There is also potential for diseases that are not yet established

in Uganda (in humans) to be introduced because of climate change. Climate change also threatens human health through its effects on food insecurity and malnutrition (USAID, 2014)

Cholera is mainly an epidemic disease in Uganda, with a yearly incidence of 250 to 5,000 cases, although it is endemic in certain parts of the country, such as the Kampala slums and along the south western border with the Democratic Republic of the Congo (DRC). The burden of typhoid in Uganda also remains unclear, although it has been associated with outbreaks and is endemic in certain regions as well due to contaminated water sources. Other waterborne bacteria and viruses that could contaminate drinking water include hepatitis (A and E) (USAID, 2014; Bwire, 2013)

The study on the economic impacts of climate change, 2014, sampled costs of managing malaria in two regions of Uganda, and it found out that Tororo in Eastern Uganda, where malaria is endemic (widespread), the cost of malaria may rise from a range of US\$8.7 - 221 million in 2010 to a range of US\$20.1 - 560.5 million in 2050. In Kabale in South-western Uganda, where the disease is more epidemic (sporadic) in nature, malaria is expected to increase in cost from between US\$0.7 - 15.8million in 2010 to between US\$1.55 - 41.7million in 2050. The economic costs of these additional cases was estimated using data on the costs of treatment, loss of earnings and productivity, and the value attached to the loss of a life.

Clearly, the costs are expected to increase significantly, even if the width of the ranges provided highlight the considerable uncertainty in the impact, in part because of the issues involved in monetary valuation of mortality and in part because of the variation in climate and socioeconomic scenarios.

HIV has also been associated with a worsening of nutritional status, particularly among children, compounding challenges in the face of climate-induced food insecurity. Climate change and HIV are global issues that are interlinked through analysis of the impacts of climate change and the resultant shocks and stresses and, how they affect the already vulnerable people living with HIV/AIDS. The resilience of communities to climate related shocks and stresses e.g vector- or water-borne, food shortages, increase in the frequency of floods and droughts which affects the health status of people living with HIV/AIDS and strains their incomes and lessens their adaptive capacities, making them vulnerable to AIDS. The last macro-economic impact study on HIV and AIDS in Uganda²⁹ showed that HIV and AIDS has played a role in increasing household poverty levels by 1.6% with rural households being more affected than urban households and women headed households being the most affected (UNEP&UNAIDS,2008; MOFPED, 2008;USAID, 2014)

Malnutrition also has negative consequences on peoples' resilience to climate change and particularly to extreme events such as heavy rainfall and flooding that adversely affect agriculture. Climate change is bound to increase cases of malnutrition through impacts on food security, access to markets, and

Impacts of the 1997/98 El Nino in Uganda

- Cholera outbreak affected 39 districts
- 41,857 people taken ill
- 1,682 deaths reported
- 11,000 people hospitalized and treated for cholera
- 150,000 people displaced by floods and landslides
- Apart from loss of life, the country
- Used approximately USD 4,300,000 to control the epidemic

(Namanya, 2014)

²⁹ Macro-economic Impact Study of HIV/AIDS in Uganda, MoFPED, 2008

the increased prevalence of infectious disease. It has been well-documented that projected climate changes will adversely impact agricultural production and various staples of the Ugandan diet, potentially leading to food security issues and consequently malnutrition.

Establishment of climate change, environment and health information systems and Strengthening of disease and weather early warning systems will be key to address climate induced health problems. Cost-effective technology for water treatment and educating communities on environment and health issues will support adaptation in the health sector and reduce the cost of adaptation.

3.2.5 Climate Change Impacts on Environment and Natural resource

Water resources

Water resources are likely to be increasingly strained in Uganda's future climate. While it is projected that precipitation will increase in some parts of East Africa, warmer temperatures will accelerate evapotranspiration, reducing the benefits of increased rainfall. With more frequent and severe droughts, Uganda will likely experience negative impacts on water supply, biodiversity, and hydropower generation. A shift in rainfall patterns may decrease the recharge of rain water into the soil, which will have a negative impact on groundwater resources and water tables in wells.

Limited surface water infrastructure inhibits flood and drought response options, while uncontrolled and inadequate land use and wetland degradation will continue to increase future damage from flooding and extreme weather events. Despite these facts, Uganda is well endowed with water resources. The abundance of surface water has not forced the country to focus on establishing integrated water resource management systems until fairly recently. It appears as though the country will be

Uganda's growing population and its rising need for food, water and energy are likely to increase water demand almost ten-fold by 2050. At the same time, an increasing incidence of drought will reduce water availability. As a result, Uganda is likely to face severe water shortages during most months of the year. There are many benefits associated with taking action through additional investments in climate adaptation in the water sector.

CDKN, 2015

able to significantly expand its surface water irrigation at the macro level without threatening the resource base. Nevertheless, these climate-related drivers combined with non-climate stressors are projected to increase water stress in localized pockets. Non-climate stressors include population growth, urbanization, increased agricultural irrigation extraction, poor land use methods, increased pollution and wetland intrusion. Extreme increases in water extraction rates for large-scale surface water irrigation could have impacts in localized areas and for lower basin countries (Markandya, Cabot, & Beucher, 2015).

Forests and wetlands

Uganda has lost about 14% of its forest cover between 2010 and 2015, thus a reduction from 24% in 1990 to 11% in FY 2015. The country's deforestation is estimated at about 1.8% per annum, with a cost of about 15% of GDP driven by encroachment of central forest reserves, illegal timber extraction and charcoal burning. In response, government embarked on reopening of wetland boundaries, demarcation of gazetted forest reserves, wetland restoration and re-forestation. In

2015/16, a total of 1 341 ha 13.41 km² of wetland were restored compared to 1 802 ha 18.02 km² the previous year. Similarly, environmental policing has been stepped up since 2012/13 to enforce environmental laws and prevent the degradation of protected areas. With the commissioning of 153 officers to police lakes, forests and wetlands, a reduction in threat of forest encroachment is envisaged. The next Forests Status report (under preparation) is due to be completed in 2017 (Oling, Workie, & Nsereko, 2017; WESPR, 2016).

Despite the above measures, USAID 2013 vulnerability assessment notes that historically, water has not been economically valued in Uganda and there is no incentive for conservation or protection of environmental flows in wetlands and upper watershed areas. These factors combined with weak institutional structures will likely result in poor protection for key ecological services. The assessment found out that although wetlands and many forests are legally protected, resources and staff to enforce protection are severely limited. This is supported by the Water and Environment Sector Performance Report 2016 which noted that there are challenges with encroachment, issuance of illegal titles in both Central Forest Reserves and Local forest reserves, Illegal extraction of timber and non-timber forest products on private lands and forest reserves and un sustainable charcoal production. With climate change impacts especially drought, cases of encroachment of wetlands and forests reserves in search of fertile soils will continue leading to further degradation.

