

A SWOT Analysis of Liberia's Natural Resources Management Environmental Policy Framework. Thematic areas addressed are: Environmental Enforcement (EPA); Mainlining (MME); Energy (MME); Agriculture (MOA); Transport (MOT); Fisheries and Aquaculture (NaFAA); Financial Drivers (MOEFDP); Forestry (FDA); Land (LLA); Water Resources, Sanitation and Public Works (MoPW); the Marine Environment (IMA); NRM and Education (MOE) and Agricultural Research (CARI)

Entity	Mandate	Operational Act(s)	Strengths Relating to Functions	Weaknesses/Threats	Gaps	Opportunities/Recommendations
EPA	The EPA protects the environment by implementing policy that ensures the long-term economic prosperity of Liberia through sustainable, social and economic development. The aim is to meet the needs of the present generation without undermining the potential of future generations. As its key function, the EPA (Section 5 of the Environmental Protection Agency Act), is mandated to collaborate with line ministries and agencies to (i) co-ordinate, integrate, harmonize and monitor the implementation of environmental policy and integrate environmental concerns in overall national planning; (ii) collect, collate, and analyze basic scientific data and other information pertaining to pollution, degradation of ecosystems and on environmental quality and resource use, (iii) train and build the capacity of line ministries and agencies; and (iv) ensure the preservation and promotion of important historic, cultural and spiritual values of natural resource heritage and, in consultation with local authorities, enhance effective natural resource management plans and activities.	Environmental Protection and Management Law (2003)	<ol style="list-style-type: none"> The Act has a strong alignment with the Rio Conventions Gives the EPA Regulatory, Coordinating, Collaborating and Supervisory functions Ensures public participation Upholds human rights Seeks Environmental quality standards Authority to issue Environmental Restoration Order Protecting the Right to a Clean and Healthy Environment Authority for Pollution Control And Licensing The Act has a section for Offences with strong penalties as deterrent Has inspection Authority and to analysis and records keeping The Act gives the EPA international obligations The Act is based on global Principles of Environmental Management and Objectives Undertakes Sector level Strategic Impacts Assessments (SEA) Focal point for all environmental issues Can propose policies and strategies for integration of environment into national development Has guidelines and standards for the management of the environment and natural resources Collect, analyze and prepare basic scientific data pertaining to pollution Build the capacity of line Ministries, authorities and organizations through the exchange of data and information Ensure the preservation and promotion of important historic, cultural and spiritual values of natural resources heritage Promote public awareness Establish environmental criteria, guidelines, specifications and standards for production and sustainable use of natural resources Investigate reports of pollution and other related matters Review sectoral environmental laws and regulations and recommend for amendments Function as the national clearinghouse for all activities relating to regional and international environment-related conventions, treaties and agreements Advise the State and participate in the process of negotiating, ratifying or acceding to relevant regional and international environmental agreements; Enter into regional cooperation for the management of shared natural resources and the harmonization of environmental laws and standards; 	<p>All of these provisions include the phrases, “the Agency [EPA] shall, in consultation with the relevant Line Ministry.” The first phrase seems to give the EPA the authority to act, with second phrase requiring only that the EPA consult with the Line Ministry before acting. With this compromise the EPA will never be able to give directives to ministries and other relevant stakeholders even if there is a need to do for precautionary or emergency actions.</p> <p>Lack of provisions for easement orders where irreversible damage is foreseen; but these may be established by regulations</p> <p>The Act now needs strong sectoral regulations</p>	<ol style="list-style-type: none"> Weak gender mainstreaming The Act gives the EPA certain omnibus roles which conflicts with the mandates of certain Authorities i.e. overlapping mandates with the FDA namely: <ol style="list-style-type: none"> Section 75 gives the Agency authority to declare rivers, lakes and wetlands as protected areas Section 77(3) gives the Agency authority to issue guidelines and prescribe measures for sustainable management of forests Section 77(7) gives the EPA authority to declare protected forest Section 79(1) gives mandate to the EPA to declare any land, lake, wetland and coastal zone as protected natural environment (i, ii, iii, iv, and v) are also mandates of the FDA especially the Conservation Department. The area of physical conservation of natural habitat should be the mandate of the Conservation Department of the FDA. Under section 84 EPA must promulgate guidelines for conservation of biological resources including the selection and management of protected areas EPA Cannot be responsible for waste management but to regulate waste management The Ministry of Agriculture is responsible for Agrochemicals through the (1) Liberia Fertilizer Regulatory Division Act (2) Liberia Plant Protection Regulatory Services Bureau Act All other chemicals could be regulated by the EPA including the importation and trading of Agrochemicals 	<ol style="list-style-type: none"> Strengthen the EPA’s regulatory powers to be able to challenge failures of entities to act resulting to environmental deterioration; Establish as urgently as possible a fast track environmental court to deal with environmental issues. This is now very urgent and cannot be postponed. The court will preside on all environmental issues (land degradation, biodiversity loss etc.); EPA to sought funds to train environmental judges Repeal FDA Regulation 113-08 and maintain the EIA Procedure; FDA should not duplicate the ESIA mandate Transfer Sections 77 and 78 to the FDA Transfer Sections 79 and 80 to the suggested Wildlife and Conservation and Protected Area Authority Transfer Section 81 to the Ministry of Mines and Energy Transfer Section 83, 84, 85, 86 and 88 to the suggested Wildlife and Conservation and Protected Area Authority Transfer Section 87 to the LLA Strengthen the regulatory role of the EPA with powers and means to arrest violators of the EPA Law. Following a Strategic Environmental Assessment, the EPA should be able to give directives to the institutions of the sectors concerned to remedy or put policies in place for the resolution of the situations that are causing the environmental degradation with time limits and penalties in the event of failure to act; For example “the absence of money is not an excuse for the municipalities to fail to clean up the environment to prevent illnesses to the population”.
