Institutional Arrangements Report

Liberia's National GHGI and MRV System

November 2020

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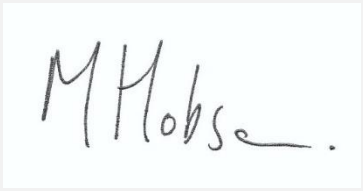
Signature	
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1 Key messages and recommendations

Through the Conservation International led, Capacity Building Initiative for Transparency (CBIT) funded project to support Liberia with its national greenhouse gas (GHG) inventory and monitoring, reporting and verification (MRV) system, Aether has been working alongside national stakeholders to build capacity around GHG inventory compilation and develop Liberia's institutional arrangements. Aether has gained insight into Liberia's national system through these activities and has developed a set of recommendations to focus the future development work needed to help Liberia meet its requirements under the Modalities, Procedures and Guidelines (MPGs) for reporting under the Enhanced Transparency Framework (ETF) of the Paris Agreement (PA).

This report refers to Liberia's institutional arrangements as being made up of five components:

1. **Organisational mandates** such as agreements, laws, and commitments (See section 3.1)
2. **Expertise** including data, modelling, compilation, and reporting experts across a range of themes. (See section 3.2)
3. **Data flows** of the data necessary for the MRV system to be of value. (See section 3.3)
4. **Systems and tools** for information, communication, and engagement (See section 3.4)
5. **Stakeholder engagement (See section 3.5)**

Aether has used these components to identify key gaps and constraints of Liberia's current institutional arrangements in line with the PA MPGs and to organise the set of recommendations. These are provided in the table below and have been prioritised to give an indication of which actions are most urgent. Further details on these recommendations are included in the body of the report.

Table 1. Recommendations for Liberia's institutional arrangements

Component	Recommendation	Short description	Page number
High priority actions			
Organisational mandates	Formally define roles and responsibilities	Define roles for (i) an MRV Coordination Unit; (ii) Sector Expert Leads; (iii) the University of Liberia	8
Organisational mandates	Developing the legal framework	Develop (i) an overarching climate change legislation; (ii) Data Sharing Agreements and Memorandum of Understanding	8
Systems and tools	Develop a GHG Inventory Archiving Hub	Build an archiving site structure to store and manage files and information relevant for Liberia's national GHG Inventory system.	14
Systems and tools	Develop a Nationally Determined Contribution Tracking platform	Develop a tool to capture project level information and track progress against NDC targets	

Systems and tools	Develop and maintain an improvement plan	Create and maintain a centralised list of improvement actions across different themes	15
Medium priority actions			
Organisational mandates	Secure long-term resources for the MRV system	Use MRV Coordination Unit to (i) develop and maintain a pipeline of funding for coordinated capacity building activities and (ii) identify new sources of funding for long term sustainability	9
Expertise	Organizing and resourcing the technical and managerial team	Identifying resource needs across all climate change themes and building expertise in well-defined technical teams	10
Data flows	Map out data flows and compile a list of datasets and data providers	Expand understanding of data flow to cover all elements of adaptation and support	12
Data flows	Consolidate existing material into the MRV system	Once finalised, collect and consolidate all relevant information into the national data management platforms.	14
Systems and tools	Workplans, terms of reference and templates for outputs	Use EKMS to store an archive of workplans, ToRs and templates for outputs (e.g. NCs, BURs, BTRs).	15
Systems and tools	Developing theme specific impact estimation tools and approaches	Develop tools for tracking and calculating impact of mitigation/adaptation actions & projections	16
Systems and tools	Indicator development and management system	Develop a comprehensive set of climate change indicators	16
Systems and tools	Metadata categorisation	Develop classifications and vocabularies to manage climate change data	16
Systems and tools	Quality Assurance and Quality Control	Develop a QA/QC system	16
Low priority actions			
Systems and tools	Public information and stakeholder engagement tools	Develop a clear single point of entry and standardised communication approach to providing stakeholders with information on progress	16
Stakeholder engagement	Establish a schedule for NCCSC coordination of stakeholder engagement	Establishing resourcing plan and schedule of activity for Liberia's National Climate change Steering Committee	17
Stakeholder engagement	Develop communications plan for disseminating MRV system outputs	Draw up communications plan for engaging decision makers and public audiences with climate change outputs.	17

2 Introduction

This report is one of the main deliverables for the Conservation International led, Capacity Building Initiative for Transparency (CBIT) funded project to support Liberia with its national greenhouse gas (GHG) inventory and monitoring, reporting and verification (MRV) system. The project will contribute to the delivery of the CBIT project components included below in **Table 2**.

Table 2. CBIT project components covered by the consultancy

Component	Outputs
COMPONENT 2: Provide direct technical support to harmonize land use, agriculture, energy, transport and waste sectors data collection and reporting through training and assistance	**Output 2.1.1: Processes and protocols for measuring results related to the land use, agriculture, energy, transport and waste sectors established** • Review the REDD+ MRV system • Develop Standardized Protocols for the measurement and harmonized reporting on emissions across the NDC sectors. • Mechanisms developed for integration of REDD+ MRV system into the NDC system. • Provide Technical support to all NDC sectors team including energy **Output 2.1.2 Implementation plans developed and at least 200 stakeholders trained to incorporate land use, agriculture, energy, transport and waste sectors into the NDC** • Identified Innovative and practical strategies for emissions reduction for each of the NDC sectors, • Preparation of implementation plans to advance the development, uptake and upscale of the innovation strategies. • Provide trainings on how to incorporate land use, agriculture, energy, transport and waste sectors into the revised NDC
COMPONENT 3: Testing and piloting the GHG emission inventory and MRV system.	**Output 3.1.1: Data for GHG inventory and MRV system aggregated from different sources, and compiled to develop a national GHGI and MRV system** • Develop Mechanisms for GHG data aggregation of GHG data from multiple sectors into a centralized system • Hold technical training workshops on on the MRV System and GHGI **Output 3.1.2: National Inventory of Green House Gas emissions (by sources) and by**

	removals (by sinks) in place and made publicly available. • Technical Assistance to establish a GHGI and MRV system at EPA • Assistance to NDC sector institutions to quantify and report policy results/impacts

This report focusses specifically on providing recommendations to further develop and strengthen Liberia's institutional arrangements for GHG inventory compilation and Nationally Determined Contributions (NDC) implementation tracking. It focuses on integrating the MRV system within the wider data gathering, analysis and reporting activities of Liberia's Environmental Protection Agency (EPA).

The objectives of the MRV component of the project include:

- To highlight the current status in Liberia regarding roles and responsibilities for climate change mitigation and GHG inventories including the legal framework defining these roles
- To increased understanding and awareness of MRV systems and approaches with selected stakeholders in Liberia
- To support the development of the MRV system tools (new or existing) used to manage and track climate change data.

The recommendations in this report are designed to support Liberia in meeting the Modalities, Procedures and Guidelines (MPGs) for reporting under the Enhanced Transparency Framework (ETF) of the Paris Agreement (PA). Liberia's reporting requirements under Article 13 of the PA are outlined below for reference:

- Every two years, Liberia shall…
  - Report on the national greenhouse gas inventory
  - Report on progress made in implementing and achieving nationally determined contributions (NDCs)
  - Undergo technical expert review of information submitted
  - Facilitate multilateral consideration of progress with respect to its implementation and achievement of its NDC
- Every two years, Liberia should…
  - Report on climate change impacts and adaptation
  - Report on financial, technology transfer and capacity building support needed and received

The following section provides a more detailed specification for the development of the institutional arrangements (Section 3). Annex 1 provides details on the underlying concepts and theory as well as an overview of the current state of MRV in Liberia.

3 Proposed institutional arrangements

In this section we provide proposals for a framework for Liberia's institutional arrangements. This draws the analysis of the current state of play in Liberia for gathering, analysing and reporting on its climate change progress and ambition. Details of this analysis are provided in Annex 1.

Figure **Error! Reference source not found.**1 presents the five key developmental e lements of institutional arrangements that we use to structure the proposed framework which comprise:

1. **Organisational mandates** such as agreements, laws, and commitments (See section 4.2)
2. **Expertise** including data, modelling, compilation, and reporting experts across a range of themes. (See section 4.3)
3. **Data flows** of the data necessary for the MRV system to be of value. (See section 4.4)
4. **Systems and tools** for information, communication, and engagement (See section 4.5)
5. **Stakeholder engagement** (See section 4.6)

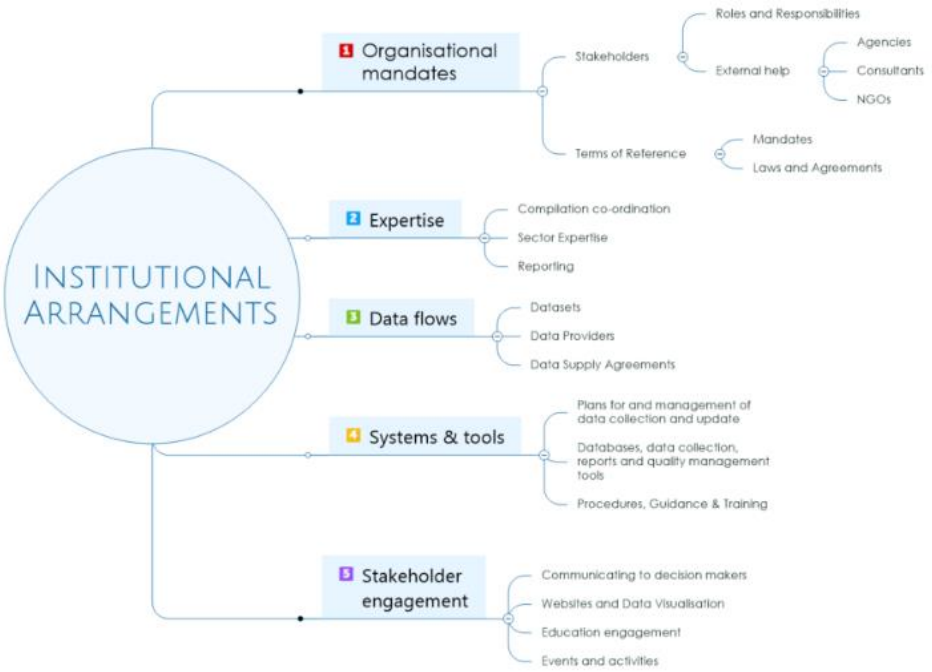


Figure 1. Overview of the Institutional Arrangements components for the MRV system.