The discovery of oil and gas in the Albertine Graben require constant monitoring to prevent disasters. Oil activities remain the biggest threats to conservation and citizens' livelihoods in the country, which might include displacements of communities and potential takeovers of protected area lands. According to the institutional Investors Group on Climate Change (IIGCC), energy-related activities contribute to about 70% of global greenhouse gas (GHG) emissions. About 60% of those energy-related emissions are a result of oil and gas industry activities, mainly attributable to the dependence on fossil fuel production. Complicating matters is the fact that a majority of GHG emissions occur later in the fuel lifecycle, and by that point are out of the hands of oil and gas companies. The Uganda Ministry of Water and Environment relies on data provided by the oil companies, and is unable to verify or corroborate data received. District Environment Officers, despite training on how to conduct inspection of oil and gas activities, are similarly constrained. Independent monitoring of the oil and gas industry is not possible without adequate financing. This will pose a challenge in assessing the impacts of the oil and gas industry in terms of mitigation and adaptation co benefits

3.2.6 Economic Impacts of Climate change

The Ugandan economy achieved modest GDP growth of 4.8% in 2016 compared to 5.5% growth in 2015, despite a decline in growth in sub-Saharan African (SSA) countries. Continued weak external conditions, relating to fresh conflict in South Sudan, Brexit uncertainties and low global commodity prices resulted in lower exports and contributed to the depreciation of the Ugandan shilling (UGX). Internal obstacles to growth such as unfavourable weather conditions and institutional capacity constraints in implementing public investment projects have also contributed to weaker GDP growth. The services sector remained the largest growth driver, increasing by one percentage point to 50.8% of GDP in 2016, followed by agriculture at 23% (2016), which dropped from 25% in 2013, owing to weather volatilities. Still, the census report 2014 confirmed that agriculture is the highest employer for 80% of households. The contribution of the industrial sector remained unchanged at 18.5% of GDP in 2016 due to stagnation in manufacturing and construction sectors. If adaptation measures are not put in place. Climate extremes will continue to affect the country's GDP, especially the agriculture sector.

According to the Economic Assessment of the Impacts of Climate Change 2015, Climate change damage estimates in the agriculture, water, infrastructure and energy sectors will collectively amount to 2-4% of the GDP between 2010 and 2050. The national-level studies show that if no adaptive

action is taken, annual costs could be in the range of US\$3.2 - 5.9 billion within a decade, with the biggest impacts being on water, followed by energy, agriculture, and infrastructure. The greatest effects of climate change will be borne by the poorest and most vulnerable people. Over the 40 years from 2010-2050, the costs of inaction are estimated at between US\$273 - 437 billion. Even if there were no further increases in climate impacts, the cost of inaction would rise over time because of an increase in population. Agriculture has potential to reduce poverty significantly if transformed from being majorly subsistence to commercial. Only about 8% of agricultural households have been using improved seed since 2011/12. Irrigation usage was 1.4% in 2015/16. In 2012/13, Uganda had a working age population of 16.5 million out of which 13.9 million were actually working and 72% of them engaged in agriculture. Structural transformation has been very slow with 43% (6 million) of the working population engaged in subsistence agriculture. (Oling, Workie, & Nsereko, 2017; Markandya, Cabot, & Beucher, 2015)

Economic impacts of climate change are multi sectoral. Loss of export earnings from crops like coffee, tea etc. would slow down growth by affecting the employment sector and constraining imports. Water deficits could act as a brake on development by limiting agricultural growth and increasing the costs of energy as hydropower potential is reduced. Events of water shortage have had major impacts, with two droughts in the past decade (in 2005-6 and 2010-11) resulting in losses of US\$250 million and US\$1,174 million respectively. Each drought occurs about every 3 years representing an average annual damage per drought event in the last decade of US\$237 million. Future droughts can be expected to have similar costs but with greater frequency, possibly every three years. Likewise energy shortages for households and industry will make it more difficult or more costly to expand output. Lastly, extreme events that cause infrastructure damages also impact on the productivity of businesses and cause delays in the movement of people and goods across the country.

3.2.7 Climate change, Gender Inequality and Poverty

According to the Africa Economic Outlook report for Uganda, 2017, the country has made commendable strides in reducing gender inequalities. There was near parity at primary (100%), secondary (90%) and tertiary (80%) education levels in 2015. The primary school pass rate in 2015 remained at 86% for female pupils compared to 90% for male pupils in the previous year, implying an almost equal chance of passing. There is 34% female representation in parliament, above the global (23%) and sub-Saharan Africa (24%) averages. This is attributed to the constitutional quota system for female district members of parliament. However, women are still unable to compete with men for directly elected parliamentary positions. The median wage for females in paid employment has remained about half of that for males since 2005/06. In agriculture, the gender gap costs Uganda an estimated USD 67 million annually. Closing this gap would lift 119,000 people out of poverty. Eliminating these disparities requires interventions that allow women to have more access to production resources, but also engaging men in challenging social, economic and cultural gender biases (Oling, Workie, & Nsereko, 2017).

In farming communities, the men go further away to look for pastures, while women walk longer distances for water and firewood, limiting the time for agricultural and food production. There are also cases of cross border migration especially the districts neighbouring other countries, where men cross in search for work and women remain home to fend for themselves and the children³⁰. Poverty, limited income diversification and livelihoods options, HIV/Aids, increasing food insecurity, population rise and weak institutions are key factors in heightening Uganda's vulnerability to climate change, lowering its resilience and adaptive capacity. Therefore in planning

³⁰ ACCRA climate change vulnerability assessment reports – Bundibugyo & Kotido

interventions around climate change it is vital to understand and consider these underlying issues and their often unequal distribution as well as direct sectoral impacts.

A study by Bagonza, 2014 found out that the social, political and economic conditions in the communities affect women, children, PWDs and the elderly most in the face of hazards and changes in rainfall and sunshine patterns (or climate variability). Women are most burdened due to their care

giving roles, while men seek help elsewhere or migrate to neighbouring areas. Whereas women and men face multiple livelihood challenges and vulnerabilities, women, children, the elderly, PWDs and other vulnerable groups are most physically, economically and socially vulnerable to hazards/disasters. The coping strategies also seem to be gendered, with men for example choosing to migrate whenever hazards such as famine, drought and floods strike, leaving women and their children behind. Men are also less involved in household -based coping mechanisms. Women most times do not have adequate access to information on disaster prevention and mitigation, and most trainings/capacity building initiatives on

UNDP 2008

disaster prevention and preparedness target more men than women. Whereas both men and women benefit from disaster preparedness activities such as environmental management measures and early warning messages channelled through radios, women are generally more knowledgeable about their environment, which could be exploited as a capacity for adaptation.

UNDP, 2016

Whereas Uganda's has a Gender Policy 2007, climate change was not considered in the design. However it focuses on livelihoods as one of its priority areas, with emphasis on gender differences in employment, productive assets and time poverty. These aspects are critical to reducing women's resilience in the face of hazards. However, the policy does not clearly outline strategies or interventions aimed at minimising women, children and men's vulnerability to hazards/disasters and their participation in disaster of climate risk management (Uganda gender Policy, 2007; Bagonza, 2014). Future policy reviews should outline strategies that seek to empower women and children in disaster-prone communities, such as increasing their opportunities for income/finance, and access, ownership and control of land and natural and household assets. The policy should also articulate interventions that increase women's roles and involvement in disaster prevention, preparedness and response.

Over all, gender mainstreaming into adaptation and mitigation programmes is key to ensure that the vulnerability of women and men, boys and girls is reduced and their adaptive capacity is strengthened.

4.0 Uganda's Climate Change Policy Framework

Uganda signed and ratified both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol (KP) and signed and ratified the Paris Agreement thus committing itself to the adoption and implementation of policies and measures designed to mitigate climate change and adapt to its impacts. Uganda is also a party to the implementation of

the East African Community (EAC) Climate Change Policy, which requires member states to initiate and develop consistent and harmonized, policies and plans to address climate change. Uganda also intends to implement strategies, plans and actions for low greenhouse gas emission development in the context of its development goals. These mitigation and adaptation intentions are based on the country's National Climate Change Policy and its implementation strategy (NCCP) (2015), which is derived from the Constitution of the Republic of Uganda (1995, as amended in 2005 and 2015) and reflects Uganda Vision 2040 (2012). The priorities in the National Climate Change Policy have been integrated in the Second National Development Plan (NDP II) 2015/16 - 2019/2020 (2015). In the long term, Uganda intends to follow a climate-resilient and low-carbon development path linked to green growth and broader sustainable development goals.

