

# GOVERNMENT OF SIERRA LEONE



## THE ENVIRONMENT PROTECTION AGENCY SIERRA LEONE

### SIERRA LEONE'S INTENDED NATIONALLY DETERMINED CONTRIBUTION (INDC)

## SUMMARY

### BACKGROUND AND INTRODUCTION

Sierra Leone has been ranked as the third most vulnerable nation after Bangladesh and Guinea Bissau to adverse effects of climate change. Our vulnerable population has low capacity to adapt to climate change and the rural populations will be the most affected because of their high dependence on rain-fed agriculture and natural resource-based livelihoods. According to the science of climate change, these impacts are likely to continue to affect Sierra Leone in the future, despite the country being least responsible for the problem since Sierra Leone's contribution to global emissions of greenhouse gases is negligible. The Sierra Leone National Development Plan – **the Agenda for Prosperity 2013 -2018** indicates that Sierra Leone is committed to mainstreaming inclusive green growth in her development process. Thus, the implementation of the INDC will support the transition to low-emission development involving decoupling carbon emissions from economic growth through a series of measures across all economic sectors.

This document presents Sierra Leone's Intended Nationally Determined Contribution (INDC) in response to decisions adopted at the 19<sup>th</sup> and 20<sup>th</sup> sessions of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC), that invite Parties to communicate to the Secretariat their INDCs, towards achieving the objective of the UNFCCC as set out in Article 2 of the Convention. The national circumstances of Sierra Leone have been fully taken into consideration during the development of the INDC. This includes national and sectoral strategies which already exist in the **National Development Plan–the Agenda for Prosperity**. A review of the current status of implementation of the cross-cutting issues of the Climate Convention at the national level has been documented. These include (a) research and systematic observation systems; (b) technology transfer; and (c) education, training and public awareness. The process is also built on the participatory multi-stakeholder and cross-sectoral consultative processes at national and district levels.

Since the year 2000, Sierra Leone has published three National Strategies on Climate Change and in 2009 adopted its first Special Program on Climate Change. In addition, Sierra Leone has presented two National Communications with their respective greenhouse gas inventories to the United Nations Framework Convention on Climate Change.

### NATIONAL CIRCUMSTANCES OF SIERRA LEONE:

#### **Geographical location and main physical features/regions:**

Sierra Leone is located on the west coast of Africa, between the 7th and 10th parallels north of the equator. Sierra Leone is bordered by Guinea to the north and northeast, Liberia to the south and southeast, and the Atlantic Ocean to the west. The country has a total area of 71,740 km<sup>2</sup>, divided into a land area of 71,620 km<sup>2</sup> and water of 120 km<sup>2</sup>. The country has four distinct geographical regions: coastal Guinean mangroves, the wooded hill country, an upland plateau, and the eastern mountains. Eastern Sierra Leone is an interior region of large plateaus interspersed with high mountains, where Mount Bintumani rises to 1,948 meters. Sierra Leone can be split into three geological areas, in the east is part of the West African craton, the western area consists of the Rokelides, an orogenic belt, and a 20- to 30-km coastal strip of sediments (*Schlüter and Trauth, 2008*).

### Major social and developmental setbacks

Due to the outbreak of the Ebola Virus Disease (EVD) in Sierra Leone which claimed 3,461 lives by February 2015 (WHO, 2015), the development gains made by Sierra Leone after the country's emergence from a ten-year civil war in 2000 were rudely reversed. Notwithstanding these setbacks, Sierra Leone recently developed and adopted its National Climate Change Policy (NCCP) and National Climate Change Strategy and Action Plan (NCCS&AP) around which this INDC revolves. The INDC of Sierra Leone has three components, one for Mitigation, one related to Adaptation and the third for Loss and Damage. This INDC is consistent with Sierra Leone's green growth pathway to development.

