REPUBLIC OF LIBERIA

Liberia's Revised
Nationally Determined Contribution (NDC)

Environment Protection Agency
Republic of Liberia

July 2021

FOREWORD

I am pleased to present the 2021 revision of Liberia's Nationally Determined Contribution (NDC) to the Paris Agreement. This NDC reflects Liberia's full ambition and commitment to doing her part to accomplish the goal to stabilize our global climate and to working with her people and the international community to meet the challenges of climate change together. Further, this NDC is the product of an intensive and inclusive effort to consult with all Liberian stakeholders to understand our national priorities, ambition, and opportunities to bring different parts of our society together in a great effort to improve our livelihoods along with reducing our impact on the climate and environment. With the vision presented in this NDC, Liberia is ready to take all necessary actions to implement climate action as enshrined in the Paris Agreement. The robust process of the NDC revision would not have been possible without the support of the NDC Partnership, which Liberia joined in December 2018. By mid-2019, the NDC Partnership received an application from Liberia under round one of the Climate Action Enhancement Package (CAEP). Liberia's CAEP application included 14 requests, which are supported by: Conservation International, the International Renewable Energy Agency, UNDP through the Climate Promise, and the EU-Climate Alliance +.

Liberia's NDC revision began with desk review that produced a Joint analysis report to help inform the country's team on what should be considered in the NDC revision process as stipulated in the joint work plan. Over the period of one year, the EPA in collaboration with its partners have completed Liberia's NDC revision, with inclusion of 3 additional sectors (Fisheries, Coastal Zone, and industry) that were not included in the INDC. Liberia's revised NDC comprise of nine (9) sectors (Agriculture, Coastal Zone, Energy, Fisheries, Forestry, Health, Industry, Transport and Infrastructure, and Waste).

I submit that the EPA is eagerly anticipating the implementation of the improved NDC through a holistic partnership that fosters development in Liberia in the face of changing climate. The Environmental Protection Agency of Liberia as the leading institution on the environment and climate change, will ensure all sectorial line ministries and agencies of government will combine efforts to drive Liberia's national climate agenda for the good of Liberia and for the rest of our one world, based on the Monrovia Declaration on Environment and Climate Action of June 2, 2020, in which the heads of sectoral agencies and ministries of the nine NDC sectors committed to collaborate on the implementation of the NDC. Liberia's commitment and high-level political support for the implementation of the NDC is further demonstrated through the cabinet level participation and statement of the President of the Republic of Liberia, HE. Dr. George M. Weah, at the NDC national validation on June 2, 2021.

We are grateful to all the stakeholders – the young people of Liberia, the women and men, the private sector, academia, and others – who helped to make Liberia's NDC revision such a successful whole-of-society effort.

Prof. Wilson K. Tarpeh
EXECUTIVE DIRECTOR/CEO

ACKNOWLEDGEMENTS

Special thanks to support provided from the NDC Partnership through the Climate Action Enhancement Package (CAEP), the NDC Coordinator, and key support partners in the development of Liberia's revised NDC: the UNDP-Climate Promise, Conservation International (CI) and the EU-Climate Change Alliance+.

NDC PARTNERSHIP | IN CONTRIBUTION TO THE NDC PARTNERSHIP

MINISTRY OF FOREIGN AFFAIRS OF DENMARK | Federal Ministry for Economic Cooperation and Development | Supported by: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety | based on a decision of the German Bundestag | Ministry of Foreign Affairs of the Netherlands | Norwegian Ministry of Climate and Environment | Norwegian Ministry of Foreign Affairs | Government Offices of Sweden Ministry for Foreign Affairs | UK Government

Activities financed in part by the Netherlands Ministry of Foreign Affairs

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EXECUTIVE SUMMARY

Nationally Determined Contributions (NDCs) are at the core of the Paris Agreement (PA), under which 191 countries, including Liberia, committed to limit global warming to "well below 2 degrees above pre-industrial levels," and to pursue efforts to limit the temperature increase to 1.5°C. NDCs are the delivery mechanism to reach the PA goals and achieving the overall global greenhouse gas (GHG) mitigation target, embodying efforts by each country to reduce national emissions and adapt to the impacts of climate change. The Paris Agreement requests countries to develop and submit updated NDCs every five years to the United Nations Framework Conventions on Climate Change (UNFCCC) Secretariat. These NDCs are expected to reflect increased ambition, whether in terms of strengthened targets, accelerated timelines, or a broader scope covering additional sectors or greenhouse gases. Liberia submitted her first NDC in 2015 and committed to revising and submitting an updated version as required by the Paris Agreement.

In so doing, Liberia revised her Nationally Determined Contribution (NDC) through robust stakeholder engagement processes. During the process, a whole-of-government-whole of society participatory approach was employed. Stakeholders involved in the process included: sectoral line ministries and agencies of government, private sector, civil society organizations, youth and women groups, national experts, and other relevant stakeholders.

The revision of Liberia's NDC began with a joint analysis of existing and proposed sectors through a detailed assessment of mitigation and adaptation measures and opportunities. Building upon this analysis, the NDC was then constructed via stakeholder consultation and participation, technical analysis of all the sectors, sectoral analysis reports, NDC costing and cost-benefit analysis, and workshop reports. The NDC revision also builds upon key national planning documents, including Liberia's first NDC (2015-2020), the National Climate Change and Response Strategy (2018), Liberia's Second National Communication, State of the Environment Reports, Liberia's first Biennial Update Report (BUR). Liberia's revised NDC is well aligned with the national government's Pro-poor Agenda for Prosperity and Development (PAPD) and its long-term sustainable development vision for 2030 (Liberia's Rising Vision 2030).

In its revised NDC, Liberia commits to reducing its economy-wide greenhouse gas emissions by 64% below the projected business-as-usual level by 2030, through a combination of the following: unconditional GHG reductions of 10% below BAU, resulting in an absolute emissions level of 11,187Gg CO_2e in 2030; with an additional 54% reduction conditional upon international support, which would result in an absolute emissions level of 4,537Gg CO_2e in 2030.

This commitment is constructed from GHG mitigation targets across nine key sectors – Agriculture, Forests, Coastal zones, Fisheries, Health, Transport, Industry, Energy, and Waste – as well as cross-cutting targets for urban green corridors. The NDC also includes climate change adaptation targets for eight sectors – Agriculture, Forests, Coastal zones, Fisheries, Health, Transport, Energy, and Waste – as well as cross-cutting targets for urban green corridors. The NDC outlines a national system for measurement, reporting, and verification (MRV) for mitigation actions and monitoring and evaluation (M&E) for adaptation actions to implement the NDC. It has also stated the policy and institutional arrangement for the NDC implementation and added the analysis of its co-benefits of adaptation and mitigation, and as well the direct and indirect investment needed to implement the NDC.

1.0 INTRODUCTION

1.1 Background

Liberia recognizes the current and future threats of climate change and has taken several initiatives to address those threats. Key among them are the ratification of the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and the Paris Agreement; the implementation of a number of climate change programs and activities including the National Adaptation Program of Action (NAPA), the National Adaptation Plan (NAP), the development of Liberia's Initial National Communication, the development of a National Policy and Response Strategy on Climate Change, among others, are all aimed at achieving the country's commitments to global climate change initiatives. Liberia's National Policy and Response Strategy on Climate Change, for instance, aims to ensure that a qualitative, effective, and coherent climate change adaptation process takes place, and also to serve as the pillar for comprehensive sectoral strategies and action plans.

The government has shown leadership in addressing climate change issues as demonstrated through its submission of an Intended Nationally Determined Contribution (INDC) in 2015, now the Nationally Determined Contribution (NDC) following the country's ratification of the Paris Agreement in 2018. The 2015 NDC aimed to reduce greenhouse gas emissions by 15% below business-as-usual levels by 2030 with a long-term goal of carbon neutrality by 2050, conditional upon international support. It also highlighted the crucial role of adaptation in ensuring the resilience of the country's communities and natural systems. The government continues to show such leadership as demonstrated through the development and subsequent submission of this revised NDC in fulfillment of its commitments under the Paris Agreement. Liberia's revised NDC addresses nine (9) key sectors – Agriculture, Forests, Coastal zones, Fisheries, Health, Transport, Industry, Energy, and Waste – as well as cross-cutting targets for urban green corridors. The development of Liberia's NDC was informed by a joint analysis of existing and proposed sectors for updating Liberia's NDC, a more detailed assessment of mitigation and adaptation measures, improved information, and data, as well as increased stakeholder consultation and participation. It presents a platform to integrate Liberia's Low Carbon Development Strategy into the country's medium-term development agenda (PAPD) as well as its long-term sustainable development vision by 2030 (Liberia's Rising Vision 2030).

1.2 National Circumstances

Liberia is located on the Atlantic Coast in the southern part of West Africa and lies between longitudes 7°30` and 11°30` west and latitudes 4°18` and 8°30` north. The country covers 111,369 km^2 and has borders with Côte d'Ivoire to the east, Sierra Leone to the west, Guinea to the north, and to the south with the Atlantic Ocean.

Liberia's population was 3.5 million people in 2008 and is estimated to have increased to 4.8 million people by 2018. The country's population is projected to reach at 10.3 million by 2050, with more than 70% of the population living in coastal cities, including Monrovia, Liberia's capital. The country's economy has experienced high growth since 2006 despite a decline from 2008 to 2010 largely attributed to the global financial crisis. The economy rebounded in 2011 with a combined increase in economic activities from the agriculture, forestry and fisheries sectors contributing 41% of the GDP and providing employment for 47% of the labor force. These sectors were driven by increased exports, especially in forestry, fisheries and rubber, followed by subsistence production of cassava and rice. The emergence of the Ebola Virus Disease (EVD) in 2014, coupled with the global economic meltdown, resulted in numerous

challenges and subsequent decline in the country's economy between 2015 and 2018. Liberia's economy was projected to rebound in 2020, but due to the global COVID-19 pandemic, there was a further decline. Real GDP growth in 2020 was projected to rebound to 1.4 percent; with said growth driven mostly by increased activities in both mining and non-mining sectors. Moreover, the rebound momentum was projected to continue in the medium term (2021 – 2024) with growth averaging around 4.4 percent.

Based on historical trends from 2009 to 2012, temperatures in Liberia typically vary between 23° C and 33° C and are rarely below 21° C or above 34° C. The records show the existence of a warm season between early January to early May, with an average daily high temperature above 31° C. There also exists a cold season that runs from early July to mid-September, with an average daily high temperature below 28° C. There are two major seasons in Liberia: rainy and dry. The rainy season lasts from mid-April to late October, whilst the dry season lasts from mid-November to mid-April. Average annual rainfall along the coastal belt is over 4,000 mm and declines to 1,300 mm at the forest-savanna boundary north of the coastal belt. The months of heaviest rainfall in Liberia are June, July and September.

1.3 Policy, Legal and Institutional Frameworks

1.3.1 Policy and Legal Frameworks

The Government of Liberia is committed to tackling climate change challenges through several national policies and strategic interventions. An overview of some key national policies related to development priorities and climate change mitigation and adaptation are outlined below:

Liberia Rising Vision 2030: Liberia's Vision 2030 is an overarching vision of the government of Liberia to direct the country to a developed society which includes a range of Pillars, Sector Goals, Strategic Objectives and Outcome Indicators, which together support the development of adaptation and mitigation capacity in Liberia.

