IDENTIFICATION OF CAPACITY BARRIERS, GAPS AND NEEDS FOR ENABLING CLIMATE CHANGE MITIGATION MEASURES UNDER THE PROJECT: MANAGEMENT OF ENVIRONMENTAL SERVICES AND FINANCING FOR SUSTAINABLE DEVELOPMENT

A STUDY CONDUCTED BY:

THE ENVIRONMENTAL PROTECTION AGENCY OF LIBERIA
4TH STREET SINKOR, TUBMAN BOULEVARD, MONROVIA

WITH SUPPORT PROVIDED BY:

THE UNITED NATIONS DEVELOPMENT PROGRAM (UNDP)

MAY 23, 2013

FOREWORD

I am pleased to present this country report whose main objective is to identify capacity barriers, gaps and needs for the successful development of Low Emissions Development Strategies (LEDS), Nationally Appropriate Mitigation Actions (NAMAs) and Measuring, Reporting and Verification System (MRVs). The report presents not only future activities that could be undertaken to build capacity for LEDS, NAMAs and MRVs but also existing projects, policies and programs with climate change mitigation benefits that provide a good basis for NAMAs and LEDS. This report will help to inform on what barriers needs to be overcome as Liberia embarks on the process of pursuing a more sustainable development path that is less carbon intensive.

Liberia, as a Least Developed Country (LDC) is cognizant of the fact that stabilization of greenhouse gas (GHG) concentration in the atmosphere at the level that would prevent dangerous anthropogenic interference with the climate system will ultimately require mitigation actions from all countries. The Bali Action Plan marks a significant step toward this overall objective of the United Nations Frameworks Convention on Climate Change (UNFCCC) as it recognizes NAMA as a key mechanism in the context of sustainable development, supported and enabled by technology, financing and capacity development from to increase mitigation action in developing countries.

It is important to note that as a post-conflict nation, Liberia faces many challenges in the effective allocation of scarce resources to address its development needs but this study underscores that these challenges provide a unique opportunity to steer Liberia down a low emissions development pathway by integrating mitigation considerations into its national development plans, particularly the Agenda for Transformation (AfT).

My special thanks go to the team of consultants for preparing this document and also to United Nations Development Program (UNDP) for providing the needed financial and technical support for the team to carry out its work. It my hope that with adequate and predictable domestic and international support, the barriers and gaps in capacity, technology and finance identified in this report will be overcome to ensure that Liberia truly adopts a comprehensive agenda for low emissions development.

Madam Anyaa Vohiri
Executive Director,
Environment Protection Agency of Liberia (EPA)

ACKNOWLEDGEMENT

This study was prepared based on desk review of existing reports and publications; websearch, interviews, meetings, stakeholders' consultations and research were also conducted. We would like to express our sincere gratefulness to all who took part in our surveys, interviews or consultation workshops. We express gratitude also to their institutions for supporting their involvement.

We would like to specifically appreciate the efforts of the national consultants in putting together this report. We wish to acknowledge the following national consultants, namely Peter G. Mulbah, Zinnah Mulbah and Urias S. Goll.The support of Y. B. Osafo of Ghana who served as the international consultant for this project is also worth mentioning. We want to also acknowledge the technical assistance provided by Kumeh Assaf, National Climate Change Specialist at UNDP, Liberia.

Funding for this study was provided by the Regional Environment Project "Management of Environmental Services and Financing for Sustainable Development," of UNDP Regional Service Centre for Eastern and Southern Africa. Funding support was made available through the UNDP Country Office in Monrovia; we express gratitude to all our colleagues who in one way or another provided operational and technical assistance.

Benjamin S. Karmorh, Jr
Coordinator
Climate Change Enabling Activities
Environmental Protection Agency of Liberia (EPA)

TABLE OF CONTENT

I. ACRONYMS

AfDB	African Development Bank
AfT	Agenda for Transformation
BSWG	Benefit Sharing Working Group
C-SET	Center for Sustainable Energy Technology
CARE	Cooperative for Assistance and Relief Everywhere
CCG	Carbon Consultative Group
CDM	Clean Development Machanism
CFDC	Community Forestry Development Committee
CFF	County Forest Forum
CI	Conservation International
COP	Conference of the Parties
CSOs	Civil Society Organizations
ECOWAS	Economic Community for West African States
ENNR	East Nimba Nature Reserve
EPA	Environmental Protection Agency
ESIA	Environmental and Social Impact Assessment
EU	European Union
FAPS	Food and Agriculture Policy and Strategy
FCPF	Forest Carbon Partnership Facility
FDA	Forestry Development Authority
FF	Financial Flow
FFI	Fauna & Flora International
FMC	Forest Management Contract
GA	Green Advocates
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoL	Government of Liberia
HTC	Hydrocarbon Technical Committee
I & FF	Investment and Financial Flow
IFC	International Finance Corporation
IMF	International Monetary Fund
INC	Initial National Communication
IOCs	International Oil Companies
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for the Conservation of Nature
IWM	Integrated Waste Management
LDCs	Least Develop Countries
LEC	Liberia Electricity Corporation
LEDS	Low Emission Development Strategies
LEITI	Liberia Extractive Industry Transparency Initiative
LFI	Liberia Forestry Initiative
LULUCF	Land Use, Land Use Change and Forestry
MDGs	Millennium Development Goals
MLME	Minister of Land, Mines and Energy
MoA	Minister of Agriculture
MoF	Minister of Finance

MoGD	Minister of Gender and Development
MoT	Ministry of Transport
MPEA	Minister of Planning and Economic Affairs
MRV	Monitoring, Reporting and Verification Systems
NAMAs	Nationally Appropriate Mitigation Actions
NAPA	National Action Plan for Adaptation
NCCS	National Climate Change Secretariat
NCCSC	National Climate Change Steering Committee
NCSA	National Capacity Self Assessment
NEC	National Energy Committee
NEP	National Energy Policy
NFRL	National Forestry Reform Law
NGOs	Non Governmental Organizations
NTPS	National Transport Policy and Strategy
PRS	Poverty Reduction Strategy
R-PP	Readiness Preparation Proposal
REDD	Reduce Emission from Deforestation and Land Degradation
RREA	Rural and Renewable Energy Agency
RTWG	REDD+ Technical Working Group
SADS	Skills and Agriculture Development Services
SESA	Strategic Environmental and Social Assessment
TSC	Timber Sales Contracts
UL	University Of Liberia
UNCBD	United Nations Convention on Biological Diversity
UNDP	United Nation Development Program
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
VPA	Voluntary Partnership Agreement

II. EXECUTIVE SUMMARY

Having ratified the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, Liberia is expected to contribute to the attainment of the objective of these multilateral treaties in a manner that takes into account its national circumstances. The objective of this study was to conduct an in-country study to identify capacity barriers, gaps and needs for the successful development and implementation of Low Emission Development Strategies (LEDS), Nationally Appropriate Mitigation Actions (NAMAs) and Monitoring, Reporting and Verification (MRV) systems. The study affirmed that low adaptive capabilities and low prioritization of climate change at the policy level is to blame for increasing Liberia's vulnerability. This is due to the slow pace of connecting scientific and technical issues of climate change to policy making. In addition many policy and decision makers consider education, health, agriculture, water and security issues as being of higher importance than climate change issues.[i] The study concludes with recommendations of actions that must be taken and capacities that could be developed to support the development and implementation of LEDS, MRV and NAMAs in Liberia.

The study reviewed past and ongoing initiatives that seek to exploit Liberia's mitigation potential and enable it to reduce its GHG emissions in the short and long-term. Much of this information was in the Initial National Communication (INC). The INC identified the energy sector as the highest emitting sector with 67 percent of national emissions, followed by the agricultural sector with 31.9 percent and the waste sector accounting for 0.6 percent of national emissions. Most of the initiatives that this study analysed aimed to reduce emissions in these three sectors. These initiatives included policies like the National Energy Policy (NEP), the National Transport Policy Strategy (NTPS) and the draft Renewable Energy and Energy Efficiency Policy and Action Plan. They also included the reports and assessments of Liberia's emission reduction potential such as the Economic Analysis of Low Carbon Economy for Liberia and the Assessment of Investment and Financial Flow (I&FF) to Mitigate Climate Change in the Energy and Forestry Sectors and Adaptation in the Agriculture Sector (2011). Other initiatives that were analysed included projects that sought to augment Liberia's hydroelectric power generating capacity, the Eco-stove projects and REDDplus, whose successful implementation to date offers a model for other NAMAs to follow. These initiatives are being developed and implemented on an ad-hoc basis as opposed to being organized in a systematic manner or under a national governing framework. There is therefore potential for greater coherence and coordination that would help maximize the benefits from their implementation.

The study also showed that institutions and stakeholders structures that are meant to support climate change activities already exist. These include the defunct cabinet-level National Climate Change Steering Committee (NCCSC) and its Secretariat (NCCS) that were created to ensure high-level commitment and political will for climate change action. Their inability to function has left state agencies like the FDA and EPA that have the capacity to implement, to fill the void. Existing stakeholder structures particularly those that were created for the REDDplus process, are considered adequate enough to help ensure wide stakeholder consultation and participation in climate change initiatives at all levels. The study also reviewed existing MRV-type instruments and processes such as the preparation of the GHG inventories, the Liberia Extractive Industry Transparency Initiative (LEITI) and the work of the Environmental Social Impact Assessment (ESIA) Unit at the EPA. The study determines that a number of these bodies that are engaged in these processes possess sufficient experience and expertise that could be built upon to develop a standard MRV system for Liberia.

Stakeholders that were consulted on the subject matter of this study were unanimous in their conclusion that the INC and the National Transport, Agriculture and Energy Policies must be taken seriously if Liberia is to develop along a low carbon pathway, because they offered the best blueprint for mitigation. They also proposed strengthening law enforcement of environmental regulations and public participation in the exercise and capacity building for climate change actions, the removal of obstacles to CDM and the development of renewable energy infrastucture, and the designing of efficient transport systems. On REDDplus, which is the most advanced mitigation initiative in the country, they recommended that the following issues be resolved before any REDD+ or other mitigation measures are put in place:

- Adequate REDD+ revenue management arrangements and benefit sharing mechanisms;
- Clarification of forest carbon rights;
- Building of capacity for national accounting for REDD+ credits;
- Addressing the drivers of deforestation;
- Clarifying the role of communities in REDD+ (MRV systems); and
- Creating access to information and justice, and establishing a legal regime for REDD+ in Liberia.

The barriers, gaps and needs that were identified in the study, were related to capacity, technology and finance. The study recommended:

- Provision of appropriate technologies identified in the Technology Needs Assessment of the INC for the implementation of climate change mitigation actions in Liberia;
- Intensive capacity building of the private and public sector technical experts to address capacity gaps in the areas of policy, regulations and modeling;
- Strengthening of national capacities at all levels, and on issues related to the formulation and implementation of mitigation and the development of low carbon strategies;
- Provision of incentives to incentivise stakeholders including the private sector;
- Provision of financial assistance to finance the setting aside of 30 percent of Liberia's forests as protected areas as required under the National Forest Reform Law of 2006[ii]
- Feasibility analysis of the mitigation options and NAMAs identified, as well as cost assessments;

Other initiatives that ought to be initiated and pursued by the Government of Liberia (GoL) include:

- National dialogue to renew commitment to pursue a low emissions development path;
- Educational programmes and public campaigns to raise awareness of climate change issues among policy-makers and the general public;
- Strengthening of regional and national institutional frameworks to support the identification of possible actions for mitigation measures;
- Enhanced coordination within the climate change sector by EPA and also ensuring the signing of memorandum of understanding (MOU) between various institutions for the purpose of environmental data management or knowledge sharing.

III. MAIN REPORT

1. INTRODUCTION

1.1. Country's Circumstances Relevant to Mitigation

Liberia is a low income, Least Developed Country (LDC) whose economy is predominantly agrarian and hence highly susceptible to climate variability. The agricultural sector accounts for 76.9% of GDP while the industrial and services sectors account for 5.4% and 17.7% of GDP, respectively (Global Finance (2009)[iii]. Majority of the 3.4 million Liberians are between the ages of 5-24 years (LISGIS, 2008). 63 percent of Liberians in both urban and rural areas are living below the poverty line with an average life expectancy of 57 years (World Bank, 2011). As a post-conflict country, it has all the traits associated with post-conflict countries. It suffers from damaged infrastructure, weak institutions and challenges of inadequate human, technological and institutional capacities. Although a decade has passed since the conflict ended, low national income and the reprecussions of the challenges listed above continue to retard progress. Liberia is still vulnerable to conflict due to high political and ethnic polarization that is not always outwardly apparent. Concern remains that any additional challenge that it is forced to confront will undermine the already fragile bond that holds the country together. But Liberia's current national circumstance where all the productive sectors of the economy have been decimated by the conflict, offers it a unique opportunity to rebuild in a manner that decouples economic growth from what is often a corresponding growth in ghg emissions.