MME	This ministry administers activities relative to mineral, water and energy. The Ministry formulates	5. Minerals and Mining	<ol style="list-style-type: none"> Chapter 8 deals with the protection of the environment 	<ol style="list-style-type: none"> The primary law governing mining is old and weak (Mines and Minerals Act 2000) 	<ol style="list-style-type: none"> The Artisanal Mining sector, however, remains largely under- 	<ol style="list-style-type: none"> It is therefore important to ensure that in the negotiating of mining agreements, the

<p>and implements policies and provides industry with information about Liberia's geology. It also works along with the Ministry of Agriculture and the University of Liberia to conduct training and research on land rehabilitation.</p> <p>The energy sector of Liberia includes four main subsectors, including:</p> <ol style="list-style-type: none"> 1. The power sub-sector, with Liberia Electricity Corporation (LEC) at center; 2. the petroleum sub-sectors, including upstream petroleum, with National Oil Company of Liberia (NOCAL) at center and downstream petroleum, with Liberia Petroleum Refining Company (LPRC) at center; 3. the rural energy sub-sector, with Rural and Renewable Energy Agency (RREA) at center; and 4. Energy sector governance, with Ministry of Mines and Energy (MME) at center. Energy infrastructure is one domain where Liberia is vastly disadvantaged relative to the rest of sub-Saharan Africa and the world, especially in the sphere of electrical power. Liberia has one of possibly the highest cost electricity on the continent, Liberia's rate of access by the population to publicly provided electricity is close to 11%, with Liberia Electricity Company effectively serving about 88% of the Monrovia urban population. <p>The future of mining holds good promise if high standards can be maintained in sector governance so as to avoid the resource curse and a narrowing of the national economic base. Cognizant of these challenges, and the fact that minerals are a finite resource, the administration has been working to update the legal, institutional and regulatory framework for the extractives sector. Sector policy comes under the jurisdiction of the Ministry of Mines and Energy. The new administration inherited a New Minerals and Mining Law adopted in 2000. The law established that "Minerals on the surface of the ground or in the soil or subsoil, rivers, streams, watercourse, territorial waters and continental shelf are the property of the Republic of Liberia and anything pertaining to their Exploration, Development, Mining, and Export shall be governed by this Law." It set out terms by which mineral reconnaissance, exploration and development would be authorized under Class C, B and A mining licenses respectively, awarded and overseen by an inter-ministerial committee. It also established that Class A development licenses would need to be accompanied by conclusion of a Mineral Development Agreement negotiated between the parties.</p> <p>The policy also acknowledges that mining makes intensive use of land and that conflicts in land use</p>	<p>Law (2000)</p> <p>6. Minerals Exploration Regulations (2010)</p>	<ol style="list-style-type: none"> i. Section 8.2 Restoration of Mining Sites disturbed by exploration and mining to its original state ii. Section 8.3 Environmental Safeguards preventing pollution of rivers, iii. 8.4 Environmental impact assessment iv. Environmental Management Plan v. Periodic Impact Assessment vi. The Mines and Minerals Act of 2000 was enacted to consolidate and amend the law on mines and minerals as well as to introduce measures to reduce the harmful effects of mining activities on the environment. The Act therefore makes provision (Chapter 8 – Sections 8.1-8.6) for the protection of the environment and has integrated environmental and natural resource considerations into the workings of the mineral sector. <p>The Ministry of Mines and Energy has the responsibility to award mineral rights such as exploration licences, artisanal mining licences or large-scale mining licences. The Ministry therefore exercises functions which have implications for the environment and the management of natural resources. The reform of the mineral sector meant that when the Mines and Minerals Act was passed in 2000 effort had been made to ensure that it was harmonised with environmental protection even before the EPA was established. Environmental considerations were included in the Act and it conforms to supplements certain environmental requirements of the EPA Act established later. Chapter 10 of the Mines and Minerals Act 2000, contains provisions on protection of the environment.</p> <p>Chapter 10 of the Act provides that in the grant of mineral rights, the Minister of Mines and Mineral Resources shall take into account the need to conserve the natural resources in or on the land over which the mineral right is sought thereby suggesting that in the decision to award a mineral right consideration shall be given to conservation and environmental issues. This provision is reinforced in the 2010 Mineral Exploration Regulations which provides that an environmental licence shall entitle the licensee to initiate or continue with their application process for a mining right or permit.</p>	<ol style="list-style-type: none"> 2. Low standards in environmental management, health and safety for sectoral employees 3. 2000 Act does not integrates environmental concerns into the licence application process by providing that the undertaking of an environmental impact assessment is a prerequisite for the grant of a small scale or large scale mining licence. 4. However, a new mineral policy obliges all mineral operations to conduct environmental and social impact assessments and develop management plans for approval by GOL. These must include provisions to redress physical impacts upon mine closure as well as measures for sustaining community livelihoods thereafter. 5. In the 2010 Minerals Exploration Regulations, in addition to the general duty of mineral right holders to protect the environment and minimise pollution the regulations also provides that the holder of a mineral right is subject to all the Laws of Liberia concerning the protection of the environment. 6. The policy also acknowledges that mining makes intensive use of land and that conflicts in land use can arise and thus commits to establishing downstream mechanisms and processes for evaluating and arbitrating between alternative land use options, including recognizing the land use rights of local communities and securing appropriate compensation and resettlement arrangements if required. <p>A comprehensive mineral policy should bear in mind the following:</p> <ol style="list-style-type: none"> 7. Mining is an inherently destructive industry, and the mining effects of even a single operation can have a severe impact on the environment and the wildlife that lives nearby. Although there are some regulations in place that are intended to minimize the damage, they are not enough to allow mining and wildlife to exist in harmony, especially the fact that regulations are difficult to enforce due to low capacity. 8. The mining industry has the potential to disrupt ecosystems and wipe out wildlife populations in several different ways. Here's how mining affects the environment and wildlife. 9. Mining is leading to the destruction of habitats in surrounding areas. The process begins with deforestation. The land above 	<p>regulated and informal. AM attracts both local and foreign miners in Liberia due to its low barriers to entry in the form of rudimentary technical equipment required to mine.</p> <ol style="list-style-type: none"> 2. Due to these barriers, artisanal miners are trapped in a cycle of crude, illegal and non-productive work activities, resulting in range of negative health; safety; security; environmental and socio-economic impacts that affect miners and other stakeholders, such as local communities. These impacts, described in further detail in the technical design section of this Roadmap, are currently difficult to mitigate owing to the absence of artisanal mining regulations through which the sector's activities can be governed. In addition, the institutional and financial capacity of relevant government agencies (Ministry of Land Mines and Energy, Environmental Protection Agency, the Forest Development Authority) to monitor the sector is heavily constrained. <p><u>Article 45 of the Land Rights Act: Mining Areas</u></p> <p>A portion of Customary Land may be used by the Community as a mining area under license from the Ministry of Lands, Mines & Energy. How concessions previously given by government under these lands are administrated is unclear.</p>	<p>Environment Protection Agency ensures that any stabilisation clauses included should be restricted to matters in the fiscal not environmental domain. If stabilisation clauses apply across the board this will have the effect of freezing such agreements to the day there are signed and restricting the application of any subsequent environmental regulations passed.</p> <ol style="list-style-type: none"> 2. Reform of the mining sector so that environmental issues are comprehensively integrated into the mineral sector and most new legislation harmonised 3. Reforms must not only target large scale or industrial mining which are perceived to be the most environmentally damaging. There hasn't yet been a comparable regulatory response to the environmental impacts of artisanal or smaller scale mining whose cumulative impacts supersede largescale operations . 4. A gap remains in addressing the environmental impacts of artisanal mining in relation to issues such as rehabilitation and reclamation of artisanal mined out areas. Artisanal mining of gold and diamonds serve as a highly critical form of livelihood for an estimated 100,000 miners in Liberia (World Bank, 2012). The AM sector, however, remains largely under-regulated and informal. 5. Land degradation as a direct result of abandonment of mining pits; pollution of rivers, creeks and streams via tailings and mercury; degradation of natural and protected forest areas; and improper waste disposal are only some of the numerous environmental impacts of artisanal mining. 6. The MME should prioritize increasing environmental awareness and enhancing environmental stewardship, particularly with regard to building awareness of the hazards of mercury usage and integrating environmental training awareness programmes into the mining cooperative model.
