



**THE REPUBLIC OF UGANDA**

**MINISTRY OF WATER AND ENVIRONMENT**

# Updated Nationally Determined Contribution (NDC)

September 2022

## FORWARD

This submission communicates Uganda's Updated Nationally Determined Contribution (NDC) in fulfilment of Article 4 of the Paris Agreement. In the updated NDC, Uganda presents an ambitious economy-wide mitigation target in 2030 of 24.7% reduction below the Business As Usual (BAU), a progression from the 22% reduction target communicated in the first NDC in 2016.

The country's number one priority response to climate change is adaptation in the context of addressing key vulnerabilities in sectors, building adaptive capacity at all levels, addressing loss and damage, and increasing the resilience of communities, infrastructure, and ecosystems. The sectoral scope for adaptation has been broadened from agriculture, forestry, water, infrastructure, energy, risk management, and health to also include ecosystems (wetlands, biodiversity, and mountains), water and sanitation, fisheries, transport, manufacturing, industry, and mining, cities and built environment, disaster risk reduction, tourism, and education.

Uganda has improved on the methodological approaches for estimating and accounting for anthropogenic greenhouse gas emissions (GHG). The implementation of the updated NDC mitigation policies and measures will be across energy, agriculture, forestry, and other land use (AFOLU), peatland, waste, and industrial processes and product use (IPPU). Unlike the first NDC of 2016, the updated NDC defines sectoral mitigation and adaptation measures and interventions with clearly defined corresponding indicators and targets for 2025 and 2030.

The NDC update process was conducted simultaneously with the formulation of the Long-Term Low Emissions Development Strategy (LTS) to ensure the alignment of long-term climate change strategies with short and medium-term climate actions to represent Uganda's contribution and the fair share of domestic effort to transition to a low-carbon and climate-resilient economy in the near future.

The mitigation and adaptation actions outlined in this updated NDC will enable Uganda meet the global commitments stipulated under the Paris Agreement, 2030 Agenda for Sustainable Development (SDG13), Sendai Framework for Disaster Risk Reduction 2015–2030, and post-2020 Global Biodiversity Framework, among others. At the national level, the adaptation and mitigation actions of the updated NDC will contribute to the implementation of the country's Vision 2040, the National Development Plan III, the National Green Growth Development Strategy, and the 10-year Environment Restoration Plan, among others.

The updated NDC actions will be implemented through a whole-of-society approach, involving government ministries, departments, and agencies; the private sector; academia; civil society organizations; youth; and development partners, in accordance with the corresponding indicators and targets for 2025 and 2030. In order to effectively implement this updated NDC, Uganda will implement unconditional actions with domestic financial resources and conditional actions with assistance from external financial resources.

Therefore, I take this opportunity on behalf of the government of Uganda to present our national commitment and ambition to contribute to limiting global temperature increase to 1.5°C and call upon all partners and stakeholders to support the implementation of the identified mitigation and adaptation climate actions presented in this updated NDC.



**Hon. Sam Cheptoris**  
**MINISTER OF WATER AND ENVIRONMENT**

## **ACKNOWLEDGEMENT**

In April 2019, Uganda launched the updating process of her first NDC in pursuance of paragraph 24 of Decision 1/CP.21 of the UNFCCC under the leadership of the Climate Change Department, Ministry of Water and Environment with financial support from the Climate Action Enhancement Package (CAEP) of the NDC Partnership.

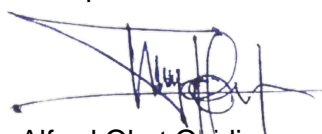
The process was coordinated by a technical team comprised of experts from the Ministry of Water and Environment; Ministry of Finance, Planning and Economic Development (MoFPED); National Planning Authority (NPA); civil society and United Nations Development Programme (UNDP).

On behalf of the Ministry of Water and Environment, I wish to take this opportunity to thank all the partners and stakeholders involved in the NDC update process for their technical and financial support. These include; the United Kingdom Foreign, Commonwealth and Development Office, the NDC Partnership, United Nations Development Programme (UNDP), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), International Renewable Energy Agency (IRENA), United Nations Environment Programme (UNEP), Red Cross Red Crescent Climate Centre, International Union for Conservation of Nature (IUCN), Local Governments for Sustainability (ICLEI) Africa, NAP Global Network, International Organization for Migration (IOM), World Wide Fund for Nature Uganda Country Office (WWF UCO), Climate Action Network Uganda (CAN-U), ENR CSO Network, Environmental Management for Livelihood Improvement Bwaise Facility (EMLI) and Participatory Ecological Land Use Management (PELUM) Uganda among others.

I am grateful to Hon. Sam Cheptoris, Minister for Water and Environment and the entire top policy of the Ministry for the overall political guidance during the process of NDC Update.

I express gratitude to the National Climate Change Advisory Committee (NCCAC), in particular, for their independent technical guidance and the Parliamentary Standing Committee on Climate Change for the political oversight.

I invite all partners and stakeholders to fully embrace and participate in the implementation of the updated NDC.



Alfred Okot Okidi

**PERMANENT SECRETARY  
MINISTRY OF WATER AND ENVIRONMENT**

## EXECUTIVE SUMMARY

The Republic of Uganda signed the Paris Agreement (PA) in October 2015 and ratified it on the 21<sup>st</sup> of September 2016. In accordance with Decisions 1/CP.19 and 1/CP.20 of the United Nations Framework Convention on Climate Change (UNFCCC), Uganda submitted its Intended Nationally Determined Contribution (INDC) in 2015, which later in 2016 became the country's first NDC following the entry into force of the Paris agreement on 4<sup>th</sup> November 2016.

As required by the Paris Agreement, NDCs are submitted every five years. In reference to that, this report contains Uganda's updated NDC with a time frame of 2020 to 2030.

The updated NDC contains information on national circumstances such as the geography, climate, and greenhouse gas (GHG) emissions profile; information on social and economic trends (population, urbanization, agriculture, forestry, water, wetlands, and energy); and policy, legal, and institutional framework.

The NDC update process was informed by a stocktake report, which highlighted the key performance levels and emerging issues that emanated from the formulation and implementation processes of the first NDC. The updated NDC addresses all the key emerging issues highlighted in the stocktake report.

The update process involved updating the national information databases for adaptation and mitigation to generate scientific information in accordance with Article 4 Paragraph 1 of the Paris Agreement to inform decisions on climate actions for 2020 to 2030. Uganda used the latest global and national information packages generated from the national risk and vulnerability assessment, the mitigation metabolic assessments, and the third national communication. The country gathered information on climate, climate change risk, and vulnerability, and GHG emission trends, sources, and projections up to 2050 using a set of tools for GHG emissions estimations and projections, taking into account the national circumstances and the country's vision for 2040, which informed the choices of the appropriate mitigation measures and adaptation actions in the updated NDC.

Results from the Risk and Vulnerability Assessment conducted indicated that both temperature and rainfall are expected to increase in Uganda. However, there is still a wide range of possible scenarios and uncertainty, particularly for rainfall. The assessment revealed further that the priority sectors for adaptation in Uganda remain: ecosystem, water, agriculture, and forestry. These were also identified as priority sectors in the initial NDC. However, there is also significant risk in other sectors, particularly in terms of the general business sector, mining and quarrying, energy, transport, and cities and the built environment.

The adaptation component of this updated NDC covers 13 sectors of agriculture, forestry, energy, health, ecosystems (wetlands, biodiversity, and mountains), water and sanitation, fisheries, transport, manufacturing, industry, and mining, cities and built environment, disaster risk reduction, tourism, and education, highlighting 48 priority adaptation actions and 82 indicators with targets for 2025 and 2030.

The mitigation component presents Uganda's emissions profile, which is projected to increase from 90.1 MtCO<sub>2</sub>e in 2015 to 148.8 MtCO<sub>2</sub>e in 2030 and 235.7 MtCO<sub>2</sub>e by 2050 under the Business-As-Usual (BAU) Scenario. Uganda plans to implement policies and measures in the AFOLU, energy, waste, transport, and IPPU sectors that will result in a 24.7% reduction of national GHG emissions below the BAU trajectory in 2030, to 112.1 MtCO<sub>2</sub>e. 82.7% of the mitigation impact will come from the AFOLU sector, while 7.56%, 6.36%, 3%, and 0.4% will come from the transport, energy, waste, and IPPU sectors, respectively. The 24.7% reduction bears both conditional and unconditional targets. The 5.9% (unconditional target) BAU

emission reduction by 2030 will be facilitated by domestic resources, and the 18.8% (conditional target) is subject to the availability of means of implementation from international support such as financial resources, capacity-building, and technology transfer.

Gender sensitivity was incorporated in the selection and prioritization of adaptation and mitigation measures and actions of this NDC, and it was further elaborated and mainstreamed in the updated NDC implementation plan.

The total cost of implementing adaptation, mitigation, coordination, monitoring, and reporting of this updated NDC is estimated at USD 28.1 billion. Uganda commits to mobilize domestic resources to cover the unconditional actions to the tune of USD 4.1 billion equivalent to 15% of the total cost of the updated NDC and will require international support to cover the conditional measures and actions. A number of capacity-building and technology needs have also been identified for implementing the NDC.

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## Abbreviations and Acronyms

BAU	Business as usual
BUR	Biennial Update Report
BFP	Budget Framework Paper
CBA	Cost-Benefit Analysis
CCD	Climate Change Department
CDM	Clean Development Mechanism
EAPP	East African Power Pool
EF	Emission Factor
FAO	Food and Agriculture Organisation
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoU	Government of Uganda
HFCs	Hydrofluorocarbons
HPP	Hydropower plant
ICLEI	Local Governments for Sustainability
INDC	Intended Nationally Determined Commitments
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use
IRENA	International Renewable Energy Agency
LDC	Least Developed Country
LEAP	Low emissions analysis platform
LPG	Liquefied Petroleum Gas
LTS	Long-Term Strategy
MACC	Marginal Attribution Cost Curve
MAP	Mean Annual Precipitation
MCA	Multi-criteria Analysis
MDAs	Ministries, Departments and Agencies
MRV	Measurement, Reporting and Verification
MWE	Ministry of Water and Environment
NAMA	Nationally Appropriate Mitigation Action
NAP	National Adaptation Plan

NBSAPII	National Biodiversity Strategy and Action Plan II 2015 - 2025
NDC	Nationally Determined Contribution
ND-GAIN	Notre Dame Global Adaptation Initiative
NDP	National Development Plan
RCP	Relative Concentration Pathway
REDD+	Reducing Emissions from Deforestation and Degradation
SCP-HAT	Sustainable Consumption and Production Hotspot Analysis Tool
SDGs	Sustainable Development Goals
SLCPs	Short-Lived Climate Pollutants
SNAP	Supporting National Action & Planning (SNAP)
SSPs	Shared Socioeconomic Pathways
TBD	To Be Determined
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Association for International Development
USD	United States Dollar
VA	Vulnerability Assessment
WBCSD	World Business Council for Sustainable Development
WRI	World Resources Institute

## Introduction and Background

In October 2015, Uganda submitted its Intended Nationally Determined Contribution (INDC) in accordance with decisions 1/CP.19 and 1/CP.20 of the UNFCCC and after ratification of the Paris Agreement on 21<sup>st</sup> September 2016, the INDC became Uganda's first NDC. The Republic of Uganda signed the Paris Agreement in October 2015 and ratified it on the 21<sup>st</sup> of September 2016.

In pursuant to decision 1/CP.21 paragraph 24, Uganda committed to update its first NDC and on 30<sup>th</sup> April 2019 and a roadmap to update the first NDC was launched. Uganda through the Ministry of Water and Environment (Climate Change Department) with support from the Climate Action Enhancement Package (CAEP) of the NDC Partnership through partners – UNDP, GIZ, UNEP, IRENA, RCCC and ICLEI Africa facilitated the formulation of the updated NDC which embraced the whole -of government and of whole -of -society gender responsive approach where various categories – youth, women groups among others fully participated in a bottom-up approach.

The updated NDC is aligned with the Vision 2040 and the third National Development Plan (NDP III) 2020/21 – 2024/25. The updated NDC has been informed by the National Climate Change Act, 2021, the National Climate Change Policy, 2015, the Uganda Green Growth Development Strategy, 2017/18 – 2030/31, Uganda NDC Partnership Plan 2018 – 2020, the Stock-take report of Uganda's NDC and other related policies, plans and strategies. The updated NDC has been harmonized with the development of Uganda's Long-term Climate Strategy 2050.

Despite the COVID-19 pandemic, the hybrid mode of participation through regional workshops, youth and civil society consultations enabled the identification of various climate actions which were discussed and prioritised by policy makers during the sectoral consultations which ensured alignment with overarching national planning and budgeting frameworks.

Developing gender responsive NDC with measurable targets is essential to improving performance in climate action. Identifying the gender equity in targets NDC aim to achieve - along with the concrete actions needed to achieve the targets and the required indicators to measure progress - are essential steps for addressing challenges related to climate change and gender equality. Furthermore, there is considerable evidence and broad international consensus that advancing gender equity helps reduce poverty, supports inclusive growth and other general development outcomes, and enhances the effectiveness and sustainability of development initiatives. However, without explicit targets, and actions to ensure gender equality and equity, the needs of the marginalised and disadvantaged continue to be overlooked.

During the process of developing this NDC, gender sensitivity of the NDC adaptation and mitigation actions and targets has been ensured through the selection and prioritization processes utilized in developing this NDC (see Appendix A), and further gender mainstreaming will be done in the NDC implementation plan

## Structure of the Updated NDC

This updated NDC is an articulation of Uganda's mitigation and adaptation contributions towards the implementation (aspirations) objectives of the Paris Agreement in 2030. The updated NDC sets out targets, measures and actions which prescribe the domestic contributions aimed at achieving the objectives of the Paris Agreement. The updated NDC is structured in the following chapters:

- Chapter 1: National Circumstances – describes the context of Uganda's updated NDC, information on the country's geography; climate; population; an overview on economic situation; an assessment of the impacts and vulnerabilities; and relevant climate change policies, institutions, and regulatory frameworks.
- Chapter 2: Adaptation Component of the NDC – highlights adaptation planning, priorities, gaps, and outlines the priority adaptation actions and targets to be implemented.
- Chapter 3: Mitigation Component of the NDC – describes baseline emission projection, emissions scenarios, mitigation targets in sectors of AFOLU, Energy, Transport, Waste and Industrial Processes and Product Use (IPPU) as well as mitigation actions and measures to be implemented in contribution towards the achieving the set-out economy-wide emission reduction target.
- Chapter 4: Means of Implementation – highlights climate financing needs for implementation of the updated NDC, financing mechanism, capacity-building and technology needs.

# 1 NATIONAL CIRCUMSTANCES

## 1.1 Geography, Climate, and Emissions Profile

### Geography

Uganda is a Least Developed Country located in East Africa. It occupies an area of 241,555 square kilometres, with water bodies.

### Climate

Uganda's climate is largely tropical with most parts of the country experiencing bi-modal rainy seasons per year except for northern region and is largely influenced by Inter Tropical Convergence Zone (ITCZ) systems.

Rainfall in Uganda is experienced during two distinct periods annually: the 'short' rains from October to December and the 'long' rains from March to May. For climatological period 1991-2020, the total annual average precipitation was 1,197 mm, and mean monthly precipitation of the country varies from 39.6 mm in January to 152.7 mm in April (World Bank Group, 2021)<sup>1</sup>. Figure 1-1 below presents the observed spatial distribution of average annual precipitation and temperature.

Climate Change Country Profile for Uganda shows a statistically significant decreasing trend in the annual rainfall. This has particular significance for the large proportion of the population that are dependent on agriculture, but also in terms of impacts on water availability, fluctuating lake levels and could also impact on the production of hydropower among the several potential impacts.

The country experiences moderate temperatures ranging from 25°C – 29°C on average. Since 1950, average temperature has increased at a rate of 0.23 °C/decade. The increasing temperatures have resulted in increased trends in the frequency of hot days and nights (UNMA, 2019 State of Climate Report).

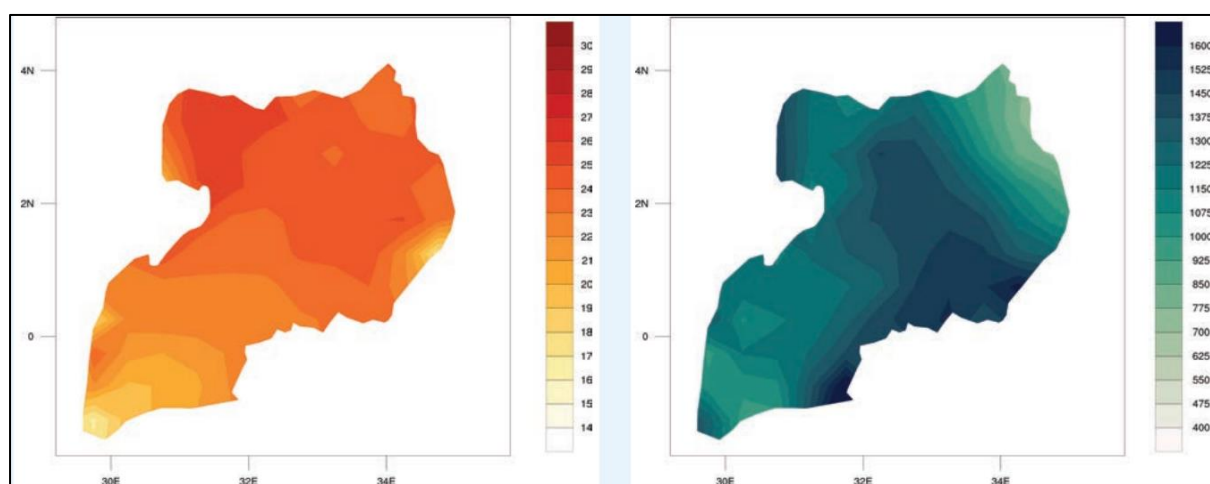


Figure 1-1: Average annual temperature (left); annual precipitation (right), 1991–2020<sup>2</sup>

<sup>1</sup> <https://climateknowledgeportal.worldbank.org/country/uganda/climate-data-historical>

<sup>2</sup> WBG Climate Change Knowledge Portal (CCKP, 2021). Uganda. URL: <https://climateknowledgeportal.worldbank.org/country/uganda>

The IPCC 6<sup>th</sup> assessment report (AR6) has noted that human-induced climate change already affects many weather and climate extremes in every region globally (IPCC, 2021). Warming trends observed in recent decades are projected to continue over the 21<sup>st</sup> century and over most land regions at a rate higher than the global average. The AR6 report also confirmed that there is a likelihood of increasing climate change risks, particularly for Africa where the increase since the previous studies was the greatest (IPCC, 2021). Figure 1-2 shows the latest scenarios for annual temperatures, precipitation and rainfall intensity for Africa.