Pro-Poor Agenda for Prosperity and Development (PAPD) (2018-2023): This is a five-year national development plan aimed at addressing the basic needs of Liberians for income security, better access to basic services, and greater opportunities for self-improvement in an enabling environment that is inclusive and stable. Its long-term goal is to raise the per capita income levels and economic status of Liberia to a middle-income country, as outlined under the Vision 2030 framework. The PAPD aligns with the African Union Agenda 2063 and Sustainable Development Goals (SDGs) across all three sustainability dimensions – economic, social, and environmental – with a special emphasis on human development and peace.

Environment Protection and Management Law (2003): This Law forms the legal framework for sustainable development, management and protection of the environment and natural resources by the Environment Protection Agency in partnership with relevant ministries, autonomous agencies, and organizations, as well as in a close and responsive relationship with the people of Liberia. It addresses a wide range of environmental issues, including environmental impact assessment, guidelines and standards, international obligations, education, and awareness.

National Environmental Policy (2003): Liberia formulated a national environmental policy to recognize the severe impact of human activities on all components of the natural environment, especially the influences of population dynamics, high density urbanization, and resource exploitation, as well as recognize the critical importance of restoring and maintaining environmental quality for the welfare and development of the people. The aim of the National Environmental Policy is to ensure the improvement of the physical environment, the quality of life of the people, and the economic and social living conditions of the entire

citizenry. It seeks to ensure reconciliation and coordination between economic development and growth with the sustainable management of natural resources.

National Policy and Response Strategy on Climate Change (2018): This national policy is a vehicle developed to support climate change adaptation, disaster risk management and mitigation capacity in Liberia. It focuses on the implementation of Liberia's commitment to achieving the SDGs, especially Goals 13, 14 and 15, which focus on combatting climate change and fostering sustainability. The Climate Change Policy also focuses on achieving Africa's vision for promoting positive socio-economic transformation (Agenda 2063 adopted in 2013) over the next 50 years. The agenda 2063 recognizes climate change and natural disasters as major threats to Africa's development now and in the future.

1.3.2 Institutional Framework

The National Climate Change Steering Committee (NCCSC) is the supreme institutional body responsible for coordinating and supervising the implementation of climate change policy and other related activities in Liberia. The NCCSC is chaired by the office of the President of the Republic of Liberia, or his/her designate, and supported through a National Climate Change Secretariat seated at the EPA to ensure the implementation of its daily activities.

The EPA is Liberia's Designated National Authority for the UNFCCC and has the mandate as the national regulatory agency for sustainable environmental management, including climate change. Section 5 of the Act Creating the Environment Protection Agency of the Republic of Liberia of 2002 mandates the Agency to:

- collaborate with key line ministries and agencies to coordinate, integrate, harmonize and monitor the implementation of environmental policy and integrate environmental concerns in overall national development planning.

- collect, collate, and analyse basic scientific data and other information pertaining to pollution, degradation of ecosystems and on environmental quality and resource use.

- train and build the capacity of line ministries and agencies.

- ensure the preservation and promotion of important historic, cultural, and spiritual values of natural resource heritage; and

- in consultation with local authorities, enhance effective natural resource management plans and activities.

To achieve its statutory mandate and other obligations, the EPA collaborates with several key entities including the Ministry of Finance and Development Planning which serves as chair of the EPA's Board, Forestry Development Authority, Ministry of Agriculture, National Disaster Management Agency, Ministry of Mines and Energy, Ministry of Internal Affairs, among others. This collaboration extends to the fulfilment of Liberia's commitment to the Paris Agreement including the development of the NDC.

2.0 LIBERIA'S NDC REVISION PROCESS

2.1 Review of Relevant Literature

A desk review was conducted through the sourcing of information and datasets from national databases and relevant literature including technical publications, sector specific reports, and other research papers; and was complemented by the appraisal of products developed during the NDC revision process. Of key significance is the Joint Analysis of Existing and Proposed Sectors for Updating Liberia's Nationally Determined Contribution, which was conducted by the government and its partners to kick-start and guide the Liberia's NDC revision process. The Joint Analysis report analyzes the national context for each of the proposed NDC sectors, underscores existing progress and challenges since 2015, identifies mitigation and adaptation opportunities, and prepares initial recommendations for consideration during the NDC update process, which was designed to take a consultative, whole-of-government approach. The review and all recommendations from this study were intended to serve as a starting point for technical expert input and consultation under the direction of the EPA.

Additionally, other relevant literature was consulted, including but not limited to the following documents: Liberia's NDC (2015-2020), all reports from the NDC revision process, all technical reports on the ten sectors identified for the revised NDC, sectoral analysis reports, other cross cutting NDC workshop reports, National Policy and Response Strategy on Climate Change (2018), Liberia's Second National Communication, State of Environment Reports, Liberia's first Biennial Update Report (BUR-1), Pro-poor Agenda for Prosperity and Development, and Liberia's Rising Vision 2030, etc.

2.2 Categorization of Stakeholders

Through a well-thought-out strategy, a list of key stakeholders was developed, and stakeholder engagement plans rolled out to ensure meaningful engagement and participation of all stakeholders in the revision process. Stakeholders were categorized according to several relevant indicators and considerations, including technical experts, national and sub-national officials of government, women, youth, private sector, non-governmental organizations, and civil society, etc. as well as into regional and city segments to ensure the full participation of cross section of the citizenry. Stakeholders were also placed into two broad categories: the first being the widely recognized stakeholders, which are segments of the population or governance structures that themselves are policy and decision makers, administrators, and are frequently recognized and consulted; and the second being the vulnerable groups who are not regularly recognized. These stakeholders were engaged through various platforms as outlined in Section 2.3 below.

2.3 Consultative Meetings

2.3.1 Regional Consultations

Three (3) regional consultative meetings were held. The first was held in Gompa City, Nimba County on September 17, 2020, which brought together delegates comprising local county officials, women, youth, and representatives of line ministries, agencies, and commissions at the county level from five (5) counties including Nimba, Bong, Lofa, Grand Gedeh and River Gee. The second meeting was held in Buchanan, Grand Bassa County on September 25, 2020, and brought together participants from Grand Bassa, Rivercess, Sinoe, Grand Kru, and Maryland counties. The third meeting was held in Tubmanburg City, Bomi County on September 30, 2020, and brought together participants from Bomi, Grand Cape Mount,

Gbarpolu, Margibi and Montserrado counties. The regional meetings were delivered through thematic expert presentations, break-out and brainstorming sessions, and plenary discussions, feedback presentations of outcomes from break-out meetings and group recommendations and resolutions. Key presentations included: an overview of the Paris Agreement, roadmap for the revision of Liberia's Nationally Determined Contribution, Joint Analysis of Existing and Proposed sectors for Updating Liberia's Nationally Determined Contribution, mainstreaming capacity building in the NDC revision process, integrating the Action for Climate Empowerment (ACE) approaches into NDC processes, among others. During these regional meetings, the delegates agreed to remain engaged and contribute to the overall NDC revision process as well as contribute significantly to the full implementation of Liberia's revised NDC. All feedback was captured in workshop reports that fed into the NDC revision process.

2.3.2 Technical/Expert Group

The Technical/Expert Group meeting was held from 10th -11th September 2020 in Buchanan, Grand Bassa County. This meeting brought together a total of 86 technicians and experts from government line ministries, agencies, commissions as well as those from civil society, private institutions, and academia to brainstorm on sectoral approaches to reduce greenhouse gas levels and the impacts of climate change in Liberia as part of Liberia's revised NDC. The technical workshop was delivered through series of presentations, technical working group discussions, as well as presentation of feedback, group outcomes and reports. The composition of each working group was based on the technical expertise within a given sector. The technical workshop reassessed the existing NDC sectors targets and put forth recommendations including the analysis and inclusion of new targets, as well as the identification of additional sectors, for inclusion into Liberia's revised NDC. Feedback from this meeting was also captured in workshop reports that fed into the NDC revision process.

2.3.3 Youth Dialogue

The Youth Dialogue was held on September 16, 2020, in Gompa City, Nimba County. This meeting brought together over thirty-five (35) youth organizations across Liberia, including the Federation of Liberian Youth; Mano River Union Youth Parliament Liberia Chapter; West African Youth Network, Liberia; Tubman University Volunteer Movement (TUVM); Liberia National Students' Union; Youth Climate Change Initiative- Liberia; ECOWAS Youth Commission; Liberia Girl's Guide; African Youth with Disabilities Liberia Chapter; among others. The Youth Dialogue produced the "Ganta Declaration" which commits the youth population of Liberia to remaining engaged in throughout the NDC development and implementation process. Since the signing of this Declaration, the Youth community of Liberia remained fully engaged throughout the NDC revision process through their representatives whose valuable participations and inputs contributed to the development of Liberia's revised NDC.

2.3.4 Gender Dialogue

The National Gender Dialogue was held under the theme "Women leading for climate action; a catalyst for Liberia's NDC ambition" from October 27-28, 2020, in Gompa City, Nimba County. The goal was to incorporate gender inclusiveness in Liberia's NDC for an effective and efficient implementation. The main objectives included to champion the advancement of women's economic empowerment and participation in the revision process of Liberia's NDC; ensure that women remain an integral part of Liberia's NDC revision process; and ensure inclusiveness in environmental planning and decision-making through capacity building for women owned enterprises to enable their integration of are into the mainstream economic activity, environmental and climate change discussion and decision-making.

The Gender Dialogue targeted civil society groups promoting gender equality and women empowerment, gender coordinators across Liberia's 15 political sub-divisions, as well as the private sector and community-based groups supporting women's empowerment. The dialogue achieved the following commitments: that women took ownership of the NDC revision process for effective implementation; that women actively and equally engaged men and other gender groups in the NDC actions and in decision-making to help ensure an inclusive approach in national climate strategies and actions; and that all participants work towards the fulfilment of both the NDC and the Paris Agreement, and most importantly towards more inclusive and sustainable development outcomes through the preparation of the declaration.

2.3.5 Private Sector

The Private Sector Dialogue was held in Paynesville City, Montserrado County, on November 12, 2020, under the theme "Private Sector: A catalyst in boosting NDC implementation for a resilient economy". The goal of this dialogue was to encourage the participation of the private sector in Liberia's NDC for an inclusive implementation of climate change management. The following were the objectives of the Private Sector Dialogue: to provide and encourage the participation and contribution of the private sector in the revision process of Liberia's NDC; to engage the private sector to take ownership of this NDC revision and implementation process; to systematically attract private finance through public-private partnerships and other means to contribute to the scaling up of climate change adaptation activities through promoting innovation and participation of the private sector in climate change adaptation/mitigation planning, etc.

The Private sector dialogue targeted all private sector institutions, Liberian businesses, non-Governmental Organizations (NGOs), Community Based Organizations (CBOs), media houses, all groups and associations, manufacturers, individuals, etc. involved one way or the other into private businesses in Liberia. During this dialogue, the private sector actors agreed to join the government and other partners in their efforts of NDC revision process, and also help to mitigate the impacts of climate change; to become an active partner in adaptation efforts as they have the potential to bolster government's efforts and complement adaptation measurers to help in climate change risk management; and to integrate adaptation measures into their strategies and investments in at risk sectors such as agriculture, tourism and energy, to make their investments and returns less risky and ultimately more profitable. At the end of the workshop, a general commitment to forge a new alliance with the government was made, with all participating institutions encourage to forge a public private partnership with the government and other partners to address the impacts of climate change and seek sustainable solutions that deliver a win-win outcome for the government, communities, and businesses in Liberia and to be a part of the Liberia's NDC.

