ICAT-Liberia Project Lessons Learnt Report

Initiative for Climate Action Transparency

Initiative for Climate Action Transparency – ICAT
Lessons Learnt during the implementation of the ICAT-Liberia Project

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Contents

Acronyms and Abbreviations

BTR : Biennial Transparency Report

BUR	: Biennial Update Report
EPA	: Environment Protection Agency of Liberia
ETF	: Enhanced Transparency Framework
GACMO	: Greenhouse Gas Abatement Cost Model
GHGMI	: Greenhouse Gas Management Institute
ICAT	: Initiative for Climate Action Transparency
INDC	: Intended Nationally Determined Contributions
LEAP	: Long-range Energy Alternatives Planning
LNC	: Liberia National Communication
MACs	: Ministries, Agencies, and Commissions
MCC	: Monrovia City Corporation
MME	: Ministry of Mines and Energy
MoT	: Ministry of Transport
MRV	: Monitoring, Reporting, and Verification
NAP	: National Adaptation Plan
NAPA	: National Adaptation Program of Action
NDC	: Nationally Determined Contribution
NEP	: National Environmental Policy
NEPL	: National Energy Policy of Liberia
NGO	: Non-Governmental Organization
NTMP	: National Transport Master Plan
SDGs	: Sustainable Development Goals
TRACE	: Tracking Real-time Atmospheric Emissions
UNOPS	: United Nations Office for Project Services (UNOPS)
WET	: Waste, Energy, and Transport

1. Introduction

1.1. Background

The Government of Liberia (GoL) through the Environmental Protection Agency (EPA) received funding from the Initiative for Climate Action Transparency (ICAT) via the United Nations Office for Project Services (UNOPS) to strengthen Liberia's capacity to assess the contribution of climate policies and actions on development objectives, and to track progress towards its Nationally Determined Contribution (NDC) under the Paris Agreement.

This project was implemented by the GoL through the EPA of Liberia from February 2020 through September 30, 2022. The project specifically focused on building the capacities of technicians and experts in the EPA, relevant sector ministries, and other stakeholders to be able to assess the impact of mitigation policies, measures, actions, and plans; and to track and monitor progress in NDC implementation.

Based on the activities and outputs that were defined in the country work plan under this project, the Government of Liberia, through the EPA, and with the funding secured from the ICAT, hired two (2) teams of 3-national consultants each. One team (Policy Assessment Team) was tasked with the responsibility to carefully assess three policies within the waste, energy, and transport (WET) sectors and provide policy directions that will lead to the updating and revision of the existing policies; and the other team (NDC Tracking Tool Team) was charged with the responsibility to develop NDC tracking tools and indicators for monitoring progress towards achieving the revised targets and actions set out in Liberia's updated NDC.

This report highlights key achievements, results, impacts, challenges, and lessons learnt during the implementation of the ICAT-Liberia Project. It also provides practical recommendations and a clear roadmap intended to guide the EPA in establishing a robust system that can meet the requirements of the enhanced transparency framework (ETF) of the Paris Agreement.

1.2 National Circumstances

Liberia is situated in the centre of the Upper Guinea Rainforest Region along the West Coast of Africa and lies between longitudes 7°30` and 11°30` west and latitudes 4°18` and 8°30` north. This region is one of the most biologically diverse areas and was originally covered by continuous, dense tropical rainforest, ranging from Guinea, south through to Ghana. Liberia has a predominantly equatorial climate, with three distinct topographical belts. The low coastal belt is about 40 kilometre (km) wide, and constitutes tidal creeks, shallow lagoons, and mangrove marshes. Moving inward, the second belt includes rolling hills that reach elevations of 60–150 meter (m) (200–500 feet). The third belt, comprises the bulk of Liberia, is marked by abrupt changes of elevation in a series of low mountains and plateaus, which are less densely forested.

Liberia has made significant economic and development progress since the end of its civil war in 2003. However, the country remains fragile and highly vulnerable due to high levels of inequality, unemployment and poverty, with limited access to basic services such as water, sanitation and energy. Liberia has a population of 5.06 million people (2020) with a current population growth rate at of 2.4% (2020).