### Greenhouse Gas Emissions status

According to the Second National Communication of Sierra Leone to the UNFCCC, total carbon dioxide emission (CO<sub>2</sub>) for the year 2000 was 574.061Gg CO<sub>2</sub>. The carbon dioxide emissions from energy generation amounted to 529.287Gg of CO<sub>2</sub> as Sierra Leone energy generation is based on diesel powered generators. The Land Use, Land Use Change and forestry (LULUCF) sector was the least significant source of CO<sub>2</sub> emissions by up taking 752,748Gg of CO<sub>2</sub>, followed by the waste sector emitting 11.8Gg CO<sub>2</sub>. The industrial processes are however marginal amounting to 39.55 Gg of CO<sub>2</sub> and these emissions came mostly from cement production.

In 2000, the total Methane (CH<sub>4</sub>) emissions were 32,312.33 Gg CH<sub>4</sub>. Agriculture was the most important source of CH<sub>4</sub> emissions (86.67%), followed by the LULUCF sector (5.631) and finally the waste sector (11.83). The other sectors were not sources of CH<sub>4</sub> emissions. Nitrogen dioxide (N<sub>2</sub>O) emissions were estimated at 13.91 Gg N<sub>2</sub>O with 8.54Gg N<sub>2</sub>O coming almost exclusively from the agricultural sector. The waste sector was also a source of emission and emitted 31.29Gg N<sub>2</sub>O.

### Projected Greenhouse Gas Emissions for Sierra Leone

Sierra Leone is yet to produce her Nationally Appropriate Mitigation Action (NAMA) and the National Communications have not produced projections of greenhouse gas emissions for the country. Although its historical contribution is low at 0.1% of the total global emissions. Since Sierra Leone gained her independence in 1961 i.e. fifty four (54) years ago, her per capita emissions has not exceeded 0.6 tCO<sub>2</sub>e.

Table 2 below shows the projections of greenhouse emissions developed for Sierra Leone by the US Environmental Protection Agency. According to these projections total emissions from all sources and sectors and for all gases, GHG emissions are projected to increase to about 4.8MtCO<sub>2</sub>Eq in 2015 and to about 6.6MtCO<sub>2</sub>Eq in 2030. The major greenhouse gas emitted is Methane (CH<sub>4</sub>) with projected emissions of 3.7MtCO<sub>2</sub>Eq in 2015 and about 5.0MtCO<sub>2</sub>Eq in 2030. The largest emitting sectors are Agriculture and Waste and between them, they are projected to emit between 95 to 98% of the projected national emissions from 2015 to 2030. The largest emitting category is Waste Management and will be responsible for about 54% of the total projected emissions in 2015 and 56% in 2030. Waste Management is projected to emit 2.6MtCO<sub>2</sub>Eq in 2015 and 3.7MtCO<sub>2</sub>Eq in 2030.

CO2: tot minus CH4 minus N2O: 0.098, 0.141, 0.237, 0.310

Table 2: Projected GHG Emissions (MtCO <sub>2</sub> e) from Sierra Leone from 2015 to 2030				
Sierra Leone	2015	2020	2025	2030
All Sources, Gases, Sectors	4.765	5.239	5.851	6.551
CH <sub>4</sub>	3.670	4.029	4.458	4.970
N <sub>2</sub> O	0.997	1.069	1.156	1.271
Agriculture	2.107	2.224	2.374	2.575
Energy	0.001	0.001	0.001	0.001
Industrial Processes	0.097	0.142	0.238	0.311
Waste	2.559	2.872	3.239	3.664
Source: <a href="http://www.epa.gov/climatechange/EPAactivities/economics/nonco2projections.html">http://www.epa.gov/climatechange/EPAactivities/economics/nonco2projections.html</a>				

This INDC is consistent with Sierra Leone's Green Growth pathway to low emissions carbon development strategy by the year 2018.

### CONTRIBUTIONS

Sierra Leone's INDC includes both conditional mitigation and adaptation components based on her national circumstances and in line with decisions 1/CP.19 and 1/CP.20

The VISION of the Sierra Leone INDC is to create a new era for a harmonious relationship between the economy, environment, social and long term sustainability; shifts to a green economy and provides for the identification and implementation of various mitigation and adaptation measures.