3.1 Organisational mandates

Objective: Well-functioning Institutional arrangements will ensure that there are sufficient laws, mandates, agreements and terms of reference in place to ensure the availability of experts, flow of data, systems and tools in place and sufficient communication and engagement with stakeholders for the MRV systems data to be useful to decision makers and for national engagement in the Paris Agreement.

Organisational mandates will include the agreements and terms of reference that ensure organisations and individuals in organisations are able to work together to gather, analyse, compile, report/communicate and monitor progress with the national climate agenda and the Paris Agreement. These organisations might include government ministries and/or agencies, academic/research institutions, local self-government, private organisations, and consultants. It will be flexible and sustainable and ensure that resources are available for recurring and continuously improving data gathering, compilation, analysis and reporting across the agreed scope. Overarching organisational structures and agreements will often be defined and formalised with agreements for data provision and reporting. These can range from national climate laws to organisational mandates, individual contracts, and data supply agreements.

An overview of the recommended roles and responsibilities is presented in the figure below. This is designed around roles and responsibilities currently set up to deliver project based outputs such as the Biennial Update Report (BUR) or National Communication (NC) projects.

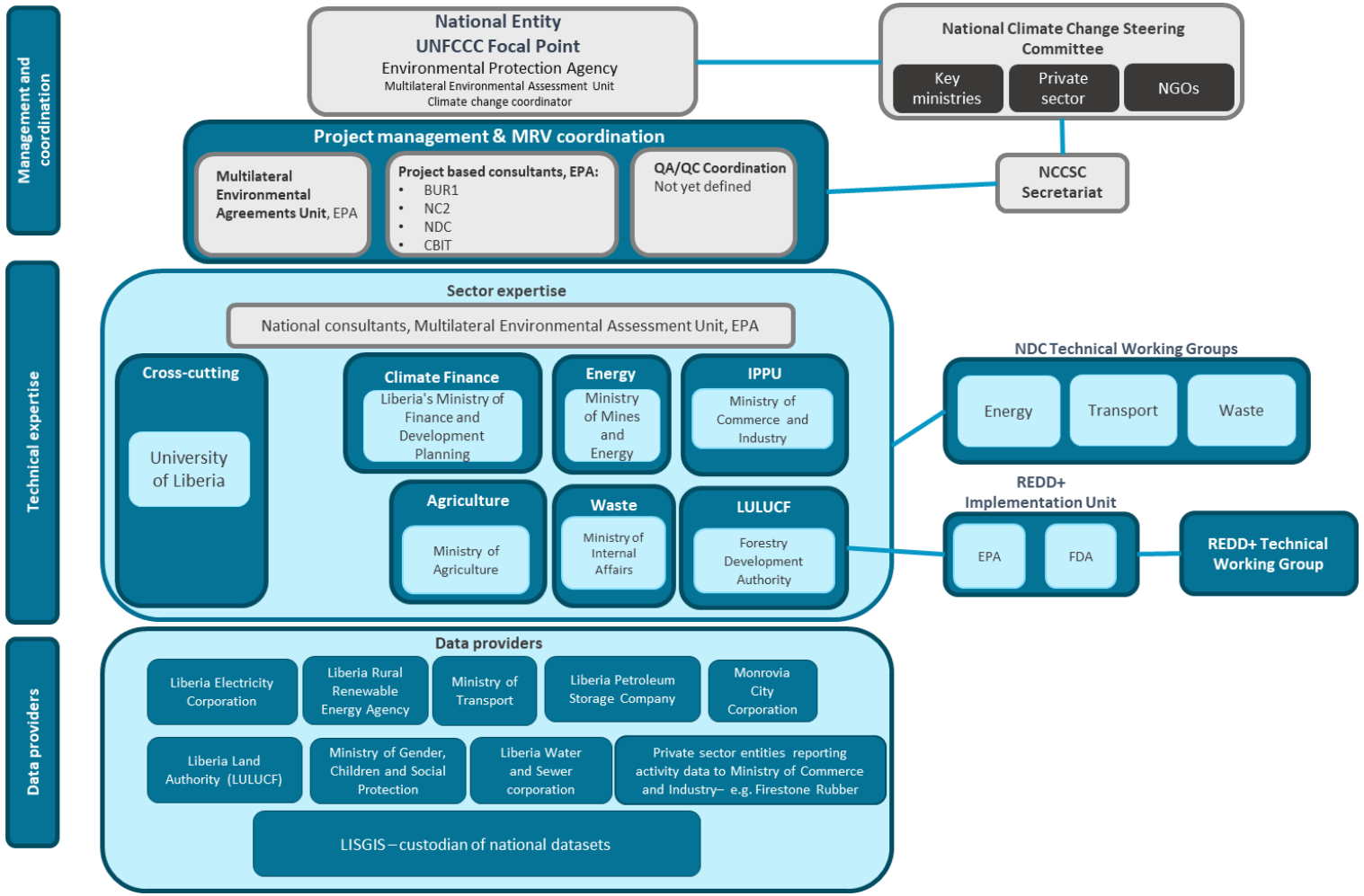


Figure 2. Roles and responsibilities diagram for Liberia

Key recommendations for developing Liberia's institutional arrangements are outlined below:

3.1.1 Formally define roles and responsibilities

Further development of the Liberia's roles and responsibilities are needed to institutionalise the following:

6. **MRV Coordination Unit:** Liberia has a climate change coordinator that is the designated UNFCCC Focal Point. However, this coordination role does not extend to the technical/project management of producing key outputs such as NDCs/NCs/BURs. The management of these processes is handled by separate project based consultants. This leads to an uncoordinated approach, with duplication of effort by different pools of experts. There is a strong need for an **MRV Coordination Unit** to oversee the production of key outputs, track progress against defined outcomes and focus development activities based on identified needs and gaps through the **Improvement Plan**. This also involves designating a formal QA/QC coordination role to ensure consistency across outputs.
7. **Sector Expert Leads:** GHG inventory compilation and NDC tracking expertise and data are currently dispersed among ministries, the University of Liberia and national consultants, and there is no clear organisation and continuity between projects for each sector. Sectors need defined lead organisations and will be the custodians of the data and expertise for compiling the GHG inventory and tracking progress against Liberia's NDC targets. **Sector Expert Leads** were suggested during the final workshop, listed below; these will need formalising through a structure legal framework and consideration of the resource requirements within each organisation for assigning staff to these responsibilities.
   a) Energy: Ministry of Mines and Energy
   b) IPPU: Ministry of Commerce
   c) Agriculture: Ministry of Agriculture
   d) LULUCF: Forestry Development Authority
   e) Waste: Ministry of Internal Affairs
8. **The role of the University of Liberia:** Whilst staff turnover can be high in government and line ministries, academia can offer a long-term solution to knowledge and expertise retention. Currently, the University of Liberia (UoL) offers cross-cutting expertise for all GHG inventory sectors. UoL could provide an opportunity to institutionalise data collection and management processes.

3.1.2 Developing the legal framework

Several legal instruments are recommended to formalise Liberia's proposed roles and responsibilities:

1. **Overarching legal framework:** An overarching climate change legislation would formalise the roles and responsibilities discussed in this report. Without the supporting legal framework, data management and sharing will remain ad-hoc and project based. The legislation would also provide justification for resource requests and allocations for additional responsibilities as part of the MRV system.
2. **Data sharing agreements and Memorandums of Understanding:** Data sharing relationships between organisations (e.g. between Sector Expert

Leads and data providers) should be formalised and strengthened with specific data sharing agreements and Memorandums of Understanding (MoUs). The process of developing these instruments will also help to define to all stakeholders the type and format of the data required. A stepwise approach to developing these agreements is outlined below:

a) Identify data needs at the sector level for both GHG inventory compilation and NDC tracking.
b) Identify relevant data provider organisations to be responsible for data supply
c) Draft data sharing agreements that define the scope of the data that will be shared, the frequency and format of the data sharing, the effective date and duration for data sharing and the key contacts.
d) Identify resource needs for data sharing

3.1.3 Secure long-term resources for the MRV system

Securing resources for the MRV system to function and evolve to support decision making and reporting. Management of the MRV system will fall under the EPA's Multilateral Environmental Agreements (MEA) Unit. EPA's MEA will need long-term human and IT resources to manage the MRV system and its regular outputs.

1. In the short term, **CBIT project activities will provide resources for additional support** including *Output 1.2.1 Online system for collecting and managing all NDC information and data transparency including GHG inventory in collaboration with Liberian Environmental Protection Agency*
2. **Strong coordination (e.g. through the proposed MRV Coordination Unit) can help develop and maintain a pipeline of funding for capacity building** and development projects for continued work on the MRV system in the short term. For example, by mapping out funders and funding avenues (CBIT, UNDP Global Support Programme, bilateral support etc.) against identified capacity building needs to ensure direction and coherence with development projects.
3. Longer term, **sources of funding should be identified to resource the additional responsibilities involved with the MRV system**. One example from the stakeholder workshop involves using a percentage of funds generated from license granting by the Inter-Sectoral Department within the EPA to fund the MRV system activities.

3.2 Expertise

The MRV system should ensure that there is a technical team of experts trained and available to produce regular outputs, inform decision makers as necessary and provide material to inform wider audiences on progress and ambition. The MRV system will ensure that experts are able to work effectively and that knowledge is retained and passed down from senior experts to junior experts. The system will ensure that junior experts stay and can progress in their roles.