Additional consultative meetings undertaken to inform the outcome of Liberia's NDC revision included other technical meetings and regional validation workshops and presentations on urban green corridors, NDC costing/financing.

2.3.6 Regional Review and Validation of Liberia's NDC

The NDC revision process was concluded with the hosting of three regional validation workshops across Liberia aimed at reviewing and validating the agreed targets and measures as proposed and developed by stakeholders during the revision processes. These workshops were held respectively in Buchanan, Kakata and Gompa cities and brought together participants from across the length and breadth of Liberia to review and validate the final Revised NDC for onward submission to the Secretariat of the UNFCCC.

The overall goal of the regional review and validation workshops was to formally present the draft revised NDC report, as developed through stakeholders' participation, to regional stakeholders across Liberia for their review, confirmation, inputs and endorsement ahead of the national validation and subsequent approval by the Cabinet. This goal was achieved at the end of the three workshops which saw the overwhelming endorsement of the draft revised NDC report by key regional stakeholders representing the 15 political sub-division of Liberia.

These regional validation workshops were preceded by series of technical expert reviews involving key subject-matter experts from across NDC-related sectoral institutions, including the Environmental Protection Agency, Forestry Development Authority, Ministry of Agriculture, Ministry of Mines and Energy, Ministry of Transport, Ministry of Health, Ministry of Internal Affairs, Ministry of Gender and Children Protection, Liberia Maritime Authority, National Fisheries and Aquaculture Authority, etc. These experts were supported remotely by international experts from CI, EU-Climate Change Alliance+, and the UNDP-Climate Promise. These technical reviews resulted in the finalization of Liberia's Revised NDC for approval by the Office of the President and subsequent submission to the UNFCCC Secretariat.

3.0 CONTRIBUTIONS

3.1 Mitigation

Liberia commits to reducing its economy-wide greenhouse gas emissions by 64% below the projected business-as-usual level by 2030, through a combination of the following: unconditional GHG reductions of 10% below BAU, resulting in an absolute emissions level of 11,187Gg CO_2e in 2030; with an additional 54% reduction conditional upon international support, which would result in an absolute emissions level of 4,536.64 Gg CO_2e in 2030. To achieve this target, the country has included additional sectors to those previously included in the 2015 NDC. ***Table 1.0*** provides details on the sectors, their proposed targets, as well as mitigation actions and policy measures to achieve the stated targets.

The extent of implementation and achievement of the targets as proposed in this updated NDC are mainly conditioned upon the provision of adequate means of implementation (financial resources, capacity building and technology transfer, etc.) by the international community. This condition does not, however, constitute an international obligation to Liberia. The government is also committed to unconditionally support the implementation and achievement of Liberia's overall targets through other financial mechanisms including the traditional budgetary allocation to the environment sector.

The government is further committed, through several national programs and policies, including the Reducing Emissions from Deforestation and Forest Degradation (REDD+) strategy, to reducing GHG emissions levels in line with its target. In demonstration of its commitment, the country has already submitted its forest reference emissions level to the Secretariat of the United Nations Framework Convention on Climate Change and aims to, among other things, achieve its Vision 2030 through a low-carbon, climate-resilient development pathway through the implementation and periodic updating of key national and climate change policies and action plans to achieve its targets.

3.1.1 Mitigation Targets, Actions, and Policy Measures

Table 3. 1: Mitigation Targets and Measures/Actions for the Revised NDC

AGRICULTURE
Mitigation Targets
In the Agriculture sector, Liberia commits to the following mitigation targets to reduce GHG emissions related to agriculture and livestock systems: • Reduce agricultural GHG emissions by 40% below BAU levels by 2030 (reduction of 13 $GgCO_2e$) through promoting low-emissions rice cultivation and reducing the burning of field residues. • Reduce GHG emissions from the livestock sector by 40% below BAU levels by 2030 (reduction of 211 $GgCO_2e$) through incentivizing improved feed, e.g., with legume fodder species, to reduce enteric fermentation (reduction of 103 $GgCO_2e$), improved waste management, e.g. with bio-digesters and composting (reduction of 108 $GgCO_2e$).
Mitigation Actions and Policy Measures

• Roll out incentives and programs to promote low-carbon agriculture practices, e.g., conservation agriculture, no/low tillage, agro-silvopastoral systems, improved lowland rice cultivation, multi-cropping, organic fertilizers, fertigation, composting, crop rotation, and sustainable agricultural waste management.
• Roll out incentives and programs to implement low-emissions livestock systems, with practices to improve pasture and manure management, reach the optimal intensity of grazing, and reduce enteric fermentation.
• Implement sustainable, low-carbon development of 150,000 ha of lowland crop systems, 500,000 ha of upland sedentary crop systems, and 500,000 ha of pastureland by 2030.
• Ensure 1,500 agricultural households adopt sustainable agriculture, animal husbandry, soil conservation, and organic/manure management practices by 2030 *(Link to Health sector)*
• Allocate $400,000 per year in funding for research on sustainable agricultural production and GHG mitigation potential from the agriculture and livestock sectors in Liberia by 2025, conditional upon international support
• Increase training and capacity building of farmers and agricultural extension agents to implement mitigation actions in the agriculture sector
  ○ Establish 100 farmer field schools and train at least 5,000 farmers to implement conservation agriculture, soil carbon sequestration methods, and low-emissions livestock systems by 2025 *(Linked to Adaptation target)*
  ○ Train at least 3 agricultural extension agents per district yearly to support implementation of conservation agriculture, soil carbon sequestration, and low-emissions livestock systems by 2025 *(Linked to Adaptation target)*
• Deploy at least 1 solar water pump and/or spring irrigation system for crop irrigation for communal farms with land constraints in each county by 2030.

- Develop programs and policies to incentivize the establishment of new agricultural areas on open and/or degraded lands by 2025 *(Link to Forest sector)*
- Develop policy and incentives frameworks to implement low-emissions practices in the production and processing systems of key commodity agriculture and tree crop value chains, e.g., oil palm, rubber, cocoa, rice, sugar cane, cassava, bananas by 2030
- Develop a circular agricultural economy plan to support reuse of organic materials and soil re-carbonization by 2025
- Link agricultural development with the National REDD+ Strategy by 2025.

FORESTS

Mitigation Targets

In the Forest sector, Liberia commits to the following mitigation targets to reduce GHG emissions from and enhance carbon sinks in forested areas:

- Reduce the national deforestation rate by 50% by 2030
- Reduce GHG emissions from forest conversion by 40% below BAU levels by 2030 (Reduction of 5,147 $GgCO_2e$ in 2030).
- Reforest an average of 12,285 ha per year to enhance forest carbon stocks by 1,013 $GgCO_2e$ in 2030, including through natural regeneration and tree planting through community and school programs.
- Restore 25% of priority degraded forests by 2030.
- Enhance carbon stocks by 600 Gg CO_2e through annual carbon sequestration in the urban canopy and the planting of additional trees in urban green corridors.

Mitigation Actions and Policy Measures[1]

- Reduce GHG emissions from avoided forest conversion by 2030 through enhanced implementation of the National REDD+ Strategy
  - Reduce GHG emissions by 1,800 Gg CO_2e per year by limiting Forest Management Concessions to 1.6 million ha by 2030
  - Reduce GHG emissions by 3,200 Gg CO_2e per year by converting timber sales contracts into carbon concessions by 2030
- Improve national programs and policies to reduce GHG emissions by incentivizing sustainable fuelwood and charcoal production by 2030 (*Link to Health and Energy sectors).*
  - Reduce emissions by 1,100 Gg CO_2e per year by increasing the efficiency of charcoal production and use by 2030
- Establish 5 new Protected Areas to complement the existing government commitment to increase forest Protected Areas to 1.5 million ha, ensuring a 3km buffer zone, by 2030
  - Reduce emissions by 210 Gg CO_2e per year by accelerating the designation of forest Protected Areas
- By 2030, increase the urban canopy covers in 5 cities (Paynesville, Monrovia, Buchanan, Gbarnga and Gompa) to 50%. In each city, this includes increasing the amount of dedicated open and green spaces by 10% each year and restoring or enhancing at least 0.5 km^2 (50 ha) of natural areas each year.

[1] Detailed GHG emissions reduction goals under Mitigation Actions are included under the high-level Mitigation Targets and are also included in this section for further information about how the high-level targets are expected to be achieved.

- Improve national programs and policies to enhance forest carbon stocks by incentivizing and increasing agroforestry, reforestation, afforestation, and forest restoration, including through reforestation agreements with logging companies, by 2030 *(Link to Agriculture sector)*
- Implement an awareness campaign concerning water pollution by logging companies and deploy additional environmental inspectors or agents in the high-risk areas to address logging-related pollution by 2025
- Conserve all High Conservation Value-High Carbon Stock (HCV-HCS) forests within agricultural, tree crop, and commercial forestry concessions, and site new concessions on open/degraded land by 2030 *(Link to Agriculture sector)*
    - Reduce emissions by 2,100 Gg CO_2e per year by siting 100,000 ha of agricultural concessions onto degraded land by 2030 *(Link to Agriculture sector)*
- Develop rehabilitation plans and agreements for mining companies by 2025 and implement a net-zero deforestation mining policy by 2030
- Increase the designation of Community Forest Area to 1 million ha and promote sustainable community forest management, including guidelines for sustainable resource extraction (e.g., hunting, artisanal mining, non-timber forest products) by 2030
    - Reach 1,500 forest dependent communities with strategic messaging about incentives and opportunities to reduce their climate footprint at the household and community level by 2030
- Enforce policy that embeds degraded land reclamation by 2025.
- Develop and implement alternative livelihoods programs with forest dependent people in 5 forested counties, including development of markets for non-timber forest products and ecotourism, by 2030 *(Linked to Adaptation target)*
- Hold 15 trainings per year to develop capacity for forest managers, researchers, and forest-dependent communities to implement mitigation actions in the forest sector for uptake of best practices for climate smart forest management, monitoring and conservation, increase forestry research, and enable forest communities to implement improved forestry practices by 2030 *(Linked to adaptation target).*
- Increase funding for agroforestry and forestry research by at least $150,000 dollars per year by 2030 *(Link to Agriculture sector).*
- Improve transparent enforcement of forest laws, e.g., against illegal deforestation and chain sawing, by 2025.