Uganda's National Adaptation Programme of Action (NAPA) was submitted to the Secretariat of the United Nations Framework Convention on Climate Change in 2007 and approved a national policy for Disaster Preparedness and Management in 2010. The GoU has taken steps to integrate climate change into the National Development Plan, as well as in sectoral policies, plans and programmes and has produced climate change mainstreaming guidelines. Specific activities have been developed on the ground to increase resilience, regarding, among others, agriculture, water and urban planning and the Ministry of agriculture has developed a 10-year Climate Smart Agriculture Program (2015-2025). The government also developed and submitted its Intended Nationally Determined Contributions (INDC) to the UNFCCC which has now converted to the NDC with discussions going on to prioritise actions for implementation.

4.1. Key Climate change policies and priority sectors

Policy Name	Policy Priorities on climate change
Second National Development Plan (NDP II) 2015/16 – 2019/20	<p>The NDP II has integrated climate change as a cross cutting issue, emphasis is on;</p> <ul style="list-style-type: none"> Increasing the country's resilience to the impacts of climate change through Integrating and implementing the National Climate Change Policy (NCCP) including awareness creation in all Ministries, Departments and Agencies (MDAs), Local Governments (LGs) as well as Civil Society Organisations (CSOs) and the private sector. Focus is also on strengthening national coordination, monitoring and reporting on the implementation of regional, international standards and commitments Improving climate change legal and institutional Frame work through establishing an appropriate institution for Coordinating National Climate Change response, and establishing an appropriate Legal framework for Climate Change Policy implementation and compliance
National climate change policy & its costed implementation strategy 2015	<p>The policy had prioritised the following sectors under adaptation; Forestry, Wetlands, Biodiversity and Ecosystem Services, Health, Energy, Wildlife and Tourism, Human Settlements and Social Infrastructure, Disaster Risk Management</p> <p><i>Cross-cutting Priority: Vulnerable Groups</i></p> <p>To give special attention to the improvement of the resilience of vulnerable groups to climate change</p> <p>Under mitigation; LULUCF (Land Use, Land-Use Change and Forestry) covering Forestry, Land Use and Land-Use Change, reduced Emissions from Deforestation and Forest Degradation+ (REDD+). Other sectors include; Wetlands agriculture, Energy Generation, Energy Utilisation, Transport, Waste Management and Industrial Sector</p> <p>Cross-cutting Priorities include: Technology transfer and the large-scale diffusion of clean, low-carbon technologies</p>

<p>NDC 2016</p>	<p>Priority mitigation Actions under the NDC include; Under mitigation contributions; Energy (power supply), Forestry, and wetlands were the key prioritised sectors. Under additional mitigation ambition, energy (demand, transport) and agriculture</p> <p>There are also adaptation activities proposed under Agriculture, Forestry, Water, Infrastructure (including human settlements, social infrastructure and transport) Energy, Health and Risk management (particularly in urban areas) GoU commits to;</p> <ul style="list-style-type: none"> • Promote Clean Development Mechanism (CDM) through on going and new projects • Undertake policies and measures to support low-carbon development in key priority sectors <p>Implementation of these policies and measures assumes the continuation of ongoing and planned international financial, technology transfer and capacity building support to complement domestic efforts</p>
<p>National Adaptation Programmes of Action (NAPA) 2007</p>	<p>The NAPA 2007 aimed at addressing the urgent and immediate needs and had nine priority areas; 1. Community tree growing 2. Land degradation management 3. Strengthening meteorological services 4. Community water and sanitation 5. Water for production 6. Drought adaptation 7. Vectors, pests and disease control 8. Indigenous knowledge and natural resource management 9. Climate change and development planning.</p>

4.1.1. NDC Implementation progress

Uganda’s NDC includes both adaptation and mitigation actions with a goal of achieving its contribution by 2030. A total emission reduction of 22% is targeted by 2030. CDKN and its partners Ricardo and Africa Development and Investment (ADI) are providing technical support to enable the country to move towards implementation. The NDC Quick-Start Guide has therefore been used to guide the development of an NDC Implementation Plan to support implementation of the Paris Agreement. The NDC Quick-Start Guide has three steps: Preparatory Work; Developing the NDC implementation plan; and Delivering the NDC implementation plan. These steps are supported by five modules: Mitigation, Adaptation, Governance, Finance and MRV. The guide emphasises the synergies between these modules, as well as the links between NDC implementation and the Sustainable Development Goals (SDGs).

Uganda has conducted a desk-research, face-to-face interviews and focused group discussions with representatives from the GoU, members of the Development Partners Thematic Group on Climate Change and Environment, and other key national stakeholders to review the NDC based on the quick start guide thematic areas. The process also involved the process of identifying whether the NDC proposes any additional adaptation activities compared to existing adaptation strategies or plans (e.g. National Adaptation Plans, additional climate change action plans and review of the existing adaptation policy landscape. At the end of the process, prioritised actions for the NDC will be laid out for implementation.

4.1.2. Progress on National Adaptation Plan (NAP)

The Uganda NAP has not been developed though the road map for the development of the National Adaptation Plan (NAP) was submitted to the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) in 2015. The NAP was launched this year (2017) with support from UNDP. An application for accessing funds for the NAP process is in advanced stages through UNEP on behalf of government.

The Agricultural Sectoral NAP supported by FAO under the Global Climate Change Alliance (GCCA) has been finalised. The Agriculture NAP (2016) aims at supporting the in-country process on integrating agricultural sector priorities and concerns into the overall Uganda NAP. The Agriculture NAP focuses on crops, livestock, fisheries and the related sub-sectors of water, forestry and environment. Apart from the fisheries activities, the NAP for Agriculture has been informed by the NDC actions under agriculture sector, but more so the National Climate Change Policy and its costed implementation strategy under the Agriculture sector.

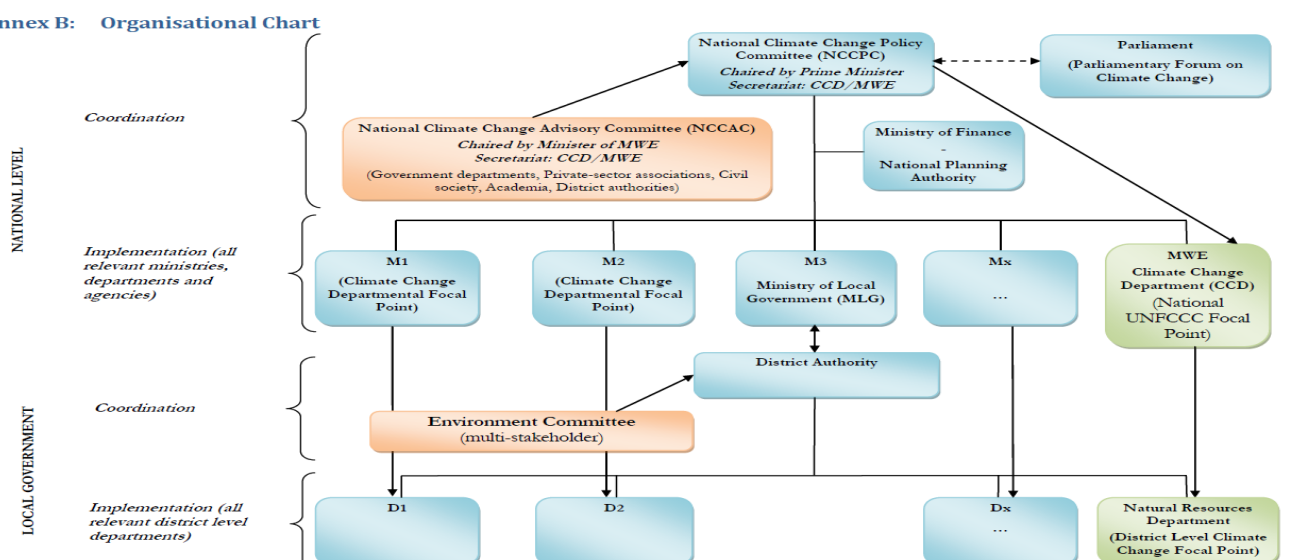
4.2. Institutional Coordination for climate change in Uganda