The technical team of experts should be capable of regularly gathering and processing the required data to produce the necessary outputs. The team should have suitable back-up expertise, training material, recruitment initiatives and, where possible, succession and progression to motivate longer term involvement. The technical team may need contracted external expert support for early development of systems or certain developments or review of outputs. There should always be a knowledge and data transfer process for this external expertise to build capacity with the national team.

This should be the responsibility of the national team coordinator and not the external expert. The key institutional arrangement recommendations are elaborated below.

3.2.1 Organizing and resourcing the technical and managerial team

Liberia's MRV system needs sufficient capacity and expertise across GHG inventory and NDC tracking themes to perform its functions of gathering and analyzing data, producing reports, and fully engaging with stakeholders. Liberia also needs to clearly define which are the main national experts dedicated to the range of thematic technical data gathering, analysis and reporting and the managerial activities required. The definition of the MRV Coordination Team and Sector Expert Leads (discussed above) will contribute towards achieving this objective.

Liberia's draft first BUR (BUR1) outlines the resource requirements needed to institutionalize the GHG inventory compilation and coordination teams. This exercise should be repeated for all elements of the climate change reporting system including adaptation, mitigation action and adaptation. The table below provides an example.

Table 3.Estimate of basic resource needs for climate action related transparency systems for small to medium sized countries (e.g. 300,000 - 30 million inhabitants)

	Suggested resources				Antigua and Barbuda		
Transparency Area	Number of people and workload (% of time)	Full Time Equivalent (FTE)	FTE for backup and succession (+30%)	Total FTE	FTE available	FTE Gap	Comments
Transparency system administrator	1 Person @ 50%	0.5	0.2	0.7			
Adaptation							
Adaptation MRV coordination	1 Person @ 100%	1	0.3	1.3			
Climate variables	3 People @ 35%	1	0.3	1.3			
Vulnerability, risks, loss and damage	10 People @ 30%	3	1	4			
Adaptation action[1]	15 People @ 20%	3	1	4			
Mitigation							
Mitigation MRV coordination	1 Person @ 100%	1	0.3	1.3			
GHG inventory[2]	5 People @ 50%	2.5	1	3.5			
Projections	3 People @ 50%	1.5	0.3	1.8			
Mitigation action	15 People @ 20%	3	1	4			
Investment (Climate finance and support)							
Investment & support	1 Person @ 50%	0.5	0.2	0.7			
Total	30–55 Stakeholders	17	6	23			

Most of the team (except for coordinators) will constitute **Lead Experts** who will work proactively on gathering, analyzing, compiling, and reporting information for their technical area. In addition to their primary roles, lead experts should also act **as support experts to review** methods, data source and assumptions for another lead expert. This builds wider collaboration on methods, data sources and assumptions and contingency so that support experts can easily stand in for lead experts if needed. Expertise does not need to be in a single organisation. Expertise can come from a range of organisations so long as appropriate terms of reference and coordination of work is in place.

Where possible the team should **include junior experts**, for example one junior to two lead experts, to support lead experts in data gathering and estimate updates at busy times. Junior experts will provide succession, back-up and fresh insights into methods, data sources and assumptions and new skills (often in data processing and engagement).

Hiring new experts: The expertise outlined above may not be readily available within the existing institutions. Resources need to also support recruitment activities and subsidize salaries/contracts to fill any gaps in the available expertise where external support is required.

Training: Where existing experts are taking on new responsibility, resources will need to be channelled into training. It is worth noting from a resourcing point of view that, where possible, training sessions should be delivered to multiple staff to build a broader knowledge base across the organisation. Training will ensure that experts feel they have adequate knowledge of the latest thinking surrounding the transparency themes and sub-themes within the MRV system. This could include specific technical training for activities such as GHG inventory compilation, QA/QC or climate change vulnerability and impact assessments. It could also include training on any new systems or technologies introduced as part of the transparency system, for example training for coordinators on any new IT systems.

Specific expert areas of the MRV system that need to be considered include:

- **GHG Inventory –** Through the CBIT project Liberia has a good foundation for its GHG inventory team. There are many national experts with some capacities and understanding of GHG inventory compilation. The challenge is retaining that knowledge among a few core members capable of undertaking the regular updates with experience in applying the IPCC guidelines. Sectoral experts (senior and junior) should be identified to provide continuity for future training and inventory compilation projects.
- **Projections and Mitigation Actions –** Liberia needs to build its technical capacity in collecting data for mitigation actions, assessing the impact of actions against targets and the development of projection scenarios. Future capacity building activities should focus on structuring data collection and management and the development of indicators for climate change mitigation.
- **Adaptation, Risks, vulnerabilities and climate change trend tracking –**Whilst this project has focussed primarily on mitigation and the GHG inventory, adaptation is an important theme to cover in future MRV system development projects. There is significant overlap in terms of mitigation and adaptation action tracking and as such the training needs for data management should be considered consistently between the two.
- **Climate finance**: An upcoming UNDP project to develop the Ministry of Finance and Development Planning's Project Dashboard (https://www.liberiaprojects.org/) into a climate finance tracking tool is significant for Liberia's MRV system more broadly. Climate finance is an important aspect of the Paris Agreement MPGs and will need to be integrated into the data flow managed by EPA. As such, expertise in identifying and reporting climate finance elements are needed. This may require coordination between the EPA MRV coordination unit and the Ministry of Finance and Development Planning.

3.3 Data flows

The MRV system should ensure that data is available for monitoring challenges, progress, ambition, and the generation of indicators, ensuring that reports are available and continuously improving. This will ensure that data providing stakeholders are engaged and understand that their data is used for a valuable national purpose.

Data flows need to be identified, explored, and secured for long term input to the MRV system. This includes managing the required datasets and data providers for an efficient data flow on trends (statistics, measurements, GHG emissions and removals), risks and vulnerabilities (from climate change), pressures (from GHG emissions) and the character, costs, benefits and impacts of adaptation and mitigation actions. Identifying and engaging with stakeholders who supply data will be key.

The EPA MEA Unit are currently responsible for the MRV data flow as UNFCCC Focal Point. The figure below provides a high level overview of the inputs and outputs of the system, some elements are still to be defined, e.g. the platform for the GHG Archiving Site and the role of the QA/QC Coordinator. This system should be expanded and further developed to cover the full scope of the MRV system including GHG projections, climate variables, analysis of loss and damage and risks and vulnerabilities as well as information on mitigation and adaptation projects and their support and investments and investors from a range of different stakeholders. This will be critically important for supporting the production of indicators to track outcomes and present in outputs.

The following recommendations for the development of the MRV systems data flows are provided below.

3.3.1 Map out data flows and compile a list of datasets and data providers

The figure below provides an overview of the data flows for the MRV system. A list of the datasets and data providers will be an important tool within the MRV system. This list and the associated management of data gathering activities should cover the full thematic scope of the MRV system across mitigation, adaptation, and support.

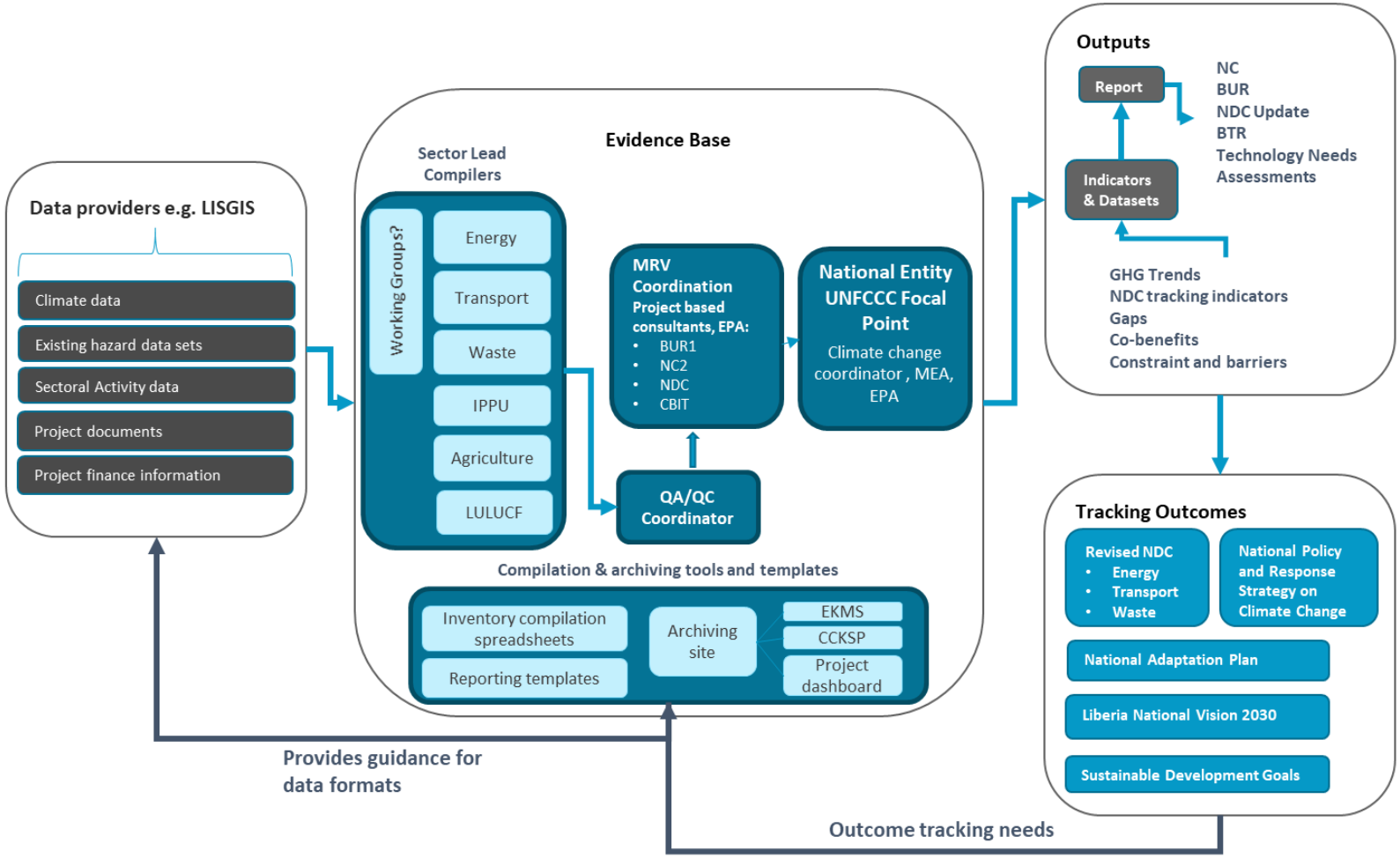


Figure 3. Liberia's data flow for climate change information

3.3.2 Consolidate existing material into the MRV system

The work to formalise the data needs and gathering activities and to consolidate existing datasets should build on the work done across a range of report development projects including:

- Data collection for **mitigation action** for the compilation of the BUR1, 2nd NC (NC2) and revised NDC.
- Data on **Adaptation, risks, vulnerabilities, loss and damage and climate change variable trend tracking** collected to analyse Liberia's resilience, risks and vulnerabilities for reports including the National Communications.
- Any data to be collected on **Climate finance and associated stakeholders for the upcoming UNDP climate finance tracking project.** This work should provide a good foundation upon which to build a sustained data flow, analysis methodologies and classification systems for tracking climate finance.
- The **Ministry of Finance and Development Planning's database of the ongoing and proposed environmental projects** with relevant information for climate mitigation and adaptation efforts including funding amount from donors expanded to include information related to all climate support funding from public, private and international development aid investors.