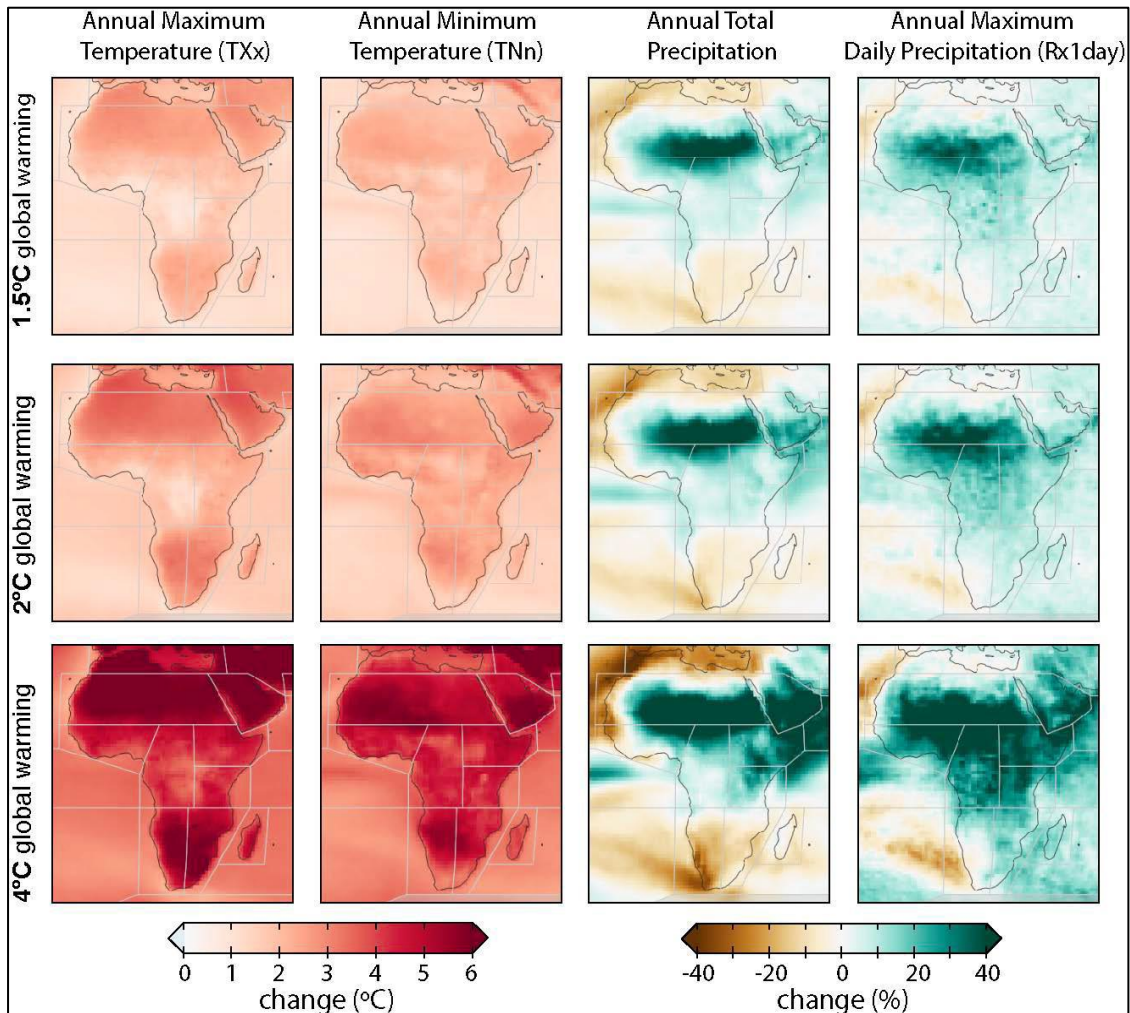


Figure 1-2: Future climate change scenarios for Africa – median impacts by 2100

Source: (IPCC, 2021)

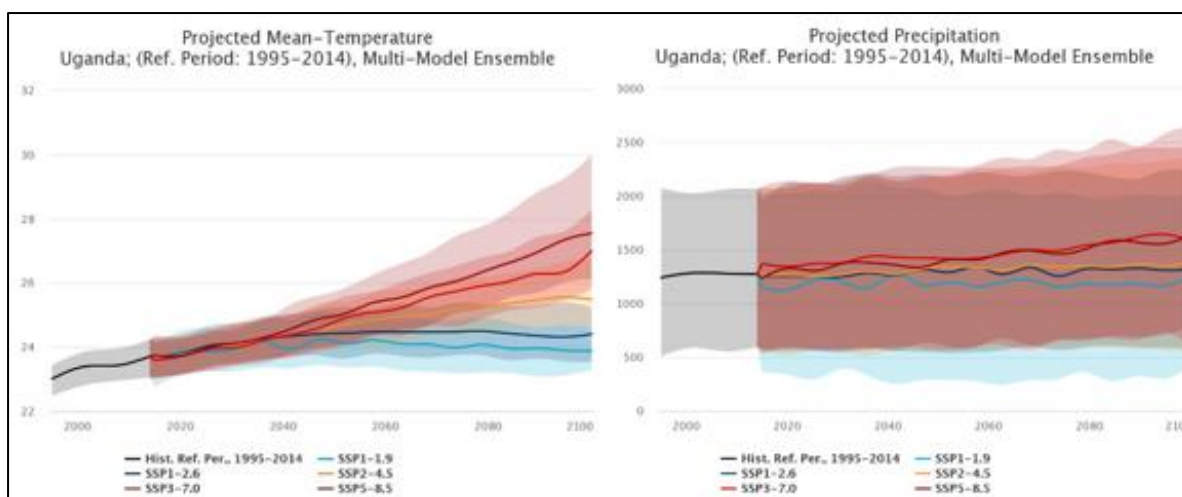


Figure 1-3: Projected Mean Temperature and Precipitation for Uganda

The projections in figure 1-3 show that both temperature and precipitation are expected to increase in Uganda. However, there is still a wide range of possible scenarios and uncertainty, particularly for rainfall. The projections illustrated in Figure 2-3 are consistent with the findings of the AR5 and are based on the CMIP6 emissions scenarios used in the IPCC AR6. In comparison to previous AR's scenarios (Representative Concentration Pathways (RCPs), the AR6 used five Shared Socioeconomic Pathways (SSPs) that provide a broader view of scenarios without future climate policy (Business As Usual), with global warming in 2100 ranging from 3.1 °C to 5.1 °C above pre-industrial levels.

Since the publication of AR5<sup>3</sup> (IPCC, 2014), the country has conducted several climate analyses. As part of the LTS formulation and NDC update process, the existing climate scenarios were reviewed and a synthesis of results is presented in Table 1.1 below.

Table 1-1: Temperature and Precipitation Projections up to 2100

Variables	2050			2100		
	RCP 2.6	RCP 4.5	RCP 8.5	RCP 2.6	RCP 4.5	RCP 8.5
Temperature anomaly	0.5 to 1 °C	1.4 to 2 °C	1.8 to 3 °C	1 to 1.5 °C	1.5 to 2.5 °C	3 to 5 °C
Rainfall	-10 mm	-10 mm	-10 mm	-10 mm	-10 mm	-20 mm

Additionally, under the Third National Communication (TNC-Uganda) climate analysis reveals that Uganda's mean temperature has been significantly changing at the rate of 0.03°C per decade, with a significant level of 99.8% for the period 1951 to 2020, 99.9% for the period 1971 to 2020, and 87.6% for the period 1991 to 2020. The minimum temperature has been increasing at a rate of 0.03 °C for the periods of 1951 to 2020 and 1971 to 2020, and 0.02°C for the period of 1991 to 2020, while the maximum temperature has increased at a rate of 0.03°C for the same periods, with a significance level of above 85%.

The annual rainfall totals have been decreasing at the rate of 10.3 mm per decade for the periods 1951 to 2020 and 1971 to 2020 with a significant level of over 95% and decreased by 3.58 mm for the period 1971 to 2020 with no significance. The spatial trend of annual rainfall

<sup>3</sup> IPCC. (2014). Climate Change 2014 Synthesis Report Fifth Assessment. . [https://ar5.syr.ipcc.ch/topic\\_summary.php#node145](https://ar5.syr.ipcc.ch/topic_summary.php#node145).



for the same period reveals that the mean annual rainfall exhibits significant increasing trends at a 95% level of confidence over most parts of the eastern, north-eastern, and patches of the south-western regions of Uganda, with decreasing trends experienced over the north-western, central west, and western parts of the country (UNMA 2020).

The mean annual temperature projections indicate an increase from 1 to 1.5°C under low, moderate, and high greenhouse gas (GHG) concentration scenarios of RCP 2.6 and RCP 4.5 for most parts of the country, while RCP 8.5 projects an increase in temperature of 1.5 to 3°C relative to the 1981-2010 average for most parts of the country.

The mean total annual rainfall, unlike temperature, does not show a similar pattern across the country, whereas in some areas, rainfall is projected to increase and in others rainfall is projected to decrease. Under RCP 2.6, much of the country's rainfall is not expected to change significantly by mid-century as compared to the 1981–2010 average, apart from the Masindi, Hoima area (mid-western Uganda), and Karamoja (north-eastern) regions, where rainfall is projected to decrease by 5 to 10% relative to the baseline.

Under RCP 4.5, no significant changes are also projected across the country, with only the South Western highlands projected to have an increase in rainfall of between 5 and 10% relative to the baseline.

In contrast, Under RCP 8.5 scenario, the mean annual rainfall by mid-century is expected to decrease by 5 to 15% in most parts of central Uganda and increase by 5 to 10% in south-western.

### **Uganda's GHG Emissions Profile**

Uganda's GHG emissions have slowly increased from 53.4 MtCO<sub>2</sub>e in 2005 to 90.1 MtCO<sub>2</sub>e in 2015 (Figure 2-4). The Land Use and Land Use Change and Forestry category was dominant, accounting for 59.5% (53.6 MtCO<sub>2</sub>e) of the total emissions. The Land sector was estimated to be a source of emissions instead of a sink. Agriculture is the second largest, contributing 26.9%, followed by energy (10.7%) and waste (2.3%). The Industrial processes and product use (IPPU) sector accounted for the least emissions.

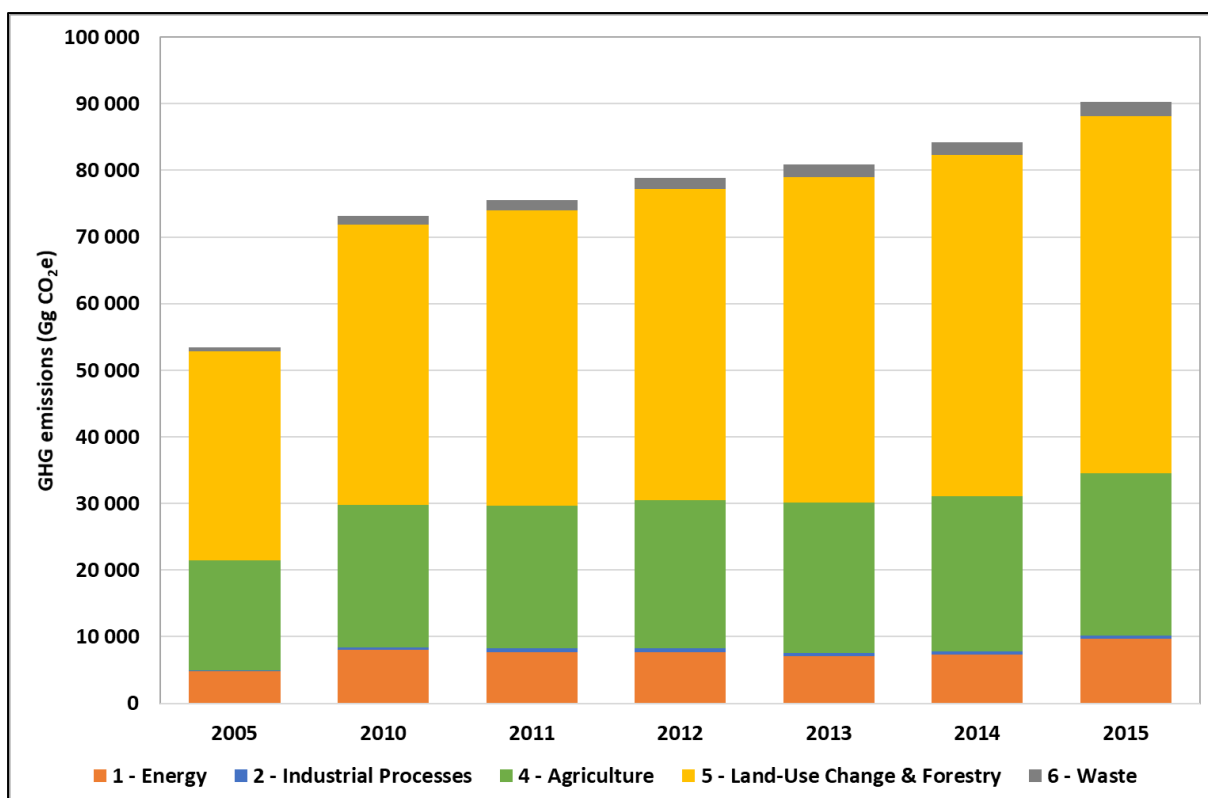


Figure 1-4: Sectoral trends in GHG emissions for Uganda

## 1.2 Socio-economic Trends

### Population

The population of Uganda has grown from 12.6 million people in 1980 to 34.6 million people in 2014. It is projected that the population will reach 57 million and 72 million in 2030 and 2040 respectively (Uganda Bureau of Statistics, 2020)<sup>4</sup>. The average annual growth rate over the last 10 years has been less than 3%. Uganda’s population pyramid has a broad base, indicating a very young population and Uganda had the second highest dependency ratio (ratio of non-working age population to working age population) in the world in 2014 (Hausmann et al., 2014)<sup>5</sup>, but this has been declining and in 2019 Uganda moved down to the seventh highest in the world. The population is evenly split between males and females.

<sup>4</sup> 11\_2020STATISTICAL\_ABSTRACT\_2020.pdf (ubos.org)

<sup>5</sup> Hausmann, R., Cunningham, B., Matovu, J.M., Osire, R. and Wyett, K., 2014. How should Uganda grow? Paper Series No. RWP14-004. Harvard Kennedy School, Harvard University.

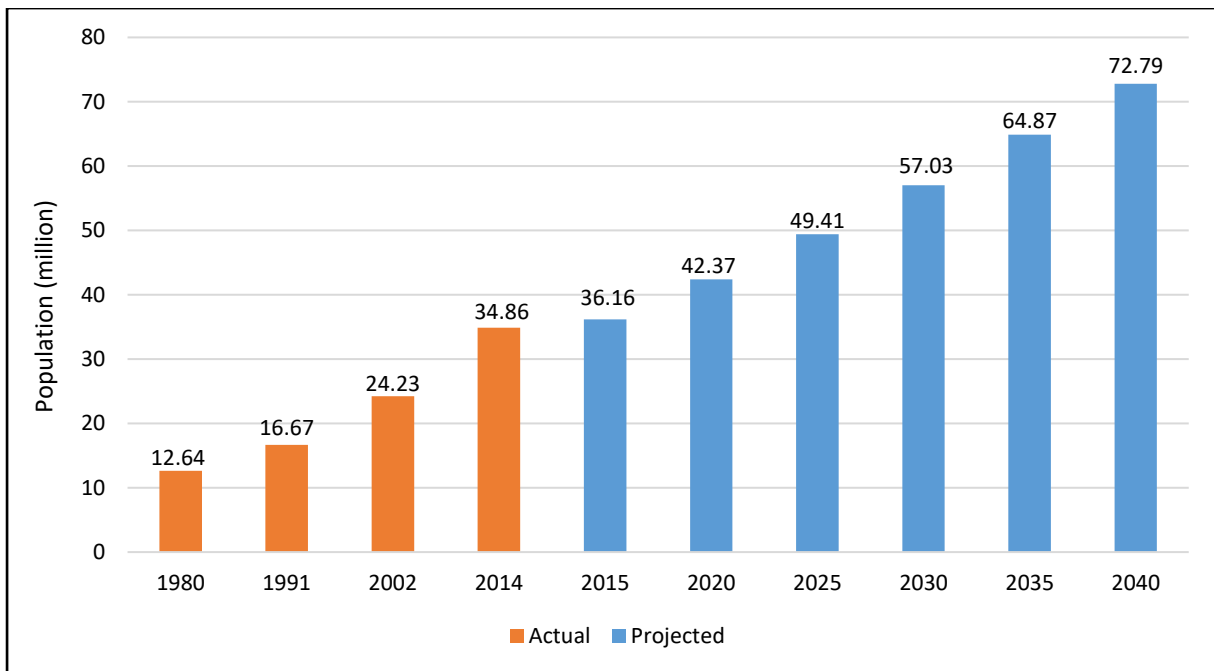


Figure 1-5: Actual and projected population in Uganda (Source: Uganda Bureau of Statistics, 2020)

The total working population was estimated at 15 million in 2016/17 with 51% of workers being female with 39% of the working population involved in subsistence agriculture. The unemployment rate was estimated at 9.2% (Uganda Bureau of Statistics, 2020).

## Urbanisation

Urbanisation has been occurring steadily in Uganda, at an estimated rate of 19%. The country has one of the highest urban population growth rates in the world (5.4%). Projections anticipate that urbanisation at the current pace would result in an urban population of more than 20 million by 2040, and 32 million by 2050. Other secondary urban areas are also beginning to attract rural migrants to the cities. Typically, secondary cities are trading and service centres, with some Agro-processing activities. Urbanisation is an opportunity to improve waste management through the installation of more centralised waste treatment centres.

Even though 65% of new jobs being created are in urban centres, urban areas have not been effective at inducing formal wage growth and job creation due to the large informal sector. Uganda has a dual economy with the informal sector contributing a significant share to the GDP (51%). The private sector is dominated by micro, small and medium enterprises, which employ about 2.5 million people. The size and strength of the informal economy creates a lot of competition, which constrains the size of the formal enterprises. The inadequate quality transport infrastructure also hinders the connection between cities and external markets.

The growing population, urbanisation, industrialisation and technology advancements have contributed to a change in the composition of waste (NPA 2017). The bio-degradable organic waste contribution has been declining, while plastic and paper waste have been increasing. In addition, the new waste profile indicates an increase in electronic waste, chemical waste, oil and gas waste and other hazardous waste. There is high solid waste generation in urban areas of approximately 0.56 kg/person/day. Urban solid waste is mainly organic (green and food waste) and accounts for 72% while plastics and paper waste accounted for 12.4% and 10.2% respectively.

## **Agriculture**

Agriculture is an important part of Uganda's economy and over 71.8% of the land area is under cultivation. Subsistence farming covers the largest portion as compared to commercial cultivation (FAO, 2016). The country's agricultural productivity trends show a mixed picture, with increasing maize, rice, millet, simsim, cassava, and sweet potato yields and decreasing cotton, coffee, and banana yields, as well as increasing cattle, sheep, goats, and poultry numbers and products, and a gradual decline in fish stocks (Situation Analysis Study for Agriculture Sector 2020). Generally, agricultural productivity is declining due to increasing soil degradation.