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<p>can arise and thus commits to establishing downstream mechanisms and processes for evaluating and arbitrating between alternative land use options, including recognizing the land use rights of local communities and securing appropriate compensation and resettlement arrangements if required. In addition, the policy obliges all mineral operations to conduct environmental and social impact assessments and develop management plans for approval by GOL. These must include provisions to redress physical impacts upon mine closure as well as measures for sustaining community livelihoods thereafter. Finally, as noted above, the deliberate intention to develop spatial corridors off the back of concession-sponsored infrastructure is acknowledged. One possible weakness in the administration of this objective is the fact that the Concessions Commission has authority over concession entities and the activity they undertake, including infrastructure.</p>			<p>the mine must be cleared of all obstructions to allow the miners to go to work. Sadly, most mining companies are quite willing to destroy an entire forest to get access to mineral wealth.</p> <ol style="list-style-type: none"> 10. Deforestation has several effects. Birds, animals, and creatures that depend on trees and plants for food or shelter lose their homes or starve to death. Any remaining survivors are forced to relocate and find a new dwelling. 11. The removal of trees also causes significantly affect the plants that rely on them for shade from the harsh sun. 12. Some mining methods cause further destruction, such as the use of explosions to destroy mountain tops. Toxic chemicals and minerals could go to streams, rivers, and other bodies of water which can create harmful effects to marine species; 13. Mining can leaks pollutants into the environment lead to water contamination. 14. At the most basic level, mining requires clearing of trees that hold soil in place. The process disturbs the ground and wash the soil into waterways. The increase in sediment is not poisonous, but it can still upset the delicate balance of the aquatic ecosystem by changing growing conditions and eventually altering the shape of the river. 15. Other forms of pollution can be even more severe. The mining process exposes bodies of water to heavy metals and toxic minerals like selenium which can negatively impact the human and the marine lives; 16. Mining cause the water table to shrink. Water often seeps into areas that contain gold, diamonds and other valuable products, and that water needs to be pumped out of the mine to allow the miners to work. Aside from pollution, the process also cause water loss in the ground. Some mines have to collect water for use as a dust suppressant, which puts more strain on the local water supply. 17. Nearby residents who depend on wells for their water supply can also get affected. They will need to drill even deeper to ensure that they have access to water. When the water loss from mining is combined with another large source of strain on the supply, it can lead to a shortage, which can contribute to the destruction of ecosystems. 18. Mining is one of the most common methods for extracting minerals from the ground. Fossil fuels used to power mining machinery. Although useful, burning 		<ol style="list-style-type: none"> 7. Enhancement of Artisanal Mining Health, Safety and Security Practices: Health and safety negligence is widespread in the artisanal mining sector in Liberia. Stakeholder consultations revealed that accidents and injuries at AM mine sites are frequent, often owing to fallen trees, pit collapse, and unsafe equipment usage and that access to safe drinking water or adequate sanitation facilities is limited. The MME should prioritizes the integration of health, safety and security models into awareness programs for miners. A key activity will include the establishment a miner ID cards to better identify members of the sector. 8. Enhance sustainable environmental practices by introducing mining practices to enhance recovery methods and mitigate environmental degradation; 9. Develop and prescribe environmental management training program. 10. Integrate environmental stewardship into by-laws 11. Require environmental training as a precondition for excavator (yellow machines) usage. 12. Enhance AM Health, Safety & Security Practices 13. Integrate Health, Safety, and Security Module into the environmental training program for umbrella organizations 14. Build awareness on deforestation, biodiversity loss and land degradation 15. NEED FOR REGULATIONS ON THE FOLLOWING: <ol style="list-style-type: none"> i. Mine Design For Open Pit Mines ii. Occupational Health And Safety Across the Sector iii. Workplace Standards iv. Waste Disposal And Containment Control including Tailings v. Explosives And Blasting vi. Surface And Open Pit Mining vii. Dredging And Placer Mining viii. Reclamation And Mine Closure Considerations ix. Mining isn't going to stop anytime soon, but it's possible to lessen their negative impact on the environment and wildlife. The Rio Conventions call
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MOA	<p>The Ministry of Agriculture works to develop the agriculture sector through effective organizational structures and agricultural development programs.</p> <p>The Department of Planning and Development</p> <p>The Department of Planning and Development is responsible for providing policy advice on agricultural economic issues and engaging in strategic planning and sector coordination in order to promote and stimulate the development of agriculture. Its principal functions include providing guidance for planning and allied functions for the establishment and maintenance of proper direction for development purposes; developing priority programs for the enhancement of agriculture; and monitoring and evaluating the performance of agricultural programs as well as providing agriculture statistics for policy planning and government guard to sector growth and economic planning.</p>	<ol style="list-style-type: none"> 1. National Food Security and Nutrition Strategy Policy 2. Liberian Agricultural Sector Investment Plan (LASIP II) (2018-2022) 3. Article 43: Land Rights Law 2018 4. Liberia Fertilizer Regulatory Division Act 5. Liberia Plant Protection Regulatory Services 	<p><u>Article 40: Agricultural Area</u> Land Rights Law 2018</p> <ol style="list-style-type: none"> 1. Every Community Member shall be entitled to carry on agricultural activities on a portion of the Customary Land designated by the Community as an agricultural area. 2. With the approval of the Community Membership, a Community Member, or Person may by lease, mortgage or otherwise use an agricultural area for medium to large or large scale agriculture, including animal husbandry and cash crops production and for an agreed term of years. 3. The CLMDC of each Community shall adopt in its by-laws procedures and requirements for leases of large tracts of agricultural land to Community Members and Persons. <p>Some of the environmental impacts of agriculture include climate change, pollution, soil degradation, and deforestation:</p> <ol style="list-style-type: none"> 3. Climate Change: For Liberia to become reliant on its own agriculture for its own food security it has to intensify and extensity: intensification and intensification lead to agriculture and climate change having a reciprocal relationship. Climate change 	<ol style="list-style-type: none"> 1. moving to sustainable development – has serious policy challenges and opportunities 2. Evidence consistently shows that agricultural growth is highly effective in promoting sustainable environment, economic growth and reducing poverty in all countries 3. Given the strong relationship between growth in agricultural productivity and reduction, future efforts need to focus on productivity-enhancing measures with a pro-poor focus that increase incomes. 4. A number of new concessions have been granted for the development of plantations, most importantly to subsidiaries of Malaysian and Indonesian giants. The conclusion of large scale concession agreements with the latter bodes well for higher production on the one hand, but environmental degradation has resulted from the replacement of biodiversity in the natural forest cover with monoculture. 5. Growth based on extensification using traditional technologies such as shifting cultivation and human powered processing and transportation is generally not profitable and sustainable and has 	<ol style="list-style-type: none"> 1. Agriculture requires several traditional practices to change. Top among these, aside from use of improved input packages including seeds and plant stock, is the abandonment of slash and burn cultivation and other practices that are increasing land degradation in Liberia. It is important that Liberia promote a green growth approach to agricultural development by introducing incentives to promote soil conservation and improved water management. These are essential in order for farmers who bear the costs of long term conservation to share directly and visibly in the environmental benefits that will accrue to society as a whole. However, security of tenure must precede farmers’ efforts to improve conservation practices. 