The MRV system will need to incorporate the above and other material into its systems and archives.

3.4 Systems and tools

The MRV system should ensure that there is sufficient coordination, support and tools available for the technical experts to manage the data flow, produce timely outputs of a sufficient quality that track outcomes and fully engage stakeholders and that improve overtime.

This requires managing the production, summarisation, reporting and archiving of data and analysis on climate trends, risks, and impacts, the GHG Inventory, projections and GHG reduction targets, support (including climate finance) and adaptation and mitigation actions. It includes developing the templates for data collection and establishing data sharing agreements as well as the development and maintenance of indicators, regular production of reports, data analysis tools and Quality Assurance and Quality Control (QAQC). The institutional arrangement recommendations related to systems and tools are included below.

3.4.1 Develop a GHG Inventory Archiving Hub

Liberia needs a central storage facility to save and share relevant files for the GHG inventory. This includes a list of key stakeholders, data collection templates, data compilation files, previous inventory calculation files and copies of national inventory reports. During the stakeholder workshop, stakeholders identified the Environmental Knowledge Management System (EKMS) as a suitable facility for storing this information. The EKMS has a password protected cloud storage facility designed to share files and folders. Developing this platform into a inventory management system would be possible given the following conditions:

- That the site administrators had adequate resources to manage and maintain the cloud storage facility
- That the inventory archiving system followed a pre-defined structure

- That all relevant stakeholders including MRV coordinators, sector lead experts, and inventory compilers had access to the cloud storage facility

If there are challenges in meeting the above conditions, an alternative option is to develop a separate GHG archiving platform. Aether has developed a draft platform for Liberia as proof of concept and to provide a template for future arching and tracking activities.

3.4.2 Develop an NDC Tracking platform

In addition to a GHG inventory archiving system, Liberia should develop a tool to track progress against NDCs. The first step in developing this tool is to build up a database of actions based on existing data collection activities such as the BUR1, NC2, revised NDC or project dashboard. This tool could be Excel based and stored on the EKMS ensuring access to a wide range of stakeholders. Alternatively, it could be a more sophisticated web-based platform. The current data management platform most suited to track this kind of information is the Liberia Project Dashboard, as it already stores a database of project-by-project based information. Adapting this site to meet the needs of an NDC tracking system would have the added benefit of integrating climate change issues with mainstream development tracking. However, as this site is managed by the Ministry of Finance and Development Planning, there are challenges with ministerial coordination and ownership that would need to be overcome. Neither the EKMS nor CCKSP sites are currently set up to accommodate a more sophisticated web based NDC tracking tool and IT development work would needed to identify if they could be modified to track national progress against NDC objectives on a project by project basis.

Aether's draft GHG Inventory Archiving and NDC tracking platform provides an example and a solid starting point for tracking climate action in Liberia. Once operational, this site can be used to build the database of Liberia's climate actions which can either be stored on a fully developed version of Aether's platform or integrated into one of Liberia's alternative platforms.

3.4.3 Develop and maintain an improvement plan

Liberia should establish a list of its improvement needs for the MRV system and store this in a centralised archiving location. This should include proposed, planned, and implemented improvements to the MRV system and be used to engage stakeholders for prioritising and addressing Liberia's gaps and needs.

Liberia identify a range of improvement recommendations for data flows, expertise, systems and tools and for stakeholder engagement in reports such as the draft BUR1, NC2 and through the GHG inventory capacity building project which can be consolidated into the MRV systems improvement plan.

3.4.4 Workplans, terms of reference and templates for outputs

Liberia should keep and elaborate a central archive (EKMS) of its workplans and terms of reference and document templates for re-use and refinement within its MRV system. This includes templates for the NDC implementation plan, NAP, NCs, BURs and BTRs provided to the UNFCCC and wider national audiences.

3.4.5 Developing theme specific impact estimation tools and approaches

Continue to develop tools and processes for compiling the GHG inventory. This should include the use of GHG data collection, Microsoft Excel compilation spreadsheet templates as well as country specific tools for more complex calculations and pre-processing of data tools for example CollectEarth for LULUCF estimates.

Mitigation and adaptation action tracking and impact quantification: Liberia needs to build a structured database of mitigation and adaptation actions. This can be informed by the BUR1, NC2 and revised NDC development processes. This could be done in close coordination with the Ministry of Finance and Development Planning with respect to data collection for development aid projects through the Liberia Project Dashboard. As well as tools for structuring, gathering, and sharing information, the EPA should also consider developing tools for estimating and tracking the various expected outcomes of action/projects. These can include calculation tools for different sectors to estimate GHG savings as well as parameters to quantify resilience and adaptation.

Liberia should also develop and consolidate its tools (and training material) for assessing climate resilience, risks, vulnerability and loss and damage. This also includes tools for analysing meteorological, hydrological and other monitoring data.

3.4.6 Indicator development and management system

Liberia should develop a comprehensive set of climate change related indicators that underpin its NDC, NAP and climate finance objectives and help stakeholders track progress on a regular basis. The revision of the NDC will be particularly important for any future work to develop indicators to track progress against Liberia's outcomes.

3.4.7 Metadata categorisation

Liberia should consider developing a comprehensive set of classifications and vocabularies to manage and communicate on its threats and challenges, action, technologies and funding/finance types. A number of existing term sets and classifications used in existing reports can be consolidated into classification libraries in the MRV system. Examples include the GHG inventory and the revision of the NDC.

3.4.8 Public information and stakeholder engagement tools

Liberia should develop a clear single point of entry and standardised communication approach to providing stakeholders with information on progress. This should be developed alongside the EPA communication strategy and thematic activities that generate regular data on the GHG inventory, projections, for assessment of risks and vulnerabilities, loss and damage and adaptation action. The indicators and lists of actions/projects will form a central part to these tools. The EPA are simultaneously developing the EKMS and the Climate Change Knowledge Sharing Platform (CCKSP). CCKSP has a good archive of resources and stakeholder organisations relevant to climate change reporting. Coordinating bodies should discuss and define distinct roles for the EKMS and CCKSP systems to provide a transparent perspective on progress and ambition for a wide range of stakeholders.

3.4.9 Quality Assurance and Quality Control

EPA MEA should develop a comprehensive QA/QC system that provides overarching as well as sector/project/activity specific guidance on QA/QC for managing its climate

change related data flows, expertise and stakeholder engagement. This should build on existing guidelines and procedures developed for QA/QC of data uploaded to EKMS and should include GHG inventory specific measures.

3.5 Stakeholder Engagement

The MRV system should excel in reaching out to a broad range of stakeholders (public awareness and education, national government, local government, private sector businesses, NGOs and the media) to bring knowledge about threats and challenges, potential actions and wider impacts and support and finance to their decision-making processes. It includes stakeholders involved in the implementation of action and the provision of data to the MRV system.

Stakeholder engagement (public, local communities and self-governments, business and other decision makers) is required for collecting data and for making use of the outputs from the MRV system for sound evidence-based decision making for action. It can include finding and offering stakeholders the benefits of their involvement and ensuring efficient outputs for publications (BUR, NC, NDC). There is an important link to consider in the wider impacts of climate change action and National Economic and Sustainability goals. This work also keeps the profile of improvement needs of the MRV system high. Recommendations for stakeholder engagement elements of the institutional arrangements included below.

3.5.1 Establish a schedule for NCCSC coordination of stakeholder engagement

The National Climate Change Steering Committee (NCCSC) is a coordination body that is under-utilised in Liberia due to resource constraints. In order to increase the impact of NCCSC, a plan should be put in place for resourcing the NCCSC and a schedule drawn up for their regular engagement on MRV system outputs (the GHG inventory, BUR/NC drafts, summarised policy options and impacts for national strategies).

3.5.2 Develop communications plan for disseminating MRV system outputs

In order to generate momentum and increase engagement with the climate change agenda, Liberia should identify the best way to represent the MRV system outputs with most impact (infographics, data visualisations, briefing notes etc.) and draw up a timeline for regular engagement of decision makers and the general public.