Like many of the LDCs, Liberia's contribution to global emissions has been minimal. In actual fact, it is a net sink. Using 2000 as the base year, its emissions amounted to 8,022Gg CO2e while the uptake from the LULUCF sector was 69,991 Gg Co2e resulting in net emissions removal of -61, 969 Gg Co2e. The energy sector is the main source of emissions in the country. It accounted for 67 percent of Greenhouse Gas (GHG) emissions in 2000[iv]. This is mostly because the energy infrastructure was completely destroyed during the civil war. By 2010 only Monrovia was connected to the electricity grid and even then less than 1% of Monrovia's population was connected[v]. The main source of energy for the rest of the country is biomass. Charcoal is used mainly in urban areas and fuel wood in the rural areas and among poor households in urban centers. Electricity generated from diesel powered generators is also quite common, making the sector the highest emitter of GHG in the country (EPA, 2012). To further worsen the situation, this energy is being used in an inefficient manner, with most of the energy being wasted due to inefficient harnessing technologies, not to mention the massive deforestation and forest degradation to feed this rapidly expanding industry. The Center for Sustainable Energy Technology (CSET)[vi] puts annual fuel wood harvest at 10.8 metric cube of wood. Consequently, energy access has become the number one priority of the GoL.

Mitigation assessment for the energy sector revealed an average annual growth of 14% in diesel oil (gasoil) consumption since 2004. An estimated 10.3% growth is projected up to 2020 and 3.4% growth between 2020 and 2028. Baseline estimates of electricity demand range from 11 to 25 MW and will rise by an average of 10.3% annually by 2010 before decreasing slightly to 3.4% growth annually until 2020. Sub-sectoral share of the residential, commercial and institutional sub-sector will be within the demand range of 10-12%. For the industrial sector, a growth rate of 5% is applied for a business-as-usual (BAU) scenario between 2008 and 2015 but followed by a more rapid growth of about 12% growth rate in an attempt to restore the full industrial capacity that existed before the civil conflict (EPA, 2012).

Emissions from the energy sector are followed by agriculture, which accounts for 31.9 percent Liberia's GHG emissions. The remaining 0.6 percent of emissions is attributed to the waste sector[vii]. For Monrovia, which is the most densely populated city in Liberia with an estimated population of 1.3 million, the average waste generated amounts to about 780 tons daily (UNEP, 2007)[viii]. This figure is projected to increase by 2.5% every year[ix]. If adequate waste management programs are not put in place, the waste sector, particularly in the municipalities could become a major source of GHG emissions. Analysis of the waste composition show that vegetables and putrescibles account for about 43 percent of waste generated, while paper wastes account for about 10%[x]. These classes of waste are bio-degradable and can be exploited for biogas and electricity production.

The forestry sector offers more mitigation promise than the other sectors. Historically, Liberia's deforestation rate has been low. Christie et al (2007)[xi] suggests that the deforestation rate for the period 1986–2000 was as low as 0.2% per annum. The rates are much higher now with the resumption of logging activities and the clearing of forests land for agriculture. Between 1990 and 2010, Liberia lost an average of 30,000 ha or 0.61% per year[xii]. This notwithstanding, Liberia forest mitigation potential cannot be overstated. With about 42% of the Upper Guinea Forest Ecosystem, Liberia is the most forested country in the sub-region and this sector offers the best alternative to providing a low-cost mitigation option for Liberia[xiii]. This is why although Liberia is a low emitter and net sink of GHG, whatever mitigation measures the country adopts in this sector can only be to support global efforts to keep emissions level below 2°C and to exploit potential gains.

Low adaptive capacity and prioritization of climate change at the policy level, has been held partially responsible for Liberia's susceptibility to the adverse effects of climate change; the EPA (2012)[xiv] reports that this is due to the slow pace of connecting scientific and technical issues of climate change to policy making. The report further notes that many policy and decision-makers consider other national issues like education, health, agriculture, water and security as being of greater urgency, but those same policy makers fail to see that gains made in those sectors can be undermined by climate change. The problem is further excarcebated by inadequate infrastructure, low institutional capacity to deal with climate change and inadequate meteorological and hydrological data and data gathering capability. All of these make it difficult to predict climate hazards and act to address them thereby increasing the country's vulnerability.

1.2. Purpose of Study

The Cancun Agreement encouraged developing country parties to undertake Nationally Appropriate Mitigation Actions (NAMA) as part of their non-binding obligation under the United Nations Framework Convention on Climate Change (UNFCCC). Developed country parties are also mandated under the Cancun Agreement to provide enhanced financial, technological and capacity building support to developing countries to undertake and report national inventory of GHGs and NAMAs.

It is against this backdrop that the UNDP in collaboration with the Environmental Protection Agency of Liberia (EPA) conducted this study to identify the capacity barriers, gaps and needs for the successful development of LEDS, NAMAS and MRV activities for mitigation.

1.3. Methodology Used

Early in the study, the assessment team agreed with the government coordinating authority, the EPA the approach, design, methods and strategy required to successfully complete the exercise. The capacity gap assessment was a transparent, participatory process involving all the relevant stakeholders within other government and partner organizations.

During the capacity/gap assessment exercise, the consultants applied the following approaches for data collection and analysis:

- Desk review of relevant documents (previous assessment reports and other related documents);
- Regular briefing and debriefing sessions with UNDP Energy and Environment Unit and the EPA;
- Interviews with the National GHG Inventory Team, data specialists, policy makers and other stakeholders; and
- Consultation meetings with relevant Government Ministries and Agencies.

2. ANALYSIS OF PAST AND ONGOING INITIATIVES

2.1. Stock Taking of Past and Ongoing Initiatives

Liberia has made a long-term commitment to reducing its GHG emissions and building national capacity for adapting to low emissions development pathways. It is a party to the Convention on Biological Diversity (UNCBD), the Vienna Convention for the Protection of the Ozone Layer and its Protocol and the Montreal Protocol on Substances that Deplete the Ozone Layer. It also demonstrated its commitment to averting global warming with the ratification of the UNFCCC and the Kyoto Protocol in 2002.

To implement its international commitments, the government in 2002 also established the EPA as the focal agency with oversight responsibility for the implementation of all multilateral environmental agreements that it had acceded to. The EPA is therefore responsible for coordination in the preparation of the national GHG inventories and the production of the country's National Communication. Liberia's Initial National Communication (INC) whose development first started in 2005 was validated in 2012. The INC sets out among other things the initiatives that will be pursued to meet mitigation targets. The various policies discussed below are initiatives that have the potential to restrain Liberia's GHG emissions in the immediate and long-term.

PART I: LOW EMISSIONS DEVELOPMENT STRATEGY

2.2. Initial National Communication (INC)

National Communications are used by all Parties to the UNFCCC to report on the steps they are taking or envisage taking to implement the UNFCCC (Articles 4.1 and 12). In accordance with the principle of "common but differentiated responsibilities" enshrined in the UNFCCC, the required contents of these national communications and the timetable for their submission are different for Annex I and non-Annex I Parties. For a non-Annex I Party like Liberia, the requirement is in the form of a submission of initial communication within three years of the entry into force of the Convention or ratification for that Party, subject to the availability of financial resources (except for the LDCs, who may do so at their discretion). Consequently, whenever Liberia submits its INC, it is within the provision of the UNFCCC. Liberia's INC covers four sectors of the economy: energy, LULUCF, agriculture and waste sectors. These are the recommended sectors for national reporting in the IPCC Guidelines, 2006.

As stated earlier, the energy and agricultural sectors accounts for the significant majority of the emissions in the country, 99.4 percent to be precise, with the land use and forestry sectors accounting for the removals that make Liberia a net sink. This would suggest a low emissions development strategy that would require efforts to consolidate and build on the gains in the LULUCF sectors and opportunities for NAMAs in the energy and agricutural sectors.

For the LULUCF sector, the mitigation assessment projects that with stricter implementation of forest regulations, due deligence in concession allocation, and improved farming methods, forest loss caused by the following activities: logging, farming, hunting, settlement, mining, fuel production, plantation and road building will be minimised. Other mitigation measures to consolidate and build on the gains in the forestry sector include sustainable forest management, carbon sink enhancement and biomass restocking using natural regeneration or reforestation techniques.

Mitigation targets for the energy sector as set out in the INC include the National Energy Policy's (NEP) GHG emission reduction target for the sector of 10% by 2030, improvement in energy efficiency by 20%, the raising of the share of renewable energy to 30% of electricity production, 10% of overall energy consumption, and increasing the share of bio-fuels in transport sector to 5%, all by 2030.

For the waste sector, three waste management systems are mentioned in the INC: solid waste disposal on land, industrial and domestic wastewater handling and incineration. Waste production for Monrovia in 2020 is projected at 321, 000 tons of solid waste per day. Suggested mitigation measures in the INC include recycling, composting, incineration and methane recovery. Presently, solid waste management does not involve any of these methods beside open disposal and incineration. Data is also not available on waste management activities in other regions of Liberia. The INC also emphasizes that both soft and hard technologies are required for the implementation of mitigation measures. The mitigation technologies are categorised as energy and fuel efficient sources, solar, wind, improved cook stoves, mini hydro, biomass biofuel, and landfill gas recovery and composting.

Beyond what is described in the INC, a number of other mitigation studies some of which are described below could provide a basis for the development of LEDS, NAMAs and MRV systems; if these measures are implemented and with the right political commitment, they could accelerate Liberia's drive for a carbon neutral future.

2.3. The National Energy Policy (NEP)

The first major initiative that has as its goal a carbon neutral Liberia by 2050 is the NEP. It emanates from a 2006 white paper approved by the Economic Community for West African States (ECOWAS) that sets energy targets for Member States to enable them to achieve the Millennium Development Goals (MDGs). The 2050 goal is to be achieved by ensuring access to modern energy services that are affordable, sustainable and environmentally-friendly in order to foster the economic, political, and social development of Liberia. The NEP recognises that energy is an essential service that impacts all aspects of life. It also recognises that there is a direct relationship between the nation's level of development and its energy consumption patterns. Liberia's present energy production and use is dominated by the household energy sector whose main source of energy is traditional biomass. About 95 percent of all energy supply in the country is generated from biomass. Fossil fuel accounts for 4 percent and hydro and solar power account for only 1 percent (Potter, 2011)[xv]. The situation is expected to change when the GoL meets its commitment to complete the main hydroelectric dam at Mount Coffee by 2015.

The NEP sets a series of ambitious short-term goals on access to energy, sources of fuel and reduction of GHG emissions from the energy sector in order to make the 2050 objective attainable. By 2015[xvi]:

- 40% of the population living in rural and peri-urban areas and using traditional biomass for cooking should have access to improved stoves and kerosene or efficient-gas cookers in order to reduce indoor pollution;
- 30% of the urban and peri-urban population should have access to reliable modern energy services[xvii] enabling them to meet their basic needs (lighting, cooking, communication, and small production-related activities);
- 15% of the rural population should have access to reliable modern energy services to meet basic needs; and

- 25% of the schools, clinics, and community centers in rural areas should be equipped with productive energy capacity and have access to modern energy services for lighting, refrigeration, information and communication, etc.

Additonally, the NEP commits the government to taking measures to:
- Reduce GHG by 10% by 2015;
- Improve energy efficiency by 20% by 2015;
- Raise the share of renewable energy to 30% of electricity production and 10% of overall energy consumption by 2015;
- Increase the level of biofuels in transport fuel to 5% by 2015; and
- Implement a long-term strategy to make Liberia a carbon neutral country by the middle of the century.

Some initiatives have been launched to help achieve these targets. More efficient cook stoves and lightening devices are being promoted on the market but with limited patronage because of costs. Additionally, the Liberia Electricity Company (LEC) has now been placed under a 5-year management contract, designed and tendered in April 2010 by the International Finance Corporation (IFC). Manitoba Hydro International (MHI) of Canada was awarded the management contract and as of July 1, 2010 took over the LEC's operations. The European Union, Norway, USAID and the World Bank has provided approximately US$50 million for MHI to expand and improve electricity services in Monrovia over the next five years.

The scope of activities to be covered under the management contract include, among others:
- Improving the operating, commercial, and financial performance of LEC;
- Optimization of existing LEC generation and distribution assets to ensure a reliable supply of electricity to existing customers;
- Expansion of electricity coverage in Monrovia; and
- Building the capacity of LEC staff and systems (HR, financial, IT, procurement, etc.) to allow for sustainable performance after the management contract ends[xviii].

Emergency generators have also been installed to augment supply in Monrovia. These include diesel generators and HFO fired generation plants that were financed by donor partners. Although no study has been done to ascertain the amount of emissions from these sources, they are expected to provide some savings on emissions when they are decommissioned and replaced by cleaner energy.

The GoL will seek to leverage the country's biomass and water resources as sources of carbon credits for energy development. They will also promote the use of renewable energy such as solar and wind systems in power plants and all large commercial facilities such as supermarkets, hotels, restaurants, entertainment centers, hospitals, and large retail shops and stores.

Through the new dedicated Rural and Rural Energy Agency (RREA), the GoL aims to pursue the development of mini and micro hydro dams on the country's numerous rivers and streams. Hydropower resources are the most researched and analysed of the known renewable energy sources in Liberia. Table 1 gives the hydropower potential of Liberia's six major rivers.

Table 1: Liberia's Hydropower Potential[xix]

Potential Site /Project	Capacity (MW)
St Paul River	1,200
Lofa –Mano Diversion	518
St. John River	225
Cavalla River (jointly with Cote d'Ivoire)	250
Mano River (jointly with Sierra Leone)	150
Total	**2,343**

The GoL and donor community have realised the enormity of this target and have made commitments to scale up investments in the sector.