2. There remains a risk that Liberia could fall back into old patterns of growth and development based on natural resource extraction industries and heavily 	<ol style="list-style-type: none"> 1. Development and promotion of appropriate policies for the growth of agricultural output and incomes, reduction of poverty, and improvement in accessibility of the population to adequate supplies of nutritious food. 2. Policy/law to compel Ministry of Agriculture to promote sedentary agriculture is now overdue. Sedentary agriculture can be achieved through high productivity, availability of inputs (fertilizers, pesticide, insecticides etc.), promotion of value addition, linking farmers to the market and provision of cost recovery tools; 3. Promote the establishment of climate services and early warning systems/information for farmers, this is important in the face of climate change; 4. LASIPII which is Pro-SDGs is a very good strategy containing the undermentioned activities. LASIPII Should be approved, extended and operationalized: <p><u>Activities:</u></p> <ol style="list-style-type: none"> a) Promote and support the conservation of forest areas and sustainable

		<p>Bureau Act</p> <p>6. The Liberia Seed Development And Certification Agency Act</p> <p>7. Liberia National Cassava Sector Strategy</p> <p>8. The Republic Of Liberia National Export Strategy Oil Palm Export Strategy 2014-2018</p> <p>9. National Gender Policy (Section 2.4): Gender and Agriculture</p>	<p>affects agricultural production through precipitation levels and temperature variations. In return, poor agricultural practices increase climate change. The most significant climate change associated with agriculture is brought about by methane, nitrous oxide and carbon dioxide, deforestation (due to the release of forest carbon) all of which are greenhouse gases released into the Earth's atmosphere from farming. Pesticides and fertilizers application affect the quality of air through production of compounds like phosphorus, nitrate and ammonia.</p> <p>4. Soil Degradation: In all ecosystems, the biodiversity held in soil is massive. Healthy soils are vital to creating ample food production. Although agriculture is not the sole cause of soil degradation, poor farming practices such as slash and burn, poor tillage, clearing as practiced in Liberia are known to cause a considerable decline in the quality of soil. This mainly results from pesticide contamination, waterlogging and leading to iron toxicity. Soil erosion leads to loss of soil fertility and structure.</p> <p>5. Deforestation: Across the Liberia, cases of forests being cleared for tree crops agricultural (oil palm and rubber) reasons is on the rise with people seeking to increase their scales of agricultural production. Deforestation enhances the effects of climate change. Destruction of habitat amongst species also leads to fragmentation and depletion. Extensive deforestation affects the water cycle, which results in interferences with precipitation.</p> <p>6. Pollution: In order to enhance agricultural production quantity and quality, several additives to the soil are used in farming. The widely used are pesticides and fertilizers, which end up as pollutants in water run-off from the soil. This run-off can adversely affect more people and animal wildlife.</p>	<p>damaging implications for the environment. The ecological footprint is too wide</p> <p>6. Given the low level of assets of most Liberians, future efforts need to address the question of access to assets (i.e. land, knowledge, inputs) in addition to the provision of opportunities and an enabling environment</p> <p>7. Operationalizing a pro-poor approach: Transformation – not just Recovery – of the Agricultural Sector</p> <p>8. Having achieved some notion of stability at the national and macroeconomic levels, Liberia needs to begin to make more concerted efforts to preserve and solidify stability by focusing on food security, environment management and poverty alleviation interventions at the community and household levels.</p>	<p>concentrated on the plantation and commercial agricultural sector. GoL policies clearly indicate that this is not the government's strategy and that smallholders are integral to Liberia's economic recovery.</p> <p>3. GoL and donors will need long-term sustained engagement to realize the transformation of Liberian agriculture for the benefit of smallholders. 'Transformation' in this sense means the conversion of a system characterized by an economically concentrated commercial plantation sector coexisting with large numbers of poor, subsistence farm households involved in low input/low output (shifting) cultivation to one in which there is broad-based farmer participation in integrated, productivity-driven cash crop/food crop systems (Tefft, 2005).</p> <p>4. Transformation does not imply the neglect of food crops and the exclusive pursuance of cash-crop agriculture. With abundant natural resources and local knowledge domestic food production and competitiveness can be increased by provision of effective support systems, as evidenced in some West African countries.</p> <p>5. Operationalizing this pro-poor approach will require strategic direction, systematic processes and greater participation from a wide cross-section of Liberian and regional actors in order to move from specific policy and programme pronouncements to a set of concrete group and geographically specific actions and investments. Systematization is important. Too often initiatives are launched to be soon forgotten or supplanted by yet newer initiatives. Breaking this pattern depends largely on accountability and strong binding policy. This implies moving from a technocratic agricultural approach to one that incorporates the environmental, social, cultural and political elements needed to</p>	<p>environmental-friendly farming practices</p> <p>Forest areas are necessary resources for communities and household livelihoods. The development of charcoal and logging is growing and can negatively impact the livelihood of the communities. Even though, measures of regulating the exploitation of forests have been undertaken, efforts need to be pursued for the conservation and use of sustainable farming practices. Meanwhile, LASIP II will support and promote actions for protecting forests, watersheds and wetlands. To further act against climate change, the plan will advocate for and support the combating of desertification and conservation of biological diversity.</p> <p>b) Promote and support sustainable and gender sensitive use of natural resources</p> <p>The issue of women accessing natural resources has always been problematic, particularly the land rights situation remains unresolved especially under the customary law. There are also social and educational barriers that limit the contribution and participation of women in the management of natural resources. Consequently, the plan will support climate change-related activities, education and training for women and youth as well as promote proven best practices and measures that support natural resource management.</p>
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MOT	<p>The Ministry of Transport establishes policy frameworks to ensure an effective and efficient service delivery, and infrastructure development. With regards to transportation the emphasis is improvement of the country's infrastructure. Although the effect of improved infrastructure in the Liberian economy will depend upon which role it plays, improvements in the infrastructure facilities linking communities (such as roads and telecommunications) would strengthen the sense of belonging to the same nation and thereby help national cohesion. This is important particularly in the case of trade in goods and factors, where the removal of policy barriers between national markets needs to be complemented with physical links.</p> <p>Liberia's public road network falls short of the country's needs both in coverage and quality. The domestic network remains largely underdeveloped and access to the isolated south-eastern part of the country is particularly limited, increasing the isolation of that area.