The GOAL of the INDC and the accompanying action plan is to prepare the government and people of Sierra Leone to limit their carbon footprint; reduce or minimize risks by improving adaptive capacity, reducing vulnerability to climate change impacts and increasing the resilience and sustainable wellbeing of all citizens; and to leverage new opportunities and facilitate collaboration in-country and with regional and global communities..

### Planning processes:

Sierra Leone's planning process on mitigation and adaptation hinges on the NCCP, NCCS&AP and the NAPA. The result shall be reviewed every five years to inform the Medium Term Plan. The adaptation and mitigation actions will further amplified in the NAP and NAMA which Sierra Leone hopes to develop.

The planning process also takes cognizance of the absence of a Climate Change law that may propose several institutional reforms to enhance coordination of climate change adaptation and mitigation. These reforms may include:

- Review, revise the already adopted (by cabinet concurrence) current Draft Climate Policy into a comprehensive Climate Act;
- Establish the enabling legislative framework to implement the NCCS&AP actions;
- Establish and/or strengthen the high-level National Climate Change Council (NCCC), in the Office of the President; and
- Support the already established National Climate Change Secretariat as the primary national government agency for climate change response.

- Establish a Sierra Leone Climate Fund to be a financing mechanism for priority climate change actions and interventions.

### **Gender perspective**

Pillar eight (8) of Sierra Leone's five year development plan considers Gender and Women's Empowerment. Therefore, in addressing climate change issues, public entities are required to undertake public awareness and consultations, and ensure gender mainstreaming.

### **National implementation:**

Sierra Leone elaborated a draft for consultation at national level of its national climate policy. It will include measures that allow emission reductions by 2035 to be achieved mainly domestically. The proposed measures to achieve the commitments will build on existing measures and strategies. The existing legal frameworks will have to be revised accordingly. These revisions are subject to approval by Parliament.

### **Assumptions and methodological approaches**

Sierra Leone's supports internationally agreed rules for accounting and reporting of greenhouse gas emissions. As they are yet to be agreed, Sierra Leone's INDC is based on the following assumptions and methodological approaches:

The **IPCC Revised 1996 Guidelines** for National Greenhouse Gas Inventories and the Good Practice Guidance were used to calculate the GHG emissions and removals as described in the Second National Communication. **Emissions of carbon dioxide from the combustion of biomass are assessed but not counted towards the contribution and the mining/extractive sector has not been included in the accounting.**

### **Information to facilitate clarity, transparency and understanding**

**Geographic coverage:** The geographic coverage is complete. No region in Sierra Leone has been left uncovered by the inventory.

**Sectors (sources and sinks):** All sources or removals of direct GHG gases included in the IPCC Guidelines **(Energy, Industrial Processes, Agriculture, Forestry and other Land Use (AFOLU) and waste sector)**. In particular, Sierra Leone target covers all greenhouse gases included in the 1990 and 2000 inventories under INC and SNC. The general gaps in the completeness are mainly due to lack of activity data and the non-occurrence of the activity in Sierra Leone.

**Gases covered:** Carbon dioxide (**CO<sub>2</sub>**), Methane (**CH<sub>4</sub>**) and Nitrous Oxide (**N<sub>2</sub>O**) are prioritized.

**Base year for gases covered:** all 2000/1990(not relevant where reference level is applied)

**Time frames/period for implementation:** **2030-2050**

### **Fairness and ambition**

Sierra Leone is of the view that the key factors in determining the fairness of a contribution should include historical responsibility and respective capability to address climate change. In light of this the country considers the following points:

- i) The country's capability to implement this contribution is subject to limitations.
- ii) The country has a very small emissions profile (<0.1% of global emissions and per capita emissions less than 0.2tCO<sub>2</sub>/year).
- iii) The country does not have absolute emission reduction targets, but has chosen the option of green growth and low emission pathway as elucidate in the NCCS&AP.