According to the NEP all these various activities will be carried out under an institutional framework that would have the Ministry of Lands, Mines and Energy (MLME) as the lead agency that defines and reviews state energy policy. The Energy Regulatory Board (ERB) will monitor policy implementation by all operators, whether public or private, or local communities. The RREA will have an operational role under the oversight of the ERB and the policy direction of the MLME. The RREA's mandate will include integrating energy into rural development planning, promoting renewable energy technologies and facilitating the delivery of energy products and services through rural energy service companies (RESCOs) and community initiatives. It also includes facilitating the funding of rural energy projects that involves managing a Rural Energy Fund (REFUND) that will provide low interest loans, loan guarantees, and grants as targeted subsidies to ensure access by the poor. The RREA as discussed in Section 2.5 is fully functional and has already begun to pursue its mandate.

Table 2: Synthesis of donor interventions in the Electricity Sector[xx]

Name	Project Description	Sub-sector	Units	Capacity	Location	Cost (US$m)	Financiers	Status
Liberia Electricity System Enhancement project (LESEP)	Expansion of Monrovia's distribution network; Rehabilitation of HFO storage/offloading facilities; Generation overhaul; Capacity building of LEC	Distribution Generation	Urban households	33'000	Monrovia	48	NORAD, GPOBA, IDA	On-going
Liberia Electricity System Enhancement project (LESEP)	Establishment of Rural and Renewable Energy Agency. Provision of micro-hydro, solar energy to off-grid users	Rural Electrification	Rural households	9'000	Lofa, Bong	3	AFREA TF	On-going
Catalyzing New Renewable Energy in Rural Liberia	Establishing RREA; Pilot microhydro & Lighting Lives in Liberia (LLL)					3.4	WB	
Scale-up LLL			Lights	100 000		1.45	WB	
Rural Energy Master Plan and SSMP	Development of Liberia's rural energy master plan; Pilot rural SSMP	Rural Electrification	Rural households	4'000	Lofa	2	EU	Funding secured
Monrovia Electricity Grid Rehabilitation	Grid Rehabilitation	Transmission & Distri-bution			Greater Monrovia	25	EU	Ongoing – final acceptance Nov. 2012

Renewable Energy for Health Care Facilities	Providing Photovoltaic Power to the 205 public Health Facilities who do not have any	Electrification	Health Facilities	205	All of Liberia	2	EU	Started 2011; ongoing
Cross Border Rural Electrification	Cross Border Rural Communities Electrification project (Côte d'Ivoire - Liberia)	Rural Electrification	Population	130'000 (25'000 households)	Nimba, Grand Gedeh and Maryland counties	11.7	WAPP (50%) EU (50%)	Funding secured
Buchanan Renewable Energy	Biomass energy plant using rubber wood chips	Generation	MW	31 - 35	Kakata	170	BR, OPIC, Mr.McBain	Planned
The Liberia Energy Sector Support Program (LESSP)	Four pilots to create micro-grids in rural areas based on biomass and hydro sources	Rural Electrification	Rural households		Lofa, Bong, Nimba	6	USAID	Funding secured
Diesel Generators	Additional generators for Monrovia	Generation	MW	3	Bushrod (Monrovia)	2	NORAD	Complete
Diesel Generators	Additional generators for Monrovia	Generation	MW	10	Bushrod (Monrovia)	6	USAID	Complete
HFO-fired generation plant	Additional generators for Monrovia	Generation	MW	10 - 20	Bushrod (Monrovia)	15-30	JICA	Planned
WAPP CLSG	Cote d'Ivoire, Liberia, Sierra Leone, Guinea (CLSG) Weat Africa Power Pool (WAPP) interconnection and sub-stations	Transmission	Kms MW	510 100 Through interconnection	Yekepa Buchanan Mt. Coffee Monrovia-Foya	494	EIB, EU, IDA, KfW	Funding secured
Mt. Coffee HEP	Rehabilitation of pre-war hydro-electric plant of Mount Coffee	Generation	MW	64	St John River	162	Norway, KfW, EIB, (AfDB,	Funding Pledges

							WB)	received
Foya River HEP	New hydro-electric plant	Generation	MW	50	Foya River (border Liberia/ Sierra Leone)	143		Funding unsecured
St. Paul River HEP1B and 2	New hydro-electric plants	Generation	MW	198	St. Paul River	879		Funding unsecured
Energising Development (EnDev)	Development of a market for pico PV products; support to installation of a pilot minigrid;	Rural Electrification	Population and Social Institutions	5,500 (people)	Monrovia, Foya, Lofa	0,586	BMZ, DGIS, NORAD, DFID, AUSAID	Pilot Phase

2.4. Renewable Energy and Energy Efficiency Policy and Action Plan of Liberia

In 2006 the GoL with funding from the Renewable Energy and Energy Efficient Partnership (REEEP) contracted the Center for Sustainable Energy Technology (CSET) to prepare a Renewable Energy and Energy Efficiency Policy and Action Plan for Liberia. The purpose of the Policy is to increase national awareness on renewables and energy efficiency and remove barriers to investment and market development through a national policy instrument.

The principal goals of the renewable energy and energy efficiency policy is to support the development process in Liberia by exploiting renewable energy resources to attract investment, develop the market, transfer technology and build local capacity in the renewable energy sub-sector. Another objective is to include renewable energy services into the overall national economic and social development agenda, poverty reduction strategies and MDG campaigns.

The Government of Liberia aims to achieve the following objectives to concretise the renewable energy and energy efficiency policy:

- Make renewable energy services accessible; this implies that the infrastructure for the supply of renewable energy would be extensive to the extent that the electricity produced from it can be easily procured by any person or institution when needed;
- Make renewable energy services reliable so they can meet all demands at any particular time in the future;
- Make renewable energy services affordable with the view to improving the living conditions of the population, especially the poor;
- Ensure that renewable energy is produced and supplied in an acceptable form so that its production, supply and use have no adverse health and environmental impact;
- Ensure that renewable energy is used in the most efficient manner.

Before 2006, Liberia did not have a renewable energy policy, although most of the energy supply to Monrovia and surrounding counties were from renewable sources, the Mount Coffee Hydropower Plant which supplied electricity to more than half of Liberia 3 million populations at the time, had a pre-war capacity of 64 MW. Back then, power was accessible and reliable, although electricity use was largely inefficient and payments for electricity services were marred by corruption and lack of transparency.

The above stated objectives are totally achievable provided some of these ghosts of the past are permanently laid to rest. So far, from what obtains in the part of the country currently enjoying grid electricity, rent collection is efficient, but the LEC is still grippling with challenges of illegal connections. These are problems caused by low generation and access, when these services are improved as per the GoL deadline of 2015, energy should be accessible and cheaper. Currently also electricity supplied to some poorer communities are being paid for by the donor community, this is in a bid to meet objective three of the Policy "Make renewable energy services affordable with the view to improving the living conditions of the population, especially the poor".

2.5. Rural and Renewable Energy Agency (RREA)

The RREA was established by an executive instrument to serve as the legal and regulatory body for the renewable energy sub-sector[xxi]. The primary function of RREA is to promote the commercial development and supply of modern energy services to rural areas with an emphasis on utilizing locally available renewable sources of energy.

The RREA's mandate includes:

- Integrating energy into rural development planning;
- Promotion of renewable energy technologies;
- Facilitating delivery of energy products and services through rural energy service companies (RESCOs) and community initiatives; and
- Facilitating the funding of rural energy projects including managing the REFUND.

The REFUND aims to provide for the coordinated and sustainable financing of projects and programs for the delivery of modern energy services for rural development. REFUND is intended to become the vehicle through which all domestic and international financial resources intended for rural energy delivery in Liberia shall be managed. REFUND's main distinction from other funds is the focus on economic viability, including environmental and social benefits[xxii].

The REFUND will mobilize funding for rural and renewable energy services from the following sources:

- **Domestic** – Energy taxes, levies, and fees; general taxes; user fees and capital contributions; voluntary corporate social responsibility contributions.
- **International** – Traditional bilateral and multilateral loans and grants; carbon finance.

2.6. Draft National Petroleum Policy (NPP)

In August 2012, consultations on a draft petroleum policy paper for Liberia were officially launched at the Monrovia City Hall. Like a white paper which gives information and details of future planned laws, the draft Liberian petroleum policy paper contains information, on nine thematic areas including resource ownership, maritime boundary, state participation, transparency and accountability, as well as safety, health and environmental concerns[xxiii]. It is hoped that intensive public consultation would secure constructive suggestions as to how to run this industry in the future and eventually public buy-in and support.

The take-off of Liberia's oil and gas industry is also expected to offer oportunities for NAMAs. While the exact quantities of oil and gas reserves onshore and offshore are still unknown (or not purblished), the extraction of oil could under the present regulatory environment result in an increase in emissions of GHGs mostly through the flaring of gas. These issues are addressed in the health and environmental sections of the NPP. There are specific mentions of the need for exploration to be done in ways that would avoid significant future emission increases from petroluem exploration, refinery and related industries. The potential capturing of the gas that would be flared in the process is also mentioned in the NPP.

To address emission reduction in the sector, the draft policy mandates the government to ensure that petroleum operations are performed in strict compliance with local and international environmental laws and conventions signed and ratified by the State[xxiv]. This would obviously include the UNFCCC to which Liberia is a party to. The NPP 2012 goes further to state that the policy '….. promotes gas utilization rather than wastage and supports prohibiting the venting of gas and discourages flaring'[xxv]. To further strengthen its commitment in the policy on emission of gases, the government pledges that 'The policy shall promote the application of best international practices for prevention and rapid emergency response mechanisms designed to mitigate air and water pollution.' At the time of this report, the draft National Petroleum Policy was being put out for a nationwide consultation by the Hydrocarbon Technical Committee[xxvi] (HTC). By the time the policy is endorsed by the cabinet, the

country will be among the few emerging African oil and gas countries to have passed this kind of legislation that prohibites the flaring and venting of gas. The latest draft of Liberia's Petroleum Policy Paper has been described as marking a significant step forward for the development of a new framework to manage the country's oil by some non-governmental observers[xxvii].

2.7. Sustainable Energy for All (SE4ALL)

The Sustainable Energy for All (SE4ALL) is a new initiative of the Secretary-General of the United Nations to mobilize action from all sectors of society, including business, government, investors, community groups and academia to forge common ground in support of three interlinked objectives:

- Ensuring universal access to modern energy services;
- Doubling the rate of improvement in energy efficiency; and
- Doubling the share of renewable energy in the global energy mix.

Liberia has been chosen as a SE4ALL nation. UNDP Liberia in collaboration with a number of donor countries and multilateral agencies has been supporting a number of activities designed to help Liberia meet the goals of SE4All. Donor countries and agencies supporting SE4All including the European Commission (EC), UNDP and Norway organised a mission to Liberia and jointly held discussions with the GoL on the initiaive and progress with the reforms necessary to significantly scale up investment in the energy sector. The mission also helped to mobilise local stakeholders and conduct a preliminary needs assessment. Next steps involve a Rapid Assessment and Gap Analysis followed by a plan of action that would be conducted at the national level[xxviii].

2.8. National Transport Policy Strategy (NTPS)

The National Transport Policy Strategy, the first of its kind for the sector in Liberia, is an integral part of Liberia's plans to reduce its emissions from the transport sector. It was endorsed by Cabinet in 2009 and launched in 2010. The NTPS is aimed at providing comprehensive policy guidance and direction for sustained national transport system[xxix]. It has at its core the goal of providing efficient transport services. The long-term strategy for the transport sector envisages the creation of a modern railway and water transport system, as part of the plan to reduce emissions from the sector. This would require significant investment, which the government is currently unable to afford. Over the immediate to mid-term, the strategy provides for other measures like requiring all vehicles to have catalytic converters to reduce pollution to be implemented. Its implementation mechanism has also been subsequently developed.

2.9. Economic Analysis of Low Carbon Economy for Liberia

An economic analysis[xxx] of the potential merits of a 25-year low carbon economy for Liberia was done in 2009. This study is regarded as giving an indication of the GoL's intention to consider low emissions development for the future. This document made some recommendations for policy initiatives in three sectors of the Liberian economy whose implementation could yield emission reductions and revenue. The study took into account the costs of implementing a low carbon economy, the amount and potential value of the carbon credits to be generated from the strategy, and the potential revenues from those credits. The primary focus of the study was on how to avoid deforestation and forest degradation and reduce emissions from the energy sector. Table 3 below shows key results, including potential carbon revenues, if specific policies are implemented:

Table 3: Key Results by Policy, including Potential Carbon Revenues

POLICY	Average CO2 Saved per year (million tons)	Cost of Carbon Saved ($/tCO2)	$5/ton: Carbon revenues per year ($M)	$5/ton: Net benefit/ Cost per year ($M)
100,000 ha of plantations are located on degraded land rather than forest areas	2.1	Very low	10.6	10.6
Fertilizer subsidies to increase efficiency of shifting cultivation	1.8	<2	8.8	7.1
Lowland rice promoted in place of shifting cultivation	1.6	<2	8.2	6.3
Conservation agriculture promoted in place of shifting cultivation	1.7	<2	8.6	6.1
Accelerated creation of Protected Area Network	0.2 (0.8 for 5 years, then 0)	<2	0.8	0.5
Increased efficiency of charcoal production & use	1.1	2.67-3.20	5.7	2.1
No further Timber Sales Contracts (TSC)	3.2	3.75	16.0	4.0
Sub-total for potential low-carbon development strategy	11.7		58.7	36.7
Restrict FMCs (Forest Management Contract) to 1.6 million ha	1.8	7.25-13.5	9.20	-4.1 to -15.6
No new FMCs	3.2	7.25-13.5	15.8	-7.1 to -26.9
Community forest areas are managed as Carbon concessions	0.7	7.25-13.5	3.3	-1.5 to -5.6
Sub-total for additional quantified strategiesxxxi	4.0		19.1	-8.6 to -32.5
Two year moratorium on new concessions	Only temporary gains	n/a	n/a	n/a
Revoke existing forestry concessions that fail to meet with terms of contract replace with carbon concession	Unknown	n/a	n/a	n/a
Improved efficiency of pitsawing	3.0	n/a	15.0	n/a

Source: Lawrence, K. et.al (2009)

The study stressed that if Liberia opts for a more carbon efficient economy by implementing the above policy measures, the resulting socio-economic and environmental benefits will be far greater than under the business-as-usual scenario. For example, for forestry sector alone, it is projected that a 25-year low-carbon development strategy could yield carbon revenues of over $55 million per year, at a

price of $5 per ton of CO_2. This amount is in excess of the annual revenue from commercial logging. Additionally, revenues could increase to three times this amount if the price of carbon rises.