COASTAL ZONES

Mitigation Targets

In the Coastal zones sector, Liberia commits to the following mitigation targets to reduce GHG emissions from ecosystem conversion and enhance carbon sinks in mangroves and other blue carbon ecosystems:

- Improve protection and conservation measures in 30% of mangrove ecosystems and reduce GHG emissions by a total of 1,800 $GgCO_2e$ through avoided conversion and draining of mangrove ecosystems by 2030 *(Link to Fisheries sector)*[2]
- Enhance coastal carbon stocks by restoring 35% of degraded coastal wetlands and mangrove ecosystems by 2030 *(Link to Fisheries sector)*

Mitigation Actions and Policy Measures

- Enhance national policies, plans and incentives to increase mangrove and coastal conservation and restoration, based on a survey analysis of coastal zone ecosystems to identify threats and priority action areas
- Expand marine and coastal ecosystem protection by establishing 2 Marine and 2 Coastal Protected Areas and develop new or updated Protected Area management plans by 2030 *(Link to Fisheries sector)*
- Hold 19 trainings per year to improve capacity building for coastal managers and communities to implement coastal mitigation actions, which will support uptake of best practices for climate-smart coastal management, monitoring and conservation and enable coastal communities to support conservation efforts by 2025
- Finalize the National Wetlands Policy by 2025
- Promote mangroves within the National REDD+ Strategy by 2025 *(Link to Forest sector)*
- Develop mechanisms for sustainable community management of mangrove areas key for local livelihoods and sustenance, including alternatives to smoking fish by 2025 *(Link to Fisheries and Health sectors)*
- Develop a Marine Spatial Plan and comprehensive Integrated Coastal Zone Management Plan/Strategy/Policy and establish community-based action groups and cross-sectorial working groups to implement them by 2025.
- Increase funding for coastal and blue carbon climate research and access to research opportunities by 2025 *(Linked to Adaptation target).*

FISHERIES

Mitigation Actions and Policy Measures

In the Fisheries sector, Liberia commits to the following actions:

- Reduce GHG emissions by harnessing the mitigation co-benefits of the Fisheries sector adaptation targets and develop a system to measure and track these benefits by 2030.
- Develop a program to provide trainings about and incentives for fisher-folk to adopt eco-stove fish dryers to reduce GHG emissions and discourage mangrove deforestation from usual methods by 2025.

[2] This target for GHG emissions reductions from mangrove ecosystems is not included in the economy-wide target, as GHG emissions from mangroves are not yet estimated in the latest GHG inventory, nor the BAU scenario. This target was calculated with GHG estimates produced by an independent analysis using a Liberia-specific land-use cover change analysis with Tier 1 IPCC Guidelines, and it is included here as a reference target for once mangroves can be included in the national GHG inventory, and thus reported on in the NDC.

HEALTH

Mitigation Actions and Policy Measures

In the Health sector, Liberia commits to the following:

- Reduce GHG emissions by harnessing the mitigation co-benefits of the health sector adaptation targets and develop a system to measure and track these benefits by 2030.
- Develop and implement programs to improve healthcare waste management practices and reduce GHG emissions from waste incineration by following reduce, re-use, recycle, and compost best practices by 2030. *(Link to Waste sector)*.

TRANSPORT

Mitigation Targets

In the Transport sector, [3] Liberia commits to reducing GHG emissions by 15.1% below BAU levels by 2030:[4]

- Reduction of 16.9 $GgCO_2e$ in 2030 by the introduction of electric vehicles with focus on kekehs (for private use);
- Reduction of 32.3 $GgCO_2e$ in 2030 by supporting the transformation of National Transit Authority (NTA) buses and private vehicles (cars and taxis) to Compressed Natural Gas (CNG); by 2030.

Mitigation Actions and Policy Measures

- Financial measures through:
  - the implementation of a vehicle labelling system which is an information system which registers the level of GHG emissions for each vehicle by 2025.
  - the implementation of a fee bate / rebate programme through which the government levies fees on relatively high GHG emitting vehicles and provides rebates on lower emitting vehicles by 2025.
  - the enforcement and adaptation of registration taxes, in particular with and the enforcement of the 10% tax on luxury vehicles and the integration of a tax on transit vehicles by 2025.
- Consumer information campaigns through heightened driver awareness about better ways of driving cars through eco-driving, speed reduction and use of well-adjusted motors, electric and Compressed Natural Gas vehicles and promotion of public transport through the use of bus transport network and car sharing; *(Linked to Health sector).*
- Promote diesel particulate filters for road and off-road vehicles.
- Continuation of road upgrading and construction.
- Support the implementation of infrastructure that foster the development of a bus public transport network for Monrovia.
- Design a transport interchange hub program by 2025.

[3] For an in-depth analysis and justification of the NDC measures for the transport sector please see "Transport sector sectoral analysis and revised NDCs, Long Term Technical Assistance (LTTA) to the EPA of Liberia, EU-Liberia Climate Change Alliance+; April 2021"

[4] BAU emissions from transport sector in 2030 are estimated at 324.96 Gg CO_2e

- Review of the institutional framework by 2025.
- Setting up of a sustainable transport policy by 2025.

INDUSTRY

Mitigation Actions and Policy Measures

- Implement a Hydrofluorocarbon (HFC) tax for regulating the consumption of fluorinated gases in the air conditioning and refrigeration sector.
- Increase the percentage of low-GWP alternatives in economy-wide uses of HFCs, consistent with the HFC phase-down level.
- Provide incentives for companies and consumers to replace high-Global Warming Potential (GWP) HFC commercial equipment or appliances with low-GWP alternatives.
- Introduce a policy or legal framework that all new high-efficiency cooling equipment must use either a low-GWP HFC or an HFC alternative.

ENERGY

Mitigation Targets

In the Energy sector, Liberia commits to the following mitigation targets to reduce GHG emissions[5]:

- Reduce GHG emissions from energy sector (excluding transport sector) by 40.6% below BAU levels by 2030[6]
  - Create a private investment enabling environment focusing on Power Purchase Agreements (PPAs) for renewable energy (RE). Reduce emissions by 79.8 Gg CO_2e per year by the installation of 100 MW RE plants producing 300GWh per year with load factor of 40% by 2030.
  - Reconnection of Monrovia clients to the grid. Reduce emissions by 124.15 Gg CO_2e per year by supporting the process by which 100% of the of the owners of individual generators will switch to the distribution network, by 2030
  - Development of off-grid small hydropower plants (HPP) and on-grid ones via PPAs. Reduce emissions by 15.4 Gg CO_2e per year by installing a batch of several sites with 20 MW capacity; medium HPP with an output of 40 GWh/year and with 50% base load minimum for rural electrification and connected to the grid, by 2030.
  - Develop large solar photovoltaic (PV) plants with (Independent Power Producers (IPPs) and PPAs. Reduce emissions by 0.52 Gg CO_2e per year supporting the installation of in total 10 MW Capacity PV Plants with an output of 2 GWh/year by 2025.
- Produce and distribute energy saving cook stoves to reduce the use of fuel wood and charcoal (*Link to Forest sector*).

[5] For an in-depth analysis and justification of the NDC measures for the waste sector please see "Energy sector sectoral analysis and revised NDCs, Long Term Technical Assistance (LTTA) to the EPA of Liberia, EU-Liberia Climate Change Alliance+; April 2021".

[6] BAU emissions from energy sector, excluding transport, in 2030 are estimated at 528.57 Gg CO_2e.

- Reduce emissions by 588 Gg CO_2e per year by making sure 60% of households using fuel wood or charcoal are supplied with energy efficient cook stoves by 2030[7].

Mitigation Actions and Policy Measures

- Improve the policymaking capacity with better cross sectoral coordination and implementation with focus on low GHG enabling investments.
- Capacity Building in NDC: Emission Reduction policies and implementation.
  - Technical Assistance to improve the applicability of the institutional and legal framework, focusing on Power Purchase Agreements, regulatory framework, and unbundling the energy sector. This is downstream to the policy making process and in synergy with it.
- Liaise with WAPP to create a strategy to obtain cleaner electricity in the dry season, avoiding in this way the uses of fossil fuel for electricity generation in that season.
- Support the implementation of a full regulation of the electricity sector with accurate costs, and tariffs.
  - Real costs and tariffs calculated in the 3 segments to be unbundled: generation, transmission distribution by 2023
  - Social subsidies to support social tariffs implemented by 2024
  - Reduce total electricity loss to 10% by 2025 through the improvement of the distribution network (technical losses) and the implementation of a social tariff (non-technical losses)
- Use the new private investment enabling environment to write a roadmap to achieve a renewable energy generation to at least 30% after 2030.
- Develop a strategy for reduction of fuel consumption in the energy industries sector.
  - To support the distribution of energy saving cookstoves, implement a campaign to increase awareness to promote the use of energy efficient cook stoves and regulate its use.

WASTE

Mitigation Targets

In the Waste sector, Liberia commits to the following mitigation targets to reduce GHG emissions[8]

- Reduce GHG emissions from waste sector by 7.6% below BAU levels by 2030[9]
  - Reduce emissions by 25.63 Gg CO_2e per year by supporting the implementation of a landfill gas recovery system on When Town Landfill by 2022

[7] Biomass is a special case because CO_2 emissions from biomass combustion are not included in the national total. They are reported separately as an information item.
[8] For an in-depth analysis and justification of the NDC measures for the waste sector please see "Waste sector sectoral analysis and revised NDCs, Long Term Technical Assistance (LTTA) to the EPA of Liberia, EU-Liberia Climate Change Alliance+; April 2021"
[9] BAU emissions from waste sector in 2030 are estimated at 681.7 Gg CO_2e

- Reduce emissions by 25.63 Gg CO_2e per year by supporting the implementation of a landfill gas recovery system on Cheeseman burg Landfill by 2025
- Reduce emissions by 0.84 Gg CO_2e per year by supporting the development of small-scale composting of market waste with a production of 500 t/year each; by 2025.

Mitigation Actions and Policy Measures

- Strengthening of the institutional and legal situation at national and municipal levels by 2025.
- Strengthen of operational and financial management capacities at the community and institutional level for integrated waste management by 2025.
- Public participation and capacity building through education and awareness raising programs to enhance awareness on proper waste management practice by 2025 (*Link to Health sector).*
- Strengthen private sector participation by 2023.
- Once the landfill recovery system is in place and stable, a feasibility study would be done for its use for biogas and power generation.
- Provide technical/logistical support for
  - Improved coverage of waste collection, including the method of waste collection.
  - Improved waste sorting mechanism
  - Improved system that incentivizes reuse, recycle as well as composting and/or bio-digestion (*Link to Health sector*).

CROSS-SECTORAL

Mitigation Actions and Policy Measures

- Establish measures to shrink the carbon footprint of at least 5 cities of Monrovia, Paynesville, Buchanan, Gompa and Gbarnga by 50% each.
- Draft a National Zoning Act on urban green corridors to promote sustainable urban development and enforcement.
- Strengthen institutional and individual capacity for urban planning and management at the Ministry of Public Works, LISGIS, and Municipal Authorities of Monrovia, Paynesville, Buchanan, Gompa & Gbarnga, including addressing gender considerations as part of training for institutional and local experts.
- Set up an initiative to explore innovative financing models, such as payments for ecosystem services, for ecosystem conservation, restoration, and climate-smart practices in the forest, agriculture, and coastal zone sectors by 2025 *(Linked to Adaptation target)*
- Establish an inter-ministerial national task force on integrated land-use planning for urban areas and green corridors, forests, coastal zones, wildlife, and agriculture by 2030
- Develop an integrated spatial data management system for sustainable land use management by 2025
- Establish a Natural Capital Accounting system for coastal zones and forests by 2030

- Establish the prerequisite conditions and regulations to enable a REDD+ nesting framework by 2030, including (i) improve national systems to increase land tenure security by 2025 and (ii) clearly define carbon rights for relevant stakeholders in Liberia by 2030, (iii) Through the Liberia Land Authority, establish a defined land-use matrix for reporting purposes by 2030.
- Fully integrate GHG fluxes (emissions and removals) from mangroves ecosystems, the agriculture sector, and short-lived climate pollutants into the next national GHG inventory by 2030
- Mainstream climate actions, capacity building, climate finance, and gender and youth concerns into every sector activity by 2025.