These gives a clear stand that the country is determined to continue playing its own part in addressing climate change by communicating a fair and ambitious contribution.

### **Global warming potentials**

The carbon dioxide equivalent was calculated using the 100 year global warming potentials in accordance with the IPCC 2<sup>nd</sup> Assessment Report.

### **Mitigation Component of the INDC**

Mitigation perspectives of Sierra Leone are presented based on strategic documents developed in and for Sierra Leone which include the National Communications, the NAPA and other strategic documents. This INDC is a strategic document concretizing Sierra Leone's shift in its development path from brown to green economy and to achieve sustainable development, based on its own socio-economic and development priorities.

### **Present GHG emission contribution**

Already, in a bid to significantly contribute towards the reduction of the sources and potential sources of GHG emissions or enhancing carbon sinks, Sierra Leone, following a mitigation assessment, and drawing upon the strategic direction of Vision 2035, Sierra Leone, proposed to undertake the following appropriate which were it's Internationally communicated pre-2020 GHG emissions reduction plans under the Copenhagen Accord (GoSL, 2012):

Thus Sierra Leone is already mitigating GHG emission which has not yet been quantified for CERs.


1. Establishment of the national secretariat for climate change (NSCC) to ensure coordination and assessment of climate change initiatives.
2. Expanding clean energy utilization (e.g. solar, mini-hydro electric power, LPG, biomass stoves etc).
3. Development of energy efficiency programmes through sensitization and awareness raising campaigns. Sustainable production of charcoal a reduce dependence on firewood.
4. Development of alternative energy sources such as bio-fuels from sugarcane, corn, rice husk, etc.
5. Developing agricultural and urban waste incineration programmes for energy production.
6. Improved waste management through composting and recycling of waste.
7. Development and enforcement of regulations on regular maintenance of vehicles (vehicle emission testing): formulation of transport plans.
8. Improved and promoting use of public transport (e.g. road, rail and water) for passengers and cargo to reduce traffic congestion and GHG's emissions.
9. Setting/developing air, water and soil quality standards, and ensure regular assessments and monitoring through control programs.



As reported to the 2009 COP 15 meeting in Copenhagen, Sierra Leone, through its relevant Ministries, will put modalities into place to fully exploit the Carbon Trading and Payment systems. For instance the use of REDD and REDD+ initiatives.

### ***Conditional Contribution***

Sierra Leone's INDCs is framed **in terms of desired outcomes**. Through this INDC, Sierra Leone is committed to implementing specific emissions-reduction actions, such as policies or mitigation actions like advancing a feed-in tariff for renewable energy technologies, phasing out fossil fuel subsidies, or converting to no-tillage agricultural practices. As a country whose **emission levels are relatively low already**, Sierra Leone could not commit to a certain outcome or result—for example, reducing emissions to a specific level (a greenhouse gas outcome). The domestic situation Sierra Leone faces i.e being solely dependent on fuel imports to meet its minimum energy needs, reducing emissions further than BAU can only be achieved through country wide LEDs which the country has already adopted.

It is against this backdrop, that this INDC **intends to maintain the emission levels of Sierra Leone relatively Low (close to the world average of 7.58 MtCO<sub>2</sub>e) by 2035 or neutral by 2050 by** reducing her carbon footprint and by following green growth pathways in all economic sectors. 

This target will **only be achieve by Sierra Leone with the availability of international support** that will come in the form of finance, investment, technology development and transfer, and capacity building. This would require substantial donor support estimated to about \$ 900 million.

### ***Long term global contribution:***

Sierra Leone intends to also present an **intensity based reduction target by 25 to 35 percent, by 2050 in phases (2020-2030, 2030-2050) compared to 1990** including use of international credits well as the vision to hold per capita emissions in Sierra Leone's average world level in the longer term. These unavoidable emissions will have to be eventually compensated through sinks or removals.

Priority climate change response strategies have been identified and included in the INDC. The following strategies are in the area of mitigation of greenhouse gas emissions.