A more carbon efficient Liberian economy would also imply a more efficient, higher-yielding agricultural sector and increased protection of natural and cultural heritage within protected areas. If these can be achieved by adopting a LEDS that reforms the forestry and agriculture sectors, then the cascading effect of a combined strategy that also includes the transport, waste and energy sectors could be far-reaching. Below is more detailed discussion of each of the sector analysed in the report.

- **Agriculture Sector Policy**

The Economic Analysis study, proposed a robust reform of the national agricultural policy to induce a shift to a more efficient agricultural system by replacing shifting cultivation (dominant mode of farming) with conservation agriculture, irrigated lowland rice cultivation or the subsidizing of fertilizer inputs. The principal effect of this would be a reduction in the amount of forest loss caused by slash-and-burn practices and the consequent increase in the carbon sinks. In addition, the study stressed the importance of a policy that ensures that tree crop plantations[xxxii] are located on degraded lands rather than on forested lands.

- **Forestry Sector Policy**

The study proposed a number of recommendations on how to reduce emissions from forestry at low cost. It proposed a policy to reduce the amount of Timber Sales Contracts (TSCs)[xxxiii] , to prevent forest lands from permanent conversion to other land-uses. Additionally recommendations were made to accelerate the establishment of protected forest area network as this would support legislation already in place to create 1.5 million hectares of protected areas[xxxiv]. Improving pitsawing regulations and practices was another proposed policy option for this sector.

- **Energy Sector Policy**

A policy to introduce energy efficient stoves for charcoal and fuelwood was recommended as a means to reduce pressure on forests and increase the efficiency of charcoal production & use.

2.10. Assessment of Investment and Financial Flows to Mitigate Climate Change in the Energy and Forestry Sector in Liberia (I&FF)

The overall objective of the I&FF study was to assess the amount of investment and financial flows that Liberia would need to address climate change in three key sectors of the Liberian economy. The study looked at mitigation actions in the energy and forestry sectors and adaptation measures in agriculture. The cost of financing such actions, the sources and the levels of financial contributions needed to achieve the objectives from now until 2030 were also assessed[xxxv]. The base year of the assessment for all sectors is 2005 and the assessment period extends to 2030, which makes for a period of 25 years.

According to the national assessment completed in August 2011, through to 2030 more than US$ 2.89 billion is needed to implement priority actions in:

- Reducing emissions of GHG in the forestry and energy sectors; and
- Adapting to the impacts of climate change in the agriculture sector.

Nearly 50 percent of these funds (US$ 1.41 billion) are needed to secure the agriculture sector against the effects of climate change. Proposed measures include improving soil fertility; protecting plants; and developing livestock species that are more resistant to climate change. A further US$ 1.29 billion

(45%) is required for the energy sector to improve the efficiency in energy production and use; and to provide access to renewable energies, particularly as alternatives to firewood. Lastly, about US$ 0.19 billion is needed in the forestry sector for the sequestration (or storage) of carbon through enhanced forest cover, enrichment of degraded forests, and afforestation and reforestation actions.

- **Forestry Sector**

For mitigation in the forestry sector from 2005 to 2030, the I&FF study analysed four measures that could be implemented to reduce emissions and expand Liberia's forest sinks. These were sustainable forest management, enrichment of degraded forest, restoration of existing plantations, and afforestation and reforestation actions. The study calculated the cost per hectare of each mitigation measure and estimated the total amount needed to reduce emissions of GHG in the forestry sector. For sequestration of carbon by the enhancement forest cover through afforestation and reforestation a cost of USD$150.00 per hectare was projected. Enrichment of degraded forest was expected to cost USD$100.00 per hectare. Restoration of existing plantation was also projected to cost USD$250.00 per hectare while sustainable forest management (3C) was expected to cost USD$2.50 per hectare. In deriving the cost for operation and maintenance (O&M) a rate of 25% of the amount for the I&FF was applied. This is the standard rate applied across projects in the country. Based on this, it was calculated tha a total of US$ 0.19 billion will be needed to reduce emissions of GHG in the forestry sector.

Investment in these activities is expected to come from the government, the private sector and households. The study envisaged 45 percent of the investment coming from the government with the private sector accounting for 35 percent. Households were expected to provide the remaining 20% of the new investment. With the increasing recognition of the rights of local communities to own forest resources and the prominence given to community rights in the Forest Reform Law of 2006, it is expected that the proportion of investment that will be attributed to household will rise very significantly. Households are already quite significantly involved in forest activities. But these are often not fully captured in the statistical data. This could account for the low figures being projected.

- **Energy Sector**

Table 4 captures measures to be taken in a mitigation scenario for both the supply and demand side for energy use. The mitigation scenario incorporates measures to mitigate GHG emissions.

Table 4: Mitigation Scenario in the Energy Sector

Category of Mitigation Measure	Energy Supply Measures		Energy End-Use Measures	
	Reduce Combustion Emissions	Reduce Fugitive Emissions	Reduce Combustion Emissions	Reduce Energy Demand
Improve efficiency of energy use	Efficiency improvements in energy supply processes (eg. efficient charcoal production)		Efficiency improvements in energy end-use technologies (eg. Improved cook stoves)	Energy conservation measures (eg. Awareness/ sensitization and education campaign)

Reduce emissions per unit of energy production or use	Switch to lower carbon fuels		Switch to lower carbon fuels	
	Switch to Clean/ Renewable energy sources (eg. Combined cycle generation, Solar, hydro, & biomass power)		Switch to Clean/ Renewable energy sources (eg. Combined cycle generation, Solar, hydro, & biomass power)	
		Reduce fugitive losses (including recovery & use)		

Increasing energy efficiency is one of two major mitigation options analyzed in this assessment. Lighting, cooking, heating, cooling power, and charcoal production were prioritized as efficiency measures for this assessment. Investment in these efficiency measures is expected to amount to US$1.347 billion of which efficient lighting would account for 70% (US$946.51 million) of the total amount. This is followed by efficient cooking, heating, cooling, motive power at 29% (US$385.93 million), and 1% for improved charcoal production at US$14.61 million.

Investments in renewable energy, mainly hydro, followed by biomass plants and solar energy technologies, account for 50% (US$1.369 billion) of all investments, the largest of which were expected to occur in 2011 and 2012 at US$ 124.61 million and US$113.70 million, respectively.

It is difficult to put a main figure on total investments in energy generation from all sources because these investments are made by different donor groups but table 2 above suggest that about $86 million have been spent on various projects that are on-going and completed, plus another more that half a billion dollars in secured funding for many other projects including the West African Power Pool project.

2.11. National Forest Reform Law, 2006[xxxvi]

The National Forest Reform Law, which was passed in 2006, amended the National Forest Law 2000 by providing greater emphasis to the conservation of forests. Section 9.1 (a) of the Law requires that 30% (approx 1.3 Mha) of Liberia‘s forest estate be placed under protected area status. Currently, Liberia has just three formally designated protected areas: Sapo National Park (180,000 ha) and East Nimba Nature Reserve (13,500 ha) and the Lake Piso Multiple Use Area. There is GEF funding to assist in the creation of five new PAs covering a total of 229,000 ha, leaving a funding shortfall for the remaining 894,000 ha[xxxvii]. Session 4.4 (d) (ii) of the Law authorises the FDA to identify specific areas it intends to propose for protection. It is hoped that financing for REDDplus could provide the funding needed to finance the setting up of the remaining 894,000 hectares.

2.12. REDDplus

REDDplus (Reducing Emissions from Deforestation, Forest Degradation, and the role of Conservation, Sustainable Management of Forest and the Enhancement of Forest Carbon Stocks) is a forest mitigation option that could reduce Liberia's increasing deforestation rate, contribute to national income, improve the livelihood of forest dependent people and deliver conservation and biodiversity benefits. Liberia is currently in the readiness phase where it is building its capacity, institutions and regulatory and policy frameworks to accommodate a domestic REDDplus mechanism. The document that would guide this readiness process is known as the Readiness Preparation Proposal (R-PP). It was developed with a US$200,000 grant from the Forest Carbon Partnership Facility (FCPF) and significant co-financing from Flora and Fauna International, Conservation International, Liberia and UNDP, Liberia. All this was after a Project Idea Note (R-PIN) had been submitted and approved by the FCPF in 2008.

In 2011 Liberia completed the R-PP and submitted it to the Participant's Committee of the World Bank for approval. The R-PP describes the current status of the forestry sector in Liberia. It reviews the trends in deforestation and the baseline emissions levels from deforestation and forest degradation. It also proposes measures to tackle the drivers of deforestation and how to implement a REDDplus strategy that will ensure the permanence of conservation measures including the provision of co-benefits. Agreement between the FCPF and the GoL has been signed and consequently Liberia is expected to receive a grant of US$3.6 m to carry out readiness activities.

In early 2012, the Government of Liberia (GoL) in consultation with the FCPF support team concluded negotiations on the implementation arrangements for REDDplus in Liberia. The details of the agreement included the respective roles key agencies and ministries that would be involved in the readiness process would play, the scope of the R-PP activities to be financed and the identification of sources of funding for other critical activities. The support of the FCPF is limited to analytical studies, capacity building, and consultation processes. It does not include financing for demonstration activities. Table 5 Below describes the strategy options that would be used to implement REDDplus.

Table 5 Summary of REDD+ Strategy Options Relevant to Mitigation

FORESTRY SECTOR	AGRIC. SECTOR	ENERGY SECTOR
Raising commercial logging standards	Transforming shifting cultivation into permanent or semi-permanent to reduce land use and forest degradation	Regulating and managing wood fuel energy
Reducing its area footprint	Ensuring that plantations and permanent agriculture development are located on degraded forest lands	Introducing more efficient kilns and cooking stoves
Regulating and managing chainsaw logging		
Integrating Conservation and Protected areas into REDDplus and acceleration of the timeline		

Source: Liberia R-PP (2011)

The REDD+ strategy options outlined in Table 5 above form a significant part of the R-PP. These strategy options will be assessed to the extent that they address environmental and social priorities. Gaps and risks identified through this assessment will inform the review of the strategy options to incorporate environmental and social considerations in their formulation[xxxviii]. An environmental and social management framework (ESMF) will be prepared to address environmental and social risks of specific actions, projects and policies to implement the revised REDD+ strategy options. Once revised, the REDD+ strategy options will represent potential options for NAMAs that could support a low carbon development strategy.

The system to Monitor, Report and Verify (MRV) the emission reductions and removals will be overseen by the National Climate Change Steering Committee (NCCSC). The NCCSC is an inter-ministerial and multi-institutional Committee that is composed of the Ministers of Lands, Mines and Energy, Agriculture, Planning and Economic Affairs, and Finance. It has been created with a membership of the highest-ranking policy-makers in those sectors to ensure a coherent and consistent national REDD+ strategy. The NCCSC will work with the relevant technical working groups, which would include a proposed Forest Monitoring Unit (FMU) to run the MRV system.

2.13. CAADP and FAPS

Liberia's adoption of the Comprehensive African Agriculture Development Program (CAADP) in 2003 has created a number of obligations relating to mitigation and adaptation in agriculture. CAADP is an integrated, continent-wide framework that seeks to restore agricultural growth, facilitate rural development, and ensure food and nutrition security in Africa. The target of the framework is a 6% per annum agriculture sector growth for all parties. In order to meet this target, Liberia is required to commit at least 10% of its annual national budget to agriculture.

The Liberia Agriculture Sector Investment Program (LASIP) report was prepared in partial fulfillment of the requirements for the CAADP. The LASIP report[xxxix] recognizes environmental and climate related issues as cross-cutting. To respond to these issues, the investment plans of LASIP propose the following key measures to help mitigate climate change and its adverse effects:

- Support and promotion of actions for the establishment of forests for the protection of watersheds and wetlands, combating of desertification and conservation of biological diversity to contribute to the stabilization of global climate;
- Implementation of programs to manage soil and water resources and for conservation farming (climate-smart agriculture);
- Promotion of proven best practices, policies and measures that encourage forest protection, sustainable farming and sustainable energy utilization;
- Support climate change-related research, education and training.