## **Forest**

According to Forest Resources Assessment (FRA), the forest area covers 11.66% of the total land area of Uganda and is declining due to deforestation at an annual rate of 1.44% (FRA, 2020)<sup>6</sup>. Deforestation has remained the primary cause of the decline in forest cover from 24% in 1990 to 10% in 2017. Private land forest cover has shrunk from 16% to 4% of the total national land area, while protected forests have shrunk from 8% to 6%. Outside of protected areas (PAs), forest cover declined from 67% in 1990 to 38% in 2017.

## **Water**

Uganda has a large water resource, both surface and groundwater. However, national access to safe water stood at 67% in 2020, with access in rural areas at 68% and urban areas at 70.5%. About 43% of households have only limited or no access to safe drinking water (Figure 2-6). In rural areas this is over 51%. Due to seasonal and inter annual variability in rainfall, and limited storage capacity, particularly in rural areas the availability of water for productive purposes is also limited and uncertain.

For sanitation, only 20% of population have access to basic sanitation services and 45% of the population have no hand washing facilities at home which presents a significant health risk.

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<sup>6</sup> Report 2020 Uganda Wood & Forest Resources Accounts.indd (ubos.org)

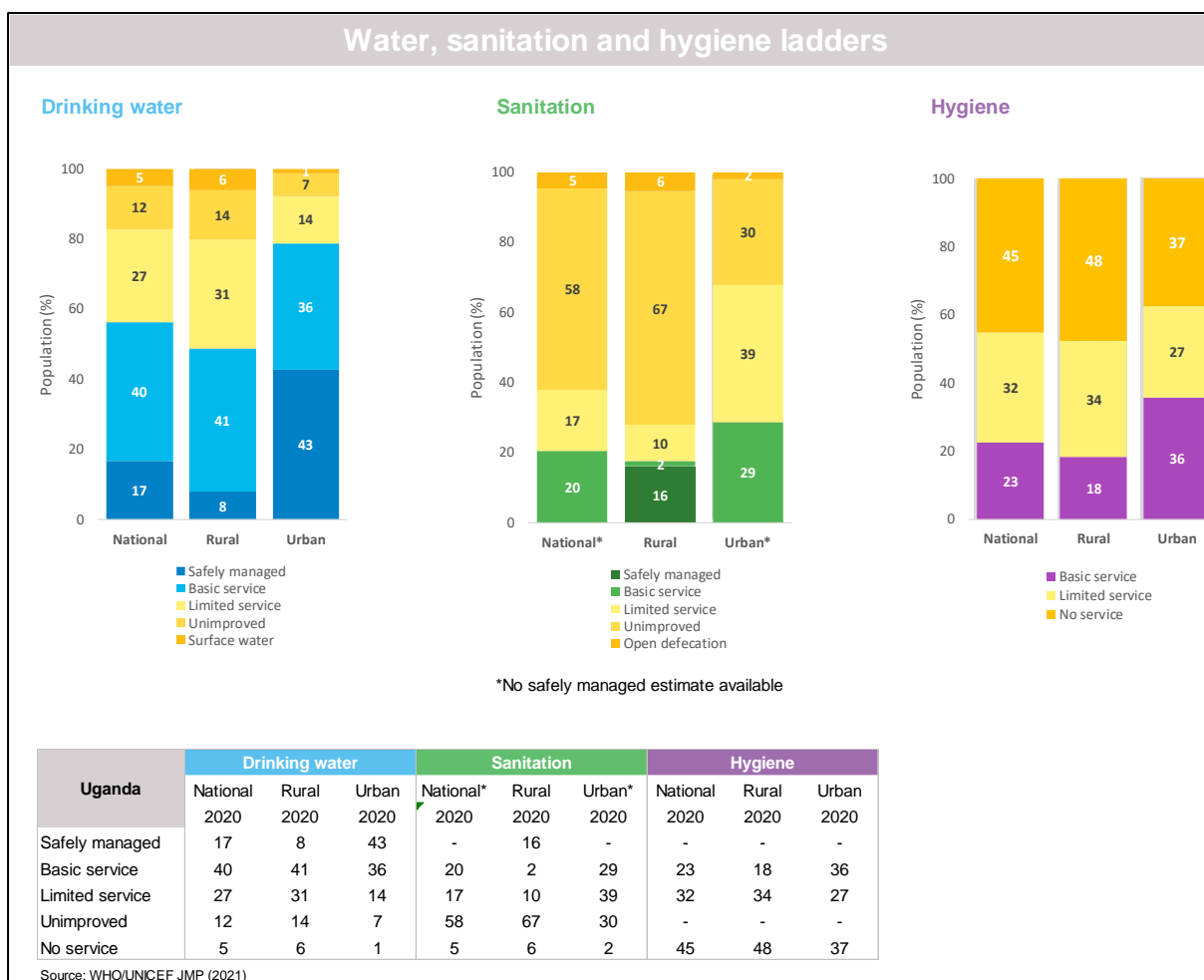


Figure 1-6: Summary of Water, Sanitation and Health data for Uganda (WHO/UNICEF JMP, 2021)

## Wetlands

Wetlands are a critical part of Uganda’s natural resources since they do not only provide wetland ecosystem services such as water supply, water treatment, flood protection, fuel, and construction materials, but also a source of employment. Wetlands are declining and degradation is increasing, with the main drivers being population explosion, expansion of land for agriculture, socio-economic pressures, and industrial development. Wetland coverage in 2020 was 8.9%, down from 10.9% in 2014.

## Energy

Uganda is a rich country in terms of energy resources which include hydropower, biomass, solar, geothermal, wind, oil and gas. However, the country’s energy potential has not been fully harnessed. To ensure a sustainable electricity supply, the country has created a conducive regulatory environment and incentives aimed at diversifying the country’s energy generation mix.

The total installed generation capacity has grown from 60 MW in 1954 to 1,267.2 MW as of 2020 (MEMD, 2020). Biomass continues to play an important part in Uganda’s economy, accounting for more than 89% of total primary consumable energy.

### **1.3 Policy, Legal and Institutional Framework**

As part of the country's commitment under the UNFCCC, Uganda has continued to develop a number of policies, strategies and plans to address climate change and its impacts as well as strengthening its legal and institutional framework.

#### **Policy Framework**

Uganda Vision 2040 is the country's ambitious long-term development blueprint. The vision recognises that climate change affects all sectors of the economy. As such, the vision provides for the integration of climate change governance into development planning. It aims to transform Uganda from a predominantly low-income country to a competitive upper middle-income country. The country has so far developed 3 consecutive National Development Plans (NDP) to implement vision 2040.

The NDP III's Program 9: Natural resources, environment, climate change, land and water management recognizes the importance of addressing climate-related disasters by promoting inclusive, climate-resilient, and low-emissions development at all levels.

Uganda developed the National Climate Change Policy in 2015 to guide efforts towards achieving Vision 2040 and moving towards low-carbon development. The policy aims to ensure that stakeholders address climate change impacts and causes through appropriate measures while promoting sustainable development and a green economy. The policy emphasizes climate change adaptation as the top priority for Uganda, given that the country's greenhouse gas emissions are still relatively very low and yet the country is experiencing climate change risks, impacts, and vulnerabilities.

Additionally, the country has developed other policies, plans and strategies that are relevant to addressing climate change challenge such as;

National Disaster Preparedness and Management Policy, 2010; National Agricultural Policy, 2013; Renewable Energy Policy, 2007; National Forestry Policy, 2001; National Irrigation Policy, 2017, National Health Policy, 2010; National Land Policy, 2013; and Uganda non-motorised transport policy, 2013 among others.

The country has also developed the following strategies:

Uganda Green Growth Development Strategy 2017/18-2030/31; Uganda National Climate Change Communication Strategy 2017-2021; the Strategic Program for Climate Resilience, 2017; the National REDD+ Strategy, and Action Plan, 2017; National Biodiversity Strategy and Action Plan II 2015 -2025; Uganda Sustainable Land Management Strategic Investment Framework (2010-2020); the Climate Smart Agriculture. Program (2015 – 2025).

Among the plans, Uganda developed the Forest Investment Plan, 2017 and the National Adaptation Plan for Agriculture, 2018; and Uganda NDC Partnership Plan, 2018 among others.

#### **National Climate Change Act, 2021**

Uganda developed and enacted the National Climate Change Act 2021 to give force of law to the UNFCCC, the Kyoto Protocol and the Paris Agreement. The Act provides for climate change mechanisms, including compliance, emissions trading mechanisms, as well as measurement of greenhouse gas emissions reductions and removal. The Act provides for the

national reference level, which includes the national base year and targets for the reduction of GHG emissions to be prescribed by the Minister responsible for climate change in consultation with the policy committee.

The Act also provides for climate change financing as well as incentives for those involved in implementing response measures for climate change adaptation and mitigation.

### **Institutional Framework**

Uganda has put in place institutional arrangements for coordination, supervision, regulation, and management of all activities related to climate change. The Ministry of Water and Environment, Climate Change Department is the mandated institution for coordination, monitoring, and evaluation of national programs and actions on climate change and ensures that the country meets its obligations and realizes benefits under the Convention, the Kyoto Protocol, and the Paris Agreement.

The National Climate Change Act, 2021 provides for other institutions, which include: The Policy Committee on Environment, mandated with the role of advising the department and lead agencies on implementation of the Act and the National Climate Change Policy; the National Climate Change Advisory Committee, mandated with the responsibility of providing independent technical advice to the policy committee on environment and the minister. The Act also stipulates the responsibilities of the Lead Agencies, the District Natural Resources Department, and District Committees responsible for climate change, as well as lower local government committees responsible for climate change.

## **1.4 The NDC Update Process**

Uganda undertook the process of updating its first NDC in pursuance of paragraph 24 of Decision 1/CP.21 to update the NDC by 2020. In April 2019, Uganda launched the update process under the leadership of the Ministry of Water and Environment/Climate Change Department with support from the Climate Action Enhancement Package (CAEP) of the NDC Partnership implemented by partners: UNDP; GIZ; IRENA; UNEP; Red Cross Red Crescent Climate Centre, IUCN and ICLEI Africa.

The update process was informed by a stocktake of NDC implementation that highlighted the performance of the first NDC and emerging issues, which included unclear methodological approaches for estimating and accounting for GHG emissions and lack of adaptation and mitigation sectoral targets, among others. The NDC update process involved: broadening the scope of sectors of the first NDC; defining adaptation targets, vulnerability index, and resilience indicators; updating quantified mitigation targets in the context of progression and ambition; development of sectoral emission targets; and improving methods, data, and information quality. Uganda used a set of tools to project its GHG emission trajectory, taking into account the country's vision 2040, which included the Low Emission Analysis Platform (LEAP), Global Livestock Environmental Assessment Model (GLEAM) and Excel models based on methodological assumptions and data in the FBUR for Uganda.

The NDC update process undertook a whole -of -government engagement and whole of society approach involving youth, women, the private sector, and civil society. Updating was conducted simultaneously with the development of the Long-Term Low Emissions Development Strategy (LTS), benefitting from joint modelling, assessments, progressive reviews, and stakeholder consultation for proper alignment. The updated NDC actions and measures were subjected to a multi-criteria analysis and a detailed gender analysis.

## **2 ADAPTATION COMPONENT OF THE UPDATED NDC**

### **2.1 Introduction**

Climate risks pose serious threats to Uganda's key economic sectors, such as agriculture, water resources, fisheries, tourism, and health, which are dependent and sensitive to climate variability and change. Climate change has severe direct and indirect impacts on the ecosystems, livelihoods, and economic development in Uganda.

The National Risk and Vulnerability Atlas of Uganda identifies droughts, floods, landslides, windstorms, hailstorms, lightning, as the major climate-induced hazards.

#### **Adaptation Planning in Uganda**

Uganda is gradually improving adaptation readiness and actions to address the impacts of climate change. In 2007, a National Adaptation Program of Actions (NAPA) was developed and submitted to the UNFCCC, which identified the urgent and immediate actions to respond to climate change.

As part of the adaptation planning processes, in 2016, Uganda communicated her first NDC with an adaptation component; in 2017, Strategic Program for Climate Resilience (SPCR) was developed; in 2018, formulated a National Adaptation Plan for the Agriculture Sector (NAP Ag) and in 2021, initiated a process for the preparation of an Adaptation Communication.

Uganda is moving towards medium-to-long-term planning for adaptation. Since 2021, the country has initiated the formulation of the National Adaptation Plan (NAP) to strengthen adaptation planning, governance, and coordination; develop tools for adaptation planning; and secure finance for adaptation. The country has established a National Adaptation Technical Working Group to guide and support the NAP process and overall adaptation planning.

However, Uganda's adaptation effort faces several challenges, including but not limited to inadequate local level climate adaptation financing, inadequate individual and institutional capacity, limited access to international climate finance, and support for technology and capacity-building.

#### **Overview of Climate Risks and Vulnerability**

As part of the NDC update process, Uganda conducted a comprehensive climate change risk and vulnerability assessment. Uganda's climate is highly variable and changing, according to the assessment, and the country is rated highly vulnerable, with a high degree of exposure, sensitivity, and low adaptive capacity. The vulnerability and risk assessment ratings are presented in the table 2-1.



Table 2-1: Results from the vulnerability and risk assessment, by sector

Sector	Vulnerability Rating	Risk Rating
Agriculture (crop and livestock)	4.07	4.18
Built Infrastructure	3.27	3.83
Business	3.75	4.00
Energy (Excluding transport)	3.40	3.40
Fisheries	3.00	4.00
Forestry	3.25	4.25
Health	3.67	3.33
Manufacturing	3.00	3.00
Mining and Quarrying	3.00	4.00
Transport	3.20	3.80
Water	4.63	4.75
Ecosystems	5.00	5.00

The vulnerability and risk scores were provided as 1= (least vulnerable, less risk) to 5= (most vulnerable, high risk).

Climate change is impacting and is projected to impact physical infrastructure, food security, water resources, agriculture, energy, health, and ecosystems. An assessment of the economic impacts of climate change in Uganda indicated that adaptation inaction could result in annual costs rising in the range of USD 3.2–5.9 billion within a decade. Even if there were no further increases in climate impacts, the cost of inaction would rise over time because of other factors such as increase in population.

### Priority Sectors for Adaptation.

The vulnerability and risk assessment indicated that the priority sectors for adaptation in Uganda remain ecosystems, water, agriculture, and forestry. These were also identified as priority sectors in the initial NDC. However, there is significant risk in other sectors, particularly the Fisheries sub-sector, Manufacturing and Mining, the Cities and Built environment, Transport, and Health. With a high dependency on hydropower, the Energy sector is also at risk due to climate variability and change in rainfall and water availability.

For all sectors, a significant cross-cutting issue remains the disaster risk sector, which has also been identified as a priority area for adaptation globally.

Table 2-2 Compares the priority sectors for adaptation in the initial NDC to the priority sectors for adaptation in the updated NDC.

Table 2-2: Updated Priority Sectors for Adaptation

Priority Adaptation Sectors in the initial NDC	Priority Adaptation Sectors in the Updated NDC
Agriculture	Environment and Ecosystems
Forestry	Water and Sanitation
Water	Agriculture
Infrastructure	Forestry
Energy	Fisheries
Health	Energy
Risk Management	Transport
	Manufacturing, Industrial Processes and Mining
	Cities and the Built Environment
	Tourism
	Education
	Health
	Disaster Risk Reduction

As part of the LTS formulation and NDC update process, thirteen (13) pillars were identified to transform Uganda into a climate- resilient and low-carbon society by 2050 that is prosperous and inclusive”. The strategic pillars include:

1. Promote climate-resilient and low-carbon agricultural development
2. Promote and apply land management practices that support sustainable and productive use
3. Promote climate-resilient water supply systems, increase water supply capacity and use efficiency.
4. Promote sustainable management of ecosystems and the use of nature-based solutions, including through community engagement
5. Strengthen climate information services through improved data collection and sharing infrastructure
6. Develop and promote a clean and resilient energy system
7. Promote climate resilient and low-carbon urban planning and development
8. Increase availability and promote access to finance for climate-resilience, low-carbon investments and climate impacts recovery
9. Promote education and training on climate change science, and sharing of indigenous knowledge
10. Mainstream and institutionalize climate change responses in policies, plans, programmes and budgets at all levels of governance
11. Promote a multimodal shift to low carbon mobility and create climate-resilient transport infrastructure to support economic growth
12. Promote a resource-efficient circular economy
13. Further develop a resilient and “fit for future” health systems

## 2.2 Priority Adaptation Actions and Targets

In this updated NDC, Uganda maintains adaptation as the priority response measure to addressing climate change. In this context, the country will continue to address adaptation in key vulnerable sectors and build adaptive capacity at all levels, address loss and damage, and increase resilience at the grassroots level.

Additionally, while in the initial NDC, priority adaptation actions lacked specific targets, in this updated NDC, adaptation interventions and actions have been assigned sectoral indicators and targets drawn from NDP III and other relevant policies and strategies, for example, energy, transport, cities, lands, water, and environmental sectors, as well as other related plans, such as the national adaptation plan for agriculture, the budget framework paper for the financial year 2022/23 to 2026/27 and alignment to the Long Term Climate Strategy (LTS).