The National Climate Change Policy and its costed Implementation Strategy has laid out institutional coordination mechanisms in the country to ensure that climate change actions are linked from the subnational, sectoral and national levels. The Climate Change Unit was lifted to a governmental department under the Ministry of Water and Environment (Climate Change Department) to be able to promote cross sectoral coordination. The main functions of the new Climate Change Department (CCD) include; information sharing, providing policy and strategic advise supporting communication and outreach on climate change, ensuring the integration of climate change concerns into overall national planning through coordination with the relevant ministries, departments and governmental agencies, providing secretarial services to the National Climate Change Policy Committee, and other committees, monitoring the implementation of the Climate Change Policy and its Implementation Strategy and serving as the National Focal Point for the United Nations Framework Convention on Climate Change (UNFCCC)

In addition to the CCD, other key ministries include the Ministry of Finance, Planning and Economic Development (MoFPED) which is tasked with ensuring that the national sectoral and district-level budgets and indicative planning figures integrate climate change through appropriate provisions for the implementation of the policy and its strategy. MOFPED is also charged with reviewing quarterly and semi-annual reports from the ministries, departments and agencies concerned, to ensure that resource use is in line with expected and actual progress in implementing the policy. They also facilitate the introduction of relevant financial mechanisms and tools to the relevant stakeholders, as per the implementation strategy, to support financial resource mobilisation and investment for the implementation of the policy

Institutional coordination framework for climate change

Annex B: Organisational Chart



Source; National Climate change and implementation strategy 2015

The other key agency is the National Planning Authority (NPA) which ensures that the ministries, departments and agencies concerned integrate climate change through adequate provisions in their annual work plans for the implementation of the climate change policy, building on the guidance provided in the costed implementation strategy but consistent with all relevant national policies and legislations. It also ensures that these agreed work plans are implemented, through a review of quarterly and semi-annual reporting by the institutions concerned and appropriate follow-up actions by the NPA

The third key important ministry is the Ministry of Local Government (MoLG) charged with providing guidance to the districts to translate the policy priorities and the implementation strategy into coherent plans at the district level, ensure that districts make adequate provisions in their development plans, annual plans and budgets for the implementation of the climate change policy and also ensure that these are acted upon as planned through a review of relevant reports from the districts and appropriate follow-up actions by the MoLG, as required

Other various ministries, departments and agencies also have roles and have a designated departmental focal point accountable for the implementation of the prescribed policy responses that concern their departments. A similar management arrangement will be mirrored at the district level with the climate change focal point anchored within the Natural Resources Department of the District Local Government, all departments will ensure that climate change issues in their sectors are integrated into the District Development Plans. Adequate provision are to be made in district-level Indicative Planning Figures for each sector to ensure they can address the climate change policy priorities, along with the setting of relevant performance indicators.

In terms of coordination, a national Climate Change Policy Committee is in place to coordinate policy implementation and ensure information flow on resource allocation for the implementation of the policy. The Committee is chaired by the Prime Minister bringing together Ministers from the various departments at the national level. A National Climate Change Advisory Committee is also in place to ensure working level coordination and provide technical input to the National Climate Change Policy Committee. This committee is chaired by the Ministry for Water and Environment and brings together technical representatives from the various government departments at the national level, along with representatives from private-sector associations, civil society, academia and district authorities

Monitoring evaluation and reporting

The GoU developed the a Performance Measurement Framework supported by the French Development Agency, which put in place different indicators to ensure coordination and management of climate actions as well as reporting mechanisms. MWE-CCD has also developed National Standard Climate Change Indicators with support from Africa Climate Change Resilience Alliance and USAID. Each MDA selected an indicator to report on and the Local Government Ministry will be assessing all Local Governments of agreed indicators to ensure mainstreaming of climate change is being done. Ministries, Departments and Agencies (MDAs) will be expected to report on a quarterly and semi-annual basis on their progress in the implementation of their respective tasks and in the attainment of their expected results and performance targets, based on the detailed Monitoring and Evaluation (M&E) Framework. This information will be reported to the Ministry of Finance, and copied to the National Planning Authority and the CCD. On the basis of these reports, the CCD will be tasked with preparing a consolidated annual progress report on the overall implementation of the policy, for consideration by the Cabinet and the Prime Minister's Office.

4.3. Policy and Institutional Gaps for Climate Change Mainstreaming

Whereas the GoU has put in place several climate change policies and strategies as well as institutional coordination mechanisms, there are still challenges and gaps that need to be addressed.

Climate change is a cross cutting issue, and the CCD is under the Ministry of Water and Environment (MWE) where environment is also treated as a cross cutting issue at all levels. At district level, climate change is under the department of environment and natural resources where other departments take it as an environment issue. Most times staff from other departments do not have sufficient knowledge and skills on climate change adaptation actions that should be undertaken in their sub-sectors or how to conduct climate vulnerability assessments. Awareness on climate change policies is also low since participation in policy formulation is inadequate, limited to a few representatives. This scenario undermines the importance of climate change mainstreaming across different Government Ministries, Departments, Agencies and Local Governments plans and budgets.

According to a study by the International Institute for Tropical Agriculture (IITA), policy formulation processes and implementation gaps are likely to increase the vulnerability of smallholder farmers to climate change. This is despite significant efforts in agricultural research for development that try to address farmers' vulnerability to climate change effects. In their recent case study research targeting policies relevant to climate change adaptation in Rakai district, it was found that in most cases, policies were formulated through a top-down and unidirectional approach with the main actors being government agencies. There is little involvement of other actors such as civil society organizations, local governments and local farming communities, who are expected to implement such policies. "There is lack of appreciation regarding the ability of communities to shape effective policy implementation," noted one of the District Officers who took part in this study. Subsequently, farmers were unaware of the existence and provisions of the policies.³¹

Other studies have also noted that the links between districts and national ministries were mostly limited to donor assisted interventions. This is due to the fact that central government is not allocating resources for climate change adaptation at the sub national levels, so all the interventions currently being implemented are through donors working with Government and civil society organisations. The challenge however is that, when the projects close, interactions between national and subnational also end and there is no sustainability plan for the completed project. A case in point is the NAPA 2007, whose budget was for only a year but it extended to 2 years and piloted in only 05 Local Governments out of the 135. When the funding ended, the projects closed without follow up. The short term planning for adaptation, coupled with poor coordination will undermine effective mainstreaming of climate change in the short and long term

The Local institutions to enhance climate change adaptation actions are also not functioning adequately. The District Disaster Management Committees and Environment committees are dormant and are only activated when there is an officially declared emergency. In most cases they are not trained, not aware of their roles and are reactive to emergency situations yet they are constituted by technical staff who should be able to proactively plan for uncertainties if supported. This undermines planning for emergencies and uncertainties caused by climate change and the

³¹ <https://ccafs.cgiar.org/policy-formulation-and-implementation-gaps-hamper-climate-change-adaptation-uganda>

local levels. Strengthening of these committees and availing financial and human resource support will be key for better preparedness and early warning at local levels.³²

Limited Technical Capacity at all levels of implementation has curtailed climate change policy formulation and implementation. To date there is limited research evidence on future impacts of climate change, despite the existence of diverse researchers in meteorology, agriculture and environment NGOs, Civil Society and local government staff lack sufficient skills to articulate climate change and its impacts leading to poorly designed adaptation strategies (GTZ, 2010). At national level, ministry officials do not have sufficient capacity for long term planning for adaptation and mitigation. This, coupled with absence of research evidence, leads to poor strategic planning and ineffective policies. Investment in capacity building will be necessary to ensure that climate change is well integrated into development planning.