</p> <p>Liberia currently has more than 12 airports, including airstrips, serving domestic and international traffic. The major ones are Roberts International Airport (RIA) and James Spriggs Payne Airport. Others are minor airports, such as those in Foya, Greenville, Harper, Voinjama and elsewhere. The Roberts International Airport serves international traffic and Spriggs Payne serves regional carriers. The Liberia Civil Aviation Authority (LCAA) regulates the development and management of both domestic and international air transport infrastructure. The state of infrastructure in the sector is poor. The facilities (runways, aprons, and terminal buildings) were not very developed to start with, and they sustained further destruction during the conflict. As a result, the sector's number one problem is the inadequacy of facilities. In addition, navigation and firefighting equipment are in sub-standard conditions. Frequent power cuts and inadequate storage (warehousing) facilities are other constraints.</p> <p>Liberia has a long coastline, which stretches from Grand Cape Mount County past Monrovia to the South East of Liberia and ends at the extremities of Maryland County, on the border with the Ivory Coast, some 350 miles. In addition to coastal waters, Liberia has three great lakes, Piso, Sherman, and Teleh, as well as major rivers such as St. Paul leading into the Mano River, St. John and Cavalla. While these endowments would ordinarily be utilized to support trade and also provide freight and passenger transport in areas which are not currently served by other means of transport, the extensive presence of rocks in the rivers seems to make that</p>	<p>Relevant Act: Section 70 Environmental Protection and Management Law (2002)</p>	<p>Section 70 (EPML, 2002) Emissions by Motor Vehicles and Other Conveyances</p> <ol style="list-style-type: none"> 1. The Agency, in collaboration with relevant ministries and agencies, shall develop an effective conveyance inspection system and establish a permitting system to reduce and prevent vehicular emission; 2. No owner or operator of a motor vehicle, train, ship or aircraft or any similar conveyance shall: <ol style="list-style-type: none"> a. Operate it in such manner as to cause air pollution in contravention of the established emission standards; b. Import any machinery, equipment or any similar device which is likely to cause emissions into the ambient air in contravention of the established emission standards; 3. A person who contravenes the provisions of this section commits an offence and is liable on conviction to a fine not exceeding 5,000 US DOLLARS or to imprisonment for a period not exceeding two years or to both. 	<ol style="list-style-type: none"> 1. The Ministry of Transport is yet to domesticate all these EPA legal provisions through a validated policy or regulations; 2. The Transport Master Plan of Liberia, 2012 Part of Capacity Development for the Transport Sector in Liberia is silent on environmental issues but, orchestrates activities that will severely impact on the environment namely 'rehabilitation of infrastructure' 3. Also looming is the threat of environmental degradation brought on by infrastructural rehabilitation. These environmental threats deserve equal attention by policy makers in the coming years or current practices combined with climate change could seriously contribute to resource and economic impoverishment in Liberia. 4. Transport is often associated with economic development. Connecting a city or region to major transport networks can give an initial boost to the local economy and create new jobs. However, once a region has reached a certain level of connectivity, additional transport infrastructure does not give comparable benefits. It can, however, generate substantial environmental impacts. 5. Transport networks can also facilitate the spread of urban areas and other built-up areas into relatively rural and sparsely populated parts of Liberia, exerting pressure on natural habitats. For example, connecting remote mountain regions or islands to the Liberian transport system could attract more tourists to the area, resulting, for example, in a boost to accommodation and food-catering services. However, increased economic activity also often comes with the negative impacts of human settlements — more wastewater, more solid waste etc. 6. Transport also leads to releases of pollutants, which can spread beyond the reach of transport networks. They can contribute to background concentrations of particulate matter, ozone and nitrogen dioxide, affecting people, plants and animals. Some areas, including mountainous regions, coastal zones and seas, can be particularly vulnerable to pollution from transport. Transport corridors through valleys or along large rivers like the Montserrado will be essential as outlined in the Transport Master Plan will be essential for the Liberia economy, but could also exert 	<ol style="list-style-type: none"> 1. The Ministry has partially Mainstreamed Section 70 of the EPML (2002): Administrative Regulation Regarding Car Dealership and Importers of Moving Vehicles 2. Liberia's recent transport policy has not significantly strengthened nature and biodiversity considerations. Now, these concerns need to be taken into account from the planning phase. Construction companies need to carry out environmental impact assessments for such projects. EPA legislation also covers the potential impacts of infrastructure projects taking place outside protected areas, but which can still affect them. 3. This approach could translate into various measures on the ground. For example, in the case of rail and road networks, the route proposal could be changed to leave larger areas untouched and to avoid landscape fragmentation. Similarly, tunnels or nature bridges could be planned and built to increase connectivity between protected areas, and facilitate the movement of animal populations. If the project does not comply with these rules, funding can be withdrawn. 4. Similar to transport and energy networks bringing economic wealth across Liberia, a trans-MRU network of green infrastructure could actually help foster healthy and rich nature. 	<ol style="list-style-type: none"> 1. By signing the Paris agreement, the Liberia committed to 'economy wide' decarbonization efforts; therefore policies must integrate the Rio Conventions especially infrastructure projects involved in the rehabilitation of the transport sector 2. Transport networks have will become a commonplace feature of the Liberian landscape ones the National Transport Master Plan is fully implemented. The networks will connect people, boost economic activity and provide access to key services, but they also introduce barriers between natural areas, while their use emits pollutants and introduces non-local species to ecosystems. Strong policy measures and a network of green spaces can help preserve and protect Liberia's natural wealth. 3. Liberia should be mindful that by 2050 the country's population will be over 10 million and will therefore be significant green gas emitters if policy to contain that are not in place now. 4. The Transport Policy should propose options for urban planning that will result in a 60% reduction in vehicle activity and a 32% reduction in CO2 emissions. 5. One of the most polluting forms of transport is benefiting from what is effectively a fossil fuel subsidy in Millions of US Dollars 6. Shipping, which still runs largely on dirty heavy fuel oil, should have an offset mechanism in the waters of Liberia. 7. Technology alone won't make Liberia mobility system more sustainable. Policy choices will be crucial in shaping future mobility revolutions. In particular, the Manor River member states should lever these new developments to reach their climate objective of keeping emissions within well below the 2°C envelope and to make livable cities. Risks are already visible today, as cheap used cars encourage new trips and lead to more kilometers driven, increasing emissions, and worsening congestion in the cities. In a scenario where such vehicles are electrified, the cost of their services is expected to drop sharply (perhaps by more than 50%) and as a consequence, demand to sharply increase. 8. The Transport Master Plan should at this early time embark on public transport using clean energy (e.g. a Monrovia City