Table 2-3: Priority Adaptation Actions for Ecosystems Sector

Sector: Ecosystems						
Outcome: Enhanced ecosystems resilience						
Sub-sector	Priority actions	Indicator	Baseline	2025 Target	2030 Target	Target alignment
Wetlands, peatlands riverbanks and lakeshores	Enhance wetlands management and restore peatlands, riverbanks and lake shores	Wetlands coverage	8.9%	9.57%	12%	NDP III
		Area of wetlands restored (ha)	16,906	55,906	70,000	NDPIII_NRE CCLWM PIAP,GCF Wetlands Project
		KM of wetland boundaries demarcated	700	4,100	TBD	NDPIII_NRE CCLWM PIAP
		Area of Peatlands restored (ha)	TBD	TBD	TBD	
		Area degraded riverbanks and lakeshores restored and maintained (ha)	200	1,550	TBD	BFP
Mountain ecosystems	Protect and restore mountain ecosystem	Area of degraded hilly and mountainous areas restored (ha)	1,250	7,500	10,0000	NDPIII_NRE CCLWM PIAP, Sustainable Mountain Development Strategy for Uganda 2016
Rangelands	Protect manage and restore rangeland	Level of implementation (%) of the Rangeland Management and Pastoralist Policy	0%	TBD	TBD	SLM Strategic Investment Framework

Biodiversity	Enhance biodiversity conservation and management	Level of implementation of climate actions in National Biodiversity Strategy and Action Plan II & III	TBD	TBD	TBD	NBSAP II
		Share of biodiversity contribution to national wealth	TBD	TBD	TBD	NBSAP II
		No. of people benefiting from Ecosystem-Based Adaptation (EbA) interventions/ projects.	TBD	TBD	TBD	NBSAP II

Table 2-4: Priority Adaptation Actions for Water and Sanitation Sector

Sector: Water and Sanitation						
Outcome: A climate-resilient water and sanitation sector						
Sub-sector	Priority Adaptation Actions	Indicator	Baseline	2025 Target	2030 Target	Target alignment
	Ensure resilient access to water supply for domestic and productive purposes.	National (rural) water supply	68%	76%	100%	WESIP
		National (urban) water supply	71%	90%	100%	WESIP
		No of Solar/wind powered water supply systems constructed	70	320	620	NDPIII Gender and Equity Commitment for NRECCLWM
	Promote sustainable water harvesting and storage	Water for Production storage capacity	42 MCM	62 MCM	TBD	BFP 2022/23 -25/26
		Rain Water harvesting tanks	TBD	TBD	TBD	Technology Actions Plan for Adaptation (TAP)
	Increase to sanitation and wastewater treatment	Population with access to basic sanitation	18%	25%	68%	BFP 2022/23 -25/23
		Population with handwashing facilities	36%	50%	TBD	NDPIII

	infrastructure and services	Sewer service coverage	23%	31%		Annual Report 2020-NWSC
	Scale-up Integrated Water Resources Management approach and use efficiency	Compliance with national water standards	61%	70%	80%	SPR and WESIP
		Water permit compliance	Abstraction (surface) 78%	82%	86%	NDPIII_PIAP
			Abstraction (ground water) 76%	81%	86%	NDPIII_PIAP
		Ambient water quality	0	8%	16%	WESIP
		Catchment management plans developed and implemented	17	21	23	NDPIII_PIAP, SDG 6.5 report
		Level of compliance of Catchment Management Plans (CMPs) to climate change adaptation	0	74	100	Constructed

Table 2-5: Priority Adaptation Actions for Transport Sector

Sector: Transport						
Outcome: A climate-resilient transport sector						
Sub-sector	Priority Adaptation actions	Indicator	Baseline	2025 Target	2030 Target	Target alignment
	Build climate-resilient roads, bridges, water, and Rail transport infrastructure systems.	Paved National Roads (Kms)	4 971	7 600	TBD	BFP 2022/23 – 26/27
		Paved urban roads (Kms)	1 253	1848	TBD	BFP
		Permanent way /railway road (Kms)	262	482	TBD	BFP
	Revise design codes, regulations and guidelines to climate proof strategic transport infrastructure	Proportional of national road reserves with green infrastructure and vegetative reinforcement	1%	30%	50%	Estimated, Annual Report 2019/20 - UNRA
		No. of revised transport regulations, guidelines and design codes integrating climate risks	TBD	TBD	TBD	

Table 2-6: Priority Adaptation Actions for Energy Sector

Sector: Energy						
Outcome: A climate-resilient energy sector						
Sub-sector	Priority Adaptation actions	Indicator	Baseline	2025 Target	2030 Target	Target alignment
	Improve access and utilization of electricity from sustainable sources.	Proportion of the population with access to electricity	24% in 2020	60%	75%	NDPIII
		Per capita electricity consumption	100 kWh in 2020	145 kWh	578 kWh	NDPIII
		Transmission capacity (in km of high voltage 7 transmission lines)	2,354 km in 2019	4,354 km	6,300 km	NDPIII
	Promote use of renewable energy sources and energy efficient technologies	Electricity generation capacity	1,276.2 MW	3,500 MW	4,200 MW	NDP III,
	Increase access to clean energy cooking technologies	Increased share of clean energy for cooking	15%	50%	65%	NDPIII
		Share of biomass energy used for cooking	88%	50%	40%	NDP III
		Proportion of households and institutions using efficient cooking technologies	1%	10%	TBD	
	Rehabilitate and climate proof electricity transmission infrastructure	Access to electricity	28%	60%	75%	BFP, NDP III
		High voltage transmission lines	2,354 km	4,354 km	TBD	NDP III
		Renewable off-grid energy solutions	10,000 km of (medium voltage networks) 15,000 km of (low voltage network)	TBD	TBD	BFP

Table 2-7: Priority Adaptation Actions for Agriculture Sector

Sector : Agriculture						
Outcome: A climate resilient and sustainable agricultural sector.						
Sub-sector	Priority adaptation actions	Indicator	Baseline	2025 Target	2030 Target	Target alignment
Crop.  Outcome: <i>climate resilient cropping systems and value chains</i>	Scaling up climate smart agriculture including agro-ecology	Proportion of farmers practicing sustainable land management practices (%)	31.7	51.2	70.7 (Est.)	NAP, Budget Framework Paper
	Strengthen water harvesting and irrigation farming	Area under irrigation (ha)	19,776	28,934	152,622 (Est.)	NAP
	Promote development of climate resilient crop varieties (crop-diversification)	TBD				NAP
	Expand post-harvest handling, storage, value addition and marketing	Share of post-harvest losses (%)	37	12	3 (Est.)	NAP, Budget Framework paper
Livestock Outcome: <i>climate resilient livestock production systems and value chains strengthened</i>	Promote highly adaptive and productive livestock breeds	TBD	TBD	TBD		NAP
	Promote agricultural (livestock) diversification	TBD	TBD	TBD		NAP

Table 2-8: Priority Adaptation Actions for Fisheries Sector

Sector: Fisheries						
Outcome: Increased- resilient Fisheries sector						
Sub-sector	Priority adaptation actions	Indicator	Baseline	2025 Target	2030 Target	Target alignment
Fisheries	Promote climate resilient capture fisheries	Volume of fish stock (tonnes/yr)	567,000	1,200,000	1,700,000	Fisheries Bill
	Promote ecosystem approach to aquaculture management	TBD	TBD	TBD	TBD	

Table 2-9: Priority Adaptation Actions for Forestry Sector

Sector: Forestry						
Outcome: Increased Forest Cover						
Sub-sector	Priority adaptation actions	Indicator	Baseline	2025 Target	2030 Target	Target alignment
	Promote afforestation and reforestation to reduce vulnerability of people and ecosystems	Area under planted forests	107,608	307,000	407,608	SPGS, National Budget Framework paper FIP
	Encourage agroforestry to enhance nutrient cycling and integrated pest management	Area under agroforestry landscape (ha)	TBD	TBD	1.3 million	Aichi Biodiversity target 15
	Encourage sustainable forest management to enhance forest ecosystem function	Forest landscape restored (ha)	TBD	200,000	2.5 million	Bonn challenge
	Promote use of non-timber forest products (NTFPs) to diversify livelihoods and improve resilience of communities	No. of people using NTFP	TBD	TBD	TBD	Forestry policy of 2001



Table 2-10: Priority Adaptation Actions for Disaster Risk Reduction

Sector: Disaster Risk Reduction						
Outcome: Reduced disaster risk and losses						
Sub-sector	Priority adaptation actions	Indicator	Baseline	2025 Target	2030 Target	Target alignment
	Incorporate climate and disaster risk reduction in planning, budgeting and reporting	Proportion of LGs with climate action plans (%)	0	10	50	National Budget Framework paper
	Expand climate information	Accuracy of meteorological information (%)	70	90	TBD	Budget Framework paper
	Build effective early warning systems	Automation of Weather and Climate Network (%)	62	82	TBD	Budget Framework paper
	Promote local, indigenous and traditional knowledge (ITK) and practices in disaster risk reduction	Application of ITK in DRR (%)	TBD	TBD	TBD	
	Strengthen policy linkage and actions on climate change, migration and disaster risk reduction	Policy coherence and synergies on disaster risk management policy, national climate policy and migration policy	TBD	30%	50%	

Table 2-11: Priority Adaptation Actions for Cities and Built Environment

Sector: Cities and Built Environment						
Outcome: Climate resilient cities and urban areas						
Sub-sector	Priority Adaptation actions	Indicator	Baseline	2025 Target	2030 Target	Target alignment
	Promote sustainable urbanization and housing.	Proportion of urban dwellers living in slums and informal settlements	58%	40%	TBD	NDP III
		Decreased urban unemployment rate ( percent)	13.5%	9.4%	TBD	NDP III
		Length of drainage channels constructed/improved in GKMA	9 km	30 km	65 km	KCCA Climate Change Strategy and Kampala Drainage Master Plan
		No. of people benefiting from social safe net	TBD	TBD	TBD	
		Level of compliance to building codes and standard for climate resilience	TBD	TBD	TBD	
	Expand and maintain cities with greenbelts	Proportion of preserved areas/parks in relation to total urban land area	3%	25%	TBD	BFP 2022
	Promote efficient mobility in cities	Increased urban paved roads	1,348 Km	7,740 Km	TBD	NDP III
		KM of NMT (cycle/Pedestrian) lane length constructed (GKMA)	1.95 km	25 km	TBD	KCCA Climate Change Strategy
	Improve solid waste management	No. of municipalities/ cities with sustainable waste management facilities	10	23	TBD	BFP 2022
		Efficiency of solid waste collection	33.2%	50.1%	70%	NDP III

Table 2-12: Priority Adaptation Actions for Health Sector

Sector: Health						
Outcome: Sustainable resilient health sector						
Sub-sector	Priority Adaptation actions	Indicator	Baseline	2025 Target	2030 Target	Target alignment
	Integrate climate considerations into national health plans and strategies	No. of climate risk and vulnerability assessments conducted for health sector	0	1	2	NCCA 2021
		No of district climate health profiles developed	0	10	30	
		Health National Adaptation Plan (NAP) developed	0	1	1	
	Improve early warning, surveillance and response system for climate sensitive health hazards	Level of linkage between the emergency medical call system with the National Disaster response call system	0	50%	100%	BFP 2022
	Strengthen climate resilience of health infrastructure and system	No. of transformed National and Regional Referral Hospitals (Climate smart hospitals)	0	2	7	BFP
	Implement integrated health related climate interventions considering policies on water and sanitation, education, social protection and reproductive health care.	Level of implementation of Health NAP	0	30%	50%	

Table 2-13: Priority Adaptation Actions for Manufacturing, Industrial Processing and Mining

<b>Sector: Manufacturing, Industrial Processes and Mining</b>						
<b>Outcome:</b> A Climate resilient Manufacturing, Industry and Mining sector						
<b>Sub-sector</b>	<b>Priority Adaptation actions</b>	<b>Indicator</b>	<b>Baseline</b>	<b>2025 Target</b>	<b>2030 Target</b>	<b>Target alignment</b>
	Scale-up adoption of resource-efficient technologies	Level of implementation of Technology Action Plan for Adaptation	TBD	TBD	TBD	TNA report 2021. Industrial Policy 2020
	Build capacity in research and Innovation	No. of incubators established and operationalized	2	8	TBD	BFP
	Promote circular economy	No. of micro-, small and medium-sized enterprises that have adopted the 6 Rs: Renew, Rethink, Reduce, Reuse, Recycle and Recover	TBD	TBD	TBD	Green Manufacturing Strategy

Table 2-14: Priority Adaptation Actions for Education Sector

<b>Sector: Education</b>						
<b>Outcome:</b> Informed citizens to address climate change						
<b>Sub-sector</b>	<b>Priority actions</b>	<b>Indicator</b>	<b>Baseline</b>	<b>2025 Target</b>	<b>2030 Target</b>	<b>Target alignment</b>
	Integrate climate change education into the national curriculum (primary, secondary and higher institutions of learning)	Level of integration of climate change in the national curriculum	TBD	20%	60%	Uganda National Climate Change Learning Strategy and Action Plan
	Improve education and awareness raising on climate change	No. of people trained on climate change disaggregated by gender	650,000 (30% female)	4 m (40% female)	11 m (49% female)	Uganda National Climate Change Learning Strategy and Action Plan
	Develop Knowledge systems for scaling up adaptation	No. of knowledge systems integrating local, indigenous and traditional knowledge and practices	0	2	6	

Table 2-15: Priority Adaptation Actions for Tourism Sector

Sector: Tourism						
Outcome: A transformed green and resilient Tourism sector						
Sub-sector	Priority actions	Indicator	Baseline	2025 Target	2030 Target	Target alignment
	Integrate climate considerations into national tourism sector plans and strategies	No. of climate risk and vulnerability assessments conducted for tourism sector	0	1	2	NCCA 2021
	Promote natural and cultural/heritage conservation.	Proportion of cultural/heritage sites accorded protected areas	TBD	TBD	TBD	Uganda National Commission for UNESCO Strategic Plan
		Share of national budget allocated for protection and conservation of natural and heritage sites	TBD	TBD	TBD	Uganda National Commission for UNESCO Strategic Plan
	Establish and protect existing wildlife corridors to strengthen the resilience of wildlife against climate risks and hazards.	Km of wildlife corridor rehabilitated	TBD	TBD	TBD	UWA Strategic Plan
		No. of water harvesting and storage facilities constructed for drought adaptation in critical conservation areas.	TBD	TBD	TBD	UWA Strategic Plan

### 3 MITIGATION COMPONENT OF THE UPDATED NDC

#### 3.1 Economy-wide Contribution

Uganda’s greenhouse gas (GHG) emissions are projected to increase from 90.1 MtCO<sub>2</sub>e in 2015 to 148.8 MtCO<sub>2</sub>e in 2030 and 235.7 MtCO<sub>2</sub>e by 2050 under the BAU Scenario. This is illustrated in figure 3-1 below.

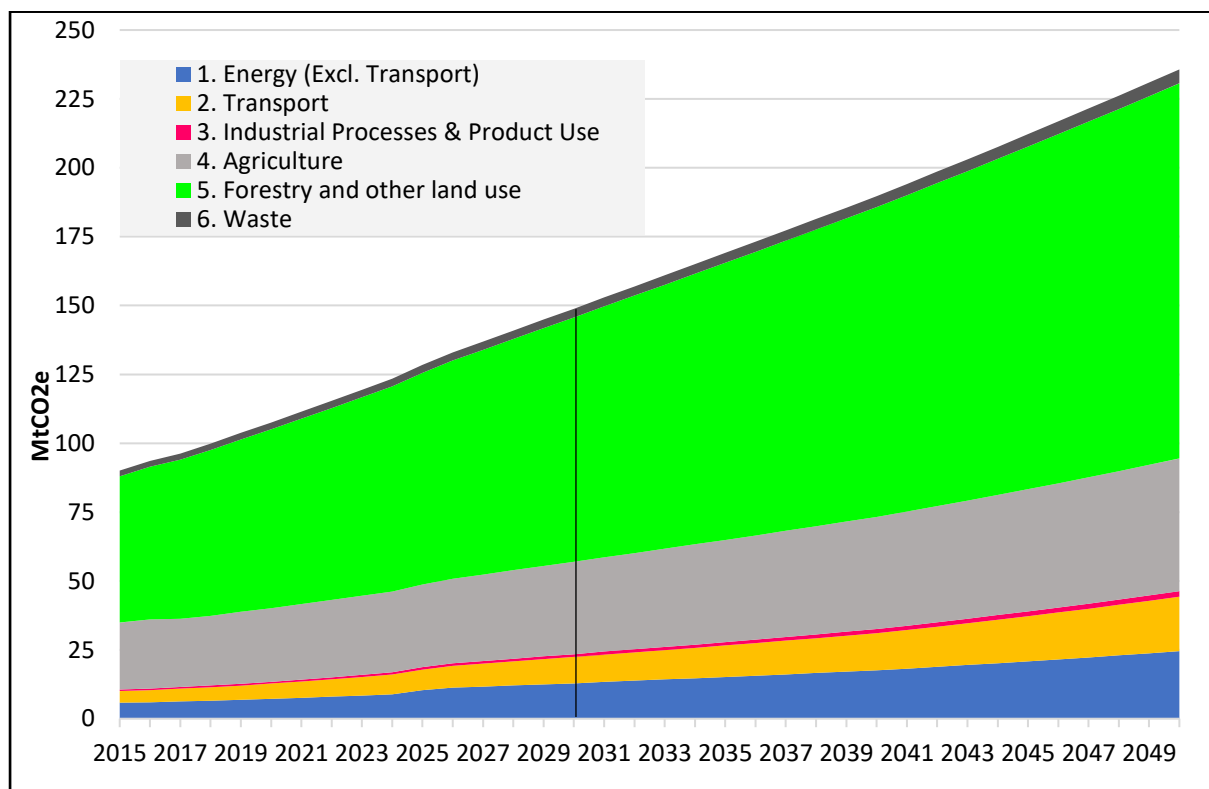


Figure 3-1: Uganda's BAU GHG emissions trajectory

To mitigate these GHG emissions, Uganda intends to implement a suite of circular economy mitigation actions in the sectors and sub-sectors presented in the table 3-1 below.

Table 3-1: Sectoral coverage of the mitigation component of the NDC

Sector	Sub-Sector	Updated NDC	Initial NDC
Energy	Electricity generation	Yes	Yes
	Transport	Yes	No (included as additional actions)
	Other energy	Yes	No
AFOLU	Agriculture	Yes	Yes
	Forestry	Yes	Yes
	Land Use	Yes	Yes
	Wetlands and Peatlands	Yes	Yes (except peatlands)
Waste	Solid waste	Yes	No
	Wastewater	Yes	No
IPPU	Mineral industry	Yes	No
	Product use	Yes	No

As shown in the table 3-1, two new sectors (Waste and IPPU) and six new sub-sectors (transport, other energy, Solid waste, Wastewater, mineral industry and product use) have been included to contribute to Uganda's NDC target in this updated NDC. This is a result of sector prioritization that was done through a metabolic assessment.

Based on the availability of financial, capacity building and technology support, Uganda will contribute conditionally and unconditionally to the global mitigation target as indicated in table 3-2 below.

Table 3-2: Uganda's Conditional and Unconditional Mitigation Contribution

Description	Unconditional	Conditional	Full Economy wide
Emissions reduction in 2030	8.78 MtCO <sub>2</sub> e	27.97 MtCO <sub>2</sub> e	36.75 MtCO <sub>2</sub> e
% Contribution / reduction in 2030	5.9% of BAU	18.8% of BAU	24.7% of BAU

When all the planned and intended mitigation policies and measures have been implemented (both unconditional and conditional), it is envisaged that Uganda's net emissions will be reduced by 24.7% below the BAU level of 148.80 MtCO<sub>2</sub>e in 2030 totalling an absolute reduction of 36.75 MtCO<sub>2</sub>e in that year (See figure 3-2).