Annex 1: Stocktake of current MRV strategies, tools activities and gaps

Background and approach

This section of the report provides details of the current state and recommendations for Liberia's Monitoring, Reporting and Verification (MRV) system that will support its tracking and communication of the GHG Inventory and NDC progress. The MRV system will support reporting to the UNFCCC (under the Paris Agreement Decision 18/CMP1), as well as supporting national and sub-national decision makers on issues related to climate action. There are three important concepts to understand when considering a national MRV system:

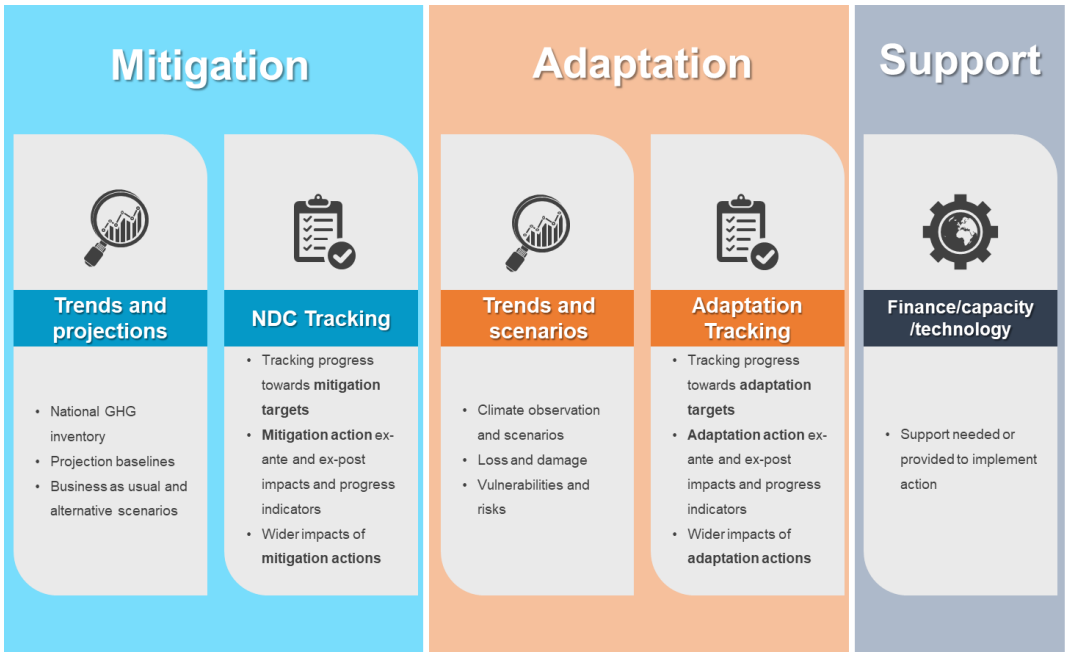
4. **MRV themes** help to sub-divide the subject matter into manageable chunks. (e.g. themes and subthemes of mitigation, adaptation and support).
5. **MRV system components** sub-divide the functions of the MRV system into manageable components (e.g. the organisation mandates, data flows, expertise, systems and tools and stakeholder engagement).
6. **Monitoring elements** provide some useful structuring to the administrative (e.g. stakeholders, datasets, workplans etc) and thematic (mitigation and adaptation) information managed in or signposted from an MRV system.

The sections below explore each of these concepts in turn.

MRV themes

Figure 1 illustrates the thematic information that can fall under the scope of the MRV system and helps to define necessary roles and responsibilities for different organisations. Clearly defining themes will be useful for managing the scope and structure of both the institutional arrangements and their roles and responsibilities as well as the data flows. Using themes will also help in categorising data inputs and outputs, scopes of work, MRV system improvements and even the details of climate change in reports. Figure 2 provides an overview of the MRV themes that can be used to help break down and define the scope of institutional arrangements.

Figure A1: Summary of the climate transparency themes included in the MRV system



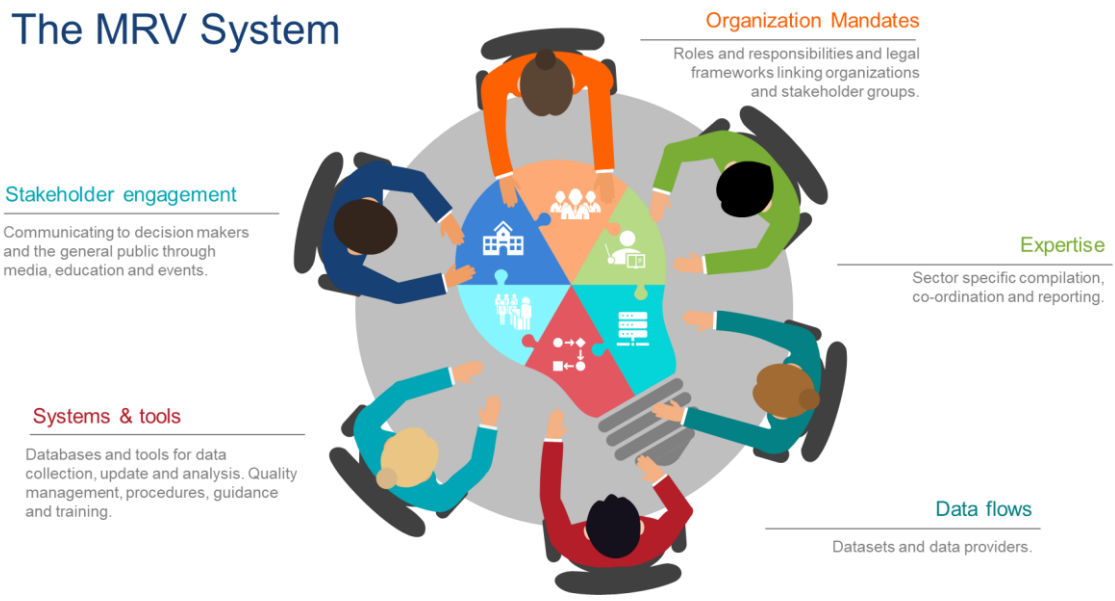
The themes above can have additional detail (sub-themes) which can provide further categorisation of sectors and their activities, impact areas, timeframes, related entities (organisations) and geographies.

It is important to note that whilst the Paris Agreement's Enhanced Transparency Framework (ETF) separates mitigation and adaptation, the underlying MRV systems (data and governance structures) for adaptation and mitigation could be very similar. It is often the same sectoral stakeholders that lead on mitigation and adaptation through key public or private decision-making processes focusing on energy systems, infrastructure, transport, agriculture, forestry, water, biodiversity, human health, waste etc. Although both adaptation and mitigation actions will have associated investment/support activities that are tracked at the action (project) level, there should also be centralised tracking of support/finance/investment. To account for this, we have also included a theme on **support/investment** to ensure this information is prioritised. This baseline assessment and the development of Liberia's MRV system will focus on the **Mitigation** theme, including GHG Inventory (trends and projections) and NDC Tracking (mitigation targets, actions, co-benefits and indicators). However, our assessment will highlight potential synergies with adaptation and support tracking where relevant and possible.

MRV system components

We split the MRV system into five key components as shown in the figure below.

Figure A2: Key components of an MRV system



7. **Organisation mandates** cover roles and responsibilities as well as agreements, laws and commitments
8. **Expertise** including data, modelling, compilation and reporting experts across a range of themes.
9. **Data flows** for the data necessary for the MRV system to be of value.
10. **Systems and tools** for information, communication and engagement
11. **Stakeholder engagement** to build value for the data and to drive public participation in the political process of climate change decision making.

These components cover a range of formalities and activities across several different organisations. These organisations might include government ministries and/or agencies, academic/research institutions, local self-government, private organisations and consultants.

Well-functioning MRV systems will be flexible and sustainable and ensure that expertise is available for recurring and continuously improving data gathering, compilation, analysis and reporting.

These components are described in more detail below.

Organisation mandates

Organisation mandates will include the agreements and terms of reference that ensure organisations and individuals in organisations are able to work together to gather, analyse, compile, report/communicate, archive useful information and monitor progress with the national climate agenda and the Paris Agreement. Overarching organisational structures and agreements will often need to be defined and formalised with agreements for data provision and reporting. These can range from national climate laws to organisational mandates, individual contracts and data supply agreements (see Legal and policy frameworks).

A well-functioning MRV system will ensure that there are sufficient laws, agreements and terms of reference in place to enable the availability of experts, flow of data, systems and tools in place and sufficient communication and engagement with

stakeholders for the MRV systems data to be useful to decision makers and for national engagement in the Paris Agreement.

Expertise

National experts should be capable of regularly gathering and processing the required data to produce the necessary outputs. The team should have suitable back-up expertise, training material, recruitment initiatives and, where possible, succession and progression to motivate longer term involvement. The technical team may need to be complimented by contracted external support while it is being established and/or for certain developments or review of outputs.

A well-functioning MRV system will ensure that there is a technical team of experts trained and available to produce regular outputs, inform decision makers as necessary and provide material to inform wider audiences on progress and ambition. This will ensure that knowledge is retained and passed down from senior experts to junior experts and that junior experts stay and can progress in their roles.

Data flows

Data flows need to be identified and secured. This includes managing the required datasets and data providers for an efficient data flow on trends (statistics, measurements, GHG emissions and removals), risks and vulnerabilities (from climate change), pressures (from GHG emissions) and the character, costs, benefits and impacts of adaptation and mitigation actions. Identifying and engaging with stakeholders who supply data will be key. Data Sharing Agreements (DSAs) can be established where appropriate.

A well-functioning MRV system will ensure that data is available for monitoring challenges, progress, ambition, and the generation of indicators, ensuring that reports are available and continuously improving. This will ensure that data providing stakeholders are engaged and understand that their data is used for a valuable national purpose.

Systems and tools

This requires managing the production, summarisation and archiving of data and analysis on climate trends, risks and impacts, GHG Inventory, projections and targets, support (including climate finance) and adaptation and mitigation actions. It includes the development and maintenance of indicators, regular production of reports, data analysis tools and QA/QC.

A well-functioning MRV system will ensure that systems and tools are available for the technical experts to manage the data flow, perform QA QC and produce timely outputs of a sufficient quality that improve over time.

Stakeholder Engagement

Stakeholder engagement (public, local communities and self-governments, business and other decision makers) is required for collecting data and for making use of the outputs from the MRV system for sound evidence-based decision making for action. It can include finding and offering stakeholders the benefits of their involvement and ensuring efficient outputs for publications (BUR, NC, NDC). There is an important link to consider

in the wider impacts of climate change action and National Economic and Sustainability goals. This work also keeps the profile of improvement needs of the MRV system high.