Some of the above measures are already being proposed in other initiatives and in some cases are already being implemented. The measures that aim at the protection and better stewardship of forests and forestry resources for instance are also part of the activities and goals of Forest Reform Law and REDDplus. The LASIP report underscores the importance of the baseline assessment of the likely impacts of climate change impacts on current and proposed activities to be undertaken as a prerequisite to any new development. This is to ensure that climate change considerations are incorporated into all agricultural activities with the purpose of identifying and mitigating the negative impacts of climate change. Like the LASIP, the Food and Agriculture Policy and Strategy (FAPS)[xl] regards Liberia as being highly vulnerable to the impacts of climate change due to its limited adaptive capacity and wide-spread poverty. To respond to the impacts posed by climate change, the FAPS

suggests that mechanisms be put in place to monitor the sector to ensure that agricultural activities neither contribute to negative impacts nor undermine efforts directed at poverty alleviation, food security and environmental protection.

2.14. National Integrated Water Resources Management Policy[xli]

The adequate supply of water for consumption, domestic and industrial use is a critical objective for the GoL. Beyond this, the water sector is also important for the generation of hydropower for the provision of energy in Liberia. As already pointed out, the renewable energy potential within Liberia's six major rivers is a key component of the NEP's renewable energy target and the goal to make Liberia carbon neutral by 2050. Before 2007 there was no comprehensive legal framework governing water resources in Liberia. Neither was there an effective Integrated Water Resources Management Policy guiding water resources development, use, protection and conservation either. Since then, a number of laws and policies have been introduced to change this. There is the Public Health Law of the code of 1956 which was revised in 1975 into Title 33, the Act Establishing the New Public Health Law of Liberia Chapter 24, which contained Liberia's first Water Pollution Control laws. The key objective of Chapter 24 is to protect the water resources of Liberia[xlii]. In terms of policies on water there is the National Integrated Water Resources Management Policy (2009), National Water Supply and Sanitation Policy (2009), Guidelines for Water and Sanitation Services in Liberia (2010) and the Sector Strategic Plan (2011).

The National Integrated Water Resources Management Policy adopts a new and integrated approach to managing water resources in ways that would promote sustainability. The water policy covers two broad areas:

- Water Resources Management: A management framework that includes policy objectives, principles and strategies for monitoring, assessment, allocation and protection of the water resource.
- Water Resources Use: This includes the policy objectives, principles and strategies for the development and use of water for ordinary users (domestic water supply), food security (agriculture), industry, maintenance of productive ecosystem and other uses including hydropower[xliii].

The fundamental component of the Integrated Water Resources Management process is the establishment of a comprehensive water policy, to reform and develop institutions and to put integrated water resources management into practice.

Goals of the Integrated Water Resource Management Policy:

- Proper land use planning and management
- Decentralization of economic incentives
- Efficient and proper disposal of wastes
- Establishment of a single body responsible for water
- Development and enhancement of human resources
- Development of international river basin managements

Objectives:

The policy is intended to guide Liberia towards the following:

- Ensuring the efficient means of domestic water supply in Liberia

- Integrated and sustainable development and management of water resources for all sectors to guarantee socio-economic growth
- The protection of all water resources (e.g. Wetlands)
- Sustainable allocation of water resources and but not limited to
- Prevention of natural disasters and the effects of Climate Change

In the roadmap of action to implement the Water, Sanitation and Hygiene (WASH) Compact[xliv] matrix, the session under environmental concerns lists the following action points:

- National Environment Policy - All WASH activities are in line with the policy, and environmentally sustainable – ensure consultation with environmental expertise.
- The Environmental Impact of all projects to be considered at planning stages
- National Adaptation Plan for Climate Change (NAPA) – adaptation and resilience criteria (eg technology choices) developed
- Monitoring of environmental data such as water levels, rainfall, river flow, water quality

The monitoring, assessment and research activities within the policy are important for understanding the occurrence and availability of water resources and the impact on the resource caused by either natural phenomena or human activities. The meteorology section within the Liberian Hydrological Service Bureau of the Ministry of Lands, Mines and Energy is currently playing this role of monitoring, verifying and reporting accurate data on water bodies and their status. Capacities are also being built to prevent natural disasters and the effects of climate change.

PART II: NATIONALLY APPROPRIATE MITIGATION ACTION (NAMA)

Liberia has already undertaken a number of projects that could qualify as NAMAs, some of which are discussed below. Most of these have other non-carbon co-benefits.

2.15. Energy Generation Projects

Whein Town Landfill Recovery Project

The Whein Town Landfill Recovery Project is a landfill gas-flaring project that is being financed by the World Bank. It is expected to generate approximately 936,353 tCO2 equivalent emission reductions over the 10-year period. When completed, it would also make significant environmental, social and economic contributions to Liberia's sustainable development efforts.

Alternative Energy Projects

The RREA has received US$2 million to implement two rural energy projects- the Yandohun microhydro project in Lofa and the solar project in Gbarnga, Bong County. The project aims to reconstruct and increase the capacity of the micro-hydroelectricity facility from its pre-war capacity of 35kW to a 60 kW. It is expected to deliver power to about 200 homes.

There is also the Solar Project which is based on the World Bank's Sustainable Solar Market Packages (SSMP) approach and is expected to provide solar lanterns and solar home systems to homes and businesses in Gbarnga and surrounding towns.

2.16. Energy Saving and Efficiency Projects

Lighting One Million Lives

The Lighting One Million Lives in Liberia project aims to reduce GHG emissions from the energy sector through the distribution of high quality solar energy efficient lanterns in exchange for kerosene lanterns. The project which is part of the Lighting Africa Program also seeks to support the capacity strengthening of RREA and the private sector to scale up access to modern lighting, targeting 200,000 rural households on a commercial basis. The cost of the project is US$ 4 million.

2.17. Forestry and Land-Use Projects

Eco-Stove Project

A number of projects to promote the production and use of eco-stoves are being undertaken across Liberia. Not only are they meant to increase energy savings and efficiency but they are also supposed to help reduce the amount of fuelwood or charcoal that is consumed. This is because the eco-stove uses up to 50% less fuel and thereby reduces users' expenditure on fuel. It also decreases cooking time and emits fewer pollutants than other types of stoves[xlv]. In partnership with the Ministry of Gender and Development, UNDP supported the training of 31 rural women and youth (26 women and 5 men) in Tubmanburg, Bomi County, in the production of low-cost and energy efficient stoves, providing them with skills and means to earn an income. This was done at a cost of USD$4, 000. Tubmanburg was chosen because its residents complained of having to trek long distances and hilly terrains to fetch fuelwood. The UNDP later contributed to the scaling up of this project through the Center for Disaster Risk and Environment Advocacy, Management and Research (CDREAM), contributing about USD$20,000 to the production of and training in the production of ecostoves.

The UNDP has also supported an eco-stove project with the Ivorian refugees in Nimba County as part of the initiatives to reduce deforestation in the refugee camp. According to the Project Manager of the Energy and Environment Program at UNDP Liberia in a conversation held at his office in Monrovia, a

total of $109,000 was spent on eco-stoves production and distribution, establishment of tree nursery and reforestation activities. He however lamented that due to over crowdedness of the camp; many of the young samplings were harvested.

UNDP/GEF (Global Environmental Facility)/ Small Grant Program (SGP) also supported ecostove production and distribution by a local community-based organization (CBO) in Paynesville, Monrovia at a cost of about $50,000. The Society for the Conservation of Nature Liberia was also supported by the SGP to carry out an ecostove project in Cape Mount County. An amount of $ 30,000 U.S. dollars was spent on this project. Substantial savings on wood and trees are expected from these projects. But the study to ascertain the amount of wood or carbon saved is beyond the scope of these projects.

A related project was recently launched by the Ministry of Internal Affairs (MIA), the Community Energy Efficient Stove Project (CEESP) in Monrovia to promote the use of environmentally friendly stoves by residents in the capital city. The launching took place under the theme, "Making Our Environment Better". This project comes in the wake of recent storm disasters across the country, a consequence of the removal of forest cover from deforestation activities by local dwellers for firewood and charcoal. It is a pilot project being undertaken by the Center for Disaster Risk and Environment Advocacy, Management and Research (CDREAM) in response to calls for environmental safety and reduction of threats posed by community actions against Liberia's forestland.

Community Wood Lots Projects

The UNDP/GEF/SGP supported community woodlots pilot project is aimed at providing a sustainable supply of fuel wood to reduce the pressures on the mangroves within the Lake Piso Basin Areas in Grand Cape Mount County. The pilot project, which has both adaptation and mitigation components, seeks to develop the capacities of local communities in eliminating the impacts of land degradation in the Lake Piso Water Basin areas, reduce the level of forest degradation in Cape Mount and its environs and contribute to enhancement of carbon sinks.

Low-Land Rice Cultivation Projects

Efforts are being made by the Ministry of Agriculture to encourage farmers and local communities to cultivate rice in the low lands as opposed to the uplands. A number of intiatives by different organizations including the FAO and CARE international are also being implemented to support this initiative. Aside from being labor intensive and low yielding, upland farming also contributes to deforestation and loss of biodiversity as it opens up the forest for conversion because of the use of shifting cultivation methods. Lowland farming on the other hand has mitigation benefits particularly through avoided deforestation and a higher yield over a shorter period with less input. If the cultivation method of zero tillage in swamplands is used, it would mean less GHG emissions.

There is also the Agricultural Sector Rehabilitation Project of the African Development Bank Group which aims to rehabilitate 3,200 farms in four South-Eastern Counties. The project's indicative target and timeframe is to complete the rehabilitation of 820 ha of irrigated low-land rice farms by 2014 and 1620 ha by 2015, of which at least 40% should be farms managed by households headed by women. The mitigation and productivity potential of cultivating rice in the vast lowland swamps cannot be overemphasied. Beyond high yields in rice cultivation which is Liberia's staple food, low-land cultivation can also minimize slash and burn and lead to a reduction in deforestation and its consequent effects. According to Lawrence et al (2009)[xlvi], sixty-three percent of households currently grow rice on the uplands through shifting cultivation. It is conservatively estimated that irrigated lowland sites can boost yields by between 50 - 300% without fallow. If, for example, an area of 30,000

ha of irrigated lowland farming were to be developed over 25 years, this would free up 150,000 ha of land for forest regrowth, with savings of 41.0Mt CO_2 (Lawrence et al, 2009).

PART III: MEASURING, REPORTING AND VERIFICATION (MRVs)

2.18. Development of a Measuring Reporting and Verification (MRV) System

A National Inventory System (NIS) is made up of the procedural, legal and institutional arrangements necessary to ensure the timely, and accurate monitoring, reporting and verification of emissions and removals of GHG[xlvii]. The establishment of a robust NIS is essential in ensuring that a country meets its obligation to the UNFCCC and the Kyoto Protocol. The NIS also prepares inventory reports and ensures that proper documentation and archiving are done in order to facilitate third-party review. Liberia does not yet have a fully functional NIS. At the time of the preparation of the INC, ad-hoc arrangements had to be made between agencies to collect and analyse activity data that could be used for the INC. Currently efforts are being made to have the NIS fully operational for the preparation of the second National Communication (NC). The lead coordinator for the NC is leading the effort to get MOUs signed between the agencies whose involvement will be critical for the proper functioning of the NIS. These agencies include the EPA and the Liberian Institute for Statistics and Geo-Information Services (LISGIS), the Forestry Development Authority, the Ministry of Agriculture and the Monrovia City Corporation (MCC).

There are a number of benefits of developing a standard MRV system. These include:

- The strengthening of the institutional, legal and regulatory framework for better implementation;
- Easier identification of needs for capacity and technology transfer;
- Improvement of the quality of national statistical systems; and
- Assistance in the development of bankable climate change projects

There already exist in Liberia a good basis for the development of a standard MRV system. There is the PRS monitoring unit within the Ministry of Finance and Economic Planning, which is responsible for the monitoring of development impacts. There is also the EPA's Environmental Social Impact Assessment (ESIA) Unit that monitors social and environmental safeguards. The FDA, the Ministry of Agriculture, LISGIS, the Ministry of Lands, Mines and Energy, Land Commission and the Private Sector all have units that are performing functions that would be useful for running an MRV system. Existing systems that have attained some level of success in MRV include the chain of custody system for tracking logs from their point of origin to any location along the value chain. This system is currently being run on a contractual basis by a subsidery of Societe Generale de Surveillance (SGS), SGS LiberFor. This arrangement is until the FDA is fully capacitated to absolve the function but for now the FDA itself has a chain of custody department that works closely with SGS LiberFor[xlviii].

There are also GIS and remote sensing laboratories at the FDA, EPA, MoA and LISGIS that could be fully capacitated to perform MRV functions. With the adequate training of the staff, these agencies can perform MRV functions that include monitoring, reporting and verifying of emission fluxes by sector, REDDplus and NAMAs in general. But the most successful system currently is the Liberia Extractive Industry Transparency Initiative (LEITI) that covers extractive industries and now the forestry sectors. LEITI's operations involve research, verification and publication of production activities of their clients to improve transparency.