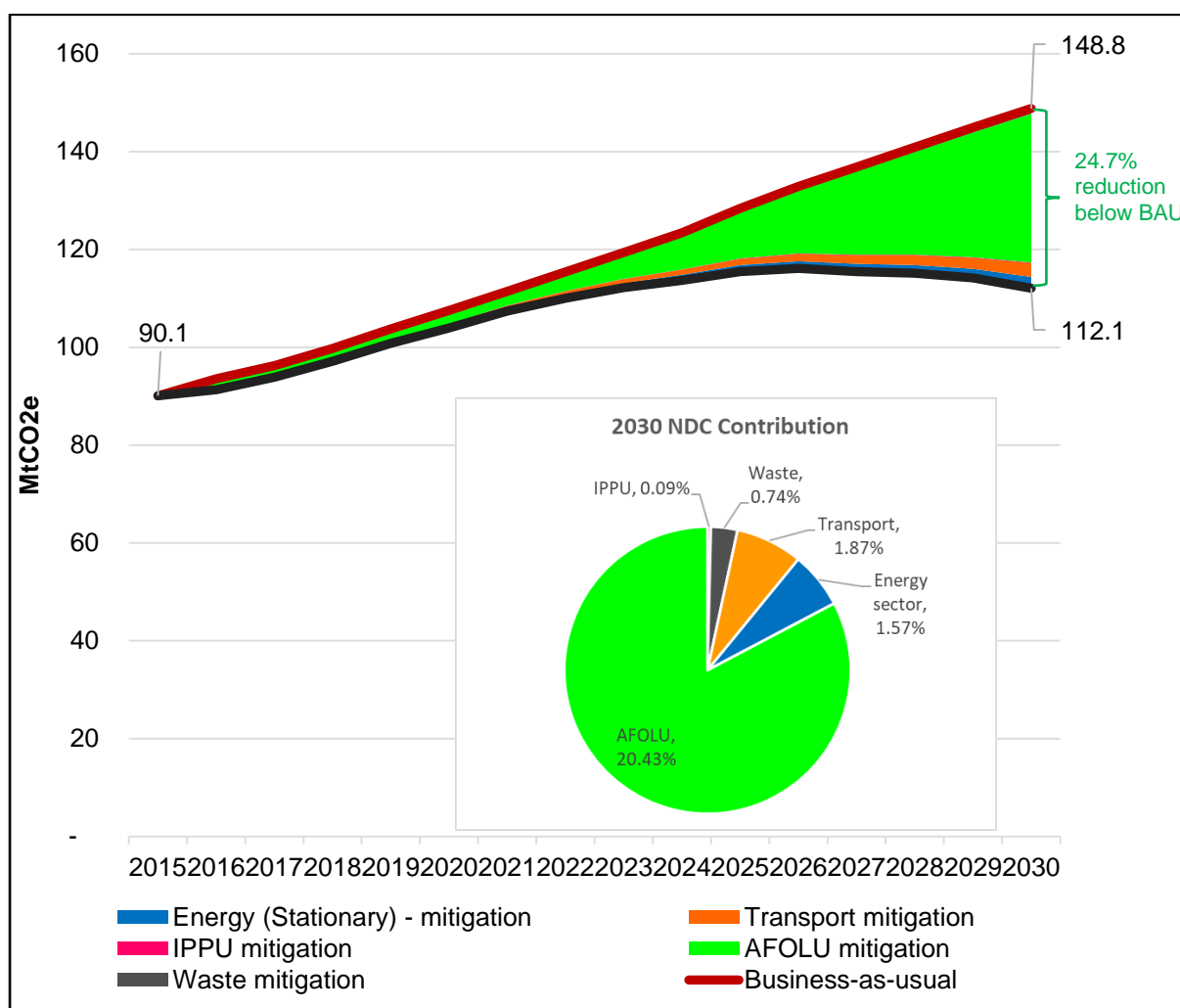


Figure 3-2: Illustration of Uganda's economy-wide mitigation contribution

In consistency with the 2015 NDC, which highlighted the 22% reduction below BAU largely from AFOLU, in the updated NDC, AFOLU accounts for 20.43% reduction and the energy sector 1.57% reduction, while the newly added sub-sectors will contribute an additional 2.7% reduction from BAU (1.87% from transport, 0.74% from waste, and 0.09% from IPPU).

Table 3-3 below presents the absolute mitigation contribution of each sector towards the full economy wide target.

Table 3-3: Mitigation potential of the priority mitigation policies and measures

Priority Mitigation Sector	2030 Mitigation Contribution (MtCO <sub>2e</sub> )
Agriculture, Forestry and Land Use Sector	30.4 MtCO <sub>2e</sub>
Energy Sector (Excl. Transport)	2.34 MtCO <sub>2e</sub>
Transport Sector	2.78 MtCO <sub>2e</sub>
Waste Sector	1.10 MtCO <sub>2e</sub>
Industrial Processes and Product Use Sector	0.14 MtCO <sub>2e</sub>
<b>TOTAL</b>	<b>36.76 MtCO<sub>2e</sub></b>

If, as a result of inadequate financial, capacity-building and technology transfer support, it is envisaged that Uganda’s unconditional efforts will result into net emissions reductions of 5.9% below the BAU trajectory in 2030.

Figure 3-3 below presents and compares the net GHG emission targets for Uganda’s unconditional and full economy wide NDC targets.

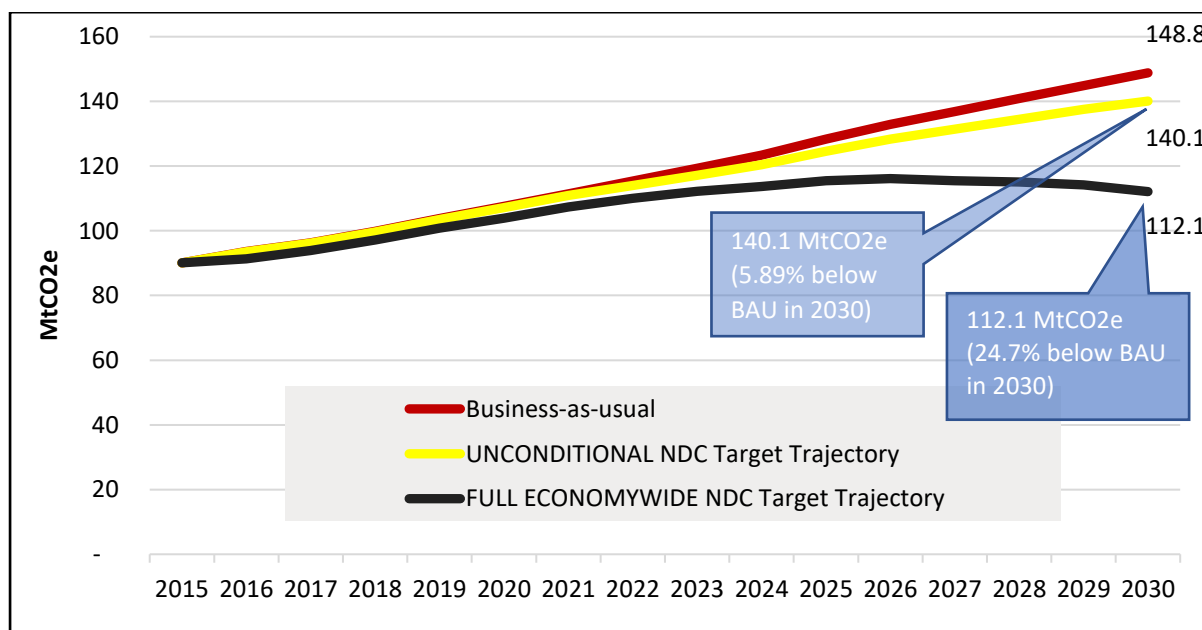


Figure 3-3: Comparison of Full Economy Wide and Unconditional NDC Targets



## 3.2 Priority Mitigation Measures and Targets

In this updated NDC, Uganda intends to implement a number of prioritised mitigation policies and measures across electricity generation, transport, energy, agriculture, forestry and other land uses, wetlands and peatlands, solid waste, wastewater, mineral, and industrial processes and product use.

## 3.3 Agriculture, Forestry and Other Land Use (AFOLU) Sector

AFOLU sector is the greatest contributor to Uganda’s GHG emissions, especially due to deforestation for various reasons including energy use, agriculture and logging. In 2020 national deforestation rates stand were estimated at 1.44%. Uganda has committed to halt and reverse forest loss and land degradation by 2030 and to increase forest cover from an estimated 12.5% in 2020 to 15% in 2025 and 21% in 2030. In addition, the country launched a 40 million tree campaign on 2 March 2021, focussing on forest restoration using indigenous trees.

### 3.3.1 Priority Mitigation Policies and Measures

In the AFOLU sector, the priority mitigation policies and measures are from REDD+ activities, based on the National REDD+ Strategy and Action Plan published in 2017 (MWE, 2017). These policies and measures are outlined in the table below.

Table 3-4: AFOLU Mitigation Policies and Measures

Sub-sectors	Mitigation action	Description and impact
	<b>1. Climate Smart Agriculture</b>	
	<b>1.1 Sustainable Land Use Management and Agroforestry</b>	The measure will entail land use management practices, the 40 million-tree campaign and REDD+ strategic interventions the will contribute to approximately 1.2 MtCO <sub>2e</sub> reduction by 2030.
	<b>1.2 Rainwater harvesting and irrigation</b>	This measure will contribute to the achievement of the National Irrigation Policy (2017), which underscores 50% of irrigation potential by 2040. Investments will be in micro, medium and large-scale irrigation systems to mitigate water shortages resulting from drought hazards. It is expected that the irrigation practice will reduce new farmland expansion and deforestation and promote solar-powered irrigation systems, contributing to about 1.6 MtCO <sub>2e</sub> reduction by 2030.
	<b>1.3 Green house cultivation of Vegetables</b>	This measure is expected to reduce GHG emissions by about 0.3 MtCO <sub>2e</sub> by 2030 in rural and semi-urban households through soil carbon build-up and reduce deforestation resulting from the need for agricultural land expansion.

Sub-sectors	Mitigation action	Description and impact
	<b>2. Sustainable fuelwood and commercial charcoal production</b>	
	<b>2.1 Commercial small-holder and community bioenergy woodlots</b>	<p>The measure will support sustainable production of wood fuel in tree-based bioenergy woodlots all over Uganda.</p> <p>Full implementation of this measure will potentially reduce emissions to approximately 2.9 MtCO<sub>2e</sub> by 2030.</p>
	<b>2.2. Commercial small-holder and community poles &amp; timber plantations (with coffee agroforestry)</b>	<p>The measure is expected to contribute to a reduction of GHG emissions of about 0.37 MtCO<sub>2e</sub> by 2030 through woodlots, and/or farm forestry practices.</p>
	<b>2.3. Improved charcoal kilns linked to bioenergy woodlots</b>	<p>This measure aims to increase the uptake of efficient charcoal production technologies whilst contributing to the objective of the biomass energy strategy for Uganda, which aims at balancing the supply and demand for biomass energy. Traditional charcoal kilns have a wood conversation efficiency of 12%. Implementing more efficient technologies could boost wood conversation efficiency from 12% in 2020 to 75% by 2030.</p> <p>Full implementation of the measure will contribute to a GHG emission reduction of approximately 3.37 MtCO<sub>2e</sub> by 2030.</p>
	<b>3. Large scale commercial timber plantations</b>	
	<b>3.1 Commercial transmission pole and timber plantations</b>	<p>The measure intends to reduce wood demand from natural forests by providing wood from tree plantations for poles and timber that will account for abatement potential of approximately 5 MtCO<sub>2e</sub> by 2030.</p>
	<b>3.2. Commercial pole and sawlog plantations</b>	<p>The measure will enhance production of wood products, especially small poles, fuelwood, and charcoal, and has a carbon emission abatement potential of approximately 5 MtCO<sub>2e</sub> by 2030.</p>
	<b>4. Restoration of natural forests in the landscape</b>	
	<b>4.1. Natural forest regeneration</b>	<p>The measure aims to rehabilitate 100,000 hectares of forest areas through collaborative forest management approaches and has a carbon emission abatement potential of about 0.3 MtCO<sub>2e</sub> by 2030.</p>

Sub-sectors	Mitigation action	Description and impact
	<b>4.2. Restoration of degraded protected natural forest</b>	This measure intends to restore natural forests in forest reserves and protected areas that have already lost their forest cover through enrichment planting with indigenous tree species. It is envisaged that over 100,000 hectares of these lands will be restored. The measure will account for approximately 0.3 MtCO <sub>2e</sub> by 2030.
	<b>5. Energy Efficiency</b>	
	<b>Energy Efficient fuelwood and charcoal stoves</b>	The measure aims to promote clean cooking solutions and biomass energy use efficiency technologies for fuel wood and charcoal stoves among households and institutions (education, hospitals, prisons, and industries, among others). The measure will reduce emissions by approximately 6.89 MtCO <sub>2e</sub> by 2030.
	<b>6. Livestock Management</b>	
	<b>Livestock management in the cattle corridor</b>	The measure aims to; promote improved cattle breeds and feeds, improve water availability for livestock through constructing water dams and valley tanks, and establish fodder agroforestry plantations for zero grazing and stall-feeding. The measure will reduce emissions by approximately 2.9 MtCO <sub>2e</sub> by 2030.
	<b>7. Wetlands and Peatlands</b>	
	<b>Wetland and Peatland management</b>	The measure aims to increase wetland coverage from 8.9% in 2020, to 9.57% in 2025, and approximately 12% by 2030 through the implementation of wetland management practices such as demarcation, gazettement, and restoration of degraded wetlands. The mitigation reduction potential for this measure is expected to account for 0.4 MtCO <sub>2e</sub> by 2030.

### 3.3.2 Targets for AFOLU Sector

Under BAU conditions it is projected that AFOLU net emissions will reach 122.2 MtCO<sub>2</sub>e in 2030, while with the implementation of all the main mitigation measures envisaged above, it is projected that the net emissions in this sector will be reduced by 24.9% to 91.8 MtCO<sub>2</sub>e in 2030. This is illustrated in figure 10.3. The figure also presents the annual mitigation targets for the AFOLU sector.

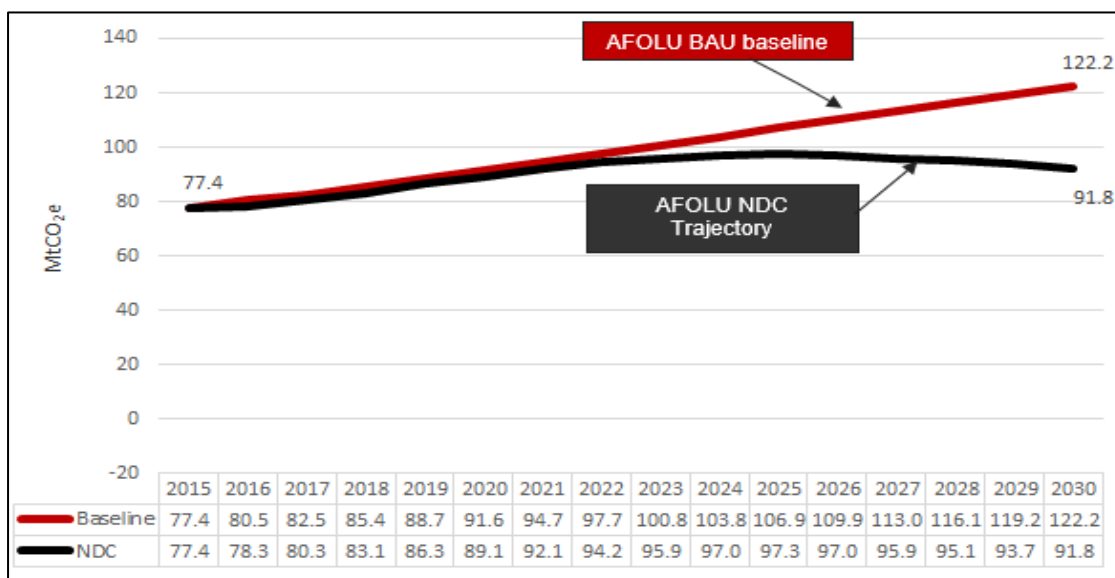


Figure 3-4: AFOLU baseline and annual targets under the conditional mitigation scenario

### 3.3.3 Additional Mitigation Actions

Table 3-5: Shows additional mitigation actions

Sub-sectors	Mitigation Measure	Description
1. Land use and land use change	Forest smart mining	landscape management
	Peatland Restoration.	The measure will promote conservation, sustainable management, restoration and rewetting of peatlands to increase carbon storage capacity. In the Nile basin part of Uganda.
2. Agriculture	NAMA for Livestock improved feed quality, supplement, and manure management	The NAMA seeks to contribute to GHG mitigation of 0.5 MtCO <sub>2</sub> e by 2030.
	Climate-Smart Dairy Livestock Value Chains in Uganda	The NAMA seeks to; sustainably increase agricultural milk productivity and incomes; adapt and build resilience to climate change along the milk production value chain; and reduce greenhouse gas emissions.
3. Agriculture	Promote cultivation of high yielding upland rice.	The NAMA seeks to increase rice production in Uganda by promoting cultivation of high yielding upland rice as opposed to low land paddy rice in parts of Uganda where rice is a major crop, to address methane emissions from rice cultivations.

### 3.4 Energy Sector (Stationary)

The Energy sector in Uganda consists of four sub-sectors; Industrial, Residential, Commercial/Institutional, Agricultural and Fisheries. Residential subsector is the main consumer of energy in the country and it is followed by industries, commercial/institutional, agricultural and fisheries. Biomass is the primary source of energy in the country.

Majority of the Ugandan population is rural-based and has limited access to the electricity grid. As a result, they depend on biomass for basic household energy needs. In 2005, direct combustion of fuel for energy use in the residential sector was approximately 369,000 TJ (Ministry of Water and Environment, 2019), of which the vast majority (almost 99.5%) was from biomass sources. The remainder (0.5%) was from liquid fuels (e.g., kerosene). In addition to energy from direct combustion, the residential sector also consumed 2,177 TJ of electricity.

In 2015, direct combustion of fuel for energy in the industry sector was around 116,000 TJ, of which the vast majority (89%) was from biomass sources (Ministry of Water and Environment, 2019). The remainder (10%) was from liquid fuels (e.g., gas/diesel oil) and solid fuels (1%). In addition to energy from direct combustion, the industry sector also consumed approximately 5,700 TJ of electricity (data from 2015 energy balance). Similarly, direct combustion of fuel for energy in the commercial sector was around 19,000 TJ, of which the vast majority (almost 91.5%) was from biomass sources. The remainder (8.5%) was from liquid fuels. Production systems in the agriculture/forestry/fisheries subsector are the lowest consumers of energy in Uganda.

#### 3.4.1 Main Mitigation Policies and Measures

There are several mitigation measures envisaged to be put in place in the Energy sector in 2030. Mitigation actions that are identified from different national policies are listed for each sub-sector.

**Table 3-6: Mitigation actions in Energy sub-sector**

Sub-sectors	Mitigation action	Description and impact
Energy generation	Renewable energy generation	The measure aims to increase energy generation in the country by promoting renewable energy resources. This can lead emission reductions of approximately 0.0003 MtCO <sub>2e</sub> by 2030.
	Reduction in transmission and distribution losses	The measure intends to reduce energy losses during transmission and distribution. This will improve available energy in the country. This can lead emission reductions of approximately 0.00001 MtCO <sub>2e</sub> by 2030.
	Improved efficiency of charcoal production	The measure is aimed at improving efficiency of charcoal production which will have an impact of reducing deforestation in the forestry sector. This can lead emission reductions of approximately 0.48 MtCO <sub>2e</sub> by 2030.
Energy use	Industrial Energy efficiency	The objective of this measure is to improve energy efficiency in the industrial sector and reduce electricity consumption. Key consumers that are targeted are process heating and process cooling, motors and refrigeration. This can lead emission reductions of approximately 0.26 MtCO <sub>2e</sub> by 2030.