<p>unattractive.</p> <p>Liberia has four seaports: Monrovia, Harper, Greenville and Buchanan. As a result of the civil war, facilities have deteriorated; cargo handling equipment is either inadequate or unavailable; and there is an inadequacy of marine crafts. There are navigational hazards owing to wreckages of sunken ship, insufficient navigational aids, and port infrastructure and facilities have not been maintained for some time. Monrovia currently handles almost all of Liberia’s seaborne trade though the port of Buchanan is used for lumber exports and cement Imports. Coastal shipping is just beginning to revive and this mode of good transport will compete effectively with roads until such time as road connections to the South East are brought up to a better quality standard. The private sector is taking the lead to fill this niche in the market.</p> <p>Prior to the war, Liberia had three operating rail lines, a “Mano River” line running from the river border with Sierra Leone inland to Monrovia, another running from Bong County to Monrovia and a third from Yekepa in Nimba Country to the port of Buchanan. These are depicted in Figure 18.54 These lines were originally built mainly to transport iron ore from the mine heads in the Western cluster and in Bong to the port of Monrovia as well as from the mines in Nimba (near the Guinea border) to the port of Buchanan. The Mano River line was largely destroyed and dismantled during the conflict and though it would offer the utility of serving the “Western cluster” mining region when that is ultimately re-developed, a large part of the land pertaining to this line has been turned over to other uses. Consequently, rehabilitation of this railway will be complicated due to land acquisition challenges.</p>			<p>pressure on unique ecosystems (mangroves). Certain pollutants, such as ground-level ozone, are known to lower crop yields, affect tree growth and cause acidification in lakes.</p> <p>7. Similarly, oil spills or the release of hazardous substances at sea can cause considerable damage to marine life. Recognizing these risks, many policy measures have to be put in place at national and MRU levels.</p> <p>8. Noise pollution from transport is another concern and its impacts are not limited to land ecosystems alone. Large ships generate significant amounts of noise. Their hulls tend to amplify the mechanical noise from the engine and propellers. Due to its low frequency, this type of noise propagates very far in water and disturbs marine life. Research indicates that whales and other species that communicate and orient themselves through sound are particularly affected. Potential impacts suffered by small fish and marine invertebrate populations are also becoming clearer thanks to ongoing research.</p> <p>9. In addition to pollution, transport can also bring non-local species into new habitats, risking significant harm to local species. From international experience, construction of large transport projects, such as the Suez Canal, altered the key characteristics of an entire ecosystem. Since the building of the canal, more than 500 non-indigenous marine species were introduced to the Mediterranean Sea, contributing to ‘a catastrophic anthropogenic ecosystem shift in the Mediterranean Sea’. In the case of maritime transport, large ships, especially those used in freight transport, take in water to stabilize the vessel. Depending on their cargo load, they release this ballast water, which often carries in it many bacteria, microbes, small invertebrates, eggs and larvae of various species. If introduced in sufficient quantities and in the absence of predators, the impact of alien species can be devastating. This is the way Chinese mitten crabs were introduced to the coast of West Africa and the rivers of western Europe.</p> <p>10. Ballast water is only one of the ways alien species are transported. Fruit seeds thrown</p>		<p>Trams) to influence car use</p> <p>9. Prepare regulations and introduce fixed road-side penalties</p> <p>10. Introduce a fast track court for traffic offences</p> <p>11. Mainstream Section 70 of the EPML (2002) into the transport operation;</p> <p>12. A ‘green transport infrastructure’ consists of a strategically planned network of high-quality green spaces. It requires a wider look at all green spaces — in remote, rural and urban areas, and beyond national borders — connects between them so as to facilitate movement of species. To this end, Liberia should adopt a Green Transport Infrastructure Strategy aimed at providing a vision for a trans-MRU green network, as well as facilitating coordination among stakeholders, and exchange of ideas and information.</p> <p>13. Better connectivity is not the only positive outcome of green infrastructure. In addition to improving public health, it is increasingly seen as a cost-efficient way of reducing current (or future) weather- and climate-related natural hazards. For example, instead of building sewerage systems to transport extreme rainwater, cities can create green areas to absorb excess water.</p> <p>14. Planning must take place with nature in mind. Transport infrastructure projects, including those related to the trans-boundary networks, will contribute to enhancing quality of life across the MRU, bringing services and public goods to remote parts.</p>
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NaFAA	<p>The National Fisheries & Aquaculture Authority (NaFAA) was established by an Act of National Legislature in 2017. The mandate of NaFAA under the Act is to management all fisheries resources which are the natural habitat of the Republic of Liberia and the natural assets, heritage and sovereign rights of the Liberian people. NaFAA has jurisdictional and consequential custody of these resources for the benefit of present and future generation. NaFAA also has responsibilities to ensure that the Fisheries and Aquaculture resources be used sustainably to achieve socio-economic benefits including economic growth, human resources development employment creation and ecological balance and that the standard of optimum utilization of resources shall be applied and adapted to value creation, to promote employment and develop the fisheries and aquaculture sectors of the</p>	<ol style="list-style-type: none"> 1. National Fisheries & Aquaculture Authority (2017) 2. Fisheries Regulations of 2010 	<p>In section 3 of the Fisheries Regulations 2010, promulgated before the establishment of NaFAA in 2017, the Bureau shall evaluate which types of management measures are necessary to ensure sustainable management of fisheries, and shall attach importance to the following principles:</p> <ol style="list-style-type: none"> a. a precautionary approach, in accordance with international agreements and guidelines; b. an ecosystem approach that takes into account habitats and biodiversity; c. effective control of harvesting and other forms of utilization of resources; d. appropriate allocation of resources, which among other things can help to ensure employment and develop the fisheries sector of the Republic of Liberia; e. optimal utilization of resources, adapted to marine 	<p>The ecosystems that support fisheries, together with other economic activities, are subject to a number of alterations of significant relevance to their functioning and resilience and to the goods and services they can provide. Because of our imperfect understanding of ecosystem structure and functioning, as well as the inherent difficulty of distinguishing between natural and human-induced changes, the latter are not always perfectly predictable and/or reversible. Some of the alterations the NaFAA act has not addressed are as follows:</p> <ol style="list-style-type: none"> 1. Impacts from fisheries on the environment have been abundantly described and reviewed. More specifically, capture fisheries impact target resources. They reduce their abundance, spawning potential and, possibly, population 	<p>For a fisheries law to be regarded as addressing the industry in a sustainable approach operational reference for management, any Ecosystem Approach to Fisheries (EAF) policies/law produced under the aegis of the UNCBD will need to be in line with its principles. It is therefore important to examine the degree to which the NaFAA law already provides an appropriate basis for the development of EAF as an effective, scientifically sound and practical approach. The law should have contained a significant number of ecosystem-related provisions (principles, axioms, conceptual objectives, constraints and conditions) which, when considered together, provide a good basis for EAF but this not the case from the current</p>	<p>The NaFAA Law should be reviewed to reflect the following sustainable fisheries principles:</p> <ol style="list-style-type: none"> 1. Respect for the Ecosystem: The Code is generally elaborated "with due respect" for the ecosystem. Recognizing the transboundary nature of the ecosystem; the law should provides that Liberia should "conserve", "protect" and "safeguard" it, including from the impact of aquaculture, to keep its "integrity". 2. It should promote research, and call for an assessment of the impact of fishing, pollution, other habitat alterations and climate change. 3. The law should provide for habitat protection and "safeguard" of critical habitats, requesting the rehabilitation of degraded ones and promoting research on the impact of their alteration on the