Climate change policy implementation will be successful through effective enactment and implementation of other legislation and relevant policies. However, due to poor performance by other sectors, climate change policy implementation will be affected. According the Water and Environment Sector Performance Report 2016, Government has failed to stop encroachment and issuance of illegal titles in both Central Forest Reserves and Local forest reserves, encroachment of wetlands, curtail charcoal burning among others. There is continued forest loss as demonstrated by the decline of forest cover from 24% in 1990 to 11% in 2015. In addition, the CCD –MWE with support from UNDP Low Emission Capacity Building Project establishment a National GHG Inventory System, but a number of sectors are reluctant to share data unless MoUs and data protocols are established between MWE and the sectors. The development of the legal framework (National Climate Act), has stalled which would accord legal powers to CCD to access GHG related information from all sectors. This will affect reporting on GHG emissions until the legislation is in place.

Financing for adaptation at different levels remains a challenge. Practical example of public financing through budgetary allocation for climate actions is elaborated in the Ministry of Water and Environment, under a sub-vote on climate change. However the current allocations under this vote, although ring-fenced to Climate Change Department is still insignificant compared to the country's climate related expenditure. At Local Government level, there is no climate change budget apart from a few who are supported by development partners and even then the projects are implemented as standalone. Mainstreaming climate finance into the MDAs and Local Governments will be very vital to spur climate action. Otherwise, financing for climate actions has remained a budgetary rather than a policy issue at national level, while at Local Government level it is considered an environment issue.

5.0. Climate change financing for Uganda

According the CDKN study on the impacts of climate change in Uganda, the cost of adaptation is high, but the cost of inaction is 24-46 times greater. Total spending on adaptation is estimated in 5 year intervals, from 2015 to 2030, based on Uganda's existing Costed Implementation Strategy and selected adaptation options. During the next five years (short term) the cost is estimated at about US\$406 million. On an annual basis this amounts to about 5% of net Official Development Assistance (ODA) received by the country and 3.2% of total government revenues (excluding grants). In future the adaptation budgets rise significantly to US\$644 million for 2021-2025 and US\$596 million for 2026-2030, and it is likely that, as a share of government revenues in those

³² DIIS Working Paper 2013:17

years, the demands for adaptation will rise. However, the cost of inaction is much greater, estimated at around US\$3.1-5.9 billion a year by 2025, a range that is around 24-46 times greater than the proposed adaptation budget. These costs combine current climate variability and future climate change, and therefore some of these costs will occur regardless of the expected climate impacts.

The MoFPED is the National Designated Authority (NDA) for the Green Climate Fund (GCF) and is to introduce relevant financial mechanisms and tools as per the NCCP Costed Implementation Strategy, and further support financial resource mobilization and investment for the implementation of the policy. In 2013, experts in the field of environment, natural resources, Climate change and development finance recommended the establishment of a directorate for climate change with a standalone fund. Unfortunately, the idea of standalone fund was not elaborated during the formulation process of the National Climate Change Policy due to anecdotal information that standalone funds tend to mar macroeconomic stability, so it was not done.³³ This is against the fact that the NCCP Costed Implementation Strategy estimates approx. 1.2 percent of GDP as required to implement climate actions in the next 15 years with 70 percent of the support expected to come from international sources.

The MoFPED, the Global Green Growth Institute (GGGI) and New Climate Economy, have identified interventions, estimated at USD 1.8 billion annually to 2020³⁴ expected to be mobilized through effective deployment of the public resources while leveraging more private sector investment to boost the country's economic activity to approx.10 percent GDP by 2040 and further reduce future greenhouse gas (GHG) emissions by 28 percent, far beyond what is expected if the NDC mitigation actions are implemented. Such interventions can play a significant role in realizing NDC priority action.

Uganda's largest share of financial resources for climate related expenditure comes from donors, both bilateral and multilateral including international financing institutions. The Climate Change and Environment Donor working group in Uganda, led by DFID is compiled on-going and projected funding since 2013 till 2023, the available data to date shows support amounting to approx. US\$ 282,117,285. Adaptation accounts for US\$206,739,939, mitigation US\$69,154,199 and crosscutting US\$ 6,223,147³⁵

The Uganda National Climate Change Finance Analysis report (2013)³⁶ revealed that climate change-related expenditure accounted for about one percent of total government expenditure with high relevance in the agriculture, water and environment sectors. However tracking such finances is difficult due to the fact that Uganda does not have a marker within her chart of accounts for climate change spending. Furthermore, the 2015 Delivery of Adaptation Finance in Uganda study by Climate Action Network-Uganda and Oxfam pointed out the lack of common definition for adaptation finance at the national and local levels in Uganda.

The country is also active in a number of international climate finance initiatives e.g. multilateral development banks (MDBs) and the UNFCCC. Uganda is a participant in the Strategic Climate Fund of the Climate Investment Funds (CIF) under MDBs. Under the Scaling Up of Renewable Energy in Low Income Countries Program (SREP), the Ministry of Energy and Mineral Development (MEMD) in partnership with the African Development Bank (AfDB) as the lead MDB is being supported with a preparation grant of USD 2.3 million for Decentralized Renewables Development Program and USD 1.875 million for Wind Resource Map and Pilot-

³³ Some of the finance facts are drawn from the ACCRA/CDKN NDC consultation notes 2017

³⁴ Achieving Uganda's Development Ambition, The Economic Impact of Green Growth: An Agenda for Action (2016).

³⁵ Donor activities to support the Uganda NDC, April 2017

³⁶ ACODE and Overseas Development Institute (ODI)

Wind Power Development Project to develop SREP Investment Plan. Currently, a request of USD 50 million to catalyze investment in projects of Geothermal Development, Solar PV Off-grid rural electrification, Solar PV On-grid Net Metering and in the development of wind mills has been tabled by the Permanent Secretary, MEMD.

Under the Pilot Program for Climate Resilience (PPCR) and Forest Investment Program (FIP), the Ministry of Water and Environment in partnership with the AfDB as the lead MDB for formulation of Strategic Program for Climate Resilience (SPCR) and the World Bank Group as the lead MDB for the formulation of FIP is being supported with a preparation grant of USD 1.5 million and USD 0.25 million for SPCR and FIP respectively.

Uganda is progressing with development of climate investment plans. Currently, Uganda is in advance stages of her programming for Climate Investment Funds i.e. Scaling Up Renewable Energy in Low Income Countries Program. (SREP), Pilot Program for Climate Resilience (PPCR) and Forest Investment Program (FIP). The country has received USD 1.5 million to prepare the Strategic Program for Climate Resilience (SPCR) under PPCR, receiving SREP funding of USD 50 million to advance geothermal exploration, solar photovoltaic net metering, and approx. USD 0.25 million to prepare the FIP. However the process is still under development.