	Industrial Fuel switching	This measure is aimed at switching energy consumption in the industrial sector from biomass to renewable electricity. This can lead emission reductions of approximately 0.23 MtCO <sub>2e</sub> by 2030.
	Increased electricity access for households	This measure aims to increase electricity access of the households so that the household's dependence on biomass can be reduced. This will reduce deforestation. This can lead emission reductions of approximately 0.02 MtCO <sub>2e</sub> by 2030.
	Lighting energy efficiency in households	The measure intends to introduce more energy efficient lighting technologies (CFLs, LEDs etc) and to replace lighting fuels (kerosene) with cleaner energy sources. This can lead emission reductions of approximately 0.003 MtCO <sub>2e</sub> by 2030.
	Cooking mitigation measures, incl. energy efficiency and fuel switch	This measure aims to improve energy efficiency during cooking by adoption of efficient charcoal and fuelwood stoves and to change from using biomass as main source energy for cooking to the use of cleaner energy resources. This can lead emission reductions of approximately 1.09 MtCO <sub>2e</sub> by 2030.

### 3.4.1.1 Electricity Generation

Table 3-7: Mitigation measures for electricity generation

Measure	Mitigation Measure Details
1. Renewable energy generation	<p>Increased grid capacity and increased renewable energy generation.</p> <p>This consists of the following power generation capacity to come online between 2015 and 2030:</p> <ul style="list-style-type: none"> <li>• 756.8 MW of Hydro power (Nyamagasani 1 HPP, Nyamagasani 2 HPP, Muyembe HPP, Achwa 2 HPP, Karuma HPP, Kikagati HPP, Kakaka HPP, Atari HPP, Kabeywa 1 HPP, Kabeywa 2 HPP, Nyabuhaka HPP, Simu HPP, Sisi HPP, Hoimo HPP, Igassa HPP, Kabasanja HPP, Tokwe HPP, Nsongya HPP, Katooke HPP, Nchwera HPP, Warugo HPP, Nyagak III HPP, Nyamwamba II HPP, Nyamabuye HPP, Sironko HPP, Kigwabaya HPP)</li> <li>• 25 MW of Baggase power (SCOUL Bagasse Plant)</li> <li>• 20 MW of Solar power (Xsabo Nkoge Solar), and</li> <li>• 20 MW of Wind power (Rupa Wind Power)</li> </ul>
2. Reduction in transmission and distribution losses	Transmission and distribution loss projections to 2040 are considered (based on ERA Least Cost Generation Plan 2020-2030)

### 3.4.1.2 Charcoal Production

Table 3-8: Mitigation measure for Charcoal production

Measure	BAU	Mitigation Measure Details
Improved efficiency of charcoal production	Remains constant from base year (90% in normal kilns with efficiency of 20%, 10% in improved with efficiency of 60%)	100% of charcoal to be made in improved efficiency kilns in 2030

### 3.4.1.3 Industrial Energy Use

Table 3-9: Mitigation measure for Industrial Energy use

Measures	Business as Usual	NDC Scenario Details
Energy efficiency	Static efficiency	10% reduction from BAU by 2025
Fuel switching	Same fuel mix as 2015, but with 8% of energy needs met by LPG in 2025, rising to 12% by 2050	25% of energy met by biomass from sustainable sources in 2030, rising to 40% by 2040

### 3.4.1.4 Commercial/Institutional Energy Use

Table 3-10: Mitigation measure for Commercial/Institutional Energy use

Measures	Business as Usual	NDC Scenario Details
Improved cook stove efficiency	Same efficiencies as 2015	50% of schools/institutions to be using improved charcoal cookstoves in 2030
Switching to cleaner fuels	Same fuel mix as 2015, but with 15% of energy needs met by LPG in 2030	15% LPG stoves and 35% electric stoves in 2030

### 3.4.1.5 Residential Energy Use

Table 3-11: Mitigation measures for Residential Energy use

Mitigation Measure	Business as Usual	NDC Scenario Details
Increased electricity access	100% by 2040	100% in 2030
Improved cook stove efficiency	65,000 improved cook stoves disseminated per year, growth in energy use driven by UBOS household projections	Electric stove penetration (see 3 below)
Cooking fuel switch to electricity	Same fuel mix as 2015, growth in energy use driven by UBOS household projections	Electricity to reach 50% of cooking fuel share by 2025
Reduced energy use for lighting	Same fuel mix as 2015, growth in energy use driven by UBOS household projections	75% reduction from BAU in energy use for lighting in 2030

## 3.4.2 Targets for Energy sector

The emissions under the Business-As-Usual scenario in the Energy sector (stationary) will increase from 5.7 MtCO<sub>2</sub>e in 2015 to about 12.4 MtCO<sub>2</sub>e in 2030. The main mitigation actions above have a potential to reduce GHG emissions in this sector by 18.8% to 10.1 MtCO<sub>2</sub>e in 2030 as shown in figure 3-5. The Figure also presents the sector's annual mitigation targets.



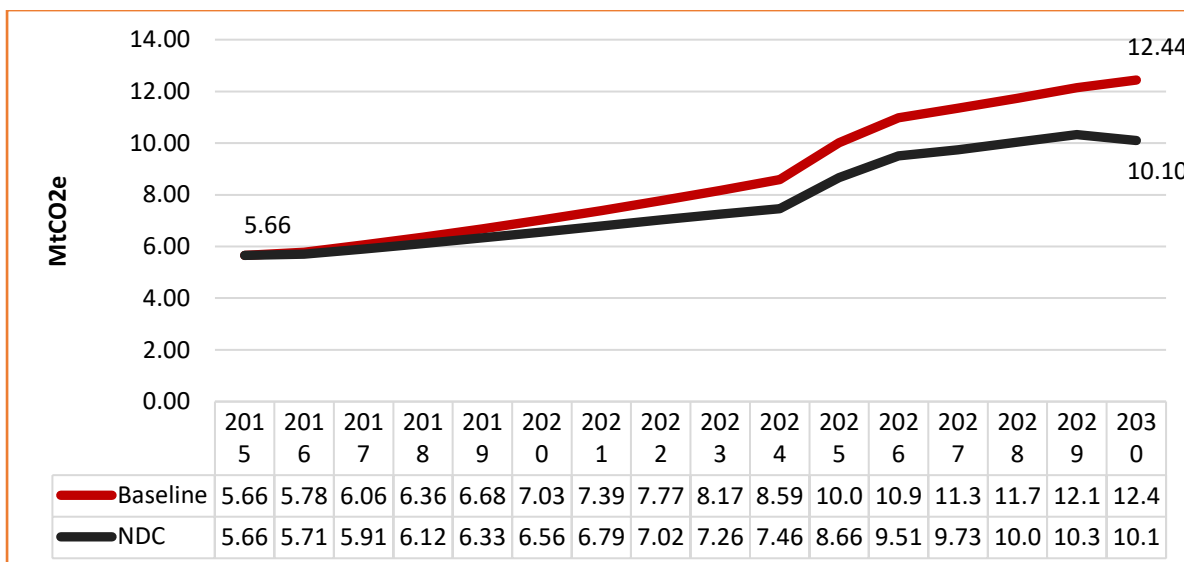


Figure 3-5: Energy sector baseline and annual targets under the mitigation scenario

### 3.4.3 Additional Mitigation Measures

Table 3-12: Additional Mitigation actions

Mitigation Measure	Description
Make the exploitation of mineral resources climate-compatible	<ul style="list-style-type: none"> <li>Strengthen enforcement of the mining Act, 2003 and the National Environment Act, 2019 and all the relevant regulations, one of the pillars of which is respect for the environment and compliance with the Acts (and its implementing provisions);</li> <li>Evaluate the feasibility of establishing and operating a financial mechanism for the mining sector to fund the contribution to the fight against climate change;</li> <li>Boost the sector's energy efficiency by conducting awareness campaigns to sensitize mining companies on sustainable energy utilization</li> <li>Supply this sector with electricity from renewable sources as far as possible. Predicted future power demand from the mining sector alone, could absorb more than 30% of the hydroelectric potential identified to date.</li> </ul>
Promote establishment of energy service companies (ESCOs)	Promoting establishment of ESCOs enhances preparation and management of large energy efficiency projects for implementation for high energy consuming industries.
Energy Management Standards	Implementing this standard in industries requires industries to put in place systems and policies for continued energy improvement in their operations.
Energy Efficiency in Buildings	Regulating energy utilization in buildings for cooling, heating, ventilation and hot water is in alignment with health, comfort, well-being and sustainability, including improving energy productivity and reducing CO <sub>2</sub> emissions



### 3.5 Transport Sector

Uganda’s transport system can be divided into five sectors: (1) road transport; (2) rail transport; (3) air transport, (4) inland water transport; and (5) other modes (LEDS, 2018)<sup>7</sup>. Road transport is the dominant mode, carrying over 95% of total traffic (LEDS, 2018). The public road network, including both classified and unclassified roads, comprises more than 140,000 km. In 2018/2019, about 96 percent of freight cargo and passenger traffic was delivered by road (National Planning Authority, 2020)<sup>8</sup>. The city of Kampala in particular accounts for over 50% of the vehicles in Uganda (Ministry of Water and Environment, 2015)<sup>9</sup>.

Majority of vehicles in Uganda originate from Japan, imported as reconditioned units, usually more than 5 years old. The current motorised vehicle fleet is approximately 1,355,090 vehicles, up from 739,036 in 2012, with the average age of vehicles being more than 15 years old. Public passenger transport in Uganda is a mix between cars, motorcycles, minibuses and buses (Ministry of Works and Transport)<sup>10</sup>.

Civil aviation transport has also expanded rapidly in recent years. International passenger numbers per annum increased during the last 8 years from 781,428 to 1,303,484 in 2016. International traffic dominates flights at Entebbe, up to 97% for passengers and 99% for cargo. Entebbe International Airport is currently undergoing expansion in order to cater for the increasing passenger traffic and cargo freight (Ministry of Works and Transport).

Rail and waterway services are generally in a run-down state (National Transport Master Plan, 2015)<sup>11</sup>. The current market shares of railways declined from 12% to 5% within the last 8 years (Ministry of Works and Transport). Railway Transport sector has been operating below its capacity due to the dilapidation of the railway line (only 26% of the railway line is operational), poor state of locomotives, unavailability of boat ferries to supplement the network, poor state of real estate property and theft of track materials (Ministry of Works and Transport).

Road transport is responsible for 84% of transport energy. It is followed by domestic aviation with 11%, and rail and water transport that consume 3% of the total each.

#### 3.5.1 Main Mitigation Policies and Measures

Table 3-13: Main mitigation actions to be implemented in the Transport sector in 2030

Sub-sectors	Mitigation Measure	Description and impact
Mobile energy consumption. Transport sector.	Road transport fuel efficiency	This measure aims to improve national fleet database, frameworks, and fuel standards so that regulation of the sub-sector can be enhanced, including regulations of imported vehicles. This measure can reduce the emissions by approximately 1.86 MtCO <sub>2e</sub> by 2030.
	Alternative fuel switch	This measure intends to improve fuel standards and efficiency in the country. Cleaner fuels will be promoted. This measure has potential to reduce emissions by approximately 0.54 MtCO <sub>2e</sub> by 2030.

<sup>7</sup> <https://ledsgp.org/wp-content/uploads/2018/03/GIP01883-LEDS-UgandaFinal.pdf>

<sup>8</sup> [http://www.npa.go.ug/wp-content/uploads/2020/08/NDPIII-Finale\\_Compressed.pdf](http://www.npa.go.ug/wp-content/uploads/2020/08/NDPIII-Finale_Compressed.pdf)

<sup>9</sup> <https://www.mwe.go.ug/sites/default/files/library/National%20Climate%20Change%20Policy%20April%202015%20final.pdf>

<sup>10</sup> Mitigation assessment of transport sector. MoWT. Unpublished.

<sup>11</sup> <https://works.go.ug/wp-content/uploads/2015/08/National-Transport-Master-Plan-2008-2023.pdf>

	Development of Non-Motorized Transport (NMT) infrastructure	This measure aims to use the planned NMT corridors in the GKMA as well as in other urban areas across Uganda as its basis. The measure has a potential to reduce the emissions by approximately 0.66 MtCO <sub>2e</sub> by 2030.
	MGR – Meter Gauge Railway rehabilitation for freight transit	This measure intends to implement 61 km of passenger rail by 2030 and to achieve 22% of fuel economy improvement of diesel locomotives. This measure has a potential to reduce the emissions by approximately 0.0005 MtCO <sub>2e</sub> by 2030.
	Efficient operation of public transportation	<b>Measures Aggregated</b> – “Modal shift of passengers to mass transit and NMT”
	Residential trip avoidance through town planning and transport orientated development	
	BRT – Bus Rapid Transit	
	GKMA Passenger service	
	Metro rail	Not implemented within time-period.
	LRT – Light Rail Transit	
	SGR – Standard Gauge Railway	

### 3.5.1.1 Transport Mitigation by Sub-sectors

Table 3-14: Transport mitigation measures by sub-sectors

Mitigation Measure	BAU	NDC Scenario Details
Road transport fuel efficiency	Global Fuel Economy Initiative (GFEI) 50 by 50 targets, <sup>12</sup> improvement of fuel economy with 20-year time-lag: 2040: <b>20%</b> 2050: <b>-35%</b> 2070: <b>-50%</b>	Global Fuel Economy Initiative (GFEI) 50 by 50 targets, improvement of fuel economy with 10-year time-lag: 2030: <b>20%</b> 2040: <b>-35%</b> 2060: <b>-50%</b>
Alternative fuel switch	<b>Road:</b> No switching to alternative fuels (LNG, ethanol or LNG). All traditional fuels (petrol/gasoline and diesel).	<b>1% per year increase</b> in alternative fuel use for all road vehicles - 60% of the increase comes from natural gas. - 20% from ethanol (E10). - 20% from biodiesel. Introduction of at least 200 e-buses in GKMA in 2030. <sup>13</sup>
Development of Non-Motorized Transport (NMT) infrastructure	<b>Road:</b> Walking accounts for 46% of daily trips. <sup>14</sup>  2015 passenger KM (PKM) Motorised: 66,715 million Non-motorised: 78,318 million	100 km of complete streets or dedicated NMT corridors, constructed in greater Kampala area in 2030 leading to 10% shift in PKM by mode from other passenger modes. Construct 100 km of NMT facilities in secondary cities in 2030.

<sup>12</sup> <https://www.globalfueleconomy.org/media/46127/50by50-report-2009-1r.pdf>

<sup>13</sup> Transformative Urban Mobility Initiative (TUMI) E-bus Mission.

<sup>14</sup> Kampala Capital City Authority (KCCA). (2018). Multi-Modal Urban Transport Master Plan for Greater Kampala Metropolitan Area (GKMA): Final Report. Section 2.3.

Mitigation Measure	BAU	NDC Scenario Details
	Total road PKM: 145,033 million	Policies introduced to manage the use of personal motor vehicles to reduce congestion and encourage a shift to public transport, walking, and cycling. Including parking management and secure cycle parking.
Efficient operation of public transportation	Standard growth rate of PKM of 7% to 2025 and 6% to 2050. No change in load factor.	Work with the taxi industry to achieve service quality improvements and operator consolidation. Introduce 1,000 high-quality city buses in GKMA15 together with bus shelters, terminals, and depots. <sup>16</sup>  Introduce ITS systems, automatic fare collection, and control centre for public transport in GKMA 2025. <sup>17</sup>  5% reduction in VKM and 5% increase in load factor from improved organisation of urban public transport.
Residential trip avoidance through town planning and transport orientated development	Standard growth rate of PKM of 7% to 2025 and 6% to 2050. No change in load factor.	Develop land use and transport master plans incorporating transit-oriented land use and measures to incentivise well-located affordable housing along planned mass rapid transit lines. Adopt TOD friendly building control rules by 2025.  TOD reduces motorised travel demand by 5% in 2050.
BRT – Bus Rapid Transit	<b>Road:</b> Standard growth rate of PKM of 7% to 2025 and 6% to 2050. No change in load factor.  Minimal policies to encourage mass transit uptake over private vehicles.	Implement 101 km of BRT in GKMA in 2030. <sup>18</sup>  Policies introduced to manage the use of personal motor vehicles to reduce congestion and encourage a shift to public transport, walking, and cycling. Including parking management and secure cycle parking.
GKMA Passenger service	<b>Rail:</b> Historical growth rate continues across period. 12% fuel economy improvement of diesel locomotives achieved in 2030 relative to 2015.  Minimal policies to encourage mass transit uptake over private vehicles.	Implement 61 km of passenger MGR rail in 2030. 22% fuel economy improvement of diesel locomotives achieved in 2030 relative to 2015.  Policies introduced to manage the use of personal motor vehicles to reduce congestion and encourage a shift to public transport, walking, and cycling. Including parking management and secure cycle parking.
Metro rail	<b>Rail:</b> Historical growth rate continues across period. 12% fuel economy improvement of diesel locomotives achieved in 2030 relative to 2015.	Implement 75 km of fully electrified passenger metro rail by 2040.  Policies introduced to manage the use of personal motor vehicles to reduce congestion

<sup>15</sup> Bus system planned by KCCA in collaboration with Metu Zhongtong.

<sup>16</sup> Kampala Capital City Authority (KCCA). (2018). Multi-Modal Urban Transport Master Plan for Greater Kampala Metropolitan Area (GKMA): Final Report. Section C-3.

<sup>17</sup> Kampala Capital City Authority (KCCA). (2018). Multi-Modal Urban Transport Master Plan for Greater Kampala Metropolitan Area (GKMA): Final Report. Section C-5.

<sup>18</sup> Four corridors identified in the MMUTMP. Section 10.5.

Mitigation Measure	BAU	NDC Scenario Details
	Minimal policies to encourage mass transit uptake over private vehicles.	and encourage a shift to public transport, walking, and cycling. Including parking management and secure cycle parking.
LRT – Light Rail Transit	<p><b>Rail:</b> Historical growth rate continues across period. 12% fuel economy improvement of diesel locomotives achieved in 2030 relative to 2015.</p> <p>Minimal policies to encourage mass transit uptake over private vehicles.</p>	<p>Implement 100 km of fully electrified passenger LRT rail by 2040.</p> <p>Policies introduced to manage the use of personal motor vehicles to reduce congestion and encourage a shift to public transport, walking, and cycling. Including parking management and secure cycle parking.</p>
MGR – Meter Gauge Railway rehabilitation for freight transit	<p><b>Rail:</b> Historical growth rate continues across period. 12% fuel economy improvement of diesel locomotives achieved in 2030 relative to 2015.</p>	Rehabilitation of 634 km of meter gauge railway by 2026 to facilitate modal shift of freight from road to rail. 22% fuel economy improvement of diesel locomotives achieved in 2030 relative to 2015.
SGR – Standard Gauge Railway	<p><b>Rail:</b> Historical growth rate continues across period. 12% fuel economy improvement of diesel locomotives achieved in 2030 relative to 2015.</p>	Implement 1,412 km of fully electrified standard gauge rail by 2050.