3.2 Information to Facilitate Clarity, Transparency and Understanding of the Updated NDC

Table 3. 2: Information to Facilitate Clarity, Transparency and Understanding of the Updated Nationally Determined Contribution of Liberia for the Timeframe 2021-2030

Para	Guidance in decision 4/CMA.1	ICTU guidance as applicable to Liberia's NDC
1	**Quantifiable information on the reference point (including, as appropriate, a base year)**	
a)	Reference year(s), base year(s), reference period(s) or other starting point(s);	Reference year for Business-as-Usual GHG emissions: 2030 Starting point for GHG emissions: 2015
b)	Quantifiable information on the reference indicators, 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;	Total GHG emissions in 2015 were 5,357.75 Gg CO_2 equivalent (CO_2e). BAU GHG emissions estimated in target year (2030): 12,429.81 Gg CO_2e Unconditional, 10% GHG emissions reductions target (2030): 11,186.83 Gg CO_2e Conditional, 64% GHG emissions reduction target (2030): 4,536.64 Gg CO_2e
c)	For strategies, plans and actions referred to in Article 4, paragraph 6, of the Paris Agreement, or polices and measures as components of nationally determined contributions where paragraph 1(b) above is not	Not applicable

	applicable, Parties to provide other relevant information	
d).	Target relative to the reference indicator, expressed numerically, for example, in percentage or amount of reduction;	Liberia commits to reducing its economy-wide greenhouse gas emissions by 64% below the projected business-as-usual (BAU) level by 2030 through a combination of the following: unconditional reductions of 10% below BAU, resulting in an absolute emissions level of 11,186.83 Gg CO_2e in 2030; with an additional 54% conditional upon international support, which would result in absolute emissions level of 4,536.64 Gg CO_2e in 2030.
e).	Information on sources of data used in quantifying the reference point(s);	For the economy wide GHG emissions reduction target, quantifiable information is based on: (1) the GHG inventory presented in Liberia's Biennial Update Report which covers GHG emissions from 2015-2017. The BUR includes details about the data sources used for the GHG inventory. National data was used where available, with international data used only to supplement national data gaps. (2) the Business-as-Usual scenario presented in the Liberia Second National Communication submitted in 2021, which uses a reference period from 2015-2050. This BAU scenario was adjusted for the NDC, as described in section 5(f)(i). The BAU scenario uses national data were available, with international data used to supplement national data gaps, as follows: • National data on population and population growth rate • National data from the Central Bank of Liberia, with supplementary data from the World Bank and International Monetary Fund, on Liberia's GDP and the GDP contribution of each sector • National data on energy balance, including biomass (2018) • National data, and supplementary data from the World Bank, on energy and electricity statistics • National data on waste and waste management • National data, with supplementary international data, as detailed in the report: *Report on Liberia's Fuel Economy and Vehicle CO2 Emission*, EPA, 2017 • National data on forest cover and forest conversion • National data, with supplementary international data from FAO and other sources, on livestock statistics and agricultural soils as detailed in the following reports: o *Comprehensive Assessment of the Agriculture Sector in Liberia*, Ministry of Agriculture, 2007 o *Liberia Annual Food Crop Production Survey 2014 and 2015*, LISGIS, 2017 o *National Rice Development Strategy of Liberia,* Ministry of Agriculture, 2012 o *Sector Scan the Agriculture Sector in Liberia,* Liberia Netherlands Business and Culture Council, 2017

f).	Information on the circumstances under which the Party may update the values of the reference indicators.	Consistent with paragraph 28 of Annex 1 to Decision 18/CMA1 and the IPCC good practice guidance, Liberia is dedicated to improving the quality of its National GHG inventory and GHG Inventory system and will make recalculations to the inventory time series as needed to reflect the latest data and to maintain methodological consistency over time. Liberia is currently in the process of updating and improving its GHG inventory systems via the CBIT project and when finalized, as needed, the country will update the values of its reference indicators to reflect changes and data improvements in its GHG estimates and inventory system.
2.	**Time frames and/or periods for implementation:**	
a).	Time frame and/or period for implementation, including start and end date, consistent with any further relevant decision adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA)	The implementation of efforts to reduce GHG emissions through proposed mitigation actions and targets across various sectors will span from 1 Jan 2022 to 31 Dec 2030.
b).	Whether it is a single-year or multi-year target, as applicable.	Single year target, 2030.
3.	**Scope and coverage:**	
a).	General description of the target;	Liberia commits to reducing its economy-wide greenhouse gas emissions by 64% below the projected business-as-usual (BAU) level by 2030 through a combination of the following: unconditional reductions of 10% below BAU, resulting in an absolute emissions level of 11,186.83 Gg CO_2e in 2030; with an additional 54% conditional upon international support, which would result in absolute emissions level of 4,536.64Gg CO_2e in 2030.
b)	Sectors, gases, categories, and pools covered by the nationally determined contribution, including, as applicable, consistent with Intergovernmental Panel on	The Liberia's NDC is an economy-wide goal to reduce emissions relative to the BAU baseline. It reflects and includes all anthropogenic emissions and removals as reported in the GHG Inventory as contained in the first BUR, and specifically includes: ▪ Sectors, as defined by the IPCC 2006 guidelines: Energy, Industrial Processes and Product Use, Agriculture, Waste, Land Use, Land Use Change, and Forestry

	Climate Change (IPCC) guidelines;	▪ Greenhouse gases: Carbon dioxide (CO2), Methane (CH4), Nitrous oxide (N2O), Hydrofluorocarbons (HFCs), The precursor gases nitrogen oxides (NOx), carbon monoxide (CO), non-methane organic volatile compounds (NMVOCs) and Sulphur dioxide (SO2). ▪ All categories, as included in the IPCC 2006 guidelines, occurring in Liberia with available data ▪ All carbon pools, as included in Volume 5 of the IPCC 2006 guidelines, occurring in Liberia with available data
c)	How the Party has taken into consideration paragraph 31(c) and (d) of decision 1/CP.21 indicating how the Party is striving to include all sources and sinks, and why any categories are excluded.	Liberia continues to use the methodologies contained in the IPCC 2006 guidelines for reporting its National GHG inventories in all the communications including the NCs, BUR and NDCs. The methodologies used in these reports are from Tier 1 using the default emission/removal factors. In general, each method was applied based on the availability of data and analysis of key categories. All required sectors and categories have always been reported. All gases have been reported in the various communications except where there is data gap. The Liberia's first NDC, reports all gases except hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6) due to the lack of data and the lack of evidence of their in-country occurrence. This NDC includes HFCs. Liberia, as a developing country encountered data gaps during preparation of the national GHG inventory that prevented inclusion of all GHG sources and sinks, including: • The lack of Activity Data for key sources (energy data, AFOLU, waste, etc.), in some cases, the available data vary in formats, not in the format required for GHG inventory. • Emissions for some categories have not been estimated due to lack of Activity Data and time. Liberia is striving to include all GHG sources and sinks via ongoing processes to update and improve its GHG inventory systems, especially via the CBIT project.
d).	Mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans, including description of specific projects, measures, and initiatives of Parties' adaptation actions	The Liberia's Mount Coffee Hydropower Project is one of the sources of revenue for Liberia's economic development and diversification plans. Even though its production potential is impacted by climate change during the dry season, it remains a potential source of revenue and production of clean energy for Liberia. Government of Liberia's plan to address climate change and enhance economic development, developed, and adapted the National Renewable Energy Action Plan (NREAP) of Liberia, which integrates national climate change resilience and mitigation.

	and/or economic diversification plans.	Moreover, the Liberia Rural Renewable Energy sector Projects (LRRESP) and the West African Power Pool (WAPP) – Cote d'Ivoire – Liberia – Sierra Lone – Guinea (CLSG) interconnection project provide significant economic benefits and enhance Liberia's adaptation and mitigation and boost energy security and promote the Country clean energy provision.
4	**Planning processes:**	
a).	Information on the planning processes that the Party undertook to prepare its nationally determined contribution and, if available, on the Party's implementation plans, including, as appropriate:	Not Applicable
i.	Domestic institutional arrangements, public participation and engagement with local communities and indigenous peoples, in a gender-responsive manner.	Liberia NDC revision process began with desk review which generated the Joint Analysis report which was used specifically to engage sectorial stakeholders and other national stakeholders. The Joint Analysis report considered existing and Proposed Sectors for Updating Liberia's Nationally Determined Contributions which was conducted by the government and its partners to kick-start and guide the Liberia's NDC revision process. The process considered series of stakeholder at different levels as follows; Technical/Expert Group meeting, Youth and Gender Dialogues, Private sector meeting, and regional engagements and validations.
Ii	Contextual matters, including, inter alia, as appropriate:	Stakeholders were categorized according to several relevant indicators and considerations, including technical experts, national and sub-national officials of government, women, youth, private sector, NGOs/CSOs, etc. as well as into regional and city segments to ensure the full participation of cross section of the citizenry. Stakeholders were also placed into two broad categories: the first being the widely recognized stakeholders, which are segments of the population or governance structures that themselves are policy and decision makers, administrators, and are frequently recognized and consulted; and the second being the vulnerable groups who are not regularly recognized.
a.	National circumstances, such as geography, climate, economy, sustainable	Liberia is located on the Atlantic Coast in the southern part of West Africa and lies between longitudes 7°30` and 11°30` west and latitudes 4°18` and 8°30` north. The country covers 111,369 km^2 and has borders with Côte d'Ivoire to the east, Sierra Leone to the west, Guinea to the north, and to the south by the Atlantic Ocean.

	development, and poverty eradication.	Liberia's population was 3.5 million people in 2008 and is estimated to have increased to 4.8 million people by 2018. The country's population is projected to reach at 10.3 million by 2050, with more than 70% of the population living in coastal cities, including Monrovia, Liberia's capital. The country's economy has experienced high growth since 2006 despite a decline from 2008 to 2010 largely attributed to the global financial crisis. The economy rebounded in 2011 with a combined increase in economic activities from the agriculture, forestry and fisheries sectors contributing 41% of the GDP and providing employment for 47% of the labor force. These sectors were driven by increased exports, especially in forestry, fisheries, and rubber, followed by subsistence production of cassava and rice. The emergence of the Ebola Virus Disease (EVD) in 2014, coupled with the global economic meltdown, resulted in numerous challenges and subsequent decline in the country's economy between 2015 and 2018. Liberia's economy was projected to rebound in 2020 but due to the global COVID-19 pandemic, there was a further decline. Real GDP growth in 2020 was projected to rebound to 1.4 percent; with said growth driven mostly by increased activities in both mining and non-mining sectors. Moreover, the rebound momentum was projected to continue in the medium term (2021 – 2024) with growth averaging around 4.4 percent.
b.	Best practices and experience related to the preparation of the nationally determined contribution.	The NDC revision process was concluded with the hosting of three regional validation workshops across Liberia aimed to review and validate the agreed targets and measures as proposed and developed by stakeholders during the revision processes. These validation workshops were held respectively in Buchanan, Kakata and Gompa cities and brought together participants from across the length and breadth of Liberia to review and validate the final NDC for onward submission to the Secretariat of the UNFCCC. The overall goal of the regional review and validation workshops was to formally present the draft revised NDC report, as developed through stakeholders' participation, to regional stakeholders across Liberia for their review, confirmation, inputs, and endorsement ahead of the national validation and subsequent approval by the Cabinet. This goal was achieved at the end of the three workshops which saw the overwhelming endorsement of the draft revised NDC report by key regional stakeholders representing the 15 political sub-division of Liberia.
c.	Other contextual aspirations and priorities acknowledged when joining the Paris Agreement	Liberia NDC revision was based on information collected on literature review and information generated during workshops and meetings. The followings are national instruments used; Liberia's NDC (2015-2020), all reports from the NDC revision process, all technical reports on the ten sectors identified for the revised NDC, sectorial analysis reports, other cross cutting NDC workshop reports, National Policy

		and Response Strategy on Climate Change (2018), Liberia's Second National Communication, State of Environment Reports, Liberia's first Biennial Update Report (BUR-1), etc.
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 act jointly and the terms of the agreement, in accordance with Article 4, paragraphs 16–18, of the Paris Agreement;	n/a
c)	How the Party's preparation of its nationally determined contribution has been informed by the outcomes of the global stock take, in accordance with Article 4, paragraph 9, of the Paris Agreement;	n/a
d)	Each Party with a nationally determined contribution under Article 4 of the Paris Agreement that consists of adaptation action and/or economic diversification plans resulting in mitigation co-benefits consistent with	n/a