A well-functioning MRV system is able to reach out to a broad range of stakeholders (public awareness and education, national government, local government, private sector businesses, NGOs and the media) to bring its knowledge to their decision-making processes. It includes stakeholders involved in the implementation of action and the provision of data to the MRV system.

Monitoring elements

It is important to consider what is monitored, and how, within the MRV system. This includes:

- **Administrative information** needed for the MRV system to function, such as the datasets, stakeholders, expertise needed, the improvement plans, nomenclatures and classifications used and workplans for developing outputs
- **Thematic information** that is at the core of the system and its outputs are reports, briefings, engagement and support tools. This includes key challenges relating to loss, damage, risks, GHG trends, the actual mitigation, adaptation actions and their support.

Further details are provided below.

Administrative information

The administrative information includes a range of lists necessary to keep the MRV system functioning. This information represents the MRV system's institutional memory of who does what, when and with what. It also includes information on how it ensures it meets its quality objectives and on its plans for improvement. This information can include:

- **Details of the MRV system scope & components** to determine its contents. This will include the thematic areas it covers (e.g. all parts or none of mitigation, adaptation and or support) and the outputs required.
- **Outputs**: A list of the systems outputs linked to the data and experts required to produce them. The priorities of different outputs will link to and set priorities for datasets, data flows, the need for experts and the engagement of stakeholders.
- **Data flows:** understanding of data flows is required to determine the datasets needed, their availability and update timings and mechanisms.
- **Roles and responsibilities** illustrated by the links between organisations involved in the MRV system. This will include the hierarchical aspects for managing the work needed in the MRV system.
- **Lists of Datasets** linked to the stakeholders that curate them and can provide them into the MRV system.
- **Lists of Stakeholders** that include data providers, data users, experts and other interested parties. The list identifies key contact points within an organisation and defines the role(s) that the organisation fulfils. It allows users to track the needs of the organisation and any Memorandum of Understandings that are in place.
- **QA/QC systems** which provide details of the planned activities and procedures (the plan), and a log and evidence of the completed QA/QC activities.

- **Improvement plans:** Improvement Plans provide a place to record ideas for improvements and track the progress of these improvement items. This is to encourage continual improvement of the System and the information it holds. The list contains information on the benefits of the improvement item, the item's progress and status and the resources needed to carry out the improvement. It also prioritises improvement items and links individual items to responsible individuals and organisation.

Thematic information

The thematic information includes the data, evidence and links to background information on the key challenges relating to the agreed themes covered by the MRV system (e.g. loss, damage, risks, GHG trends, the mitigation, adaptation actions, their support). The structuring of this data and / or metadata, where possible, will enable the system to efficiently support the preparation of a narrative on progress, ambition and transparency on the action. Figure 3 below outlines the linkages between the thematic information that will be gathered/organised/prioritised by the MRV system.

Figure A3. Monitoring elements for the domestic MRV system

- **Challenges:** include information on key risks and challenges for including vulnerabilities (for adaptation) and pressures (for example, for GHG emissions for mitigation). These are the challenges that the climate actions should address. The structuring can allow for a simple quantification of the challenge by assessing the level of exposure to the risk, the sensitivity of a system to the risk and the ability to respond.
- **Targets:** records numerical and non-numerical targets and objectives in a hierarchical manner. The information can be categorised by sector, geography and action type. The list also links targets to indicators and other forms of evidence that can be used to track progress.

- **Actions:** A list of actions is central to the MRV system. This list pulls together the information under specific climate actions/projects/policies and measures into a consistent, coherent and engaging form. Actions can be categorised, prioritised, linked to responsible individuals and organisations, quantified using estimated emissions reductions and linked to supporters, indicators and wider impacts.
- **Indicators:** allow the recording of data and information that track climate challenges, targets and actions. Information on indicators includes a description of progress, a description of the indicator (methodology, unit and update date) and links to key datasets.
- **Support/Investments:** Includes information on the support available for the implementation of climate actions and the MRV system. The support list can also be linked to a climate action, supporters, recipients and beneficiaries. Support opportunities can be categorised by status, type and channel with information being provided on amount and progress of the support.
- **Wider Impacts:** Wider impacts are the additional impacts (positive and negative) that a climate action can have on other national strategies (e.g. economic, social and environmental) and on the UN's Sustainable Development Goals. The analysis of these wider impacts can strengthen the justification for the implementation of a climate action. It can also reveal potential areas of conflict where caution should be taken. The wider impacts can be subjectively classified using agreed classification approaches.

Review of existing overarching MRV system

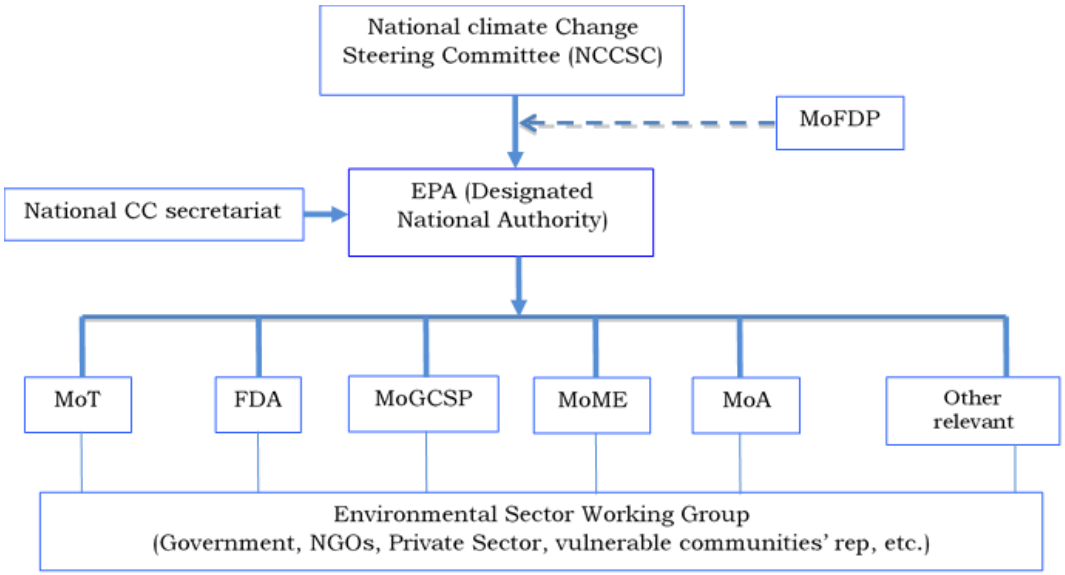
Liberia's First BUR (draft), First NC (28th June 2013) and Second NC (draft) highlight the current situation and steps for improvement to the way Liberia collects and manages data relevant to the Paris Agreement Enhanced Transparency Framework.

The sections below provide a descriptive review of Liberia's ability to monitor, report and to verify its evidence and data on climate change. Analysis focusses on the organisation mandates, data flows and technical capacity, tools and systems and stakeholder engagement needed to gather and continuously improve its evidence for the GHG Inventory and NDC tracking.

Organisation mandates

Liberia's UNFCCC reporting provides outlines for the different roles and responsibilities within the national system. These relate to the GHG Inventory system and, although not explicitly stated, tracking of climate action also. Figure 4 below illustrates which organisations and bodies are involved in the national system and how they are related to each other. The section below provides a summary of our understanding of the national system and a review of constraints and barriers.

Figure A4: Organogram of Liberia's national climate change reporting system (taken from draft BUR1)



The **Environmental Protection Agency** (**EPA)** is the designated National Authority, UNFCCC Focal Point and GHG Inventory Agency. Within the EPA, **the Multilateral Environmental Agreements (MEA)** department is responsible for climate change matters. MEA oversees the compilation of the GHG Inventory and coordinates contributing experts. MEA also oversees strategic short- and medium-term actions relevant to the NDC such as the Nationally Appropriate Mitigation Actions (NAMAs), National Adaptation Plan (NAP), National Adaptation Plan of Action (NAPA), National Climate Change Secretariat (NCCS) and National Disaster Management Agency (NDMA). As part of this role, MEA is responsible for mainstreaming climate change concerns and policy goals into broader national strategies. MEA successfully integrated climate change mitigation and adaptation goals (for 2030) into the development agenda *Pro-Poor Agenda for Prosperity.* However, integrating these elements into long term development planning coordinated by other agencies e.g., National Land – Use Policy and Plan, has proved more challenging.

The **Ministry of Finance and Development Planning (MoFDP)** play an important role in supporting the EPA with their responsibilities. MoFDP are responsible for planning, budgeting and coordination of climate change policy activities. MoFDP mobilise and allocate financial resources for climate change in Liberia and provide Monitoring and Evaluation (M&E). The division of labour between MoFDP and EPA is not clear relating to climate change activities, with both organisations contributing to the development of policy design and guidance documents such as data collection and management protocols.

A focal point for collaboration, the **National Climate Change Steering Committee (NCCSC)** brings together a broad range of stakeholders to collaborate on nationally important cross-sectoral strategies**.** Established by presidential decree in October 2010, the mandate of the NCCSC is to coordinate and supervise the implementation of climate policy. NCCSC provides oversight and high-level support for climate change policy (including GHG inventory reporting). NCCSC is responsible for ensuring that Liberia achieves its policy goals which requires engaging key decision-makers and reviewing legislature to secure adequate and accessible funding. NCCSC's role also involves authorizing any external support needed and annually reporting on progress made

towards implementation of the climate change policy, although it is unclear whether NCCSC produce these reports. Membership of the NCCSC is far reaching and includes representatives from the following organisations:

- President of the Republic of Liberia-ex-official
- Energy, Environment and Climate Change Advisor to the President of Liberia
- Heads of Standing Committees on Environment and Natural Resources of the Senate and the House
- Minister of Planning and Economic Affairs (MoPEA)
- Minister of Mines and Energy (MME)
- Minister of Agriculture (MoA)
- Minister of Finance (MoF)
- Minister of Gender and Development
- Minister of Transport
- Minister of Finance & Development Planning
- Managing Director of the FDA
- Executive Director of the EPA
- Chairman, National Investment Commission
- Commissioner of Liberia Maritime Authority
- World Bank
- University of Liberia
- Civil society
- Fauna & Flora International
- National Climate Change Secretariat Coordinator

The **National Climate Change Secretariat (NCCS)** is an operational body supporting the activities of the NCCSC. The NCCS is housed within the EPA and is reportedly responsible for the administrative and coordination capacities of the NCCSC. The NCCS maintain the records of the NCCSC and keep track of policy implementation. Several identified barriers and constraints listed relate to strengthening and engaging NCCSC and NCCS which suggests these bodies do not currently have the resources to actively engage with the national system. NCCSC and NCCS are periodically active, heavily dependent on budgeting for meeting attendance.