These strategies include:

- Strategy 1:** Institutionalization of coordination, monitoring, reporting and verification of climate change issues by strengthening the Environment Protection Agency for effective and efficient provision of technical policy advice to the Government and people of Sierra Leone for relevant decision making in transitioning to green economic growth.
- Strategy 2:** Transformation of the National Meteorological Services of Sierra Leone and strengthening of Climate Change Early Warning System of Sierra Leone
- Strategy 4:** Promotion of energy efficiency, enhanced management and expansion of the energy mix through uptake of renewable energy sources (Solar, Wind, Hydro, Biomass) particularly in the rural areas of Sierra Leone.

- Strategy 5:** Enhancement of waste management systems at all levels to reduce pollution and greenhouse gas emissions under the category so as to improve health of both humans and animals and reduce global warming.
- Strategy 6:** Diversification of economic growth through strengthened transport sub-sector, particularly the infrastructure to contribute to the reduction of regional and global emissions of greenhouses and build a stable economy.
- Strategy 7:** Adoption and application of climate-smart and conservation agriculture through best agricultural practices that enhance soil fertility and improve crop yield

#### ***Contribution by land sector emissions***

This includes emissions from the land use, land use change and forestry (LULUCF) sector. Relevant national policy documents and the FAO's Global Forest Resource Assessment 2010 for Agency Sierra Leone were used. A global land -use data approach was used, as described in the 2003 IPCC Good Practice Guidance for LULUCF. A state and transition model consistent with the 1996 Revised IPCC Guidelines was used to calculate fluxes of CO<sub>2</sub> to (or from) the atmosphere and biomass carbon pools is the same as outlined in the 1996 Revised IPCC Guidelines. There is significant uncertainty in the BAU emission and mitigation potential estimates for this sector and work is underway to update and improve these estimates.

#### ***Contribution of international market based mechanisms***

Sierra Leone supports the inclusion of the international Carbon Markets such as CDM in a post 2020 agreement on climate change and proposes that such instrument be tied to an appropriate MRV system to be used to help finance low carbon and climate resilient infrastructure investments.

Sierra Leone considers that certain low emission development options mentioned in the INDC or additional actions could be entirely or partially be funded by the transfer of international carbon assets while taking into account environmental integrity and transparency.

#### ***Avoidance of double counting***

Sierra Leone intends to include the above mentioned carbon assets in accounting for its emission reduction commitment. For the CDM under its current use and operation it is assumed that only the acquiring Party will account for the emission reductions covered by the credits acquired from the host Party. For new market mechanisms, Sierra Leone supports the elaboration of UNFCCC rules for avoiding double counting of emission reductions, or otherwise appropriate.

#### ***Reference Point***

##### ***BAU emissions in the target year***

Business as usual (BAU) emissions is estimated to be 6.6 MtCO<sub>2e</sub> by 2030. This excludes downstream exploitation in the mining/extractive sector.

##### ***BAU projection methodology***

The BAU projection methodology is detailed within the NCCS& AP and the Second National Communication (SNC), including key assumptions, drivers and methodologies for each sector. The base year is 1990.



Sierra Leone has over 20 hydro potential sites of which the Bumbuna Dam is the only one that has been tapped. This dam, which has been completed, has a capacity of 50MW. This was considered as the most **viable mitigation option** for the electricity sector. If five of these hydro potentials including Bumbuna are utilized, it may result in almost zero emission for the electricity sector.

### **The Adaptation Component of the INDC**

The INDC is developed to take the efforts (adaptation) needed to respond to climate change in Sierra Leone to another stage beyond identification to implementation. Under the INDC the strategies identified have been translated into adaptation actions to enable Sierra Leone to take decisive and sustainable actions in addressing the adverse impacts of climate change on the national economy and move the country into a green and resilient economy. The Action Plan includes (a) prioritised activities that will support Sierra Leone to transition to a low-carbon and climate-resilient economy; (b) information on financing the INDC; (c) mobilisation of resources and (d) monitoring, reporting and verification of impacts on the citizens and economy of Sierra Leone due to the implementation of the strategy and action plan.