### 3.5.2 Targets for Transport Sector

Transport sector GHG emissions under Business-As-Usual conditions will more than double from 4.2 MtCO<sub>2</sub>e in 2015 to 9.6 MtCO<sub>2</sub>e in 2030. If all the main mitigation measures under the NDC scenario are implemented fully, they have the potential to limit the growth of the emissions by 29% to 6.8 MtCO<sub>2</sub>e in 2030 as illustrated in the figure 3-6. The figure also presents annual targets under the transport sector mitigation scenario.

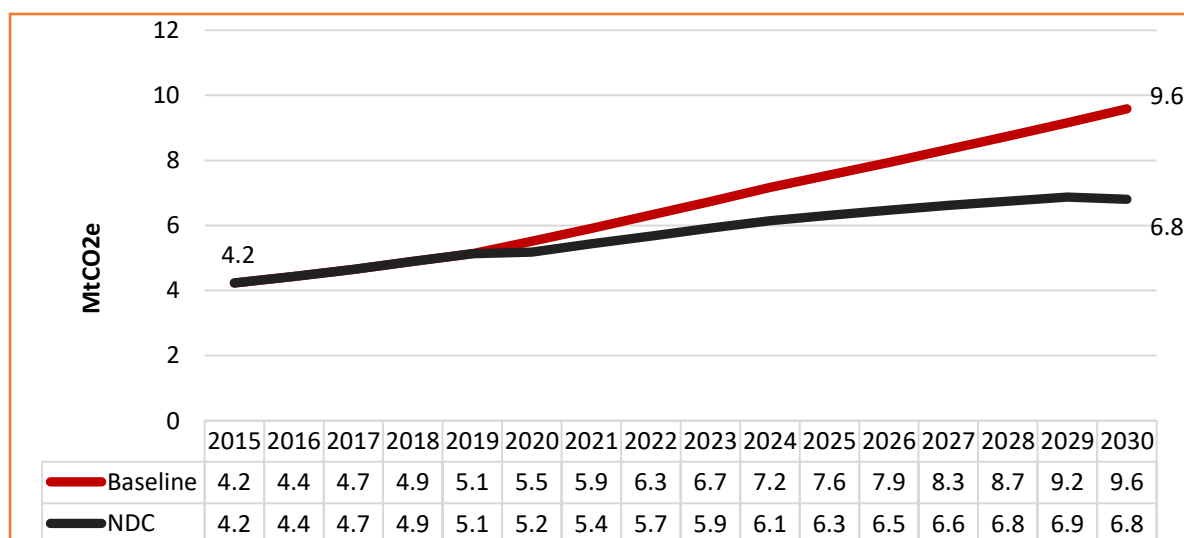


Figure 3-6: Transport baseline and annual targets under the NDC scenario

### 3.5.3 Additional Mitigation Measures

Table 3-15: Additional mitigation measures

Mitigation Measure	Description
Road improvement projects	Improvement of road infrastructure, including roads, bridges, etc
Electric road vehicles	Electric boda-boda or buses
Electrification of rail	Plans for electric traction of passenger rail
Oil pipeline	Pipeline to transfer oil internally in Uganda, replacing road freight
Utilisation of water transport	Increased water-borne transport
E-commuting	Increased use of remote working

## 3.6 Waste Sector

This sector covers solid waste and wastewater. Waste composition is changing rapidly in Uganda particularly in urban areas. Waste generation rate in tonnes per day, is increasing annually in the cities because of growing urbanization. The country generates waste in the form of domestic and industrial wastewater as well as solid waste. Despite challenges of poor data collection systems, it is estimated that the content of biodegradable material in the country decreased from 88.5% in 1990 to 77% in 2014. Content of plastics in the waste increased from 1.6% to 12.4% during the period. It is estimated that over 755 kilo tons of solid waste was generated in Uganda in 2017. The city of Kampala is responsible for half of the waste generated in the country.

Volumes of wastewater are also increasing in the country especially in the cities. However, there are limited sewage systems with many households constructing their own septic tanks. The fraction of households that are connected to the municipal sewage system in the cities is estimated to be only 1%<sup>19</sup> with a projected growth to 30% in the next decade. In the absence of wastewater collection and treatment services, households often rely on onsite sanitation systems, such as pit latrines. In this case, GHG emissions depend on the individual use of the system, e.g. poor flush latrines vs. dry latrines, the quality and efficiency of faecal sludge management and the type of faecal sludge treatment.

#### Baseline assumptions:

The population with access to waste management services was assumed to grow in line with national population growth, while consumption, waste generation and solid waste management practices are assumed to remain the same over the projected period. The following assumptions were made for solid waste disposal:

- Waste management technologies remain constant from 2015 (40% unmanaged shallow and 60 percent managed anaerobic);
- Degradable organic carbon fraction remains constant for all waste types;
- Waste per capita remains constant at average 2002 - 2015 value (237 kg/capita/yr);
- Percent of waste sent to managed sites remains constant at 2015 value (60%);
- Waste categorization remains constant at 2015 values (38.7% food; 34.4% garden; 10.6% paper; 1.3% wood; 0.5% textile; 0.5% nappies; and 14% plastics);

<sup>19</sup> Progress on household drinking water, sanitation and hygiene 2000-2020: five years into the SDGs. Geneva: World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), 2021. Licence: CC BY-NC-SA 3.0 IGO

- Sludge sent to managed sites remains constant at 2015 value (0%); and,
- Amount of methane recovered remains constant at 2015 value (zero kg).

For wastewater treatment and discharge, it was assumed that consumption, wastewater generation and treatment practices remain the same over the projected period, while wastewater generation grows in line with national population growth. The following specific assumptions for wastewater treatment and discharge were made:

- Degradable organic component remains at default value;
- Types of treatment and discharge remain constant from 2015 to 2025 (mostly anaerobic deep lagoon; the remainder, latrine); from 2025, mostly septic tank and latrine; the remainder, lagoon;
- Fraction of population using different treatments remains constant from 2015 to 2025 (mostly anaerobic deep lagoon; the remainder, latrine); from 2025, mostly septic tank and latrine; the remainder, lagoon;
- Degree of technology use remains constant from 2015 to 2025 (mostly anaerobic deep lagoon; the remainder, latrine); from 2025, mostly septic tank and latrine, the remainder lagoon; and,
- Per capita protein consumption remains constant as of 2015 (17.888 kg/person/year).

For industrial wastewater treatment and discharge, future activity was assumed to increase in line with the historical increase for the period 2005 - 2015.

### 3.6.1 Main mitigation Policies and Measures

Table 3-16: Main mitigation Policies and Measures

Sub-sectors	Mitigation Measure	Description and Impact
Waste sector	Planned Green Cities Waste management	This measure will target green development in the large municipal areas. It will look into improving infrastructure in the cities. This measure has potential to reduce emissions by approximately 1.1 MtCO <sub>2e</sub> by 2030.
	NAMA - Schools bio-latrines	This measure is aimed at introducing biogas digesters in schools. Biogas digesters will be fed by waste from bio latrines and used for cooking. The measure has potential to reduce the emissions by 0.0006 MtCO <sub>2e</sub> by 2030.

#### 3.6.1.1 Waste Mitigation by Sub-Sectors

The waste sector produces relatively smaller amounts of greenhouse gas emissions as compared to other sectors. Two main mitigation measures in the waste sector are planned;

- i. Green cities waste management
- ii. School bio latrines – Nationally Appropriate Mitigation Action

Table 3-17 gives a description of the proposed mitigation measures for the waste sector.



Table 3-17: Waste mitigation measures by sub-sectors

Sub-sector	Mitigation measure	Description
Solid Waste and Wastewater	<b>Efficient Solid Waste and wastewater management in Planned Green cities</b>	Support comprehensive physical planning and efficient waste management (solid and wastewater) for five cities and 15 municipalities.  This will entail proper implementation of the waste hierarchy and relevant regulations, including reduction, recycling and reuse of solid waste, and wastewater treatment in the cities of Greater Kampala Metropolitan City (GKMC), Gulu, Mbarara, Hoima and Mbale, as well as 15 municipalities. It includes acquisition of land for infrastructure and service facilities for sanitation, solid waste management and drainage services.
Wastewater	<b>NAMA - Schools bio latrines</b>	Improving cooking and sanitation conditions of schools through use of bio latrines (biogas digesters).

### 3.6.2 Targets for Waste sector

Under the BAU scenario, the waste sector emissions are projected to grow from 2.08 MtCO<sub>2</sub>e in the base year to 3.19 MtCO<sub>2</sub>e in 2030. If fully implemented, the main mitigation measures and policies are projected to reduce the 2030 emissions by 34.8% to 2.09 MtCO<sub>2</sub>e. This is illustrated in figure 3-7.

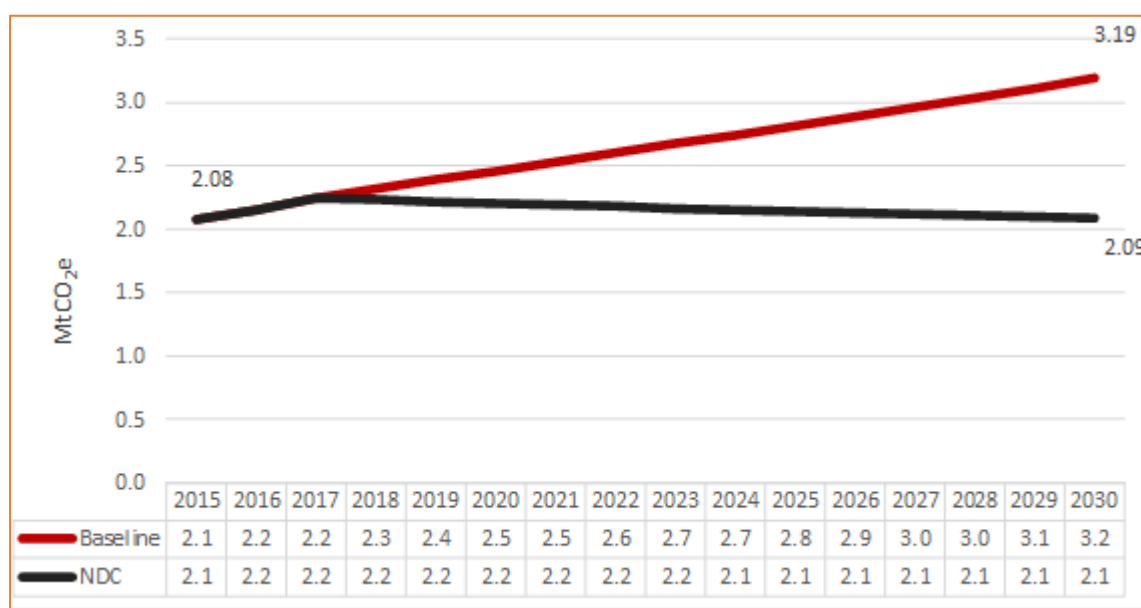


Figure 3-7: Waste sector baseline and annual targets under the NDC scenario

The figure also presents the annual mitigation targets for the AFOLU sector. Planned green cities waste management has high mitigation potential over the schools' bio latrines and can account for nearly all the current potential abatements in the NDC scenario.

### 3.6.3 Additional Mitigation Measures

Table 3-18: Additional mitigation measures under the Waste sector

Sub-sectors	Mitigation Measure	Description
Waste	Sugarcane waste management	Waste from sugarcane is increasing in the country. There is potential to generate energy from this waste. Energy generation potential from this waste needs to be investigated.
Wastewater	NAMA - Integrated Wastewater Treatment for Agro-process Water in Uganda	The NAMA seeks to increase efficiency and value addition prospects for wastewater treatment of agro-processing firms by establishing an integrated wastewater treatment process using both an anaerobic and aerobic digester with sequencing batch reactor. Methane will be captured as biogas. The NAMA will address methane emissions from agro-process wastewater treatment, which were estimated at 14,358 tCO <sub>2</sub> e/year for effluent from 11 fish factories and three abattoirs in Kampala City
Wastewater and sanitation	Wastewater treatment	Enhancing wastewater collection and treatment, including decentralized sanitation solutions
Wastewater and sanitation	Energy recovery	Achieving energy neutrality in wastewater treatment plants with implementation of energy recovery
Water and Wastewater	Energy efficiency	Implement measures to improve the energy balance of water and wastewater treatment and transportation, including technological upgrades of aeration and compressors; sludge management; pipes maintenance; digitalization and variable speed drive control; sensors; process controls etc.; as well as addressing water losses or unnecessary water consumption.
Water and Wastewater	Renewable energy	Replacement of fossil energy sources with renewable energy in water and wastewater management.

### 3.7 Industrial Processes and Product Use

Uganda's industrial sector continues to grow having been prioritised as a key programme in her NDP III. The sector has a high potential for enhanced economies of scale for factor productivity and deeper, more dynamic and stronger forward and backward linkages with other sectors. Emissions in this sector are from cement production, lime production, iron and steel production, lubricant use, refrigeration and air conditioning. Cement production accounts for the highest share of emissions within the sector. Two types of cement are produced in the country: Portland cement and Pozzolana Portland Cement. The clinker fractions in the Portland cement and Pozzolana Portland Cement are 95% and 72% respectively (Ministry of Water and Environment, 2019).



### 3.7.1 Mitigation Policies and Measures

#### 3.7.1.1 IPPU Mitigation by Sub-Sectors

Because cement production is responsible for the majority of emissions in the IPPU sector, targeting it is therefore the best course of action for reducing emissions in the sector. Clinker is a component of cement and is essentially a mix of limestone and minerals that have been heated and transformed in a kiln. The table 3-19 presents the main and additional mitigation measures for this sector.

Table 3-19: Mitigation measures under IPPU sector

	Sub-sector	Description
Main Mitigation Measure	Cement sector	Clinker substitution in cement production.
		<p>This measure aims to substitute clinker in cement production with less carbon intensive constituents like pozzolana, fly-ash or slag. This measure has a potential to reduce the emissions by approximately 0.10 MtCO<sub>2e</sub> by 2030.</p> <p>Other constituents (i.e., pozzolana, fly-ash or slag) are used to replace clinker in cement, thereby lowering emissions and energy use.</p>
Additional Mitigation Measure	Refrigerant use	Circular economy management of refrigerants

### 3.7.2 Targets for IPPU Sector

Under Business-as-Usual scenario, the industrial processes and product use sector emissions are projected to grow from 0.57 MtCO<sub>2e</sub> in 2015 to 1.0 MtCO<sub>2e</sub> in 2030. Implementation of the main mitigation measure has the potential to reduce the emissions in this sector by 14% to 0.86 MtCO<sub>2e</sub> in 2030 as shown in the figure 3-8. The figure also presents the annual mitigation targets for the IPPU sector.

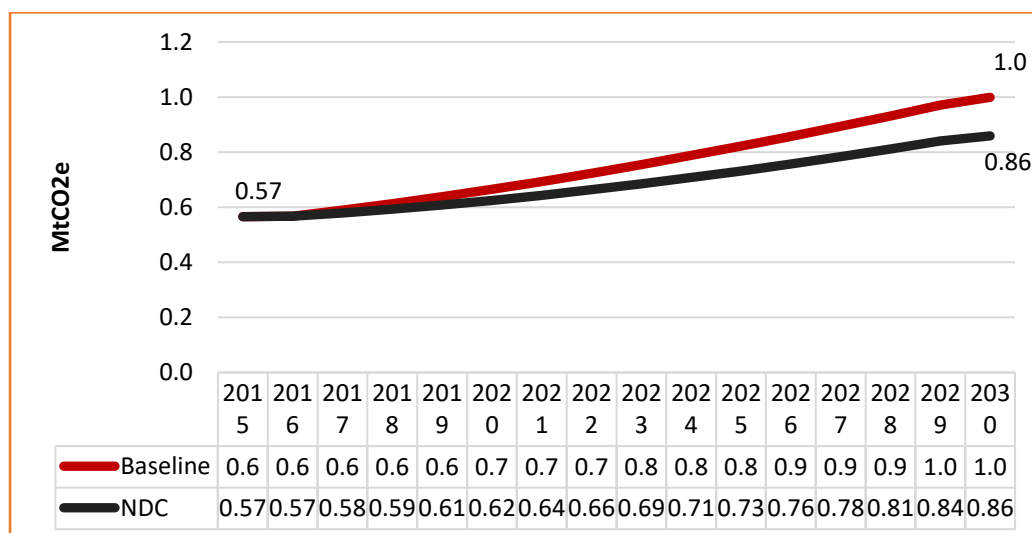


Figure 3-8: IPPU sector baseline and annual targets under the NDC scenario

### **3.8 Co-benefits of NDC implementation for short-lived Climate pollutant and Air pollutant mitigation**

Uganda joined the Climate and Clean Air Coalition in 2021, and is committed to undertaking integrated action that simultaneously improves air quality and mitigate climate change.

Under the Climate and Clean Air 3 Coalition's Supporting National Action & Planning (SNAP) initiative, Uganda is enhancing institutional capacity to address climate change and air pollution through the development of national ambient air quality regulations and standards and by integrating climate change and clean air strategies.

Uganda intends to improve her national planning process to mitigate short-lived climate pollutants (SLCPs) by developing a national emission inventory of SLCPs and air pollutants for instance black carbon, methane and hydrofluorocarbons (HFCs). This will complement Uganda's efforts towards the implementation of the Kigali Amendment to the Montreal Protocol on substances that deplete the Ozone layer. Additionally, national appropriate policies and measures to reduce SLCPs will be identified and integrated in the next round of NDCs.

## **4 MEANS OF IMPLEMENTATION**

This section highlights the financial support required for implementing the updated NDC actions and measures across all sectors up to 2030 including capacity building and technology development and transfer requirements, and gender equity and transformative actions for ensuring resilience building and low carbon development.

### **4.1 Climate Finance Needs**

Uganda requires USD 28.1 billion to implement both unconditional and conditional adaptation and mitigation actions and targets of the updated NDC and its cross-cutting issues of technology development and transfer, gender, and capacity building across all sectors up to 2030. The financial support is expected to be mobilized from domestic and international sources.

The estimated cost of the adaptation up to 2030 across all sectors is USD 17.7 billion of which USD 2.5 billion equivalent to 14% of the total adaptation cost is unconditional and USD 15.2 billion equivalent to 86% is conditional on international support.

The estimated cost of the mitigation policies and measures up to 2030 across all sectors is USD 10.3 billion of which USD 1.6 billion equivalent to 15% of the total mitigation cost is unconditional and USD 8.7 billion equivalent to 85% is conditional on international support.

The estimated cost of crosscutting activities including coordination support is USD 0.1 billion.