Approximately 51.6% of the population currently live in urban areas and this is projected to increase to 57.3% and 68.2% of the population by 2030 and 2050, respectively. The country has a Gross Domestic Product (GDP) of $2.95 billion (2020), growing at a rate of -2.3% in 2019 and -2.9% in 2020. The country has experienced highly volatile, yet positive growth rates since the early 2000s. According to 2020 data, the country's GDP is dominated by the agriculture sector (inclusive of fishing and forestry), which accounts for 42.6% of GDP and the industry sector (including mining, construction, electricity, water and gas), which contributes 11.7% of GDP and services comprising 49.7% of GDP.

Liberia is highly vulnerable to adverse effects of climate change. Liberia is also highly vulnerable to environmental instability due to its extreme poverty and high dependence on 'climate sensitive' sectors such as agriculture, forestry, fisheries, energy, and mining. While, the rural economy is largely dependent on rainfed subsistence farming, forest produce and fishing.

However, having recognized the current and future threats of climate change, the Country 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 also shown leadership in addressing climate change issues as demonstrated through its submission of an Intended Nationally Determined Contribution (INDC) in 2015, 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 the revised NDC in which 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 CO2e in 2030; with an additional 54% reduction conditional upon international support, which would result in an absolute emissions level of 4,537Gg CO2e in 2030. This commitment was 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.

1.3. Objectives and outcomes of the ICAT-Liberia Project

The general objectives of the project were to support the EPA and the Government of Liberia in assessing the degree of alignment of existing sectoral policies within the updated NDC and how these policies can be strengthened in the context of delivering sustainable development co-benefits. A better understanding of co-benefits will support future policy making as well as communicate the sustainable development advantages that well-designed climate policies can entail. The project also

aims to support the EPA in strengthening systems and frameworks for tracking progress on Liberia's NDC under the Paris Agreement.

Hence, the project focused on three (3) priority sectors: **waste, energy, and transport** with specific objectives to:

1. Contribute towards ongoing efforts to build a national transparency framework that meets international standards and is tailored to domestic needs.

2. Strengthen the EPA's and relevant stakeholders' capacities to apply methodologies and tools to assess GHG and sustainable development impacts and the effectiveness of policies, measures, actions and plans included in Liberia's updated Nationally Determined Contributions (NDC) submitted to the UNFCCC on 4th August 2021.

3. Contribute towards ongoing efforts to improve the availability and quality of data required for measuring GHG and sustainable development impacts and the effectiveness of policies and measures included in, and achieved by actions as set out in Liberia's updated NDC.

4. Support the tracking of NDC targets and actions in a manner that allows consistent monitoring and evaluation (M&E) of progress towards achieving those NDC targets and actions (in collaboration with relevant existing initiatives that support the NDC implementation in the framework of the NDC roadmap).

5. Contribute towards ongoing efforts to develop frameworks that facilitate tracking of progress on NDC implementation and strengthen capacities to construct and apply indicators towards that end.

1.4. Main tasks of the assignments: Policy Assessment and NDC Tracking Tool

Two (2) consultancy teams (Policy Assessment Team and Tracking Tool Team) were hired to accomplish the tasks of the consultancy assignments and deliver on the desired outputs of the project.

1.4.1. Policy assessment tasks

The main tasks and targeted outputs of the policy assessment were to accomplish the following:

- Develop the working methodology, timeline and execution plan for the assignment and present it to the EPA.
- Conduct meetings (in-person or virtual) with the project teams, sectoral working groups and NDC hubs that collaborate under the "NDC Roadmap process" to identify the full set of targets, policies, measures, actions and plans in the energy, transport and waste sectors that are included in the updated NDC.
- Provide expert advice to technicians at the EPA in their efforts to assess the sustainable development impacts of climate policies, measures, strategies, actions and plans and the degree to which they are aligned to the updated NDC targets of Liberia;
- Support technicians in the EPA in undertaking consultations with sector ministries, civil society, private sector and academia to identify how the three (3) priority policies ***(National Energy Policy of Liberia (2009)***, ***National Transport Master Plan (2012)***, ***National Environmental Policy of Liberia- 2003)*** can be assessed in the context of understanding the sustainable development

impacts of these policies and how they can be strengthened on delivering sustainable development co-benefits as well as identify linkages to the updated NDC;

- Support technicians in the EPA to undertake consultations with sector ministries, civil society, private sector and academia to identify sustainable development priorities that should be assessed as part of the policy assessment of the National Energy Policy of Liberia, National Transport Master Plan, and the National Environmental Policy of Liberia;
- Assess the GHG and selected sustainable development impacts for the three policies, measures, strategies, actions or plans selected by the EPA through the consultative process;
- Provide a synthesis of the challenges encountered in conducting the assessments and how to overcome them, especially with regard to data availability and quality.