Priority climate change response strategies have been identified and included in the INDC. These strategies are in the area of adaptation to the impacts of climate change.

- Strategy 1:** Estimation, in a sustainable manner, of Sierra Leone's contribution to global warming and climate change.
- Strategy 2:** Management of rangelands and pastures by managing grazing systems and grazing intensity, fire management and pasture rehabilitation.
- Strategy 3:** Integrated management of crops and Livestock management.
- Strategy 4:** Restoration of degraded lands with high production potential
- Strategy 5:** Management of coastal and fisheries resources through promotion of non-destructive fishing techniques to maintain resilience of marine ecosystems.
- Strategy 6:** Promotion and facilitation of early warning and disaster preparedness system.
- Strategy 7:** Strengthen integration of climate change adaptation into the health Sector.
  
- Strategy 8:** Strengthen the adaptive capacity of the most vulnerable groups and communities through social safety nets and insurance schemes.
- Strategy 9:** Enhance the resilience of the tourism value chain.
- Strategy 10:** Create enabling environment for the resilience of private sector investment, demonstrate an operational business case.
- Strategy 11:** Integrate climate change adaptation into the mining/extractive sector
- Strategy 12:** Mainstream climate change adaptation in land reforms.

### **The Loss and Damage Component of the INDC**

These priority actions include:

1. Adopt the current Disaster risks reduction Policy into a comprehensive Climate Policy;
2. Establish the enabling legislative framework to implement the DMD policy and action plan;
3. Establish and/or strengthen the high-level National DMD Council (NCCC), in the Office of the Vice President; and

4. Establish a National DMD agency as the primary national government agency for climate change response.

Jointly implemented, these actions constitute a comprehensive package that facilitates preparedness and response to disasters and effective INDC implementation.

## **RESOURCE MOBILIZATION STRATEGY FOR INDC**

### **Means of implementation**

The realisation of the bold ambitions and actions identified in the Sierra Leone INDC will require substantial financial resources, investment, technology development and transfer, and capacity-building to fully realize her intended contribution.

To succeed in this ambitious intention, Sierra Leone will need to access both public and private sources and from both within Sierra Leone and overseas. The cumulative expenditure commitment estimates in the INDC is about **900 Million US Dollars**. Further analysis will be necessary to refine the required investment cost and determine the domestic support.

### **Barriers to Raising the necessary capital**

Raising the necessary capital is currently impeded by a number of barriers some of which include policy and regulatory weaknesses, difficulties in accessing commercial finance and technical capacity. For sustainability, it is recommended to create a stand-alone dedicated Sierra Leone Climate Fund (SLCF) and the resources should be mobilized both domestically and internationally. For this reason, the SLCF should be designed to have three (3) windows: (1) Domestic Climate Finance; (2) International (Bilateral and Multilateral) Climate Finance; and (3) Private and Market Climate Finance.

International cooperation is an important and necessary prerequisite for leveraging of inputs for the implementation of the INDC. Capacity building needs for the implementation of the INDC of Sierra Leone have been identified as (a) for gathering, processing, and providing and communicating meteorological and socio-economic data and information; (b) improving National GHG Inventories and Assessments of GHG Mitigation and Climate Change Adaptation Technologies; and improving climate Vulnerability (impacts and adaptation) Assessment

## **MONITORING, REPORTING AND VERIFICATION OF THE IMPLEMENTATION OF INDC**

Finally, the monitoring, reporting and verification of the implementation of the INDC of Sierra Leone have been articulated with the objective of tracking the transition of Sierra Leone to a low carbon and climate resilient economy. It will be necessary to develop and apply an integrated framework for measuring, monitoring, evaluating, verifying and reporting results of response (mitigation and adaptation) actions and the synergies between them. Effective implementation of the INDC is highly dependent on the internal “feedback” generated through monitoring, reporting and verification (MRV) processes.

In this INDC Sierra Leone will choose to consider what emissions reductions can be achieved with available resources and those to be undertaken if additional resources were available.