Liberia's existing forest monitoring systems may serve as a basis for building an effective REDD+ MRV program. The primary responsibility for monitoring and reporting could be assigned to the FDA[xlix] who already performs similar functions. Under the NFRL of 2006, forest license holders must report on their annual operations and the FDA must monitor to ensure that the use of forest resources is in accordance with statutory provisions. The FDA is also required to collect and maintain a forest

land-use database containing all available socio-economic, biological, and physical data on forest land in Liberia[l]. The REDDplus's MRV system in particular would need to be effective and robust given the potential for negative social and developmental impacts. This has led to requests, particularly from civil society groups, for such impacts to be monitored, reported and verified[li]. In practice, communities are responsible for ensuring transparency and reporting on community forest lands. They also have a role in monitoring commercial forest activities (NFRL §20.10). Under section 7 of Chapter 4 of the Community Rights Law, the Community Forest Management Body (CFMB) is empowered to:

- Stop and immediately inform the nearest Authority Office (FDA) about any forestry offense occurring within the community's forest area;
- Report quarterly to the Executive Committee of the Assembly on the management of community program; and
- Submit quarterly financial reports to the Executive Committee

Monitoring by community members may help the REDD+ program to achieve the principles of transparency and accountability and improve the overall benefits of the program.

3. EXPERIENCES GAINED, GAPS AND BARRIERS

3.1. Process for Stakeholder Consultation

Prior to 2009 there was no formal stakeholder coordination structure for climate change until Liberia signed up to the FCPF for the purpose of initiating the processes for REDDplus. One of the requirements of the FCPF was for participating countries to map-out and organize stakeholders who will be instrumental in the preparation and implementation of REDD+ strategies.

Preparation for REDDplus has resulted in the establishment of stakeholder consultation processes that is extensive in scope. The Consultation & Participation (C&P) Taskforce formed in collaboration with the UNDP, implemented a series of regional, national and civil society consultations in the form of workshops and training sessions with the aim of informing relevant stakeholders about REDD+, the R-PP process and climate change. Stakeholders were also provided with an opportunity to have meaningful discussions on the information provided and to present their own ideas, hopes and concerns about REDDplus. Stakeholders at the national level included the private sector, NGOs/CSOs, national traditional authority, relevant GoL Ministries and Agencies, Academia and international non-governmental organizations. In order to ensure that each stakeholder group including forest dependent communities's concerns, suggestions and recommendations were fully captured, the C+P task force convened several focused groups discussions in four regional workshops.

As the readiness phase of the R-PP continues, Liberia will continue to engage the relevant stakeholders in extensive consultations on the various components of the R-PP by building on the early information and social mobilization campaign and dialogue conducted. Participatory mechanisms and structures identified in the initial stage of information sharing will also be used to enhance the active engagement and inclusion of stakeholders most especially the forest dependent communities.

The team of national consultants working on this project was also extensively involved in the REDDplus process and applied some of the lessons learned from the REDDplus process to the consultations for this study. For instance, stakeholders were consulted individually, in focused group discussions and in meetings like the inception and validation workshops. The process for stakeholder engagement for this study involved stakeholders identifying the issues to be discussed with each stakeholder and assigning appropriate consultants to conduct the consultations if it required fact-finding on an individual basis or the setting up of a team for a bigger group.

3.2. Institutional Gaps and Barriers

In September 2010, members of Cabinet endorsed the establishment of the National Climate Change Steering Committee (NCCSC). The NCCSC was subsequently launched in October 2010. The NCCSC is a high-level policy coordination committee that is responsible for overall climate change policy in Liberia. Its membership includes the Ministers, Directors of Governmental Agencies, the National Energy & Climate Change Adviser to the President, private sector, civil society and international partners. This advisory body serves as the policy-clearing house for all climate change related issues, including REDDplus. Consequently every policy formulation and review must be by the approval of this high-level policy committee.

This institutional set-up together with its secretariat the National Climate Change Secretariat (NCCS) has been dormant for a number of years now. Issues surrounding its demise are related to capacity, political will and funding. The EPA and to an extent the FDA have endeavored over the years to fill this gap with some success. In our view, these issues will have to be resolved before any meaningful

LEDS can be adopted, because it would require a high-level group like the NCCSC to make LEDS possible by instituting the actions that should have been taken since the establishment of the NCCSC.

The total inadequacies of professional staff and monitoring equipment means that institutional weakness is a barrier for LEDS, NAMAs development and MRV. The EPA which is working to fill the void left by the NCCS is grossly underfunded and understaffed with real capacity needs. This has hampered the agency's ability to carry out many core functions. The NCCS should be empowered to function as a fully independent secretariat that is not embedded in the EPA and FDA functions. This is in line with the practice in many countries in the region where climate change activities are coordinated from the presidency or a ministry of environment. For political expendiency it is best to have climate change spearheaded by a cabinet minister at the least, as is also the practice in many countries.

The following are additional gaps and barriers to the development of LEDS, NAMAs and MRV systems in Liberia.

- The inadequacies of data and information about the natural, physical, socio-economic and political environment;
- Weak political will;
- Poor regulatory environment;
- Conflicting sectorial mandates;
- The lack of a monitoring systems and strategy that includes data collection, monitoring and the strengthening of the mandate of the M&E officers; and
- Insufficient equipment for monitoring e.g. GIS instruments.
- A lack of standardization of MRV systems in the country;
- Weak inter-sectoral coordination;
- Lack of alignment and harmonization of regulations on monitoring, evaluation and reporting and lack of the tools in the key institution; and
- Poor frequency of reporting, data and information utilization.

4. SYNTHESIS OF STAKEHOLDERS CONSULTATIONS

4.1. Existing Stakeholder Coordination Structures

Stakeholders in climate change were not organized into a unified structure until 2009 when the GoL with support from non-governmental organizations and civil society organizations worked to set up a national stakeholder coordination structure for climate change enabling activities. This structure is made up of bodies existing at the governmental and grassroot levels.

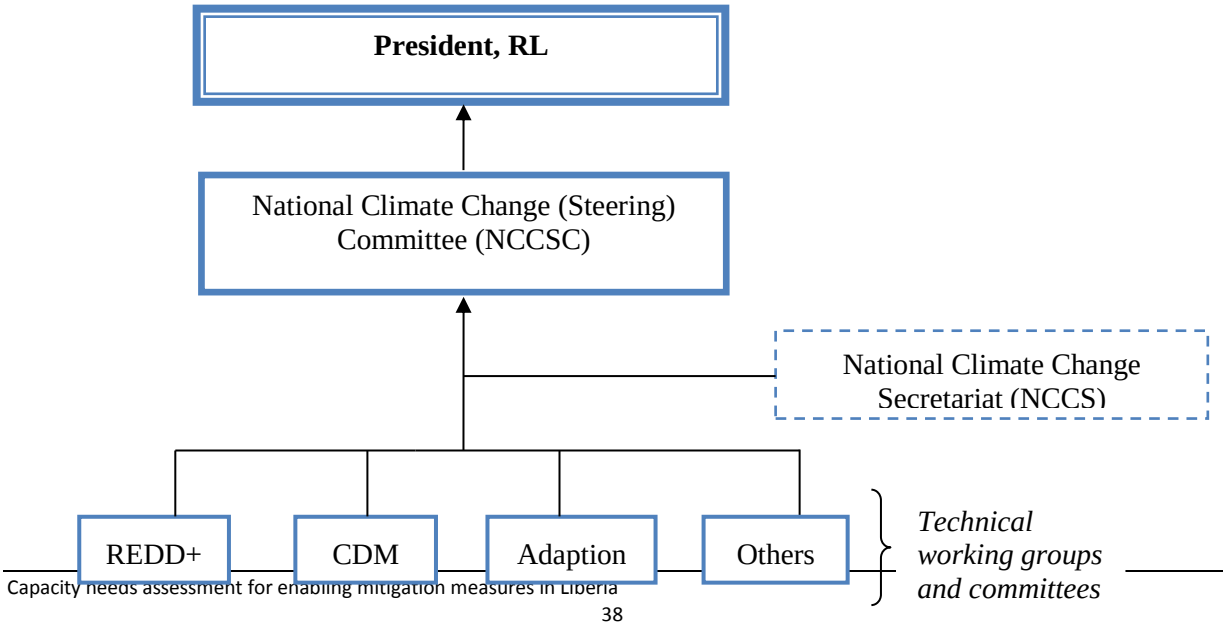
4.2. Stakeholder Organisation at Government Level

At the government level, there are number of existing coordination agencies and committees some of which have been created purposely for climate change that comprise of all the relevant stakeholders. They function within a hierarchical structure and have been organised to facilitate the proper coordination of climate change policies and activities. The NCCSC which was commissioned in 2010 by the President, is at the apex of this structure and is coordinated and headed by the Minister of Finance and Economic Planning. It is made up of Ministers and representatives from stakeholder groups. As the highest-level policy coordination committee it is responsible for the overall climate change policy in Liberia. All climate change related plans, policies and programmes are meant to be reviewed and approved by this high-level policy committee to secure political will and buy-in. The implementations of approved programs are carried out by the relevant Ministries and State agencies.

Supporting the NCCSC is its secretariat, the NCCS which operates from the Office of the President as another way of ensuring that climate change issues are accorded the highest priority at all levels of government. Under the direct supervision of the Energy, Environment and Climate Change Advisor to the President, the NCCS performs the administrative supervisory functions required of the Secretariat as well as providing the coordination and monitoring of programmes and ensuring the implementation of policieslii. Technically, the NCCS is supported by a number of experts on adaptation, mitigation/REDD+, GIS/mapping, climate change policy, communication/information among others.

Figure 1 shows the organizational chart of the national climate change policy framework and coordination structure.

Figure 1 : National Climate Change Policy Framework for Liberia



Source: Liberia R-PP (2011)

The structure above makes it is possible to form different sub-technical working groups to address different aspects of climate change e.g. climate finance, agriculture, adaptation or CDM. The working groups will work under the supervision of the EPA and serve as the vehicle for the facilitation of a national consensus on that particular issue.

4.3. REDD+ Stakeholders as a Model

Of all the working groups that are likely to be established; only the REDD+ Technical Working Group (RTWG) has been established and is fully functional. It plays the specific role of leading and monitoring REDD+ actions in the country. The RTWG which replaced the Carbon Consultative Group (CCG) has the mandate of advising and building the capacity of the FDA and serving as the sole national platform for multi-stakeholders to meet on REDD+ issues. Members of the RTWG are drawn from the government, NGOs, CSOs, forest dependent communities, trade organizations, the private sector, research institutions and academia.

The RTWG has been the driving force behind the development of the R-PP and also contributed immensely to the validation and subsequent endorsement by the cabinet of the economic analysis for a low carbon development strategy, which the international NGO Conservation Internation (CI) conducted on behalf of the government. The RTWG is supporting all programs under REDDplus and has proven to be a well-coordinated unit under the co-chairmanships of the FDA and the EPA. With the dormancy of the NCCS, it is the RTWG that is complimenting efforts of the EPA to implement climate change actions in the country.

REDDplus in Liberia will be implemented through a REDD+ Implementation Group (RIG) that would be supported by a REDD+ Implementation Unit (RIU) which in turn reports to the NCCSC. The RIG will comprise of key implementing agencies and ministries including:

Ministry / Agency	Represented by
Forestry Development Authority (Chair)	Managing Director (FDA)
Environmental Protection Agency of Liberia (co-chair)	Executive Director (EPA)
Liberia Institute of Statistics and Geo-information Services (LISGIS)	REDD Project Officer - Forest Monitoring Unit (FMU)
Lands Commission	REDD Project Officer – rural land registry
Ministry of Planning and Economic Affairs (MPEA)	REDD Project Officer = planning
Ministry of Lands, Mines and Energy (MLME)	REDD Project Officer –wood energy
Ministry of Agriculture (MOA)	REDD Project Officer – agricultural modernizationand tree crop development
FDA	REDD Project Officer – forestry sector
National Climate Change Secretariat (NCCS)	REDD Project Officer – EPA

Within the RIG, a number of REDD Implementation Task Forces (RITF) will be set up to harness needed expertise and synergies, and will be led by the appropriate agency of the Ministry. These task forces will align with project implementation components in the FCPF Project Appraisal Document. It is important to note that actual implementation may be contracted to a national or internal service provider, under the supervision of the RITF.

Proposed working groups like that for NAMAs would likely rely on the experiences from REDDplus and apply many of its lessons learned when they and other working groups such as that of energy are commissioned by the currently inactive NCCSC. Despite the failure to establish the energy working group, energy activities are still being coordinated through an ad-hoc inter-ministerial/agency coordination. Energy projects related to charcoal and deforestation, for instance, are coordinated by the sector agency - the FDA, while those relating to generators and fossil fuel use are coordinated by the LEC. Efforts are currently underway to establish the Energy Working Group, which will drive the entire energy agenda in Liberia. This group might be very useful in the development of LEDS due to the fact that a significant amount of Liberia's emission come from the energy sector. Other stakeholder organizations are taking their own initiatives to implement activities that have the potential to reduce Liberia's ghg emissions. These organizations are working with international partners to develop more effective low carbon techniques in carrying out their activities. For example, the charcoal producers are currently developing a project with the World Bank and FDA to improve charcoal production and use, thereby using less wood and reducing deforestation. [The list of other on-going projects with UNDP and partners support was discussed earlier.] These projects collectively or when individually scaled up could reduce significantly Liberia's emission levels.

4.4. Hydrocarbon Technical Committee

Another Committee whose work could make a meaningful contribution to the development of LEDS is the Hydrocarbon Technical Committee (HTC). The HTC's role is to negotiate oil agreements between Liberia and private companies. While the HTC current's function might not be directly linked to emission reduction targets, it possesses the mandate and ability to shape the country's future emission trajectory. Since gas flaring is known to cause air pollution and contamination of water bodies and farmlands through wet and dry deposition of pollutants, the HTC has committed itself to reducing the amount of gas that can be flared by International Oil Companies (IOCs) and is planning to make this a requirement in the draft petroleum policy. The head of the EPA of Liberia is a member of that committee and must among other things flag the importance of minimizing environmental damage by adhering to environmental best practices.