1.4.2. NDC tracking tool tasks

Whereas, the tasks and targeted outputs of the NDC Tracking Tool assignment included the following:

- Develop the working methodology, timeline and execution plan for the assignment and present it to the EPA.
- Conduct meetings (in-person or virtual) with the project teams, sectoral working groups and NDC hubs that collaborate under the "NDC Roadmap/Implementation process" to engage in reviewing NDC targets in the Energy, Waste and Transport Sectors.
- Produce a summary report on the review of the targets in the updated NDCs in the Waste, Energy and Transport sector and how they can be tracked using the TRACE, GACMO and LEAP Models as well as conduct scenario analysis on NDC Tracking.
- Provide advice to the EPA, sectoral working groups and NDC hubs on the NDC target tracking process and ensure that updated NDC targets are fully trackable.
- Development of indicator tracking tools to track NDC progress in the energy, transport and waste sectors using GACMO, LEAP TRACE and other relevant climate models useful for Liberia's three (3) mitigation sectors and Capacity building to apply the indicator tracking tools in the Energy, Waste and Transport sector.

2. Approach and key results

The project has two (2) general objectives: the first is to support the EPA and the Government of Liberia in assessing the degree of alignment of existing sectoral policies within the updated NDC targets and how these policies can be strengthened in the context of delivering sustainable development co-benefits; and to support the development of an NDC tracking tool and indicator set for the waste, energy, and transport (WET) sectors.

The results of the project were presented and validated through stakeholder workshops, which had the participation of representatives from different line ministries, agencies and commissions (MACS), academia, civil society organizations, representatives of the private sector, the media, and other international development partners. The work in the country was done by two (2) teams of six (6) national consultants, with close supervision from the EPA, ICAT/UNOPS Partnership. The national consultants hired for the project have previous experience working with several national and

international projects and project documents, including the Liberia's INDC and updated NDC, the development of NAPAs, NAPs, and are also involved in the current development of Liberia's 2nd National Communication.

The ICAT-Liberia project produced and validated three (3) assessment reports, provided practical recommendations, and other relevant project deliverable reports including:

- Project inception reports
- Report describing the stakeholders that have been consulted and introduced to the objectives of the project, and a description of selected mitigation policies to be assessed.
- Report on the assessment of the National Environmental Policy of Liberia with focus on the Waste sector (2002)
- Report on the assessment of the National Energy Policy of Liberia (2009)
- Report on the assessment of the National Transport Master Plan (2012)
- Project diagnostic report
- A road map for the establishment of a strengthened national Monitoring Reporting and Verification (MRV) system and framework for tracking progress on Liberia's NDC
- Training in the use of the Greenhouse Gas Abatement Cost Model (GACMO)
- Report on practical recommendations for developing framework and indicator sets for the waste, energy, and transport (WET) sectors; and improving the national MRV system.
- Lessons learnt report
- Project closure and validation workshop report

The result of the three (3) assessment reports of the WET sectors revealed that the three (3) policies *(National Energy Policy of Liberia (2009)*, *National Transport Master Plan (2012)*, *National Environmental Policy of Liberia- 2003)* which are currently providing the overarching regulatory basis and framework for introducing new sectoral actions and measures in these sectors date back to a time prior to the adoption of the Paris Agreement in 2015.

The ICAT Methodology Guide for Assessing Sustainable Development Impacts was the general guiding tool used in the conduct of the assessments. The ex-post policy assessment approach described in the guide was used in conducting literature review, assessing the impacts of the policies in relation to the sustainable development goals and to measure the consistency and effectiveness of the policies in relation to measures, actions, and plans presented in Liberia's updated Nationally Determined Contributions (NDC).

The three (3) reports generated from this process generically assessed and analysed the following:

- The Status of specific interventions targeted by each of the policies
- Degree to which the NDC targets, actions, and measures are covered by the 3 policies
- Current policy environment of the three (3), WET sectors containing the policies
- Performance of the 3 policies against specific SDG Impacts
- SDGs, targets, and specific elements captured by the 3 policies

- Additional SDG impacts/benefits to be accrued from implementing the NDC actions and measures of the 3 policies.