5.1. Ireland's Contribution to Climate Finance

Globally, Ireland has made significant advances in delivery of climate finance in recent years. In 2015, Ireland mobilised €36million in climate finance, an increase from €33.67m in 2014 and €34.15m in 2013. This included support for multilateral climate change funds including the Least Developed Countries Fund (LDCF) as well as the Least Developed Countries Expert Group (LEG) via the UNFCCC Trust Fund for Supplementary Activities. Ireland will continue to support climate mitigation and adaptation in developing countries in line with our commitments under the UNFCCC. Ireland's public climate finance will be predominantly provided through bilateral grants to Key Partner Countries through Irish Aid, Ireland's overseas development assistance programme, together with direct grant contributions to various multilateral institutions or funds, such as the GEF, GCF and LDCF. Ireland is currently exploring ways to mobilise private climate finance to support mitigation and adaptation in developing countries. A cross-departmental working group is being established to progress this work.

5.1.2 Overview of Ireland Climate Finance in Uganda in 2016

In 2016, Ireland provided a total of €1,137,983 to Uganda in climate finance through its bilateral aid programme. In addition, Ireland provided €1,563,447 in 2016 in climate finance to projects in Uganda through its civil society programme. Climate relevant expenditure provided by Irish Aid to civil society organizations in 2016 was Rio marked and accounted for systematically for the first time, in cooperation with the project partners themselves. Projects funded directly by Irish Aid under the bilateral aid programme include the provision of water, sanitation and hygiene services to South Sudanese refugees, as well as the provision food, shelter and site planning for refugees, and a skills development programme in the Karamoja region in response to market needs. Civil Society partners GOAL, Self Help Africa, Misesan Cara, Traidlink, Childfund and Help Age are helping to build resilience to climate change through a wide range of projects including increasing community access to water, sanitation and improved hygiene practices, increasing smallholder skills and knowledge to benefit from diversified agricultural production, and engaging smallholders in networks and relevant policy processes to improve their livelihoods.

Expenditure Summary		
	Bilateral €	Civil Society €
Climate Finance Adaptation (UNFCCC)	458,250	1,513,245
Climate Finance Mitigation (UNFCCC)	0	0
Climate Finance Cross-cutting (UNFCCC)	679,733	50,202
Biodiversity (UNCBD)	579,733	510,885
Desertification (UNCDD)	1,032,000	424,356
Disaster Risk Reduction (DRR)	1,557,000	N/A
Total Climate Finance	1,137,983	1,563,447

6.0. Donor coordination in Uganda

There is a donor working group on environment and climate change which meets once a month to discuss issues on climate and environment. The Chair for 2017 is DFID who took over from USAID. The working group is focusing on coordination between different donors on climate change to avoid duplication. DFID has led a process of compiling all climate change financing contributing to the Uganda NDC to avoid duplication of services and resources. The group also reviews government documents on request, ToRs and also presents joint decisions on climate issues to Government. The platform promotes information sharing and sometimes conduct joint field visits on specific programmes.

In addition, the UN One Programme , part of delivering as One (DaO) brings all members of the UN Country team together under one nationally-owned strategy has developed the United Nations Development Assistance Framework (UNDAF) for Uganda, 2016-2020. Outcomes 3.1 focuses on natural resource management and climate change resilience with a target that by end 2020, Natural resources management and energy access are gender responsive, effective and efficient, reducing emissions, negating the impact of climate-induced disasters and environmental degradation on livelihoods and production systems, and strengthening community resilience. UNDAF is based on national priorities, internationally agreed development goals, and the UN's capacity and comparative advantages. Joint programming enables greater responsiveness to national priorities, allows space for cross-cutting themes, increased possibility for upstream work required by governments. This increased role in policy support results in more coherent advocacy by the UN system on national priorities and the Post 2015 development agenda.

The updated 3rd version of the Climate Change Actors' landscape of Uganda (CCALoUg) 2016 identified and logged the interests of 84 climate change actors across government; (23) development partners (22) NGOs (20) research institutes (16) and the private sector (3). The majority are engaged in the environment, energy, agriculture and climate change-specific sub-sectors, with different cross-cutting climate change issues. The support can be categorized into four areas: (i) policy and capacity building, (ii) adaptation, (iii) mitigation and (iv) cross-cutting issues. The study found out that 52.3% of the funding was on mitigation and 47.7% on adaptation. Climate Change Actors have grown in number in Uganda, as well as the activities and volume of funds being spent on adaptation and mitigation of climate change. This has brought various challenges such as duplication of work by the actors, lack of coordination and in some cases conflict over activity areas of intervention.³⁷

³⁷ Climate change actors landscape report by GIZ and CCD, 2016

Other key donors on climate change include the World Bank, African development Bank, UNDP, UNEP, The Royal Danish Embassy, DfID Uganda, Norwegian Embassy, Belgium embassy, and Netherlands embassy

7.0. Ireland's Approach to Climate Change Adaptation

One World One Future (OWOF); Ireland's Policy for International Development, 2013 has a vision of contributing to a sustainable and just world, where people are empowered to overcome poverty and hunger and fully realise their rights and potential. Amongst the key changes that we will make will be the reorientation of our efforts towards developing countries that are experiencing greater degrees of hunger, fragility and instability, because of conflict, disaster or the harmful effects of climate change. Climate change is one of the six priority areas. And the key decision is to put climate change at the centre by working hard to ensure that our efforts are more firmly geared towards addressing this challenge, including promoting a balance between the social, economic and environmental aspects of development.

In addressing environment and climate change, Ireland recognises that in all countries, economic and social progress is dependent more than ever before on the health of the environment. Environmental hazards such as pollution, severe weather events and climate change threaten livelihoods and development, and could drive millions more into extreme poverty. Climate change is projected to reduce crop yields for subsistence farmers in many African countries making them more vulnerable to food shortages. Two of the three goals in OWOF focus on reduced hunger, stronger resilience and sustainable development and inclusive growth speak to climate change commitments, including; working more strategically to advance economic growth which benefits poor people and is environmentally sustainable while supporting efforts that respond effectively to climate change. The top priority for the Government of Ireland is to reduce hunger and vulnerability, and build people's resilience to natural and other disasters.

Under climate change and development, there is focus on achieving a balance between the economic, social and environmental aspects of development. Our approach follows on from Our Sustainable Future, a Framework for Sustainable Development for Ireland, the Government's policy framework for green and sustainable national prosperity. Our efforts will be aimed at ensuring that developing countries, especially our Key Partner Countries, can develop in a way that is resource-efficient, climate-resilient (protecting themselves from the risks of climate change) and low in carbon emissions.

Ireland is investing in building capacity of staff in Irish Aid and in partner countries (both government and civil society organisations), to integrate climate change into development programmes and projects and to improve tracking and accountability on climate finance at the programme planning and appraisal stage.

A resilience approach is a way of working that helps to build resilience in order to protect the assets – property, knowledge, well-being, security and social cohesion of poor people and countries in the face of a range of shocks and stresses. Adopting a resilience approach helps to shine a spotlight on the root causes of poverty, inequality and exclusion from the perspective of communities

(Irish Aid, 2016)

A Climate Change and Development Learning Platform was launched with the assistance of the International Institute for Environment and Development (IIED) to facilitate the sharing of information and lessons between Irish Aid staff, climate and development experts, and partners in developing countries. The Climate Learning Platform documents local experiences and uses the

learning to inform countries decisions when designing programmes to address climate change, with a particular focus on integrating climate change into development planning, adopting climate-smart technologies particularly in agriculture, better targeting social protection systems to address climate vulnerability, developing smallholder household sustainable energy systems and addressing gender equality. The Climate Learning Platform can be accessed through the Irish Aid website and via www.climatelearningplatform.org