	Article 4, paragraph 7, of the Paris Agreement to submit information on:	
i	How the economic and social consequences of response measures have been considered in developing the nationally determined contribution.	n/a
ii	Specific projects, 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.	n/a

5	**Assumptions and methodological approaches, including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals:**	
a)	Assumptions and methodological approaches used for accounting for anthropogenic greenhouse gas emissions and removals corresponding to the Party's nationally determined contribution, consistent with decision 1/CP.21, paragraph 31, and accounting guidance adopted by the CMA;	The methodologies and assumptions used for accounting for anthropogenic greenhouse gas emissions and removals have been those recommended by IPCC 2006 Guidelines for National Greenhouse Gas Inventories. The 2006 IPCC Guidelines were supplemented with the European Monitoring and Evaluation Program/ European Environment Agency (EMEP/EEA) air pollutant emission inventory guidebook for compiling estimates for nitrogen oxides (NOx), carbon monoxide (CO), non-methane volatile organic compounds (NMVOCs) and Sulphur dioxide (SO2). All the methodologies and tools recommended by IPCC within the inventory cycle have been followed according to the 2006 IPCC Guidelines. Generally, the inventory has been compiled using tier 1 methodology except for the solid waste category where tier 2 was applied. Global Warming Potentials (GWP), as recommended by the IPCC, have been used to convert GHGs other than CO2 to the latter equivalent. As per the requirements from decision 17/CP.8, the values adopted were those from the IPCC Second Assessment Report for the four main GHGs, namely: Carbon dioxide, Methane (21), Nitrous Oxide (310) and HFC - 134a (1,300). The estimates of emissions and removals used in accounting for the NDC are those reported in the Inventory, which follows IPCC good practice guidance and the guidance included in Section II of the Annex to 18/CMA1.
b)	Assumptions and methodological approaches used for accounting for the implementation of policies and measures or strategies in the nationally determined contribution;	In addition to the overall methodologies in 5a above, policies measures and strategies in the NDC were guided by 2006 IPCC guidelines and additional approaches for the Liberia's NAMA plan. Policies, measures, and strategies in sectors are described within the respective strategy documents: ▪ Forest related policies and measures are described in the National REDD+ Strategy and Action Plan 2016 ▪ Energy related policies and measures are described in the National Energy policy and other related plan such as National Renewable Energy Action Plan (NREAP)
c)	If applicable, information on how the Party will take into account existing methods and guidance under the Convention to account for	As described in 5a above.

	anthropogenic emissions and removals, in accordance with Article 4, paragraph 14, of the Paris Agreement, as appropriate.	
d)	IPCC methodologies and metrics used for estimating anthropogenic greenhouse gas emissions and removals;	In accounting for the NDC, Liberia uses the IPCC 2006 guidelines and the 100-year global warming potential from AR5, for estimating anthropogenic emissions and removals. The IPCC 2006 Guidelines has been supplemented with the European Monitoring and Evaluation Program/ European Environment Agency (EMEP/EEA) air pollutant emission inventory guidebook for compiling estimates for nitrogen oxides (NOx), carbon monoxide (CO), non-methane volatile organic compounds (NMVOCs) and Sulphur dioxide (SO_2). All the methodologies and tools recommended by IPCC within the inventory cycle have been followed according to the 2006 IPCC Guidelines. Generally, the inventory has been compiled using tier 1 methodology except for the solid waste category tier 2 was applied. Global Warming Potentials (GWP) as recommended by the IPCC, have been used to convert GHGs other than CO_2 to the latter equivalent. Consistent with Good Practice in the 2006 IPCC guidelines, as much as possible, Liberia has used available official national statistics for the inventory. Where country-specific AD is not available, data from recognized international organizations (FAO, AU, ITTO, IEA) has been used to fill the gap. Some data gaps were filled through personal contacts and from results of surveys, scientific studies and by statistical modelling. Local experts' knowledge was resorted to as the last option. Thus, data collected at the national level from numerous public and private institutions, organizations, and companies, and archived by the EPA/LISGIS provided the basis and starting point. In a few isolated cases, due to the restricted timeframe and the inexistence of a declared national framework for data collection and archiving to meet the requirements for preparing GHG inventories, derived data and estimates were made to fill in the gaps. These were considered reliable and sound since they were based on scientific findings and other observations. Not all the AD required to compile an exhaustive GHG inventory could be collected due to the short timeframe or absence of a proper data collection and archiving system, and some categories could not be assessed due to the civil conflict. Nevertheless, the data collected was used to make estimates that are of good quality.
e)	Sector-, category- or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, as appropriate, including, as applicable:	

I	Approach to addressing emissions and subsequent removals from natural disturbances on managed lands;	Liberia will continue to adopt the approach of the 2006 IPCC guidelines and its subsequent versions as may be provided consistent with the NDC reporting requirements.
Ii	Approach used to account for emissions and removals from harvested wood products;	For the National GHG inventory, the IPCC 2006 guidelines on the forest sector were followed.
Iii	Approach used to address the effects of age-class structure in forests;	For the National GHG inventory, the IPCC 2006 guidelines on the forest sector were followed.
f)	Other assumptions and methodological approaches used for understanding the nationally determined contribution and, if applicable, estimating corresponding emissions and removals, including:	
I	How the reference indicators, 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 BAU reference scenario is based on the data presented in the Liberia Second National Communication, with some adjustments to fit the NDC. BAU emissions were modeled through 2030. The BAU scenario was modeled for all sectors, except for the forestry and land-use sectors, using the Low Emissions Analysis Platform (LEAP) model, as developed by the Stockholm Environment Institute. Key parameters, assumptions, definitions, and methodologies follow the LEAP standard model. The BAU GHG emissions estimate for the forestry and land use sector was constructed using a simple, linear historical model, based on the observed data on forest area loss and associated GHG emissions from 2015 to 2017 to model expected forest loss and GHG emissions through 2030. Data sources used in the BAU model are detailed in this table in section 1(e).
Ii	For Parties with nationally determined contributions that contain non-greenhouse-gas components, information on assumptions and methodological approaches used in relation	n/a

	to those components, as applicable;	
Iii	For climate forcers included in nationally determined contributions not covered by IPCC guidelines, information on how the climate forcers are estimated;	n/a
Iv	Further technical information, as necessary;	n/a
g)	The intention to use voluntary cooperation under Article 6 of the Paris Agreement, if applicable.	Yes (see section 6)
6.	**How the Party considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances:**	
a)	How the Party considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances;	Liberia is committed to promote the goal of keeping within reach a 1.5-degree Celsius limit on global average temperature increase through its fair and ambitious contributions to reducing its economy-wide emission to 64% below its Business-As-Usual scenario by 2030. Liberia has set forth short, medium, and long terms targets in its NDC to achieve its targets. Furthermore, this revised NDC includes new mitigation targets for sectors that previously only had adaptation targets in the 2015 NDC, including forests, agriculture, fisheries, health, and coastal zones, thus raising its realistic ambitions and fairly contributing towards this great global effort of keeping the temperature within healthy planetary boundaries. These ambitious targets could be achieved through both national and international supports and Liberia remains committed to provide national supports address climate change and achieve global goal of climate change mitigation targets.
b)	Fairness considerations, including reflecting on equity;	In additional to 6(a) above, Liberia's current GHG emission is near-negligible to the global emissions and Liberia's commitment to reduce its economy-wide emission to 64% is more than equitable and fair. This is, in addition, reflected in the conditionality of the implementations of targets on international support as an equitable transfer of support given Liberia's fair share and national circumstances.

c)	How the Party has addressed Article 4, paragraph 3, of the Paris Agreement;	The Liberia's Second or Revised NDC set up a very ambitious economy-wide targets and contains enhanced actions as compared to the First NDC: ▪ Whereas the first NDC has limited ambition and coverage, the second NDC has increased ambitious and increased coverage, ▪ Whereas the first NDC contained limited priority areas for both mitigation and adaptation action, the 2nd NDC presents specific sectoral mitigation actions with both GHG and non GHG target aligned with sectoral strategies and national development priority. ▪ The data for this NDC has been greatly enhanced with the first BUR and second NC GHG Inventories, as compared to the first NDC. ▪ Coastal Add-On project (CAP) –through this project, the Government of Liberia obtained funding from GEF through UNDP to Enhance Resilience of Liberia's Montserrado County Vulnerable Coastal Areas to Climate Change Risks. The CAP constructed a 1200 (One Thousand, Two Hundred) linear meters coastal defense "Revetment" in the D-Twe, Kru-Town. *See.* Republic of Liberia Ministry of Mines & Energy 2018, Coastal Add-On project (CAP) Coastal Defense, Republic of Liberia Ministry of Mines & Energy, viewed 2 April 2019. Implementation of the first NDC adaptation targets have implemented over the period including adaptation measure on coastal erosion.
d)	How the Party has addressed Article 4, paragraph 4, of the Paris Agreement	Liberia is committed to continue enhancing its mitigation efforts and has moved toward economy-wide emission reduction targets as detailed in this NDC to 64% below the BAU scenario.
e)	How the Party has addressed Article 4, paragraph 6, of the Paris Agreement.	n/a

7	**How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its article 2:**	
a)	How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its article 2.	Liberia considers that its revised NDC complies with the goal of Article 2 and the long-term goal of the Paris Agreement, as explained in 6(a) and 6(b above. Liberia's NDC represents Liberia's contribution to the objective of the UNFCCC of stabilizing greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, and within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner. Liberia climate mitigation ambitions detailed out in this revised NDC will contribute to the achievement of Article 2 of the Convention.
b)	How the nationally determined contribution contributes towards Article 2, paragraph 1(a), and Article 4, paragraph 1, of the Paris Agreement	The Liberia's proposed mitigation actions and detailed out in this revised NDC (section 4 and 6 on adaptation) and economy-wide emission reduction ambition targets detailed out in 6(a) and 6(b) will substantially contribute to the goal of Articles 2 and 4.

3.3 Adaptation

Liberia faces significant climate change-associated risks due to high level of dependence on climate-sensitive activities, including rain-fed agriculture, which make the country vulnerable to climate variability and change. The Liberian population experiences the impacts of climate change in loss of livelihoods, income, and settlements, as well as increased risks for adverse health impacts. The National Adaptation Program of Action (NAPA) process of 2004 revealed that the adverse effects of climate change variability and extreme events are already significantly impacting Liberia. The climate hazards identified during the NAPA process include changes in rainfall patterns, extreme coastal flooding events, and sea level rise. The adaptation policy framework of Liberia recognizes that there are four principles that provide the basis from which integrated actions to adapt to climate change can be developed: (1) adaptation to short-term climate variability and extreme events serve as a starting point for reducing vulnerability to longer-term climate change; (2) adaptation must occur at different levels in society, including the local level; (3) adaptation policy and measures must be assessed in a development context; and (4) the adaptation strategy and the stakeholder process by which it is implemented must be given equal importance. Based on this framework and the elements of adaptation strategy, key additional sectors were identified, and their corresponding adaptation policy and strategies formulated.