The three (3) assessment reports also uncovered that the current policy environment of the WET sectors is generally insufficient to provide appropriate solutions for the strangling challenges besetting the growth and development of these sectors. The reports suggest that in order for Liberia to meet its international commitments and to address the impacts of climate change and other challenges mentioned in the assessment reports, the GoL needs to update or recalibrate these core policies to create the right enabling environment for NDC implementation.

3. Impacts of the project in the country

The project had impacts at different levels. A key contribution of the ICAT-Liberia project created awareness and buy-in for the revision and update of climate policies especially the three (3) important NDC mitigation policies. It also contributed in building the capacity of technician to use the GACMO tool for the establishment of an enhanced national MRV system and development of indicator sets for the waste, energy, and transport (WET) sectors.

The process of assessing the policies, identifying gaps in the development of a national MRV system and developing a road map for enhancing it engaged various stakeholders in Liberia and promoted a discussion in the country about how to improve policy planning, monitoring, and reporting.

The more specific impacts are:

- An in-depth understanding of the expected impacts of selected climate policies, which are planned in the country's NDC, including their GHG emissions and sustainable development impacts;
- Development of capacity for planning mitigation actions, assess their impacts, and track its implementation;
- An understanding of the barriers and limitations of the national MRV system coupled with a road map to overcome them and to establish a robust system that can meet the requirements of the enhanced transparency framework (ETF) of the Paris Agreement;
- Development of capacity for establishing systems for monitoring and reporting on climate action and support at national and international level.

Regarding the assessment of policies, barriers of the national MRV system and the road map to overcome them, the project engaged in consultations with many stakeholders and through this has increased awareness about the benefits of an improved structure for planning, monitoring and reporting on climate policies and the requirements for reporting internationally to UNFCCC and the Paris Agreement.

These consultations involved ministerial staff, technicians, focal points, experts, and high-level officials, representative from the private sector, public sector companies, civil society organizations, and academia. The involvement of more high-level decision makers like the Executive Director of the EPA and UNFCCC National Focal Point contributed to the increased visibility of the project results and

to creating momentum for advancing this kind of work in the country.

As more stakeholders in Liberia get sensitized on the benefits of monitoring and reporting of climate policies and international transparency requirements, the capacity for the country to establish systems that enable planning, monitoring, and reporting of policies also increases. For Liberia to improve on policy planning, it is key that policy development is linked to costing and budgeting and that an efficient system and methodology for policy assessment and evaluation be put in place.

The ICAT-Liberia project contributed to development of capacity to establish GHG emission scenarios through the training provided on the Greenhouse Gas Abatement Cost Model (GACMO) excel-based tool. It has provided participants with a tool for establishing business-as-usual and emissions reduction scenarios resulting from the implementation of specific mitigation actions.

With respect to policy assessment, the national consultants engaged for the work in assessing the policies are climate change and sustainable development experts who now have the capacity to perform impact assessments following the ICAT Assessment Guides. The lessons learned from their work have been communicated to staff in line ministries, agencies and commissions (MACs), and they can be engaged in future training programs to capacitate MACs staff.

For the development of the tracking tool and indicator sets, the EPA plans to transition from LEAP into GACMO for their scenario modelling needs. More targeted training on GACMO is envisioned to develop the skills of staff and other technicians

On the overall, the ICAT-Liberia has created awareness and timely momentum in Liberia for establishing a functional national MRV system across a wide range of stakeholders. By highlighting the national benefits of improved policy monitoring, and the existing gaps in national MRV system development. ICAT has helped to reinvigorate national efforts to comply with UNFCCC requirements and to prepare for the implementation of Paris Agreement's ETF.

4. Challenges, lessons learnt and recommendations

For the policy assessment, there were few but very long-standing challenges encountered during the assessment of the three (3) sectoral policies. Many of these challenges have been stumbled upon by researchers and consultants who have carried out similar assignments in other sectors. They are mainly methodological, capacity needs, and data related.

4.1. Methodological Challenges

4.1.1. Waste, Energy and Transport Sectors

- In the WET sectors, the main methodological challenge encountered during the assessment of the policy was the difficulty of the respondents to understand and master the wide-ranging and long questionnaires that were developed. Interviewees had to be repeatedly consulted and walked through the questions to garner appropriate responses. At times, the information and responses provided by some of the respondents were

insufficient to get information on the subject matter of the questions.