<p>Republic of Liberia.</p> <p>In the context of the United Nations Convention on Biological Diversity, ecosystems are complex and dynamic natural units that produce goods and services beyond those of benefit to fisheries. Because fisheries have a direct impact on the ecosystem, which is also impacted by other human activities, they need to be managed in an ecosystem context. "Ecosystem approach to fisheries" (EAF), is now universally defined, adopted and progressively evolving. International instruments also provide the institutional foundations for EAF. The FAO Code of Conduct for Responsible Fisheries has been around for decades, but remains relevant and is particularly important in this respect and contains provisions for practically all aspects of the approach. The analysis discusses the types of action needed to achieve EAF. Experience in EAF implementation is still limited but some issues are already apparent, e.g. in added complexity, insufficient capacity, slow implementation, need for a pragmatic approach, etc.</p>	<p>value creation, markets and industries; and</p> <p>f. Ensuring that harvesting methods and the way gear is used take into account the need to reduce possible negative impacts on living marine resources.</p> <p>Section 6 prohibits use of heavy fishing gear in the Inshore Exclusion Zone, reserving the zone for artisanal purposes.</p> <ol style="list-style-type: none"> 1) An inshore exclusion zone, the breadth of which shall be six nautical miles seawards of the low-water line along the coast as marked on official large-scale charts, shall be reserved solely for the use of subsistence, artisanal and semi-industrial fishing activities and artisanal fishing vessels. 2) No person shall, in the inshore exclusion zone: <ol style="list-style-type: none"> a. engage in fishing activities other than subsistence, artisanal or semi-industrial fishing; b. carry out fishing activities in such zone in connection with an industrial fishing vessel; or c. Carry out fishing activities otherwise than in accordance with these Regulations. <p>Section 7 outlines what constitutes illegal fishing gear and methods that are prohibited. No person shall:</p> <ol style="list-style-type: none"> a. use, permit to be used or attempt to use fishing gear that has not been authorized by a valid and applicable license issued pursuant to these Regulations for the purpose of fishing; b. use, permit to be used or attempt to use the method of pair trawling for the purpose of fishing; c. use, permit to be used or attempt to use explosives, firearms, lights or other electrical devices or poison for the purpose of fishing, including stunning, disabling, catching or killing fish, or in any way rendering fish to be caught more easily; or d. carry on board a vessel, transport or have in her/his possession or control any fishing gear, explosive, firearm, poison or other noxious substance for any purpose referred to in subparagraphs (a), (b) and (c). <p>Section 9 of the Regulation prohibits sea pollution.</p> <ol style="list-style-type: none"> 1) It is prohibited to dump gear, moorings and other objects in the sea or leave unnecessarily or abandon such objects in the sea or on the seabed if they may adversely affect fish or other marine organisms, impede harvesting operations, damage harvesting gear or endanger vessels. 2) Any person that acts in contravention of 	<p>parameters (growth, maturation, etc.). They modify age and size structure, sex ratio, genetics and species composition of the target resources, as well as of their associated and dependent species. When poorly controlled, fisheries develop excessive fishing capacity, leading to overfishing, with major ecosystem, social and economic consequences.</p> <ol style="list-style-type: none"> 2. Fishing may also affect ecological processes at very large scale. The overall impact has been described as comparable, in aquatic systems, to that of agriculture on land in terms of the proportion of the system's primary productivity harvested by humans. Overfishing transforms an originally stable, mature and efficient ecosystem into one that is immature and stressed. This happens in various ways. By targeting and reducing the abundance of high-value predators, fisheries deeply modify the trophic chain and the flows of biomass (and energy) across the ecosystem. They can also alter habitats, most notably by destroying and disturbing bottom topography and the associated habitats (e.g. seagrass and algal beds, coral reefs) and benthic communities. 3. The alteration of the habitat by various human activities may be physical, mechanical (e.g. through the "ploughing" effect of dredges and trawls), or chemical (e.g. through injection of nutrients, pesticides, heavy metals, drugs, hormones). 4. Fishing may result in changes in productivity of resources (some positive and some negative) and affects associated species. Some aspects of fisheries can have significant and long-lasting effects, e.g. destructive fishing techniques using dynamite or cyanides or inadequate fishing practices (e.g. trawling in the wrong habitat); pollution from fish processing plants; use of ozone-depleting refrigerants; dumping at sea of plastic debris that can entangle marine animals or be swallowed by turtles; loss of fishing gear, possibly leading to ghost fishing; lack of selectivity, affecting associated and dependent species, resulting in wasteful discarding practices, juvenile mortality, added threat to endangered species, etc. Poorly-managed large-scale mariculture can damage coastal wetlands and nearshore ecosystems, often used as nurseries by key capture fishery resources, and contribute to ecosystem contamination with food residues, waste, antibiotics, hormones, diseases and alien 	<p>NaFAA law point of view and therefore a gap that need to be filled.</p> <p>ecosystem, as well as a prior assessment of the potential impact of new fisheries or introduction of new technologies.</p> <ol style="list-style-type: none"> 4. Account of the Environment: The NaFAA law should state, that it "takes account of" the environment. Its provisions should seek to promote its protection. It should promote research on environmental factors and requires that such factors be taken into account in the "best scientific information available, even when the scientific information available is inadequate. It should provide that fishing be conducted "with due regard" for the environment, which should be monitored for impacts. It recognizes, in line with the Rio Convention, the qualifying role of environmental factors on sustainable use of biological resources. 5. The law must reflect "due respect" for biodiversity. It must promote its maintenance protection, safeguarding and conservation, mentioning genetic diversity, the need to minimize fisheries impact on biodiversity and to develop research about fishing gear impact. 6. The law also recognizes the existence of endangered species that need to be protected, and the need for measures to minimize fisheries impacts on them. Species Interdependence 7. The law must distinguish between exploited and non-exploited species belonging to the same ecosystem, the target species on the one hand and "non-target" species or "dependent or associated" species on the other. 8. Regarding the latter, the law should promote the study of their behavior, their conservation even in the absence of adequate scientific information (precautionary approach), the taking into account of accidental fishing mortality, the assessment and the reduction/minimization of catches; or fisheries impacts. 9. The law should provide for conservation of populations structure, their rehabilitation in case of damage and the analysis of the impacts of environmental factors on them. It should also provide for the scientific study of the relations between populations. 10. The law should provide that the impact of fisheries activities (including aquaculture) should be minimized; and recommend the development of research on such impacts for their assessment and monitoring. It should aim at "ecologically sustainable"