4.5. Stakeholder Organisation at Grassroots Level

At the grassroots level, stakeholders are generally arranged in the following groupings; county/local government, community council, youth groups, union groups, women groups and traditional leaders. Community-driven stakeholder structures already exist for specific sectors and activities. Examples of structures that address sector specific concerns are the Community Forest Forums (CFFs) and the Community Forest Development Committes (CFDCs). Both of these were established as part of the forestry reform process in 2006. The CFDCs and CFFs were set up to address concerns about forest resources harvest and use. This county/regional structure can be used for climate change enabling activities at the regional level.

CSO (CSO) can also be useful in assisting in the coordination and development of LEDS. Currently, CSOs involved in environment and climate change related work include the Liberia NGO Coalition, Liberia Oil and Gas Initiative, National Civil Society Organizations of Liberia, the Liberia NGO

Network, Action Against Climate Change, Skills and Agriculture Development Services, Green Advocate, Sustainable Development Institute, etc. The involvement of these networks of CSOs could serve as a useful engine in the preparation of the LEDS and NAMAs. Their participation provides additional credibility and increases national ownership.

4.6. Views from Stakeholders - Public Sector, Civil Society, Academia and Private Sector

A stakeholder consultation workshop was held in 10th January, 2011 to capture the views of the stakeholders on the subject matter of this study. The stakeholders were grouped into three different categories as illustrated in Box 1.

Box 1: Major and Secondary Stakeholders for LEDS[liii]

Major Stakeholders	Secondary Stakeholders	International Organizations
Policy Makers	Civil Society Groups	UNDP
National Legislatures	Green Advocates	Conservation International (CI)
Regulatory Agencies	Making Enterprises	Fauna and Flora International (FFI)
Energy Providers General Energy Esers (Public)	Skills and Agriculture Development Services (SADS)	International Union for the Conservation of Nature (IUCN)
Charcoal Producers	Sustainable Development Institute (SDI)	World Bank – Forest Carbon Partnership Facility
Large-Scale and Subsistance Farmers	Society for Liberian Foresters (SLF)	USAID
Transport Sector	Society for the Conservation of Nature in Liberia (SCNL)	CARE
Land-Use Private and Public Sector Actors	Action Against Climate Change (AACC)	European Union
Private and Public Sector Whose Activities Emit Emissions	Liberia NGO Coalition	
	Center for Sustainable Energy Technology (C-SET)	
	Save My Future Foundation (SAMFU)	
	Environmental Relief and Development Organization (ERADRO)	
	Society for Environmental Conservation (SEC)	
	Farmer Associated to Conserved the Environment (FACE)	
	Wonegizi Conservation Foundation (WCF)	
	Federation of Liberian Youths (FLY)	

Major stakeholders in this study are those considered to have direct influence or impact on emissions levels, LEDS policy and strategy formulation and implementation (examples are the industries and

policy makers). Secondary stakeholders are concerned individuals or groups. Their activities do not contribute to emissions but they are affected by the impacts of climate change and are moved by their conscience to act mainly though advocacy and by taking small remedual actions to influence the process for LEDS. International organizations play supporting roles some in the policy arena while others work to support projects in the downstream (e.g CARE, FFI and CI). Of particular note is FFI attempt to pilot a REDD project in Sinoe County which did not fully materialize because of the flowing reasons:

• Hesitation of community to fully engage in REDD+
• Suspicions that REDD is the new way of creating national park
• Doubt over why developed countries want to pay forest dependent communities for keeping their forests
• Logging companies proposing immediate benefits (employment/roads /clinics…)[liv]

REDD+ and mitigation as a whole is still misunderstood around this part of the world and those that have some understanding are suspicious of the process and profer such arguments as why an LDC like Liberia should engage in mitigation when national emissions levels are so low and the country is already a net sink. The national benefits of mitigations are usually downplayed and global benefits highlighted which makes it seem unfair. Couple with other challenges as listed below, mitigation seems less of a priority to adaptation and understandably so, but the facts that are often over-looked is that some mitigation activities are a form of adaptation and in mitigation are lots of benefits in terms of capacity building and technological advancement; mitigations activities such as REDD+ has benefits for forest governance and biodiversity conservation.

During the consultation process, the following concerns were raised by participants:

- Transparency in the managment of REDDplus revenue;
- Complicated and uncertain funding structures for mitigation activities;
- Lack of clarity on forest carbon rights;
- Underdeveloped national account of carbon stocks, and where such data exist, it is not generated by nation experts;
- Lack of a functional monitoring system (including for FPIC, MRV and benefit sharing);
- Lack of clarity on the role of communities in MRV systems and the need for capacity building;
- The potential for resource and technical constraints to cause delays in the implementation of NAMAs;
- Poor data collection, management and analysis; and
- Poor and inadequate national reporting;

The following recommendations were made by participants during the consultation:

- Livelihood alternatives need to be provided to forest dependent communities;
- The drivers of deforestation like slash and burn agriculture and pit-sawing need to be addressed;
- Consideration of National Capacity Self Assessment (NCSA)'s recommendations which calls for institutional and human capacity strengthening;
- Reassessment of Liberian forests to establish credible baselines;
- Establishment of a national standard GIS laboratory with personnel from sectoral ministries to address challenges of data collection in the natural resources;
- The need to develop the capacity of the EPA and FDA for enforcement of forest regulations;
- The importance of strengthening law enforcement, public participation, access to information and justice for NAMAs;

- REDD+ implementation strategies must be communicated to all stakeholders groups and their roles well defined;
- The NCCS must be made functional; and
- Provision of early warning systems and capabilities of national institutions enhance for monitoring and reporting.

5. OPPORTUNITIES AND PRIORITIES FOR MITIGATION MEASURES

5.1. National Priorities

Liberia's national priorities, as set out in PRS I (2008-2012) focused on the reconstruction of the infrastructure, State institutions and structures, the economy and the restoration of public services. Most of these priorities are also being considered in the PRS II, which is still under development. They are expected to be prioritized in the national budget which was under review by the National Legislature at the time of the writing of this paper. But the bigger priority in the PRS II will be the provision of infrastructure. The medium to long-term priority of the GoL is to transition the country to a medium income country by 2030 in an initiative that has been tagged "National Vision 2030". The pursuit of the key priorities of PRS II (2012 – 2017) is expected to lay the foundation for this Vision. These are likely to include priorities that overlap with low emission development initiatives such as the provision of constant and cheap energy supply, renewable energy targets, education and training and capacity building. But the fact that the low emissions co-benefits are not necessarily the priority in themselves buttress the point made in the EPA's report[lv] that policy-makers are not connecting the scientific and technical issues of climate change to policy making. This is also manifest in the fact that there isn't a governing national framework to coordinate mitigation action like a national action plan on climate change. This has also meant that mitigation initiatives that are being implemented, are been done on an ad-hoc basis, reducing the scope for synergies, harmonization and sustainability of effort, further raising doubt about the attainability of the 2050 carbon neutral goal that the NEP aspires to. Something of this nature would be instrumental in organizing the mitigation opportunities that have been identified in this study to facilitate greater coherence and coordination that would help maximize the benefits from their implementation.

5.2. Prioritisation of Mitigation Opportunities

As stated earlier, the draft INC provides a list of potential mitigation projects that could be undertaken to reduce Liberia's emission footprints now and in the future. Given Liberia's national circumstance and financial and capacity constraints, it is unlikely that all or much of these projects can be implemented in the immediate term without significant international support. Decisions would have to be taken on which of these projects should be initiated in the immediate future and which to pursue later. However, as energy infrastructure is the number one priority of the GoL, it makes sense to consider energy mitigation as a priority. Fortunately, current major investments in the sector are toward provision of hydro and solar energy.

Considerations for mitigation decisions would likely involve financial, capacity and impact considerations among others. If the government were to mainstream low emissions development considerations into its national plans, projects that fit into existing national priorities and deliver significant emission reduction co-benefits would likely receive immediate attention. 'Low hangin fruit' projects that are low technology and moderate in cost terms, that are within the reach of the government and its development partners could also be prioritized. Initiatives that would require significant financial suppport and technical expertise that Liberia does not as yet possess are unlikely to be fasttracked.

5.3. Energy

Support for the rehabilitation and expansion of hydro electric power facilities will contribute to reduction in consumption of petroleum products; this would reduce emissions and pollution from the use of generators, contribute to the attainment of the MDGs, poverty reduction and also support income generation, education and improvement in health ans security. The rehabilitation of Mount

Coffee, the largest dam in the country has begun, the project and others when completed will provide clean, cheap and renewable electricity for Monrovia and surrounding counties by the end of 2015 (according to a proclamation by the GoL). Mitigation in the energy sector as have been stated before offers opportunities for low emissions and carbon neutral development and a reliable energy supply to drive economic growth.

5.3.1 Alternative Energy Projects

Increasing energy production from renewable sources for communities (solar, wind, mini and micro hydro) is a major mandate of the RREA. Results of the Renewable Energy Feasibility Study conducted in 2006 showed great potential for solar and wind energy. Fuel switching from fossil to renewable, solar and wind energy will lead to reduced GHG emissions.

As mentioned above, the Global Energy Fund (GEF Trust Fund) in partnership with the World Bank has endorsed a US$ 4 million project titled "Lighting a Million Lives in Liberia", as part of its Lighting Africa Program.
The program seeks to achieve the following:
• Disseminate at least 1 Million high quality solar lanterns in exchange for kerosene lanterns
• Reduce Green House Gas emissions from kerosene
• Build RREA and private sector capacity to scale up high quality lighting dissemination, targeting 200,000 rural households on a commercial basis.

This program was intended to benefit an estimated 200,000 households and is being implemented by the RREA. The RREA was established by the Government of Liberia with the aim of facilitating the economic transformation of rural Liberia by accelerating the commercial development and supply of modern and renewable energy products and services.

The program also supports the commercialization of off-grid solar lighting products in the Liberian market and will seed the market with solar lighting devices that meet the Lighting Africa Minimum Quality Standards. The project was designed to be driven initially through a pilot sales phase and then through a lantern exchange program. Beneficiaries are Liberians who currently rely on inferior and more expensive sources of lighting such as kerosene lamps, dry cell battery powered lights, Tiger generators, candles and others.

In March 2011 the Government of Liberia and the World Bank signed a US$2 million grant agreement to provide modern renewable energy services to off-grid users in Liberia. Two pilot activities identified under the grant are (a) rehabilitation of a 60 kW micro-hydro power plant in Yandohun, Lofa County; and (b) establishment of solar off-grid rural electrification program in Liberia. The micro-hydro power project is ongoing, while the solar off-grid rural electrification program is being launched[lvi].

5.4 Forestry

The overdependence on natural forests for the supply of wood fuel for the population is very high. This demand is significantly depleting the forest and causing emissions that is expected to reach about 41 million tons of ghg emissions by 2030.

A project to promote the use of energy efficient cooking stoves and efficient charcoal production kilns is proposed in the INC to help address this problem. This project, the INC suggest will aim to produce two hundred thousand (200,000) improved cook stoves and one hundred thousand (100,000) charcoal

and firewood stoves to be distributed by 2030. It will be implemented by the training of four persons (2 for charcoal and 2 for firewood) in each region in the making of improved cooking stoves. The cost of each improved cooking stoves will be $7 in order to make it within the reach of the average Liberian household. With the implementation of this policy, it is suggested that 452,453.36 tons of wood and 419,486.11 tons of charcoal is expected to be saved. This policy will save households a sum of U.S.$135 million by 2030; a sum greater than the cost of implementing the policy. In addition to the monetary savings, it will greatly reduce indoor pollution and its related health consequences.

The following are related projects some of which are already being implemented that would also contribute to the reduction in demand for wood products and consequently emissions from the forestry sector:

- UNDP 27,000 supported Eco-Stove Project with Ivorian Refugees in Nimba County;
- UNDP/SGP/GEF supported Community Wood Lots Project at Lake Piso in Grand Cape Mount County and other such projects;
- Reforestation/Afforestation Project to start soon with the Forestry Development Authority (a related project as already commense to restore the forest ecosystem around the Mt. Coffee Hydro facility under rehabilitation).

5.5 Agriculture

Low-Land Rice Cultivation Projects by the Ministry of Agriculture and partners, the avoided deforestation can be captured in carbon credits. If, for example, an area of 30,000 ha of irrigated lowland farming were to be developed over 25 years, this would free up 150,000 ha of land for forest regrowth, with savings of 41.0Mt CO2 (Lawrence et al, 2009).

5.6 Waste Management

Integrated Waste Management (IWM) is also proposed in the INC: with an expected waste generating rate of 321,000 tons/day by 2020 in Monrovia alone, there are enormous mitigation opportunities in the waste sector in Liberia. It is therefore quite important that integrated waste management measures are put in place, to help reduce the volume of waste that are placed in the streets and in other unplanned/unauthorised garbage dumps and to capture the methane gas that would be produced for energy generation purposes. The INC sees waste management as having potential for mitigation and many other co-benefits.

The INC proposes that this project be for a duration of six years with the first six months being the awareness stage to enhance a smooth project implementation. A budget of $200 million dollars is proposed.

In terms of “low hanging fruits”, the current waste management project called the Whein Town Landfill Recovery Project, which is a World Bank supported project could be a good pilot for an IWM.