4.1.2. NDC tracking tool

- Significant time is required, if GACMO is to be used to ensure that LEAP modelling inputs, assumptions, results and measures are mirrored in GACMO as appropriate and calibration of the tool is performed.

4.2. Data Challenges

4.2.1. Waste Sector

- Obtaining core technical information from some of the agencies that have mandate on the waste sector was a challenge during the assessment. Except for a few agencies and government institutions whose focal persons were highly knowledgeable when it came to assessing the relevant data relating to waste management in Liberia, most of the institutions lack personnel with adequate knowledge about the sector. It was observed during the assessment process that some agencies with oversight on waste management are unfamiliar with the NDC targets and the role of those agencies in mitigating GHG emissions of the waste sector. Further, these agencies currently do not measure GHG emissions, hence data are unavailable.
- The lack of a centralized Work Station where statistics are collated and analysed regarding wastes collected and conveyed through weigh bridges of the two transfer stations and the only landfill sites proved a serious challenge in assessing the relevant data that would indicate how the management of waste from primary source (household) level impacts the waste sector, especially as it relates to measuring the impact of the National Environmental Policy of Liberia against the Nationally Determined Contributions and the global Sustainable Development Goals. Moreover, there was difficulty in getting statistics/data from the relevant agencies about the level of waste pollution impacting land, sea and public health.
- The shortage of specialized and qualified technicians in the waste sector with knowledge and expertise in measuring GHG emissions and in conducting projections on future emission levels under different scenarios. A particular need is to be able to better measure and estimate GHG emissions and other pollutants from open burning of solid waste.

4.2.2. Energy Sector

- Within the energy sector, it was observed that personnel who are responsible to give reliable technical information pertaining to the number of individuals who have access to clean, affordable, and adequate energy services were incapacitated to provide such information.
- The inadequacy of monitoring, reporting, and verification systems to provide necessary real-time data about the current number of individuals who have access to the generation, distribution, and transmission networks in urban and rural areas was a limitation. The lack of the actual number of renewable energy service suppliers and consumers in the country was a challenge. Moreover, the lack of information to sufficiently measure the impacts of the NEPL against the NDC targets and SDGs was another major data challenge; as was the case of the unavailability of data on CO_2 emissions of the sector.

- The inadequacy of institutional capacity concerning highly skilled and qualified data technicians that have knowledge and expertise in data collection, processing, and management of the sector's GHG emission to provide timely data analysis to inform and support a more robust policy assessment process was a major constraint to the assessment.

4.2.3. Transport Sector

The following data challenges and difficulties were encountered during the assessment of the National Transport Master Plan.

- Lack of relevant and competent technical personnel to provide the necessary technical information and responses to questions relating to transport GHG emissions, alternative fuel consumption, air and noise pollution, and transport waste generation. Alternative responses gathered from consulted personnel were inadequate to strongly support our enquiries and assessment analyses, thereby reducing the confidence level, credibility, and strength of the assessment results.
- Lack of an enhanced information management system that provides real-time data to measure, track, and report on the evolution of transport GHG emissions. The collection of data on vehicle and fuel emissions, air pollution, number of illnesses and deaths caused by transport pollution annually, etc. was a hurdle to sufficiently determine specific qualitative and quantitative impacts of the NTMP.
- Lack of highly skilled, capacitated, and qualified technicians with expertise to collect, process, manage, and model transport GHG emissions and other relevant transport-related data (such as fuel type, vehicle emission rate, vehicle age etc.) hindered the analyses and results of the assessment. The unavailability to provide basic information and data didn't permit to conduct a more robust, accurate and sensitive quantitative analysis of the net impacts of the NTMP.

4.2.4. NDC tracking tool

For the development of the tracking tool and indicator sets, the following challenges were encountered:

- Data Availability- the LEAP modelling (i.e. LEAP files data) required to develop a robust NDC implementation tracking tool was not available during the project timeframe;
- Some of the measures described in the NDC do not have the relevant supporting policies.