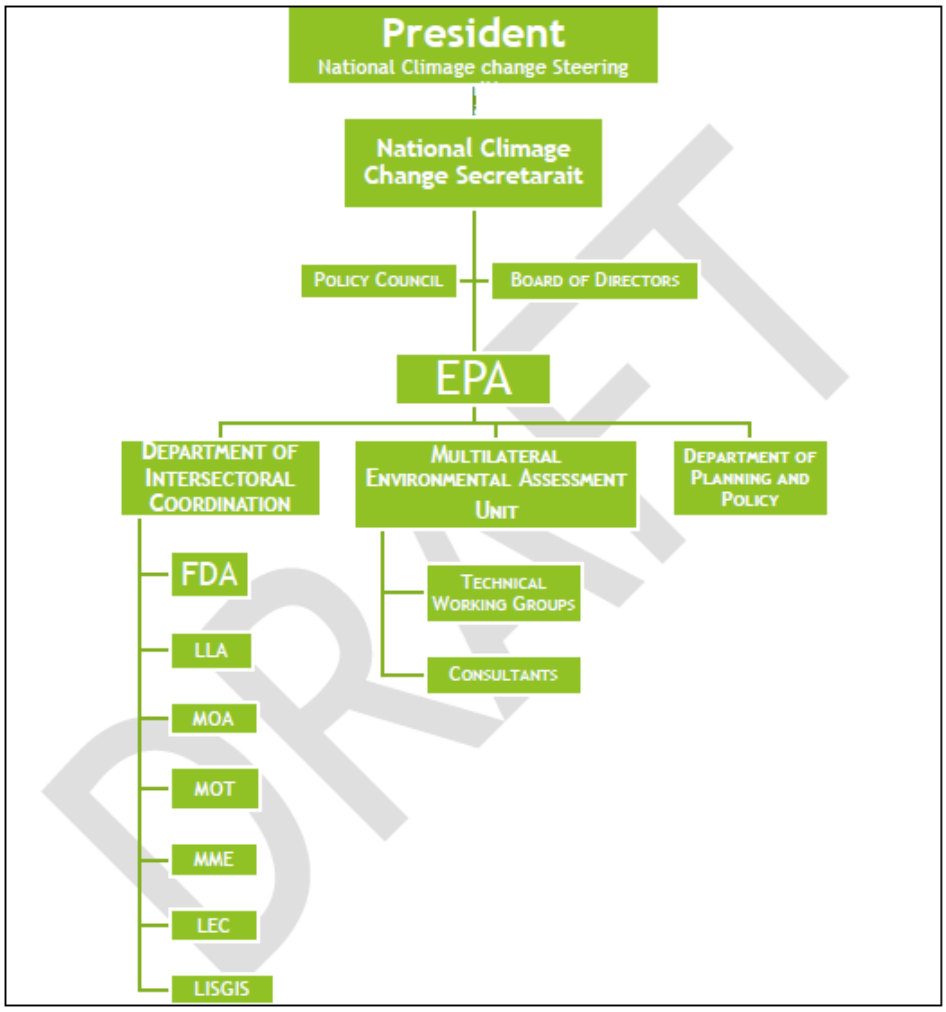
A number of organisations support EPA with the implementation of climate change policy including:

- Ministry of Transport (MoT)
- Forestry Development Authority (FDA)
- Ministry of Gender, Children and Social Protection (MoGCSP)
- Ministry of Mines and Energy (MME)
- Ministry of Agriculture (MoA)
- Liberia Land Authority
- Liberia Institute of Statistics and Geo-Information Services

These organisations are also involved in data collection for the GHG inventory under the BUR project through **Technical Working Groups (TWGs)** established by EPA. This is a development from the NC1 project which saw the compilation of the GHG Inventory undertaken by external consultants. However, it is unclear as to whether the role of the TWGs is formalised and backed by a legislative instrument or if it is project funding dependent. The TWGs are responsible for data collection activities, with the compilation of the GHG remaining the responsibility of the MEA. It is unclear how these

responsibilities relate to climate action tracking. The TWGs are working under the supervision of coordinators within the MEA unit. A revised, proposed set of roles and responsibilities is also included in the BUR1 (Figure 5) however, it is unclear as to the operational status of these arrangements. These arrangements include the TWGs, but also introduce a Department of Intersectoral Coordination to coordinate input from various organisations.

Figure A5. Proposed roles and responsibilities set out in the BUR1



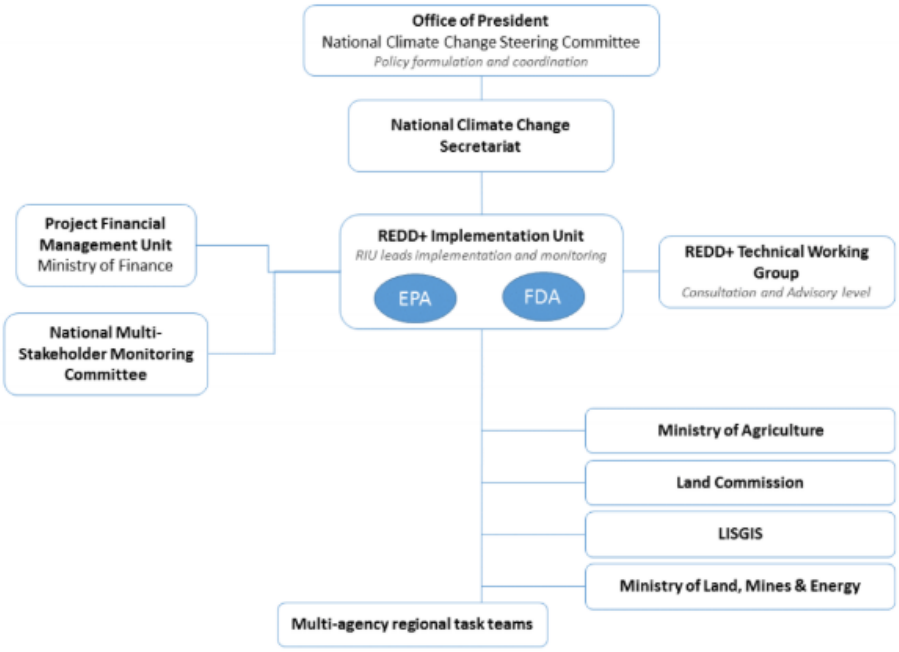
Stakeholder engagement and barriers and constraints in the draft BUR1/NC2 documents have highlighted the gaps in the **legal framework** underpinning the MRV system. The NC2 flags that MEA has a weak mandate for requesting and sharing data for the GHG Inventory and on climate action. There are no formalised data sharing agreements or other Memorandums of Understanding (MoUs) that facilitate the flow of information across the whole national system. Similarly, Liberia is lacking overarching legislation to provide EPA or MoFDP with a means to request resources for the national MRV system (including for the regular engagement of the NCCSC).

In addition to the roles, responsibilities and legal framework that has been defined at the national level, across all sectors, national institutions have also developed an **MRV system focused on REDD+ implementation**. Figure 6 illustrates the specific roles and responsibilities identified for REDD+ implementation. Common elements with the national MRV system include the role of NCCSC and NCCS, input on project financing

from MoFDP, the presence of a REDD+ Technical Working Group, which mirrors the TWGs established by EPA for the BUR project, data input from a range of institutions, and the central role of EPA as the main coordinating body. In addition, the REDD+ implementation MRV system proposes a coordinating role for the Forestry Development Authority (FDA) and includes an M&E role for a National Multi-Stakeholder Monitoring Committee. There exists a form of MoU between FCA and EPA that could be replicated and expanded for the national MRV system, although it is not an explicit data sharing agreement.

Interestingly, the National Strategy for REDD+ in Liberia[1] (FDA REDD+ Implementation Unit, 2016) highlights the lack of institutional strength within the NCCSC as a body and the challenges that presents in integrating REDD+ into national policy. The strategy document suggests integrating REDD+ planning with development planning under **The Liberian Development Alliance (LDA).** The LDA is the Government's most strategic forum for engaging state and non-state actors on the national development agenda. It is chaired by the president and led by MoDFP. This has implications for the national MRV system and the integration of the climate change agenda more broadly which does not feature significantly in either Liberia's 2013-2018 *Agenda for Transformation* or the long-term development strategy *Vision 2030: Liberia Rising.* This is an important consideration as climate change mitigation and adaptation affects cross cutting issues for a number of topics included under Agenda for Transformation's Pillar II – Economic Transformation, e.g. agriculture and food security, infrastructure and forestry and protection.

Figure A6. Roles and responsibilities for REDD+ implementation



The BUR1 also identifies a list of key resource needs and barriers for the operationalization of the MRV system:

[1] Available here: https://drive.google.com/file/d/1syrwnfZpFpjJzr0xAkAAJFU3gFr8fAb0/view

- Sectoral working groups need to be identified (financial support requested $30,000)
- NCCSC continuously engaged (estimated at $150,000 per year)
- Establishment of a GHG inventory Technical Advisory Committee requested led by EPA ($60,000 per year)
- Inventory management team within EPA ($50,000 per year)
- MoUs put in place

Expertise

The draft BUR1 identifies a lack of technical capacity to compile the national GHG Inventory or to analyse, develop or cost climate change policies and measures. The establishment of the TWGs is a positive first step in building teams of experts but as outlined in the section above it is unclear what expertise has been recruited into the TWGs. One of the key challenges identified in the BUR1, is that the lack of a dedicated, effective climate change committee or task force means that for each new climate change activity, new technicians are nominated by parent institutions who have no previous knowledge of climate change issues.