Priority areas for action under climate change and development³⁸

What we will do	
<ul style="list-style-type: none"> > We will support developing countries and vulnerable communities to formulate national responses to environmental degradation and climate change as a matter of priority. In this, we will continue to focus primarily on improving people's resilience to climate change. > We will build on the synergy between our priority areas for action and will appraise our programmes against the economic, social and environmental aspects of development, recognising their interlinkages and ensuring that these remain balanced at all times. > Our efforts to support sustainable natural resource management (for example, maintaining land and soil fertility) will be continued. We will support developing countries to conserve and sustainably use their biodiversity, securing local ecosystems that are vital in all development efforts. > We know that climate change impacts disproportionately on women, and we are committed to working to address this by supporting efforts to promote gender equality. > We will support developing countries to maximise the potential of green development, including approaches to carbon sequestration (the storage of carbon that would otherwise be released into 	<ul style="list-style-type: none"> the atmosphere) for the reduction of poverty. Opportunities for engaging Irish expertise in the area of green technology and in off-setting emissions will be explored. > We will support developing countries in their transition from the inefficient use of traditional energy supplies towards the use of modern energy sources such as solar energy and energy-efficient cook stoves. > We will increase our focus on disaster risk reduction in development programmes - bridging the gap between our emergency interventions and our development efforts and supporting efforts to increase resilience to the adverse impacts of climate change. > The international community has committed to provide \$100 billion per annum by 2020 for climate action in developing countries within the ongoing climate change negotiations. Ireland will maintain its engagement with the UN Framework Convention on Climate Change and Kyoto Protocol global processes, and strive to meet the obligations arising from these.

7.1 Irish Aid Uganda's climate change programming

The Irish Aid Uganda Country strategy paper 2016-2020 recognises the impacts of climate change on rural households making them more vulnerable to falling into poverty, thus highlighting the need for building resilience at different levels. The strategy notes that climate change impacts on agriculture and rural poverty may cause increased rural-urban migration as people suffering the impacts of climate change in rural areas seek (perceived) opportunities in towns and cities.

Irish Aid programming in Uganda focuses on Karamoja region where the majority of the population subsist through agro-pastoral and pastoral livelihoods. Karamoja region is highly susceptible to the impacts of climate change, which the strategy acknowledges. The region has been experiencing an increase in extreme weather patterns resulting in extended dry spells every second or third year or floods. Moreover, climate variability/ change is projected to continue manifesting through extreme weather conditions. The region experiences chronic food insecurity, severe environmental degradation, poor infrastructure and high prevalence of diseases such as malaria and diarrhoea among children, poor health practices, and poor sanitation conditions. Coupled with high poverty levels, the situation has eroded people's coping capacity, leaving them in a precarious vulnerable state.

³⁸ Extract from One World One Future; Ireland's Policy for International Development

Social Protection Programme

From 2010 to 2015, Irish Aid and DFID supported a pilot programme the Expanding Social Protection (ESP) Programme. The ESP had two objective s; to develop the National Social Protection Policy and, to pilot the Social Assistance Grants for Empowerment (SAGE) under which the Senior Citizens Grant was implemented. Following the successful completion of the pilot in 2015, the Government of Uganda took a decision to roll out the Senior Citizens Grants to

Why Focus on Social Protection?

Builds and prevents eroding of assets and capacities at individual, community and national levels by stresses and inequalities.

Relevant social protection tools, in particular well designed, delivered and targeted social cash transfers, can support poor people in building their resilience to stresses and develop less risky coping mechanisms

Social protection is relevant for humanitarian crises -the countries most in need of humanitarian assistance are often the same as those with most pressing needs for social protection.

An increase in social protection spending, through easing the income constraint, can have the knock-on effect of making spending in other sectors, such as health and education, more efficient

(Irish Aid, 2017) *Social Protection Policy*

an additional 40 districts over 5 years; starting with 20 in Financial Year 2015/16, thereafter to 5 districts every year, till 2019/20. The National Social Protection Policy for Uganda was approved by Cabinet in November 2015 and launched in March 2016. The policy³⁹ provides a wider framework for social protection implementation in Uganda, beyond the social grants (specifically the Senior Citizens Grants). Irish Aid and DFID have continued to support the roll out of the social protection programme.

The Irish Aid Uganda country notes that there is evidence to show that when an increased number of poor vulnerable individuals and households access regular, predictable direct income support through social protection programmes they are able to become more resilient, improve their adaptive capacity to climate change and rise from poverty. Globally such transfers have been shown to improve the education, health and lifelong income of

beneficiaries and their families. Specifically, evidence from the phase 1 of the Expanding Social Protection Programme cash transfer indicates that beneficiaries spend most of their direct income transfers on food, health care and education and productive investments. This results in improved nutritional status of household members, better health, increased productivity and improved performance as well as retention of children in school. Cash transfers to the poor helps individuals to avoid risky coping strategies such as selling assets or withdrawing children from school

Irish Aid Uganda intends to maximise the impact of the Senior Citizen Grant among areas disproportionately affected by poverty, climate change and post-conflict challenges, enrolment within five districts in the Acholi, Karamoja and Lango sub-regions over the next 5 years, increasing by 100 people a year to achieve coverage of the oldest 500 senior citizens in each sub-county by 2020. Partnerships with CSOs will also include lesson learning, especially for the Karamoja region, in niche areas such as around climate change adaptation strategies and linkages between nutrition and HIVAIDS.

Social protection (SP) has the capacity to increase resilience and reduce vulnerability at the level of the household, community and increase local economy, human capital, engagement in productive activities, and increase the ability to deal with risk. However, studies have also noted the need to link cash transfers to particular 'positive' behaviours in order to maximize long-term outcomes. Effective adaptation at the household level requires striking a balance between diversification and asset building, and creating long-term impact by transferring resources to the poor which can be invested productively. Promoting activities like micro-credit saving schemes has often been

³⁹ <http://socialprotection.go.ug/wp-content/uploads/2016/07/National-Social-Protection-Policy.pdf>

proposed as a means of giving the poor the possibility of investing in small-scale activities. The decisions taken by individuals can either increase or reduce vulnerability thus the need for integrated approaches to address the limitations of cash transfers in the broader structural and institutional barriers to pro-poor adaptation. Social protection programmes need to be linked with climate change and disaster risk management strategies and linking these programmes to the network of institutions involved in climate change resilience and disaster response interventions to achieve long term resilience.

Irish Aid through the Climate Change and Development Learning Platform; www.climatelearningplatform.org/ is planning to conduct a case study research in 2017 on Integrating Social Protection with Climate Resilience, which will inform the Irish Aid country programme as well as social protection partners and Government on approaches and opportunities for integrating climate change into the SP programme

Humanitarian response

The Irish Aid Humanitarian Response Fund is meant to cover four key areas; emergency response, acute crisis, early recovery and preparedness activities. It also covers nutrition and food insecurity in the Karamoja region due to problems of chronic food insecurity and malnutrition which continue to impact the health and wellbeing of the Karamajong, creating need for providing periodic, short term and targeted humanitarian interventions. It's also noted that significant numbers of refugees in Uganda also experience food and nutrition insecurity, so the humanitarian response fund is also positioned to address urgent and unanticipated humanitarian needs in-country.

The Country strategy 2016-2020 is focusing on the need to improve food and nutrition security as a key priority of GoU and Development Partners in Karamoja. As a component of Irish Aid's approach to building resilience and countering fragility, an innovative rapid-response mechanism for humanitarian response is proposed within country funding of €1m per annum to respond to humanitarian emergencies (refugee influxes, food scarcity, flooding or other disasters) which are very common. In supporting vulnerable individuals and households to prepare for, withstand and recover from acute shocks and stresses, Irish Aid Uganda commits to use the Humanitarian Response Fund, aligned to Irish Aid's revised Humanitarian Assistance Policy (HAP, 2015) with a particular emphasis on gender, protection and on targeting forgotten and underfunded humanitarian crises.