4.3. Lessons Learnt

The following were key overall lessons learnt from the implementation of the ICAT Liberia project:

- The ICAT project helped integrate transparency of climate policies and actions with evidence-based policymaking, assessing the sustainable development impacts of climate plans, actions, policies, and measures in Liberia;
- That the assessment of three (3) national policies (National Transport Master Plan of Liberia, National Energy Policy of Liberia, and National Environmental Policy of Liberia) have helped inform NDC implementation as well as core sustainable development benefits for national development planning and the attainment of the SDGs in Liberia;

- That ICAT project uncovered the need for the EPA to accelerate efforts to locate and retrieve the LEAP modelling for Liberia's revised NDC to help strengthen the development of the NDC tracking indicators;
- That the succeeding UNFCCC reporting requirements such as the Biennial Transparency Reports (BTRs) and National Communications, etc. should consider using the LEAP model to analyse GHG emission factors for NDC sectors;
- That the I CAT project uncovered the need for the EPA to increase efforts to locate and retrieve the LEAP model/LEAP modelling for Liberia's revised NDC to strengthen the development of the NDC implementation tracking tool;
- That the ICAT Project also identified the need for more capacity building in the use of the GACMO, TRACE, and LEAP Models for transparency reporting as well as the ETF;
- The ICAT project uncovered the need for more NDC policy impact assessments for national policies across NDC sectors;
- That the ICAT project required time to fully implement all components and outputs as outlined in the Project Cooperative Agreement (PCA);
- The ICAT project-built synergies and further strengthened coordination amongst line Ministries, Agencies, and Commissions in promoting NDC Policy impact assessment and NDC tracking;
- The ICAT Liberia project helped build national capacities to measure the impact and effectiveness of climate plans, actions, policies, and measures in the energy, transport, and waste sectors to strengthen evidence-based policy-making;
- Through the ICAT project, Liberia was able to jointly organize a joint side event with ICAT/UNOPS and the Greenhouse Gas Management Institute (GHGMI) at SB 56 to enable the country to share knowledge and experiences on the lessons learned in the context of transparency for NDC financing and implementation;
- That the support from the technical team hired by ICAT Secretariat to work with the project management team and the EPA including the national consultants who work for the Greenhouse Gas Management Institute and OEKO Institute helped greatly to ensure that the project deliverables were concluded;
- Periodic virtual meetings with the technical experts from GHGMI and OEKO Institute supported the Government of Liberia to implement the ICAT Liberia Project.

4.4. Recommendations

These recommendations provide policy and decision-makers with a more reliable information on the synergies between the NDC and SDGs in regard to the three assessed mitigation policies, and their corresponding impacts and co-benefits. These recommendations are also useful material to inform the assessment of mitigation policies and plans in other sectors.

4.4.1. Waste Sector

- The capacity of technical personnel working in agencies and institutions with oversight on waste management must be enhanced to international standards; and those personnel, based on performance rating, should be paid salaries commensurate with their qualification and output.

- All institutions and agencies with oversight on climate change must be equipped with a Climate Change Directorate staffed with the requisite qualified and competent personnel knowledgeable about the issues, policies, protocols, conventions and laws that govern climate change globally and nationally, with the aim of assisting researchers with details about the progress and challenges made by the specific agency in addressing the issues of climate change. Such directorates must be fully equipped with the necessary technical infrastructure and tools to enhance the storage and provision of information on the waste sector as captured under the NDCs.
- There is an overriding need to operationalize the Waste Sector Work Station that is currently housed at the Chevron Children Park in Vai Town. According to a Monrovia City Corporation (MCC) stakeholder, the workstation will serve two purposes:
    - 1. A centralized storage centre for waste data collected daily from the various weigh bridges established at the Fiama Waste Transfer Station, the Stockton Creek Waste Transfer Station, and the Whein Town Landfill Site. The data collated and stored at the Chevron Children Park Work Station will provide policy makers with real-time statistics regarding primary source waste collection and disposal, with the objective of programme planning on waste management interventions that will lead to the mitigation of climate change.
    - 2. The Work Station has a conference room that will serve as training facility to build the technical capacity of personnel working with the MCC who deal directly with waste management.

In view of the aforementioned, the operationalization of the Work Station will be a key step for improving data availability and enhancing the ability to monitor GHG emissions from the waste sector more accurately. Close coordination between the MCC and the Environmental Protection Agency, as the Government of Liberia lead agency on climate change, will be instrumental for putting in place the administrative set-up for the station, which is currently the main missing element required for it to commence its work.