### **4.2 Capacity Building**

Capacity building and technology development and transfer are critical for both implementing the interventions in this updated NDC and achieving the Paris Agreement's goals. Recognising the importance of supporting climate change education, training, public awareness, public participation and access to information is crucial to the implementation of the updated NDC. Uganda will apply a whole- of -society approach to promote knowledge, awareness raising and information sharing.

The following are some of the capacity building needs to drive implementation of the updated NDC;

- Reviewing and implementing the Uganda National Climate Change Learning Strategy.
- Building long-term strategic multi stakeholder partnerships.
- Strengthening coordination and institutional arrangement to enhance collaboration and promote knowledge sharing.
- Establishing climate change knowledge and learning centres.
- Expanding access to tools and support for capacity building and awareness raising.
- Strengthening monitoring, reporting and verification of the implementation and achievement of the updated NDC.
- Technology Development and Transfer.

Uganda has conducted a systematic process for identifying and selecting climate technologies for mitigation and adaptation to climate change. A technology action plan for adaptation and for mitigation has been developed but yet to be implemented. For effective implementation of this updated NDC, the following investments are required to accelerate the development and transfer of climate technologies;

- Implementing the technology action plans for adaptation and mitigation.
- Establishing national and regional demonstration centres of excellence to foster update of climate technologies.
- Building community ownership and capacity to operate and management climate technologies.
- Building partnership with private sector, research institutions and non-governmental organization to expand co-investment in technology transfer and diffusion.
- Creating an enabling environment to address barriers for the development and transfer of climate technologies.

### **4.3 Gender Mainstreaming**

In this updated NDC, a gender analysis was carried out to highlight the different roles of women and men, the challenges they face in light of climate change, and priorities for climate action, particularly in improving resilience and adaptation. Women and girls, particularly those living in poverty, were found to be at greater risk and burden of climate change. This was partly attributed to unequal opportunities on land rights and the exclusion of women from decision-making and thus not benefiting from technologies and practices which enable them better adapt to changing climate conditions.

Under the NDC support program, Uganda has made significant progress on gender and NDC, which includes a draft report for gender analysis for agriculture, energy, and waste; establishing a climate action innovation challenge grant for women and youth-led enterprises; and designating gender focal points for key NDC sectors to support gender integration in their respective institutions' planning cycles.

This updated NDC comprises adaptation and mitigation actions that take gender into consideration. To ensure gender-responsive NDC implementation, the following actions should be put in place:

- a) Enhance women participation in decision making processes across all levels to enable their contribution in the assessment of needs and prioritization of climate actions.
- b) Designate gender and climate change specialists across Ministries, Agencies and Local Governments to strengthen gender and climate change mainstreaming in the formulation, implementation and monitoring of NDC actions.
- c) Expand the mainstreaming of gender and climate change in all budget framework papers and local government plans.
- d) Develop gender disaggregated data for the updated NDC implementation plan
- e) Develop skills and capacity on gender and climate change.

## Annex 1: Information to facilitate clarity, transparency and understanding of Uganda’s updated NDC

1. Quantified information on the reference point, including, as appropriate, a base year	
a <b>Reference year(s)</b> , base year(s), reference period(s) or other starting point(s)	The updated base year is 2015 reflecting the latest national greenhouse gas (GHG) inventory. The reference year is 2021 and the reference period is 2021 – 2030.
b. Quantifiable information on the <b>reference indicators</b> , their values in the reference year(s), base year(s), reference period(s) or other starting point(s), and, as applicable, in the target year	In the base year, the emissions were 90.1 MtCO <sub>2</sub> e. Under Business-as-usual (BAU) conditions (baseline scenario) the country’s GHG emissions are projected to increase to 148.8 MtCO <sub>2</sub> e by 2030. Sectoral BAU baselines for each of the key mitigation sectors have been computed.
c. <b>Target</b> relative to the reference indicator, expressed numerically, for example in percentage or amount of reduction	Economy wide emissions reduction of 24.7% in 2030 below the BAU conditions. Of which, Uganda’s unconditional efforts will result into reduction of 5.9% in 2030 below the BAU conditions.
d. For strategies, plans and actions referred to in Article 4, paragraph 6, of the Paris Agreement, or policies and measures as components of nationally determined contributions where paragraph 1(b) above is not applicable, Parties to provide <b>other relevant information</b>	Instead of responding to Article 4, paragraph 6, of the Paris Agreement, Uganda has responded to Article 4, paragraph 19 thereby developing the country’s first Long Term Climate Strategy (LTS) which highlights pathways to a resilient, inclusive and low carbon economy by the year 2050.
e. Information on <b>sources of data</b> used in quantifying the reference point(s)	<p>The key data sources used for baseline projection are:</p> <ul style="list-style-type: none"> <li>• Uganda’s 2015 GHG inventory report</li> <li>• East African Commission (2015). The East African Community Vision 2050.</li> <li>• Electricity Regulatory Authority (2021) Least Cost Electricity Expansion Plan 2020-2030. PLN/83-120/021/008</li> <li>• Government of Uganda (2007). Climate Change: Uganda National Adaptation Programmes of Action (NAPA) submitted to UNFCCC.</li> <li>• Government of Uganda (2019) Uganda State of the Environment Report. National Environmental Management Authority (NEMA).</li> <li>• Government of Uganda (2013). Uganda National Climate Change Learning Strategy 2013 – 2022. Ministry of Water and Environment.</li> <li>• Government of Uganda (2015a). Annual Statistical Abstract. Uganda Bureau of Statistics (UBOS).</li> <li>• Government of Uganda (2015b). National Climate Change Policy. Ministry of Water and Environment.</li> <li>• Government of Uganda (2015d). Second National Development Plan 2015/2016 – 2019/2020. National Planning Authority. Kampala Uganda.</li> </ul>

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<p>f. Information on the circumstances under which the Party may <b>update</b> the values of the reference indicators</p>	<p>Baseline projections may be updated under following circumstances:</p> <ul style="list-style-type: none"> <li>• Significant difference between the actual and projected economic growth (GDP)</li> <li>• Significant difference between the actual and the projected livestock population</li> <li>• Significant difference between the actual and projected population consumption and waste patterns.</li> <li>• Methodological improvements</li> </ul>

2. Time frames and/or periods for implementation	
a. <b>Time frame</b> and/or period for implementation, including start and end date, consistent with any further relevant decision adopted by the CMA;	The Implementation period is 2021 to 2030. A mid-term review may be conducted in 2025.
b. Whether it is a <b>single-year or multi-year</b> target, as applicable.	Single year target in 2030.
3. Scope and coverage	
a. General <b>description of the target</b> ;	<p>Uganda has committed to reduce her economy-wide Greenhouse gas emissions by 24.7% in 2030 below the BAU baseline. 82.7% of the mitigation action will come from the Agriculture, Forestry and Other Land Use AFOLU sector.</p> <p>Uganda will use domestic sources of support to reduce emissions by 5.9% below the BAU trajectory in 2030 (un conditional contribution). International support in form of financial, capacity-building and technology transfer, will enable the country to reduce emissions by 18.8% in 2030 below the BAU (conditional contribution).</p>
b. <b>Sectors, gases, categories and pools</b> covered by the nationally determined contribution, including, as applicable, consistent with IPCC guidelines;	<p>The following IPCC gases have been covered in Uganda's NDC:</p> <ul style="list-style-type: none"> <li>• Carbon dioxide (CO<sub>2</sub>)</li> <li>• Methane (CH<sub>4</sub>)</li> <li>• Nitrous oxide (N<sub>2</sub>O)</li> </ul>
c. How the Party has taken into consideration <b>paragraphs 31(c) and (d)</b> of decision 1/CP.21;	<p>To the extent possible, categories of emissions or removals have been included, especially those considered 'significant source categories'</p> <p>To address the challenge of data availability, a GHG improvement plan has been developed to guide future GHG inventories.</p>
d. <b>Mitigation co-benefits</b> resulting from Parties' adaptation actions and/or economic diversification plans, including description of specific projects, measures and initiatives of Parties' adaptation actions and/or economic diversification plans.	These have been specified under the Adaptation Component of the NDC.



4. Planning process	
a. Information on the <b>planning processes</b> that the Party undertook to prepare its NDC and, if available, on the Party's implementation plans, including, as appropriate:	
<p>i. Domestic <b>institutional arrangements</b>, public <b>participation</b> and engagement with <b>local communities</b> and <b>indigenous peoples</b>, in a <b>gender-responsive</b> manner;</p>	<p>Uganda has put in place institutional arrangements for coordination, supervision, regulation, and Management of all activities related to climate change. In particular, the Climate Change Department of the Ministry of Water and Environment is the mandated institution for coordination, monitoring, and evaluation of national programs and actions on climate change, ensuring that the country meets its obligations and realises its benefits under the Convention, the Kyoto Protocol, and the Paris Agreement.</p> <p>Uganda launched the NDC update process under the leadership of the Ministry of Water and Environment/Climate Change Department with support from the Climate Action Enhancement Package (CAEP) of the NDC Partnership implemented by partners: UNDP; GIZ; IRENA; UNEP; Red Cross Red Crescent Climate Centre, IUCN and ICLEI Africa.</p> <p>The NDC Update Process applied a whole- of- government engagement through a sector-wide approach that ensured key Ministries, Departments, Agencies and Local Governments fully participated in the consultations. A whole -of -society involvement was also followed through a flexible and phased approach to ensure systematic engagement, public awareness and effective participation. As such, five multi-stakeholder regional workshops organised in a hybrid format were conducted in accordance with COVID 19 Standard Operating Procedures of the government in the regions of Central, Western, Eastern, Northern and West Nile. Special consultations were conducted for the youth and civil society with the private sector. Sectoral specific consultations were structured into four groups: AFOLU and Wetlands; Energy and Transport, Waste and IPPU; and Water, Health, Cities and DRR. Representatives of women groups and indigenous peoples were also consulted.</p> <p>The NDC update process was conducted simultaneously with the Long-Term Low Emissions Development Strategy (LTS), benefitting from joint modelling, assessments, progressive reviews, and stakeholder consultation for proper alignment.</p>
ii. <b>Contextual matters</b> , including, inter alia, as appropriate:	
<p>(a) <b>National circumstances</b>, such as geography, climate, economy, sustainable development and poverty eradication;</p>	<p>Uganda is located in East Africa and occupies an area of 241,555 square kilometres, with water bodies and wetlands covering about a third of it, and standing astride the equator.</p>

	<p>Uganda's climate is largely tropical with the rest of the country experiencing bi-modal rainy seasons per year except for northern region. The economy and people are highly dependent on the country's rich natural resource base including agricultural land, forests, water bodies, wetlands and soils.</p> <p>The percentage of the population in poverty reduced from 21.4% in 2016/17 to 20.3% in 2019/20(Uganda National House Hold Survey 2019/2020).</p>
<p>(b) <b>Best practices</b> and experience related to the preparation of the NDC;</p>	<p>The NDC Update embraced whole -of- society approach where various categories of the society fully participated in a bottom-up approach.</p> <p>Despite the COVID-19 pandemic, the hybrid mode of participation through national and regional consultations enabled the identification of various climate actions which were discussed and prioritised by policy makers to ensure alignment with sectoral priorities.</p> <p>The collaboration with National Planning Authority and the Ministry of Finance, Planning and Economic Development ensured alignment of the update process with the Vision 2040 and development aspirations highlighted in the third National Development Plan (NDP III) of the country.</p> <p>The simultaneous work on mid-term climate action planning (NDC update) and long term (LTS development) promoted efficient strategic planning for climate action.</p> <p>The joint modelling for NDC update and LTS scenarios; systematic data and information sharing and joint progressive planning and pooling of partners support propelled synergy.</p>
<p>(c) <b>Other</b> contextual aspirations and priorities acknowledged when joining the Paris Agreement;</p>	<p>The country envisages to achieve a middle-income status that comes along with improvements in socioeconomic welfare for all Ugandans.</p> <p>The updated NDC will support Uganda's ambition of transitioning from a peasant to a modern and prosperous country by 2040.</p>
<p>b. Specific information applicable to Parties, including regional economic integration organizations and their member States, that have reached an agreement to act jointly under Article 4, paragraph 2, of the Paris Agreement, including the Parties that agreed to <b>act jointly</b> and the terms of the agreement, in accordance with Article 4, paragraphs 16–18, of the Paris Agreement;</p>	<p>Not Applicable</p>

c. How the Party's preparation of its NDC has been informed by the outcomes of the <b>global stocktake</b> , in accordance with Article 4, paragraph 9, of the Paris Agreement;	Not applicable
d. Each Party with an NDC under Article 4 of the Paris Agreement that consists of <b>adaptation action and/or economic diversification plans resulting in mitigation co-benefits</b> consistent with Article 4, paragraph 7, of the Paris Agreement to submit information on:	
i. How the economic and social consequences of <b>response measures</b> have been considered in developing the NDC;	Not Applicable
ii. <b>Specific projects</b> , measures and activities to be implemented to contribute to mitigation co-benefits, including information on adaptation plans that also yield mitigation co-benefits, which may cover, but are not limited to, key sectors, such as energy, resources, water resources, coastal resources, human settlements and urban planning, agriculture and forestry; and economic diversification actions, which may cover, but are not limited to, sectors such as manufacturing and industry, energy and mining, transport and communication, construction, tourism, real estate, agriculture and fisheries.	Projects, measures and activities have been identified and are contained in the updated NDC Implementation Plan.
<b>5. Assumptions and methodological approaches, including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals:</b>	
a. Assumptions and methodological approaches used for <b>accounting for anthropogenic greenhouse gas emissions and removals</b> corresponding to the Party's nationally determined contribution, consistent with decision 1/CP.21, paragraph 31, and accounting guidance adopted by the CMA;	The "2006 IPCC Guidelines for National Greenhouse Gas Inventories" was used in compiling the 2015 base year GHG inventory as well as the assumptions used in the first Biennial Update Report 2019
b. Assumptions and methodological approaches used for <b>accounting</b> for the implementation of <b>policies and measures or strategies</b> in the nationally determined contribution;	Not applicable since implementation of policies and measures is yet to commence
c. If applicable, information on how the Party will take into account <b>existing methods and guidance</b> under the Convention to account for anthropogenic emissions and	See below

removals, in accordance with Article 4, paragraph 14, of the Paris Agreement, as appropriate;	
d. <b>IPCC methodologies and metrics</b> used for estimating anthropogenic greenhouse gas emissions and removals;	The NDC update was informed by the use of Global Warming Potential (GWP) of Greenhouse gases for 100 years which was used for the 2015 national GHG inventory highlighted in the first Biennial Update Report 2019.  Calculation of emissions from some categories was based from the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories.
e. <b>Sector-, category- or activity-specific</b> assumptions, methodologies and approaches consistent with IPCC guidance, as appropriate, including, as applicable:	
i. Approach to addressing emissions and subsequent removals from <b>natural disturbances</b> on managed lands;	Emissions and removals were approached in accordance with the Good Practice Guidance for Land use, Land-Use Change and Forestry.
ii. Approach used to account for emissions and removals from <b>harvested wood products</b> ;	Not included in the emissions calculations
iii. Approach used to address the effects of <b>age-class</b> structure in forests;	Not Applicable
f. <b>Other assumptions and methodological approaches</b> used for understanding the nationally determined contribution and, if applicable, estimating corresponding emissions and removals, including:	
i. How the <b>reference indicators</b> , baseline(s) and/or reference level(s), including, where applicable, sector-, category- or activity-specific reference levels, are constructed, including, for example, key parameters, assumptions, definitions, methodologies, data sources and models used;	The baseline projections were modelled using a variety of tools in accordance with 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories, including the Low Emissions Analysis Platform.
ii. For Parties with nationally determined contributions that contain <b>non-greenhouse-gas components</b> , information on assumptions and methodological approaches used in relation to those components, as applicable;	Not applicable
iii. For <b>climate forcers</b> included in nationally determined contributions not covered by IPCC guidelines, information on how the climate forcers are estimated;	The revised NDC has not considered any climate forcer which has not been covered in IPCC
iv. <b>Further technical information</b> , as necessary;	None
g. The intention to use <b>voluntary cooperation under Article 6</b> of the Paris Agreement, if applicable.	Uganda will use voluntary cooperation provided for in Article 6 in accordance with the National Climate Change Act 2021 to demonstrate her mitigation and adaptation ambition and mobilise support to promote sustainable development.

6. How the Party considers that its NDC is fair and ambitious in light of its national circumstances	
a. How the Party considers that its NDC is <b>fair and ambitious</b> in the light of its national circumstances;	<p>Uganda remains highly vulnerable to climate change and its impacts with a low human development index of 0.477 and per capita emissions estimated at 0.1 tCO<sub>2</sub>eq. Despite Uganda's very low contribution to historical and current global emissions, the country has set new economy-wide emission reduction target of 24.7% under the Business as usual constructed in 2021, greater than the target in the first NDC communicated in 2016 of 22% under the Business as usual constructed in 2015.</p> <p>Uganda will mobilize domestic resources equivalent to 15% of the total cost of the updated NDC to cover the unconditional actions.</p> <p>Additionally, the country has communicated its first unconditional mitigation contribution of 5.9% reduction below the BAU trajectory in 2030 and broadened the adaptation sectors from 7 to 13.</p>
b. Fairness considerations, including reflecting on equity;	<p>Uganda is still a Least Development Country with overarching goal of transforming from a predominantly peasant and low-income country to a competitive upper middle-income country.</p> <p>Uganda 's updated NDC represents her contribution and the fair share of domestic effort towards achievement of the long-term temperature goal.</p>
c. How the Party has addressed <b>Article 4, paragraph 3</b> , of the Paris Agreement;	The updated NDC highlights a huge progression from 22% to 24.7% reduction in 2030.
d. How the Party has addressed <b>Article 4, paragraph 4</b> , of the Paris Agreement;	Uganda continues to set economy-wide emission reduction target despite challenging times of Covid-19 pandemic and contracting economy. In this updated NDC, the economy-wide emission reduction target of 24.7% reduction is inclusive of new sectors: Transport, Waste and Industrial Processes and Product Use (IPPU).
e. How the Party has addressed <b>Article 4, paragraph 6</b> , of the Paris Agreement.	The NDC has been updated simultaneously with the development of the first Long Term Climate Strategy (LTS) in accordance with Article 4, paragraph 19, of the Paris Agreement.
7. How the NDC contributes towards achieving the objectives of the Convention as set out in its Article 2	
a. How the NDC contributes towards achieving the objective of the Convention as set out in its Article 2;	The updated NDC reflects Uganda's contribution as highlighted above, towards achievement of the objective of stabilization of greenhouse gas concentrations in the atmosphere and defines priority adaptation and mitigation actions.
b. How the NDC contributes towards Article 2, paragraph 1(a), and Article 4, paragraph 1, of the Paris Agreement.	The updated NDC defines the country's contribution highlighted in form of priority adaptation and mitigation actions towards limiting increase to 1.5°C See 6. (a)