3.3.1 Adaptation Targets, Actions and Policy Measures

Table 3. 3: Adaptation Targets and Measures/Actions for the Revised NDC

AGRICULTURE
Adaptation Targets
In the Agriculture sector, Liberia commits to the following adaptation targets to increase the ability of farming communities and their agricultural and livestock systems to adapt to the impacts of climate change: • Develop incentives and programs to promote crop and livestock diversification, climate resilient seeds, Integrated Pest Management (IPM), water harvesting, irrigation systems, increased soil fertility • Develop facilities and climate smart technologies to promote postharvest and value addition practices, including establishment of 5 seed/gene banks and improved storage facilities for agricultural products, based on Liberia's five agricultural regions, by 2030
Adaptation Actions and Policy Measures
• Increase training and capacity building of farmers and agricultural extension agents to implement climate adaptation actions in the agriculture and livestock sectors, especially by increasing support for education and training on agricultural climate risks and adaptation solutions for vulnerable groups o Establish 100 farmer field schools and train 5,000 farmers in climate-resilient agricultural and livestock practices by 2025 (*Linked to Mitigation target*) o Train 150 agricultural extension agents per year to support implementation of climate-resilient agricultural and livestock practices, with 45 agents receiving additional support for increased implementation with vulnerable groups by 2025 (*Linked to Mitigation target*) o Roll out a "Women in Agriculture" program with 4 training sessions per year (with at least 45 women trained per year) to support implementation of climate-resilient agricultural and livestock practices and increase women's access to agricultural inputs and labor-saving devices by 2025 • Increase finance for agriculture and livestock diversification by $3,000,000 dollars by 2025. • Strengthen the Environmental Knowledge Management System platform to increase the integration of local and indigenous knowledge of climate-resilient agricultural and livestock practices by 2025. • Establish or strengthen crop and livestock insurance systems by 2025 • Strengthen agricultural climate services and early warning systems by 2025. • Develop national dietary guidelines to support climate-resilient, food secure livelihoods by 2025 (*Link to Health sector*) • Establish a national research institution focusing on new climate smart seed varieties and improving livestock breeding by 2030

FORESTS

Adaptation Targets

In the Forests sector, Liberia commits to the following adaptation targets to increase the ability of forest-dependent communities and forest ecosystems to adapt to the impacts of climate change:

- Catalogue 100% of water catchments in forest areas, with 50% of these under sustainable management plans by 2030 (*Link to Agriculture sector*)
- Develop alternative livelihoods programs with forest dependent people in 5 forested counties to ensure a just transition from forest extractive models for local communities, including development of models and markets for non-timber forest products and for sustainable eco-tourism by 2030. *(Linked to Mitigation target).*

Adaptation Actions and Policy Measures

- Develop training, capacity building, and strategic communications plans for forestry authorities and forest communities to implement climate adaptation actions in the forest sector, especially by increasing support for education and training on climate risks and adaptation solutions for vulnerable groups
- Conduct 20 trainings with forestry authorities and forest-dependent communities on climate-related risks, adaptation solutions and adaptive forest management practices, with strategic messaging for communities about incentives and opportunities to enhance their resiliency to climate change at the household and community level by 2025 *(Linked to Mitigation target)*
- Encourage sustainable fuelwood/charcoal production with alternative domestic energy options by 2025 *(Link to Health sector)*
- Implement an effective benefit-sharing mechanism for forest communities by 2030
- Increase funding for research on adaptive forest management solutions by 2025
- Develop an adaptive forestry management and conservation plan to prevent poaching, forest fire, land conversion, invasive species, and diseases, including training/capacity building by 2030

COASTAL ZONES

Adaptation Targets

In the Coastal zones sector, Liberia commits to the following adaptation targets to increase the ability of coastal communities and ecosystems to adapt to the impacts of climate change:

- Design and implement green-gray infrastructure approaches along 60% of Liberia's highly vulnerable coastline by 2030 (*Link to Transport sector)*
- Establish an early warning system and predictive scenario modeling for climate disasters and coastal flooding by 2030.

Adaptation Actions and Policy Measures

- Develop training, capacity building, and strategic communications plans for coastal managers and communities to implement coastal adaptation actions, especially by increasing support for education and training on climate risks and adaptation solutions for vulnerable groups
    - Conduct 22 training sessions with coastal managers and communities on climate-related risks, adaptation solutions, adaptive coastal management practices, and climate-smart infrastructure development, with strategic messaging for communities about incentives and opportunities to enhance their resiliency to climate change at the household and community level by 2025
- Develop a strategic communications plan to educate and disseminate adaptation actions via awareness programs, establishment of research & innovation centers within coastal communities, development of multi-stakeholder platforms for information sharing with regular/timely updates etc. by 2025
- Invest in coastal zone monitoring equipment for data collection, research, and management purposes by 2030
- Develop and support coastal and marine research project proposals, initiatives, and activities, and increase funding for research on adaptive coastal management solutions and access to research opportunities by 2030 (*Linked to Mitigation target*)

FISHERIES

Adaptation Targets

In the Fisheries sector, Liberia commits to the following adaptation targets to increase the ability of fishing communities and fisheries to adapt to the impacts of climate change:

- Establish 2 Marine Protected Areas by 2030 and 4 co-managed fishery areas in coastal and aquatic ecosystems associated with fish production in coordination with fishery communities by 2030 (*Link to Coastal zones sector*)
- Support alternative fishery livelihoods by developing the foundational structures and extension services needed to increase aquaculture production and reduce the impact on marine fisheries, including through provision of 25 aquaculture kits to smallholder fishers by 2025

Adaptation Actions and Policy Measures

- Identify endangered and vulnerable fish species, map the areas valuable for their protection, and work with fishery communities to create multiple-use conservation areas and/or Marine Protected Areas to improve their ability to survive the impacts of climate change (link with coastal zones sector)
- Strengthen the capacity of the National Fisheries and Aquaculture Authority, including manpower development, logistics, and training in adaptive management; research funding; and set up a robust monitoring, reporting and verification system that captures and reports in a timely and accurate manner changes in the stock of productivity and pressure in fisheries, including climate-related impacts

- Increase funding by $1.5 million dollars per year for research on climate-related pressures on fisheries and appropriate climate adaptation solutions in the fisheries sector, including on alternative approaches to the traditional way of using mangroves for smoking fish by 2030 – Conditional on international support
- Implement 20 trainings (2 per year) for fishery managers to learn and implement adaptive management practices by 2030

- Invest in marine store and tracking systems for artisanal fisher communities, including the provision of training, fishing gears and alternative livelihoods.
  - Conduct 1 training per year with artisanal fishers, fishmongers, and fish processors, especially women, on sustainable fishery and fish handling practices by 2030
- Integrate fisheries fully into climate change adaptation and food security policies at the national level by 2025 (*Link to Agriculture and Health sectors*)
- Develop and implement climate smart fishery management systems to enhance the adaptive capacity and resilience of fisher communities, including technical support and backstopping for artisanal fishing cooperatives and extension services by 2030
- Increase capacity building of women involved in marketing & smoking of fish and wider community engagement to promote conservation of mangroves (e.g., introduce alternative approaches to smoking fish) by 2025 (*Link to Forest sector*)
- Strengthen effective early warning systems to identify probable threats and risks related to fisheries by 2025
- Establish a fisheries program at the University of Liberia by 2025
- Establish five (5) artisanal fish landing and processing centers in the Mesurado basin by 2025
- Develop an awareness program in schools within coastal counties to promote climate-smart fisheries and mangrove conservation by 2025
- Support the establishment of improved information and communication networks among and between fishing communities by launching information, education and communication campaigns and conducting public awareness on fisheries policy and education on threats and risks in the sector by 2025
- Setup an inter-ministerial national task force to reduce both land- and water-based sources of pollution (e.g., agricultural, and urban runoff; boat effluent) and destructive fishing practices (e.g., fishing with explosives and poisons) by 2025
- Improve national systems for monitoring and tracking fishing vessels by 2030
- Reduce threats from illegal, unreported, and unregulated (IUU) fishing by purchasing necessary equipment, launching coordinated surveillance, and monitoring operations, and launching public communications campaigns about the risks and impacts of IUU fishing by 2030

WASTE

Adaptation Targets

In the Waste sector, Liberia commits to the following adaptation targets:

- Improved landfill practices and/or establishment of new landfill facilities
  - Landfill leachate collection system planned with enough capacity for heavy rainfall events.

- Divert organic waste from landfill through segregated organics collection contributes to preventing landfill fire outbursts.
- Provide fire-safety structures for landfills, including periodical cover with dry material.
- Disposal sites compacted each day to force waste disposed to settle, preventing deadly landfill slides (most dangerous for communities living off waste salvaged in or around dump sites).
- Ensure landfill has more than one access route and effective drainage systems.

- Development of small-scale composting of market waste
  - Implement frequent organic waste segregate collection, distributing food waste caddies (reduces odors, pest and insects from rapidly degrading material) *(Link to Health sector).*

Adaptation Actions and Policy Measures

- Provide technical/logistical support for
  - Reduce risk of waste bags sitting at the curbside for too long and being carried away into streets or waterways by heavy rainfall, heavy wind or landslides or snow by implementing frequent collection at scheduled times (based on extreme weather forecasts)
  - Avoid insects, pests (as well as risk of waste bags being carried away by extreme events) by a proper scheduling collection *(Link to Health sector)*.
  - Ensure waste transfer stations, disposal sites and storage areas are elevated and safe from floods, for example avoiding flood plains (low-lying near rivers or coastal areas) and develop adaptation plans for established sites located in flood areas (*Link to Coastal zones sector*).
- Strengthening of the institutional and legal situation at national and municipal levels; by 2025.
  - Include in the sectoral strategies and policies at the national level climate adaptation strategies and policies.

HEALTH

Adaptation Targets

In the Health sector, Liberia commits to the following adaptation targets to increase the ability of Liberian communities and health systems to adapt to the impacts of climate change:

- Strengthen preventive measures to address health issues that are likely to be negatively impacted by climate change, such as disease transmission (outbreak), malnutrition and malaria prevalence, by implementing measures such as improving access to health services, environmental sanitation, and long-term food storage systems (*Link to Agriculture sector*)
  - Ensure that 80% of the rural population is within 5km of health service points by 2030.
  - Reduce malaria prevalence by 45% by 2030
- Train and deploy 1000 community health assistants, 500 environmental health technicians, and 250 specialists for referral facilities to understand the increased health risks due to climate change vulnerability and how to respond by implementing climate adaptation actions in the health sector by 2030.