4.4.2. Energy Sector

- The systematic implementation of capacity-building activities, training, and career development for technical personnel in addition to better wages and the actualization of proper human resource management is required. A highly skilled and fully capacitated workforce is primal for the sector's advancement in mitigating carbon emissions, thereby improving the sector's performance against SDG targets.
- Information systems and collection of necessary data to adequately support the sector's policy development processes must be prioritized. These should be done by setting up an integrated database that collates pertinent energy-related data, such as CO2 emissions for sound decision-making and to initiate an established process for monitoring, reporting, and verifying. These data would also be necessary to track policy impact performance on indicators encompassing poverty reduction, economic growth, GHG reduction, and other cross-cutting themes such as environmental sustainability and gender equality.
- Regulations must continue to be implemented and enforced by the Ministry of Mines and Energy (MME), Liberia Electricity Corporation (LEC), Rural and Renewable Energy Agency

(RREA), Liberia Electricity Regulatory Commission (LERC), Liberia Petroleum Regulatory Authority (LPRA), Liberia Petroleum Refining Company (LPRC) and the EPA.

- Institutional capacity, increased public funding, investment priority focusing on renewable energy products and services, and collaboration between various ministries and agencies in the sector must be strengthened to inform policy and decision-making relative to impacts, costs, benefits, and potential trade-offs. These are important in planning and funding decisions, thus influencing the distribution of resources. Building institutional and staff resource capacity concerning data collection, processing, and management is also key to measuring the results of policies and government commitments.

4.4.3. Transport Sector

- Capacity-building activities, trainings and career development programmes for technical personnel in addition to better wage and proper human resource management must be implemented. These interventions are important in creating and maintaining a highly-skilled and qualified workforce. Building institution and staff resource capacities, with respect to data collection, processing and management is also key to measuring the results of policies and government commitments.
- The setup of an integrated information system to accurately measure, track and report on sustainable development impacts of the sector's policies, actions, measures and plans is required. Basic information on number of vehicles, proper road vehicle classification, mileage driven per vehicle, information on vehicle type, engine type, size and fuel use, fuel consumption rate, and gross vehicle weight for heavy duty vehicles for example, are important for policy scenario and formulation, and the determination of net impact on each impact category captured by the policies.
- The transport sector must initiate an established-process for monitoring and evaluating transport policy impact performance with respect to indicators encompassing poverty-reduction, economic growth, GHG reduction and other cross-cutting themes including environment sustainability and gender equality. The assessment revealed that policy performance monitoring and evaluation (M&E) is generally poor or non-existent in the sector.
- The availability of sufficient and sustainable financial support to adequately and effectively implement the sector's policy objectives, plans, strategies, actions and measures cannot be overemphasized.

4.4.4. NDC tracking tool

The following are key recommendations made by the consultants to develop NDC tracking tools and indicators for monitoring progress towards achieving the revised targets and actions set out in Liberia's updated NDC.

- The EPA should continue making efforts to locate and retrieve the LEAP modelling for the NDC;
- The EPA should make sure that all deliverables prepared for the revised NDC (LEAP modelling results including leap file for Liberia) are available to the consultant;
- Where applicable, the EPA should ensure that deliverables for all consultancy contracts

must include all data and material used;

- Conduct proper selection procedure and identify PAMs with significant impact or PAMs that are on critical pathway for achieving the NDC emission reduction target;
- Make sure that NDC indicators will be policy relevant, analytically sound and measurable;
- Since LEAP model was used to develop the revised NDC. It is logical to use LEAP model to develop the NDC tracking tool;
- If GACMO is to be used for NDC tracking make sure that LEAP modelling inputs/assumptions/results and measures are mirrored in GACMO as appropriate and calibration of the tool is performed;
- The EPA should make sure NDC indicators will have definitions and methodological explanation and will be able to fulfil all MPG requirements.
- The EPA make sure that reporting frequency will be aligned with other reporting under the national MRV system and will ensure that if needed corrective actions can be applied in a timely manner;
- The EPA should make sure stakeholders will not be overburdened with NDC reporting. Stakeholders are in principle to report relevant data, not to perform additional assessments, calculations or GHG emission reduction estimates;
- The EPA should make sure that NDC indicators address mitigation measures and policy instruments. Note that tracking measures that do not have relevant policy instruments is in principle tracking the BAU scenario.