5.7 National Constraints

As a post-conflict LDC, the challenges that Liberia face as mentioned is several places throughout this document, also offer it a unique opportunity to chart a new course down a low emissions development pathway. Fourteen years of civil conflict have destroyed Liberia’s infrastructure, state institutions and led to the loss of its human capital and technical capacity. The tasks of rebuilding the country and its institutions along low emissions, clean development lines can only be achieved if there is sufficient

financial, technological and capacity support. This support would address the following constraints, many of which were identified in the draft INC:

- Institutional and technical constraints in the inventory of greenhouse gases;
- Management, storage and analysis of data;
- Designing of mitigation activities;
- Low awareness of climate change among key policy makers;
- Scepticism of climate change, particularly about the effects of mitigation measures on development;
- Inadequate access to financial and technological resources;
- Weak human, technical and institutional capacity;
- Weak institutional coordination;
- Lack of experience in the use of UNFCCC guidelines and processes; and
- Difficulties in reporting to the UNFCCC and access to information on some of the UNFCCC activities.

These constraints can be addressed through the following measures, which would also require significant financial, material, technical and technological support:

Capacity Building

- Capacity building for NAMAs, MRV, GHG accounting;
- Provision of training and software for GHG inventory and analysis;
- Training in carbon finance and UNFCCC processes; and
- Capacity building for policy-makers

Technical and Financial Support

- Support for improvement and expansion of of energy infrastructure;
- Support for efficient and low emissions agriculture practices;
- Support for the preparation of a national climate change policy;
- Support to the National Climate Change Secretariat;
- Support to academic institutions for training in climate change; and
- Support for State institutions

6 ANALYSIS OF CAPACITY BUILDING NEEDS

Liberia has already made its commitment to developing a low emission strategy. This decision cannot be carried out under the present low-budget, low-technology and low-capacity constraints. Since the end of the conflict, Liberia's capacity needs have been growing as the country transitions from recovery to a developmental stage. These capacity needs are technical, institutional, and financial in nature. Addressing these needs will set the country on the right trajectory in developing and implementing its LEDS. Liberia's capacity building needs can be organized under 3 broad categories:

- Capacity Building (Training and Manpower Development and Institutional Strengthening and Enhancement)
- Technological Support; and
- Financial Support.

6.3 Individual Needs

Capacity building needs for Liberia rest principally on building the individual capacities and expertise of the experts in Liberia. The civil conflict did not only damage the infrastructure and systems. It also led to the flight of many of the country's educated and trained workforce and the institutional memory they possessed. Those that remained were unable to add to their experience and expertise because of the lack of support and facilitie. All the country's professional training facilities were destroyed and consequently many of them remain closed leading to a lack of trainers, facilities and materials. The experts that remained are overworked with little or no institutional support and the institutions they work for poorly resourced.

6.4 Institutional Needs

The lack of capacity and expertise among staff of the public institutions makes it difficult for the State to formulate and implement policies without external assistance. Other deficiencies within the institutions that affect their capacity include lack of accountability, commitment and motivation[lvii]. Lack of coordination and duplication of efforts by these organizations has also been cited as one area that needs improvement. The Multilateral Environmental Agreement (MEA) Coordinator at the EPA has for instance called for the establishment of a National MEA Coordinating Committee[lviii] to resolve some of these issues. Support for the institutions directly involved in the development and implementation of LEDS should be prioritized. The institutional strengthening must focus on the following:

- Material and technical support;
- Staff training and restructuring; and
- Budgetary support for adequate motivation and knowledge sharing

Training packages could be delivered to the National Meteorological Service (NMS), the EPA, FDA and the Liberia Institute for Statistics and Geo-Information Service (LISGIS) to ensure that individual and institutional technical competences are developed for the purpose of capturing and calibrating key emissions data at those centers. Training would be needed to build capacity for the preparation of Liberia's ghg inventory and to monitoring Liberia emissions profile and tracking progress toward a low emission economy. The training in data management will cover all sectors including agriculture, forestry, energy, industrial processes and other sectors recommended by the IPCC Good Practice Guidelines and in keeping with Article 5, paragraph 1 of the Kyoto Protocol[lix].

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

As a post-conflict country, Liberia faces challenges that must be addressed in order to meet the social and economic needs of the citizens. These challenges include the provision of and access to affordable energy, restoration of public services, the reconstruction and expansion of infrastructure, economic growth and job creation. Most of these constitute priorities for the GoL that require significantly more financial support than is available. But these challenges also offer the GoL a unique opportunity to steer Liberia down a low emissions development pathway by mainstreaming mitigation considerations into its national reconstruction and development plans at a time when they are still being formulated and implemented. Going forward, the Agenda for Transformation (AfT), Liberia's current "roadmap" for the attainment of Vision 2030 is the best avenue to integrate some targets for low emissions development (so far a some consideration of climate change and natural resources management have been captured, an improvement over the PRS I).

This study has shown that there are elements that already exist in Liberia that could provide a good basis for the development of a national action plan on climate change that should be integrated into national development plans and priorities and hopefully provide coherence on how mitigation actions are implemented. These elements include reports and assessments of Liberia's potential for reducing its emissions and how to do it. They also include policies and laws that would have co-mitigation benefits, existing structures that have been established to help ensure wide stakeholder consultation and participation in climate change issues and at all levels, institutions that are currently fulfilling functions that border on monitoring and verification functions, and initiatives that are being undertaken whose impacts should lower Liberia's carbon footprints.

7.2 Recommendations

On the face of it, these elements offer a lot of promise. But significant barriers and gaps in capacity, technology and financing exist. These must be addressed if Liberia intends to implement LEDs, NAMAs and a standard national MRV system. The following support must be geared towards addressing those gaps and barriers:

- Provision of appropriate technologies identified in the Technology Needs Assessment of the INC for the implementation of climate change mitigation actions in Liberia.
- Intensive capacity building of the private and public sector technical experts to address the capacity gaps in the following critical areas:
    - Policy and regulatory environment;
    - The use of specific models for mitigation analysis at the sectoral level;
    - Development of baseline and mitigation scenarios to estimate emission reduction potentials; and
    - Development of socioeconomic scenarios
- Strengthening of national capacities at all levels, and on issues related to the formulation and implementation of mitigation and the development of low carbon strategies
- Provision of incentives to engage effectively with stakeholders including the private sector;
- Provision of financial assistance to finance the setting aside of 30 percent of Liberia's forests as protected areas as required under the National Forest Reform Law of 2006[lx]
- Feasibility analysis of the mitigation options and NAMAs identified, as well as cost assessments;

Other initiatives that ought to be initiated and pursued by the GoL include:

- National dialogue to renew commitment for to pursue a low development path

- Educational programmes and public campaigns to raise awareness of climate change isues among policy-makers and the general public.
- Strengthening of regional and national institutional frameworks to support the identification of possible actions for mitigation measures;
- Enhanced coordination within the climate change sector by EPA and also ensuring the signing of memorandum of understanding (MOU) between various institutions for the purpose of environmental data or knowledge sharing.

8 ENDNOTES

[i] EPA, (2012) : Initial National Communication of Liberia, Zero draft. UNEP and EPA. Monrovia
[ii] Liberia's R-PP, 2011
[iii] Global Finance (2009) http://www.gfmag.com/gdp-data-country-reports
[iv] EPA, 2012
[v] World Bank (2011) Options for the development if Liberia's energy sector
[vi] Center for Sustainable Energy Technology (CSET, 2004) Monrovia
[vii] EPA, Draft INC 2012
[viii] UNEP (2007): http://postconflict.unep.ch/publications/Liberia_waste.pdf
[ix] EPA, (2012): Initial National Communication of Liberia, Zero draft. UNEP and EPA. Monrovia
[x] As quoted in the UNEP (2007) study « Assessment of Solid Waste Management in Liberia »
[xi] Christie T, Steininger M.K, Juhn D.and Peal A.(2007): Fragmentation and clearance of Liberia's forests during 1986-2000: http://journals.cambridge.org/action/
[xii] http://rainforests.mongabay.com/deforestation/2000/Liberia.htm
[xiii] Koffa S. 2009: Evaluating the Investment and Financial Flows of the Forestry Sector Issue in Climate Change Mitigation in Liberia. A report submitted to UNDP, Liberia. 16 pp.
[xiv] EPA, (2012) : Initial National Communication of Liberia, Zero draft. UNEP and EPA. Monrovia
[xv] Potter S. V (2011) Presentation at an ECREEE Regional Workshop, Accra, Ghana http://www.ecreee.org/sites/default/files/eventatt/renewable_energy_technologies_for_productive_uses-liberia_0.pdf
[xvi] National Energy Policy: an agenda for action and social and economic development. Ministry of Land, Mines & Energy, May 2009
[xvii] Grid electricity
[xviii] http://www.dgmarket.com/tenders/np-notice.do
[xix] Jayjay R.G : An overview of investment opportunities in the energy sector of Liberia http://www.developingmarkets.com/sites/default/files/session-2-roosevelt-jayjay.pdf
[xx] https://energypedia.info/wiki/Liberia_Energy_Situation
[xxi] Executive Order No. 23
[xxii] https://energypedia.info/wiki/Liberia_Energy_Situation
[xxiii] Asumana C. (2012): A look at the draft Petroleum Policy for Liberia - http://www.frontpageafricaonline.com/op-ed-editorial/commentary
[xxiv] Thematic Component 9 (Health, Safety, Environment and Social Impact) of draft National Petroluem Policy, 2012
[xxv] Para 6 of (Health, Safety, Environment and Social Impact)
[xxvi] The HTC is a statutory inter-ministerial committee created by the new petroleum law with power to negotiate oil and gas contracts for Liberia. It members include Ministry of Lands Mines and Energy, Ministry of Planning and Economic Affairs, Ministry of Justice, Ministry of Labour, Bureau of Hydrocarbobn, National Investment Commission, Environmental protection Agency, Office of the legal Advisor to the President of Liberia and chaired by the National Oil Company of Liberia.
[xxvii] Global Witness (2012)
[xxviii] http://www.ecreee.org/sites/default/files/event
[xxix]http://64.37.57.130/~motgov/page_info.php
[xxx] Lawrence K., Niesten E., & Werker E. (2009): Economic Analysis of a Low Carbon Economy for Liberia
[xxxi] Excluding restricting FMCs to 1.6 million ha, as this would be double-counting with 'no new FMCs' policy
[xxxii] Tree crop plantations will occupy more than 1 million ha of Liberia's 4.5 million ha forest area.
[xxxiii] Timber Sales Contracts (TSCs) are short-term forest contracts of between 3 – 5 years
[xxxiv] The Forest Reform Law, 2006 calls for setting aside of 30% of Liberian forest in conservation
[xxxv] http://www.undpcc.org/en/liberia
[xxxvi] http://www.fao.org/forestry/
[xxxvii] Liberia's R-PP, 2011

[xxxviii] The roadmap for the implementation of the Strategic Environmental and Social Assessment (SESA) has been developed and the SESA terms of reference (TORs) has also been agreed upon. This assessment is necessary given that the financing for REDDplus is predominantly coming from multilateral institutions like the World Bank for whom SESA is a requirement.
[xxxix] Liberia Agriculture Sector Investment Program (LASIP) Report (2010) : http://www.gafspfund.org/sites/gafspfund.org/files/Documents/Liberia
[xl]http://www.gafspfund.org/sites/gafspfund.org/files/Documents/Liberia
[xli] http://www.lr.undp.org/documents/pdf/draft_integrated_water_resource.pdf
[xlii] http://www.lr.undp.org/documents/pdf/draft_integrated_water_resource.pdf
[xliii] http://www.molme.gov.lr/content.php?sub=56&related=20&res=56&third=56
[xliv] http://www.sanitationandwaterforall.org/files/Liberia_Compact.pdf
[xlv] http://www.liberianobserver.com/index.php/news
[xlvi] Lawrence K., Niesten E., & Werker E. (2009): Economic Analysis of a Low Carbon Economy for Liberia http://www.google.com/economic+analysis+of+low+carbon+economy+for+liberia
[xlvii] http://www.ec.gc.ca/ges-ghg/
[xlviii] http://www.standards.org/certification_bodies/listing/sgs_liberia
[xlix] Liberia's R-PP, 2011
[l] FDA Regulation 102-07, sec. 22 (d)
[li] http://redd-net.org/themes/mrv
[lii] This was the structure during the preparatory stages, some changes could be expected in the future
[liii] Stakeholders mapping
[liv] http://forestgovernanceforum.com/wp-content/uploads/2012/04/nouhou-ndam-redd-and-redd-pilot-projects-in-liberia.pdf
[lv] EPA, (2012) : Initial National Communication of Liberia, Zero draft. UNEP and EPA. Monrovia
[lvi] http://www.micatliberia.com/index
[lvii] Assaf K. S (2011): State Parties Commitments and Obligations under the Multilateral Environmental Agreements. Presentation at an EPA workshop on "Enhancing Effective Implementation of MEAs". Pp 5
[lviii] Voker J. (2011): An Overview of Multilateral Environmental Agreements Implementation in Liberia". Power-point presentation at an EPA workshop on "Enhancing Effective Implementation of MEAs". 12 slides
[lix] Article 5, para 1: …….a national system for the estimation of anthropogenic emissions by source and removal by sinks of all greenhouse gases not controlled by the Montreal Protocol.
[lx] Liberia's R-PP, 2011