Adaptation Actions and Policy Measures

- Establish 425 community health clubs to improve community-level health care and disseminate information on changing health risks to enhance the response to climate-related diseases by 2030
- Increase funding by $500,000 per year for research on climate-health nexus, including on the increased health vulnerabilities caused by climate change, the temporal, spatial and spectral aspects of meteorological data needed for healthcare purposes, and on the quality, level, and detail of healthcare data required for disease modelling to develop adequate response measures by 2030
- Promote household and community-level adoption of practices that improve air quality, improve water safety and reduce the risk of disease transmission, while also reducing fuelwood use, such as water filters and improved cookstoves (*Link to Forest and Agriculture sectors*)
    - Conduct 40 training sessions on health risks of using firewood and other climate-related health risks by 2030 (*Link to Forest sector*)
    - Provide at least 170 water safety and purification kits to rural communities by 2030
- Develop climate health hazards risk mapping and area-based scenario planning for responding to climate health hazards and improve disease surveillance systems, preparedness and response capacity for the health consequences of climate change (e.g., heat-related illness, infectious diseases, malnutrition, natural disasters, mental health, forced migration, chronic disease) by 2025
- Mobilize and sustain financial resources for national level engagement of the health sector that ensures project implementation by 2025

TRANSPORT

Adaptation Targets

In the Transport sector, Liberia commits to the following adaptation targets:

- Support the implementation of infrastructure that foster the development of a bus public transport network for Monrovia
    - Ensure low-income population to reach jobs, education and healthcare services, improving their access to economic and social opportunities.

Adaptation Actions and Policy Measures

- Continuation of road upgrading and construction
    - Risk mapping of climate stress vulnerability of transport infrastructure – future investment should be guided by such risk mapping.
    - Updating design and construction standards and materials to ensure that future infrastructure is more resilient to anticipated climate and extreme weather events.
    - Integration of climate change into infrastructure design practices
- Review of the institutional framework by 2025
    - Include in the sectoral strategies and policies at the national level climate adaptation strategies and policies.

ENERGY

Adaptation Targets

In the Energy sector, Liberia commits to the following adaptation targets:

- Create private investment enabling environment focusing on Power Purchase Agreement (PPA) in renewables
  - Diversify the energy matrix to provide a more resilient system under climate variability
- Reconnection of Monrovia clients to the grid, supporting the process by which the owners of individual generators will switch to the distribution network
  - Risk mapping of climate stress vulnerability of energy infrastructure – future investment should be guided by such risk mapping.
  - Updating design and construction standards and materials to ensure that future energy infrastructure is more resilient to anticipated climate and extreme weather events
- Development of off grid small Hydro Power Plants and on grid ones via PPAs
  - Maximize the opportunities that energy access offers in improving livelihoods and diversifying income sources.
  - Promote productive uses of energy through skills trainings, access to finance and business development.
- Develop large photovoltaic (PV) Plants with Independent Power Producers (IPPs) by signing PPAs
  - Diversify the energy matrix to provide a more resilient system to climate variability.

Adaptation Actions and Policy Measures

- Improve the policy making capacity with better cross sector coordination and implementation with focus low carbon enabling investments
  - Include mainstreaming activities to improve the energy sector strategies and policies at the national level with climate adaptation strategies and policies.
- Support the implementation of a full de-regulation of the electricity sector (into independent transmission, distribution, and generator subsectors) with accurate costs, and tariffs
- Improve the adaptation capacity of the most vulnerable since access to reliable and affordable electricity provides social and economic development.

CROSS-SECTORAL

Adaptation Actions and Policy Measures

- Develop and implement green infrastructure plan for the cities of Monrovia, Paynesville, Buchanan, Gompa and Gbarnga by ensuring the plans are adequately followed.
- By 2030, facilitate community and corporate awareness of the values of urban green infrastructure and how the community can contribute to improving the management and condition of blue-green infrastructure to foster direct and indirect economic development

resulting from 15% of small businesses (Monrovia, Paynesville, Buchanan, Gompa & Gbarnga cities) focused on/dedicated to supporting green infrastructure in urban areas.

- Increase urban resilience through use of blue-green infrastructure in the 5 cities of Monrovia, Paynesville, Buchanan, Gompa & Gbarnga by increasing the volume of runoff/storm water captured by at least 10% annually to 2030 and by increasing the number of rain garden and cistern/rainwater harvesting installations in urban areas by 15% annually to 2030.
- Develop national plan for ecosystem-based adaption in forests, coastal zones, and urban green corridors, ensuring integration of local and indigenous knowledge, cultural systems, and gender and youth considerations into adaptation plans by 2030
- Establish cross-ministerial coordination mechanisms to mainstream practices for adaptive management of forests, coastal zones, and urban green corridors by 2025
- Revise national policies to address interlinkages between forests and mangroves, coastal ecosystems, water quality, fisheries, mining and energy production, agricultural production, transport infrastructure, and urban green corridors by 2030
- Set up an initiative to explore innovative financing models for ecosystem-based adaptation in forests, coastal zones, and urban green corridors, as well as climate-resilient practices for agriculture, fisheries, and aquaculture by 2025 (*Linked to Mitigation target*)
- Integrate gender-sensitive considerations into existing climate change policies by 2025.

4.0 MONITORING, REPORTING AND VERIFICATION (MRV)

As a means of showing its commitment to the Paris Agreement, Liberia has developed a national MRV system to measure, verify and report progress for emissions, reductions, and removals. The national MRV system incorporates relevant key actors and institutions involved with climate MRV, including GHG emission inventories, GHG mitigation actions, climate finance, and climate impacts to enable tracking of climate change actions and reports. Liberia's national MRV system is a single entity driven system solely implemented by the Environment Protection Agency. The national MRV system also contains a set of measuring and monitoring tools and protocols for measurement, verification, and reporting. In the case of forest measurement for example, the following exists: Forest Reference Emissions Level (FREL); National Forest Monitoring System (NFMS); and National Forest Inventory and Living Standard Measurement System (NFI & LSMS). Similarly, for forest verification and reporting, the follow exists: MRV institutional arrangement protocol/regulation; IPCC reporting guidelines; and NFI and Administrative Standard Operating Procedures (AD-SOP's), and Memorandum of Understanding (MOU). The forest MRV system tracks GHG emissions reductions and removals through the FREL and biennial change monitoring of forest and is linked directly to national legislations and other thematic institutional mandates.

Liberia's National Policy and Response Strategy on Climate Change informs the development and implementation of the MRV system. Liberia's MRV system is also being supported by the Capacity Building Initiative for Transparency (CBIT) project with support from the Global Environment Facility (GEF) and implemented by the Government of Liberia through the Environment Protection Agency of Liberia and Conservation International. The governance structure of Liberia's national MRV system allows the EPA to lead on the coordination and reporting of all climate- related MRV activities to the UNFCCC and other bodies. All reports produced through the national MRV system will contribute to addressing various reporting obligation to the UNFCCC and other relevant institutions. The national MRV system will be used to ensure and achieve the implementation of Liberia's revised NDC.

Liberia also intends to strengthen its MRV systems by expanding on existing national MRV system to integrate agriculture and livestock and product traceability system, with a spatial data management system for sustainable land use management by 2025; and by also establishing comprehensive measurement, reporting, and verification systems for coastal zones and forests, including community-based monitoring systems by 2025.

On the overall this will enhance existing national MRV systems to track NDC progress and mitigation actions over time.

5.0 FAIRNESS AND AMBITION

Liberia is committed to achieving the goals of the Paris Agreement of keeping the temperature rise well below 2° C, aiming to limit warming to 1.5° C, provided that the international community supports Liberia with the appropriate means of implementation. As a Party to the Paris Agreement, Liberia aims to achieve fair and ambitious contributions to reducing its emissions and has therefore adopted GHG reduction targets by 2030 in this NDC. To achieve this, the country has set short, medium, and long terms targets in its NDC and further committed two additional sectors that were not included in the 2015 NDC – short-lived climate pollutants and green corridors. Further, the revised NDC includes new mitigation targets for sectors that previously only had adaptation targets in the 2015 NDC, including forests, agriculture,

fisheries, health, and coastal zones, thus raising its realistic ambitions, and fairly contributing towards this great global effort of keeping the temperature within healthy planetary boundaries.

Liberia's contribution to global GHG emissions was 3.51 $MtCO_2$ eq in 2014, representing 0.01% of the global total. The country is fully committed to continuing in this path in order to achieve a low carbon resilient development in line with its short-, medium- and long-term development agenda. Liberia further commits to reducing its economy-wide greenhouse gas emissions by 64% below the projected business-as-usual (BAU) level by 2030 as indicated in Section 3.1 above through a combination of 10% unconditional contribution and an additional 54% conditional upon international support. Thus, Liberia's NDC targets reflect high level of fairness and significant climate ambition given its status as a Least Developed Country couple with its current and historical low contribution to GHG emissions.

6.0 NDC IMPLEMENTATION

To fully implement Liberia's mitigation and adaptation actions under its revised NDC, there is a need for adequate, predictable, and sustainable financial, technological, and capacity support and mechanisms provided by various sources. The NDC Costing and Cost-Benefit analysis estimated that a total investment of US$490,590,000 dollars through 2025 will be needed to achieve Liberia's NDC mitigation and adaptation targets. Of this amount, US$400,645,000 dollars will be required to achieve Liberia's mitigation targets, whilst US$89,945,000 dollars will be required to achieve its adaptation targets. To achieve the conditional portion of its NDC target, Liberia intends to mobilize approximately US$460,000,000 dollars from the private sector, bilateral and multilateral sources and all other sources, mechanisms, and instruments. The investment in achieving Liberia's NDC will yield direct and indirect economic benefits of approximately US$3.2 billion dollars, thus, generating significant returns for the global climate, Liberia's economy, and the well-being of its citizens.

Liberia also plans to develop a tracking system to analyze the support (finance, technology transfer and capacity building) for implementation. The country will consider inclusion of international carbon market mechanisms, including cooperative approaches under Article 6 of the Paris Agreement, as these economic instruments, supported by appropriate accounting systems (i.e., MRV systems), can be used to help finance low-carbon and climate-resilient infrastructure investments. Liberia considers that some low carbon development options in the NDC, or additional actions, could be financed in full or in part, through the transfer of international carbon credits/assets or results-based financing, in line with the guidance to be agreed under Article 6, taking into account environmental integrity and transparency.

Liberia recognizes that its system of Monitoring, Reporting and Verification (MRV) is a fundamental pillar of its NDC for the purpose of transparency and accountability. The MRV system for the NDC will build upon existing structures for monitoring and evaluation (M&E) and inter-sectoral coordination. In this regard, the country will require further support to ensure that its MRV system is strengthened (institutional arrangement and responsibilities, indicators, methodologies) in order to track progress toward the implementation of NDCs including non-GHG co-benefits.

With support from the NDC Partnership, Liberia has begun the process to develop an NDC Implementation Plan, which will provide the timeframe for implementation and detail the short- and long-term actions required to reach the climate mitigation and adaptation goals as outlined in the revised NDC. The Plan will integrate all relevant elements required for Liberia to achieve its NDC, including the enabling conditions, policy frameworks, institutional arrangements, climate related MRV systems, gender equality and social inclusion, and financing strategies. The plan will further establish a clear logical framework that defines

outcomes, outputs, and activities, including within sectoral plans, leading to the achievement of stated targets, describes vital enabling conditions for the NDC implementation based on an analysis of key barriers and gaps, such as new or improved policies and regulations, capacity-building, technical assistance, awareness raising, etc. Liberia's NDC Implementation Plan will describe the roles and responsibilities of relevant institutions and institutional frameworks in NDC implementation, reporting, coordination, support, and finance, as well as a description of the MRV systems that will track progress toward achievement of the NDC targets, among others.