The draft BUR1 and NC2 highlight that in-house technical capacity is limited in the following areas:

- Compilation of the GHG inventory
- Assessment of climate change mitigation and adaptation options
- Effective participation in the UNFCCC negotiation process
- Development of planning and policy documents, for example the Low Emissions Development Strategy
- Development of nationally or regionally specific emission factors

Data flows

The review of each sector in the sections above highlights the data availability, and indicates which datasets are regularly and reliably available for the data compilers. The formation of the TWGs looks to improve data availability and provide more coordination between data providers. Neither current nor proposed organisation mandates include the representation of industry and private sector level data suppliers. These are an important data source for the GHG inventory and of grass-roots climate action and often requires comprehensive legislation and active engagement to encourage their participation in the MRV system. One or more ministries can coordinate this. **The Liberia Institute of Statistics and Geo-Information Services (LISGIS)** has a key role to play in ensuring consistency across datasets for example on demographics, population, GDP etc. International sources of these datasets (e.g. World Bank, UN Energy Statistics or FAO) are also helpful in ensuring consistency across sectors.

The NC1 and draft BUR1/NC2 highlight that sustained access to a reliable body of scientific and technical information remains a challenge, and that ground level data collection has been difficult with monitoring stations deteriorating or lost leading to data gaps. Liberia has explored climate smart agriculture options[2] through supporting

[2] Wilson, Joe. (2018). Climate Smart Agriculture: A Strategy to Increase Smallholders Farmers Production and Mitigate Liberia's Dire State of Food Insecurity.

projects, the outputs of which relating to challenges for the agriculture sector and land use and will be important to incorporate in the national system.

Liberia's draft UNFCCC reports include project specific information on climate change actions, including a table with information on status of individual actions, the implementing agency, progress indicators and co-benefits. This demonstrates a good base to build on and the beginnings of a climate action database to further develop. During this project, it will be important to build on this climate action data and identify the flows of information that can support regularly tracking of this information. Existing data collection processes are reported as informal and ad-hoc. Data requests are sent as needed between national experts and staff of relevant ministries, departments, and agencies but are not currently supported by a legal mandate. The climate action data could also be improved with additional information on climate action and project level financing. This information often requires the coordination between several different ministries responsible for managing, overseeing or tracking the actions. The draft BUR1 flags a lack of transparency around the data flows on support needed or received and on tracking actual government expenditures on climate change. A 'bottom-up' approach to project level identification and tracking can support this.

Systems and tools

Through this project, it will be important to consolidate information of the range of different systems and tools being used by Liberia to monitor and track MRV system elements. It is noted that Liberia used the IPCC Software for the compilation of its GHG inventory for the draft BUR1. The NC1 proposed the development of a GHG archiving system for collecting and tracking inventory data, however this has not yet been implemented.

The most significant development in terms of knowledge or data management systems is the development of the **Environmental Knowledge Management System (EKMS)**[3] under the GEF funded Cross-Cutting Capacity Development Project (CCCD). Information of EKMS states that:

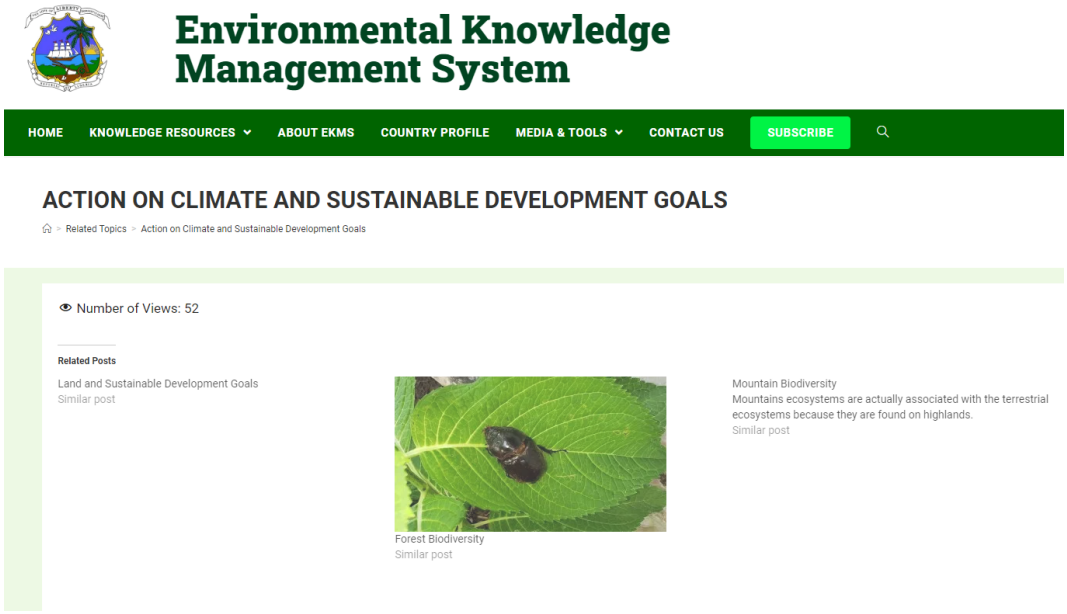
"The EKMS provides free and open access to information from key government and other institutions in Liberia relating to the implementation of the Rio Conventions – The United Nations Framework Convention on Climate Change, The United Nations Convention to Combat Desertification, and The United Nations Convention on Biological Diversity. The EKMS is deployed under the supervision of Environmental Protection Agency (EPA) in collaboration with twelve relevant government institutions. Information access on this platform include reports, publications, case studies, tools and guidelines, institution's technical documents, and other related materials."

EKMS provides a hub for linking datasets between Multilateral Environmental Agreements, as well as linking other existing data systems such as the Liberia REDD+ Safeguards Information system, the Liberia Data Portal, the Liberia Forest Atlas and the Liberia Farmers Registration Data. There a number of pages earmarked for listing information relevant to the MRV system such as on climate actions and SDGs (Figure 7 below), however, these have not yet been populated with any information. In its current form, EKMS is a useful tool for public engagement and disseminating general information about climate change and various other environmental issues. However, it

[3] Available here: https://ekmsliberia.info/

does not appear to be operational in terms of effective management of climate action information, tracking against NDC targets or providing effective institutional memory for the whole MRV system. More information is needed on the in-built infrastructure that would allow tracking of information on climate actions, indicators and key administrative information (outlined above). It would be useful to get a better understanding of the backend of the system and what a coordinator with appropriate user access rights has access to. Visually, the site could be an effective public engagement tool, however it would also require a developed database back-end to provide effective management of the MRV system data.

Figure A7: EKMS page for climate action



EKMS is also linked to a number of other existing data systems, these are summarised in the table below:

Table A1: Overview of Liberia's existing data systems linked to EKMS

Data portal	Description
Liberia REDD+ Safeguards Information System	A database interface that allows the user to generate reports showing the extent to which social and environmental safeguards have been addressed and respected in REDD+ activities. Allows the user to filter projects based on year, type, region, program and project. Generates a report (with the option to print) with safeguarding information organised by principles, criteria and indicators. No information available on the project activities themselves or climate change mitigation/adaptation impacts. User sign in also available.
Liberia Data Portal	Site storing statistics, datasets and data visualisations such as GDP and financial information. Topics include Agriculture, Economics, Education, International Trade and Poverty. Sponsored by the African Development Bank and owned by LISGIS. High level information on SDGs available. No data on climate observations or actions.

Liberia Forest Atlas	A database of GIS layers and datasets relating to Forest Management, Conservation, Agro Industry, Oil & Gas, Infrastructure and Administrative Boundaries. Also, a document archive for community forests documents, commercial forests documents, conservation documents and REDD+ documents. Administered by FDA and World Resources Institute (WRI)
Water Sanitation and hygiene (WASH)	Data portal with information about Liberia's WASH program, WASH survey data and datasets relevant to the WASH program. Limited overlap with data relevant for the climate change MRV system.
Liberia Farmers registration Data	The link to this page was non-responsive but information available on the Ministry of Agriculture's website indicates that the purpose of the platform is to provide information to Liberian farmers on the latest knowledge and information on farming varieties, breeds and fertilizers to improve productivity and efficiency.
Infrastructure Implementation Unit	A citizen engagement portal linked to a mobile app to submit information on infrastructure issues such as damaged roads, landslides and collapsed bridges.

Stakeholder engagement

The BUR1/NC2 highlights a key gap in public awareness of climate change issues as well as a low-level awareness from decision makers. There is limited engagement from non—state actors in the development, review and reporting of climate change actions or the GHG inventory. Several initiatives have tried to address these gaps, including the development of EKMS and the introduction of climate change issues into the national curriculum (proposed, not implemented).

There are two key aspects for stakeholder engagement:

- Engagement of a wide range of stakeholders (state and non-state) for data inputs into the MRV system
- Dissemination of the outputs of the MRV system to the general public, decision makers and the education system through engaging data visualisations, establishing channels of regular engagement to provide feedback on outputs of the MRV system (the GHG inventory, BUR/NC drafts, summarised policy options and impacts for national strategies) and integrating climate change issues into the curriculum.

The first of these elements is developed through the roles and responsibilities within the national system and establishing a vessel for feedback and communication. The NCCSC and TWGs provide channels for this but are not active in this space due to a lack of resources and political mandate. Currently, EKMS provides the primary platform for climate change information dissemination but is still in early phases of development. The integration of climate change issues into the national curriculum has been identified as a need within the draft BUR1/NC2. This could also include the development of the higher education curriculum and tie in with the development of a supply chain of technical expertise through university level training programmes. Active membership and engagement of NCCSC could provide an efficient channel for disseminating and consulting on the outputs of the MRV system, but as noted above it is only periodically active.

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