This pre-positioned support will provide fast responsive emergency funding in a context where HQ humanitarian funding is increasingly under pressure due to the current large numbers of protracted crises worldwide. Regionally Uganda plays an important role catering for large influxes of refugees over an extended period, from countries including DRC, South Sudan and Burundi. The importance of addressing refugee issues in the Horn of Africa and East Africa is highlighted in the EU's approach to addressing mixed migration flows in the region. As already noted, Karamoja, the area of particular focus of the current strategy is very vulnerable to crisis, timely funding can assist in reducing the impact of extreme shocks, protecting development gains and addressing vulnerability.

Gender equality and climate change

Gender is a cross cutting issue in the CSP, and there is evidence that climate change impacts women and men, boys and girls differently, exacerbating their vulnerability. In many of these contexts, women are more vulnerable to the effects of climate change than men—primarily as they constitute the majority of the world's poor and are more dependent for their livelihood on natural

resources that are threatened by climate change. Furthermore, they face social, economic and political barriers that limit their coping capacity⁴⁰. Women and men in rural areas are especially vulnerable when they are highly dependent on local natural resources for their livelihood. They are charged with the responsibility to secure water, food and fuel for cooking and face the greatest challenges. When coupled with unequal access to resources and to decision-making processes, limited mobility due to hard to reach places women in rural areas are in a position where they are disproportionately affected by climate change. Climate change has also challenged the masculinity of men where they fail to provide for their households and are sometimes driven to engage in unproductive and harmful actions that further hurt women and children e.g. domestic violence, extra marital affairs, alcoholism etc. It is thus important to identify gender-sensitive strategies to respond to the environmental and humanitarian crises caused by climate change. It is important to remember, however, that women and men are not only vulnerable to climate change but they are also effective actors or agents of change in relation to both mitigation and adaptation. Women and men often have a strong body of local indigenous knowledge and expertise that can be used in climate change mitigation, disaster reduction and adaptation strategies. Furthermore, women and men can contribute to livelihood strategies that can make their communities more resilient.

The Carbon Neutral Programme

At the national level, the Embassy of Ireland is supporting the carbon neutral initiative through Uganda Carbon Bureau (UCB). The Embassy of Ireland previously participated in the Uganda Carbon Bureau's Carbon Neutral programme (2012-2014), whereby its various sources of carbon emissions were assessed in accordance with the World Business Council for Sustainable Development/World Resources Institute's Greenhouse Gas Protocol. It then purchased a matching number of carbon credits from a local NGO (ECOTRUST) working with smallholder tree farmers, and UCB certified the embassy as being "Carbon Neutral".

The Embassy of Ireland renewed its Climate Friendly /Carbon Neutral Initiative (CFCN) and had discussions with UCB to work together and mobilise the European diplomatic missions to participate in the CFCN, process as a good practice. The Embassy will continue to be carbon neutral by measurement its carbon footprint and the purchase of a corresponding number of locally sourced carbon credits, either as a spot purchase or as a forward purchase from recognised organisations. In the latter case, some of these carbon credits will be Fairtrade accredited, in addition to CDM and Gold Standard.



UCB will work with the Embassy in taking forward the Climate Friendly/Carbon Neutral Initiative to demonstrate to the Ugandan public the commitment of the community of accredited diplomatic and international missions to reduce and mitigate their carbon dioxide emissions, and to contribute

⁴⁰ UN women watch; Women, gender equality and climate change

to the sustainable development of the Ugandan communities from whom they will purchase the carbon credits.

ECOTRUST plan Vivo project known as 'Trees for Global benefit' has demonstrated that apart from reducing GHGs, there are social economic benefits that have resulted from the carbon credits purchased from the tree farmers. Trees prevent landslides, contribute to nitrogen fixation, sequester carbon from the atmosphere but also improve the farmers' incomes and incentivize the growing of indigenous trees. With ECOTRUST support, farmers who supply the carbon credit are able to receive the money through a local Savings and Credit Cooperative Organization (SACCO). Some of the farmers use the money from their carbon credits as security to acquire loans from the SACCO. As a result farmers report that they are able to build permanent houses, and cater for other needs like health, feeding and education of their children.

Uganda's greenhouse gas (GHG) emissions are largely from transport activities and the depletion of forest cover for various forms of wood fuel. The proposed actions will impact on making the Embassy and other participating organisations aware of the need to measure, reduce and offset these GHG emissions as much as possible. The purchase of matching carbon credits from smallholder tree planting initiatives and from users of improved cook stoves will directly benefit these households with the multiple advantages from better tree cover, and the financial, health and environmental benefits from cleaner indoor air, and the more efficient use of wood fuel and alternatives such as renewable biomass briquettes.

8.0. Climate Change Implications for Country Development Programming

- Likelihood of increases in the intensity and frequency of disasters (droughts, floods and landslides) due to projected climate variability and this will vary by region. Focus on the nexus between climate change, disaster risk reduction, humanitarian response and development will be key in reducing vulnerability and building resilience and sustainable development, given Uganda's high vulnerability ranking.
- If adaptation actions are not integrated into development planning and budgeting, the national economy will go down, undermining progress towards a middle income country as an aspiration for vision 2040. GDP losses due to climate change is likely to increase thus reversing economic development gains. Need to therefore focus on inclusive economic models that can increase incomes for the poor will be important.
- The numbers of people that will require humanitarian assistance if disaster resilience is not strengthened in the medium and long term will increase affecting National Budget availability and a shift in available ODA towards humanitarian response. In February 2017, the number of Ugandans who needed food shot up to 1.5 million people from 1.3 million registered in November 2016 and Government had to re allocate funds meant for other development interventions to manage the crisis. The influx of refugees in Uganda is rated at 1,273,875 as of May 2017, which brings in the conflict and fragility nexus which needs to be addressed in a holistic manner with development interventions
- Capacity building and strengthening of Government structures at national and sub national levels will be key to improve sustainable development, planning for

uncertainties, managing risks and reducing vulnerabilities resulting from climate change and disaster impacts.

- Investment in generating and disseminating accurate, timely and reliable weather and climate information will be important to inform different sector adaptation and climate risk management plans and decisions regarding changes in climate.
- Decrease in agriculture production and productivity will lead to serious negative impacts on food security and nutrition which is already a challenge. Climate risk management and strengthening of food systems approaches will be important across all development programmes to improve food security, nutrition, but also enhance economic development for the poor.
- Climate changes may also affect the health of wetland and forest ecosystems, which provide critical ecosystem (and economic) services for communities. Estimates of the cost of natural resource degradation in Uganda are as high as 17 per cent of gross national income (GNI) per year, of which 6 per cent consists of forest degradation and 11 per cent soil degradation. Enforcement of natural resource management policies and regulations as well as regulating oil and gas production to cater for clean development will be important in reducing emissions.
- The Vulnerability, Poverty and Inequality will most likely increase for those who are already vulnerable. Poor households will become more food insecure, lose household income and will continue spending their little earnings on buying food and managing risks and shocks. Integration of climate change, disaster risk reduction and social protection mechanisms into development programmes will be important to make sure that the impacts of climate change and disasters is reduced on the very poor
- Systematic integration of gender analysis into the climate change vulnerability assessments to understand the different capacities and vulnerabilities of women and men, boys and girls to shocks and stresses and design adaptation options suited to the needs and capacities
- Gender disparities will increase with shifting gender roles and vulnerabilities enhanced by climate change impacts. Gender equality and climate justice should be a key focus. Gender analysis should be done across all climate change adaptation programmes to understand the different capacities and vulnerabilities of women and men, boys and girls and ensure they are participating in climate decision making

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