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			<p>subsection (1) shall clear up or remove the relevant objects, in addition to other fines and penalties described in these Regulations.</p> <p>The policy promotes activities for conserving of aquatic ecosystems associated with fish production and it states that:</p> <ol style="list-style-type: none"> 1. Fish production cannot be sustained without conserving the associated ecological processes therefore the aquatic environment will be protected including the habitats and bio-diversity. The interventions outlined by the policy include: <ol style="list-style-type: none"> a. Incorporate the principles of the ecosystem approach and its human dimensions to fisheries management systems. b. Monitor aquatic biodiversity and key habitats through periodic assessments so as to identify critical changes and their origin. c. Reduce by-catch, discards, and destructive fishing practices through the introduction of incentives and gear replacement schemes and to encourage the use of selective, environmentally safe and cost-effective fishing gears and techniques. d. Promote and declare marine protected areas for purpose of sustainability and genetic conservation in line with coastal zone management. e. Strengthen the regulatory framework and conduct sensitization programs with the aim of protecting and enhancing the productivity of the mangroves and wetlands. f. Seek and strengthen inter-agency collaboration in order to adopt and implement regulations aimed at aquatic environmental protection and reduction of negative impact of other policies on fisheries. 	<p>species.</p> <ol style="list-style-type: none"> 5. The Law of the Sea provides that fisheries management must take care also of associated and dependent species. The impact of fishing on these species has been documented in some areas but is still frequently unknown or only partly understood. The decline of primary productivity consumers low in the food chain removes important forage species needed higher in the food web, with cascading effects for the ecosystem. Conversely, the removal of top predators such as mammals, tuna or sharks, may release an unusually large abundance of preys at lower levels with cascading and feedback effects on the food chain and species composition. For example, as most sharks, barracuda and some batoid fishes (angel fishes) are predators located at or near the top of marine food webs, their depletion modifies the intricate trophic interactions of their ecosystems. 6. A well-documented example of direct impact on benthic species is that of modern towed gear (trawls and dredges) which caused, inter alia, long-term changes in abundance and species composition. 7. Fishing gear can change the living and non-living environment within which the target and other related resources live. Environmental damage may come from the very nature of the fishing technology (e.g. in the use of dynamite or poison) or from the inappropriate use of an otherwise acceptable gear (e.g. using trawls in coral reefs or seagrass beds). 8. The use of dynamite and other explosives for "blast fishing" is still common in parts of Liberia Africa, Caribbean and South Pacific. A relatively small explosive (beer-bottle size) is capable of destroying a three-metre circular area. These practices are generally officially banned by fisheries regulations and laws but often persist because the people involved have little, if any, alternative livelihood. 9. The impact on the habitat depends on the gear and sediment type. Highly dynamic, soft bottoms (e.g. coarse sand, hydraulic dunes) may suffer limited damage even when exploited by heavy (including hydraulic) dredges. On the contrary, stable, hard, and highly structured habitats (such as coral reefs, seagrass beds, sponge beds) will be easily damaged. One well-documented example is the use of modern towed gear (trawls and dredges) which caused, inter alia, destruction of seagrass 		<p>activities.</p> <ol style="list-style-type: none"> 11. It must promote a reduction of pollution and use of chemicals, environmentally sound processing, transport or storage, and calls for regulation of environmental impacts of post-harvest practices. 12. The law should also provide for the prior impact assessment and monitoring of gear impact, the prohibition of destructive practices and the development of environmentally safe gear. 13. The law also should considers, albeit very briefly, the problem of sound or optimal use of energy. 14. Selectivity, Ghost Fishing, Bycatch, Discards and Waste 15. Selectivity, or lack of it, is central to many biological issues affecting fisheries. Bycatch or incidental capture is responsible for endangering and contributing to extinction of a number of non-target species (such as sea turtles) caught in driftnets or longline fisheries. In addition, the discarding of unwanted catch, which is particularly important in unselective fisheries, is being considered by society not only as wasteful but as unethical. 16. The law should dedicate a whole section to the issue. It must promote the use of more selective gear and must call for more international collaboration in better gear development, as well as for the agreement on gear research standards. 17. The law must call for minimizing discards and waste including through reduction of dumping and loss of gear.
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				<p>beds (<i>Posidonia oceanica</i>) in the Mediterranean and destruction of the oyster (<i>Cassostrea virginica</i>) habitat. Damage is also related to fishing frequency, gear weight and rigging. Addition of heavy tickler chains to the trawl ground rope increases bottom abrasion and turbidity while adding rollers reduces it.</p> <p>10. Fishing generates bycatch and discards. A first attempt to address the issue at global level was made in the late 1990s by FAO (1997c). Most fishing activities are not selective enough to remove from the ocean only the desired targets and will probably never be. This leads to accidentally catching other species (bycatch), part of which has little or no use (at least in the local context) and will be dumped overboard (as discards) together with the offal from fish processing at sea. The effect is to increase availability of food to scavenger species (including sea birds) and, when concentrated over time, may cause local anoxia of the seabed environment. The resulting amount of organic material may not be negligible. Some of this is consumed by sea birds, but a certain amount of offal becomes available to benthic scavengers.</p> <p>11. Bycatch mortality also affects many non-fish species which are relevant to the functioning of the overall ecosystem. For example, surface and sub-surface driftnet and long-line fisheries have serious negative effects on populations of sea birds. High seas drift nets have had a considerable impact on sea birds.</p> <p>12. Voluntary dumping or loss of fishing gear may lead to ghost fishing. The scale of the impacts of ghost fishing is basically unknown but there are indications that the effects are not negligible. Species affected by discarded gear include not only teleost fish but sea birds, marine mammals and turtles. For example, the incidence of entanglement of marine mammals in floating synthetic debris has been related to growing fishing effort and increased use of plastic.</p>		
MOFDP	The Ministry of Finance and Development Planning formulates, institutionalizes and administers fiscal, economic development, and tax policies.		Environmental sustainability has moved in recent years from the margins to the center of many government agendas. As just one sign of the issue's new prominence, all World Bank and EU projects requests for environmental impact and social management studies prior to the commencement of the project. Moreover, environmental issues are the deciding factor in infrastructural project emerging from donors.	1. Despite all the developments, the Bank of Liberia is not committing any funds to address global climate change, biodiversity loss and sustainable land management. Every part of the bank, from lending to investments to philanthropy, should pitch in to reduce carbon emissions, biodiversity loss and	1. Economic instruments for environmental management and sustainable development are absent in Liberia's financial policies. The plea for a sustainable development path and the need to cope with transboundary and global pollution	1. Role of financial policies on environmental protection, climate change and sustainable development Creating a legal framework to ensure the grounds, policies to encourage the audience to participate in environmental protection 2. To raise the individual consciousness, businesses, agencies and organizations in

			<p>Managing sustainably, defined in this report as managing environmental impacts to meet the needs of both present and future generations, can affect the very core of a economic interventions. It influences processes and systems of all kinds, from roads construction to mining, from fisheries to forestry. A variety of pressures have elevated sustainability's prominence in recent years: donor demands, regulation, globalization, climate change, and other factors. These pressures promise to change the role and responsibilities of the Ministry of Finance and Development Planning.</p>	<p>land management.</p> <ol style="list-style-type: none"> 2. Another investment the bank is not strongly considering is the development of large-scale capacity to supply solar power at the consumer level. Most homeowners cannot afford the up-front costs of home-based solar units. Should work with commercial banks in the bank's consumer lending, tax leasing, and other groups to figure out how to finance and transform that marketplace. "There are obviously tremendous environmental benefits in taking people away from carbon-based electricity. 3. Perhaps more quickly than in other areas, the greenhouse gas issue must catapult the Bank of Liberia finance function in new directions. Finance professionals across the bank must take on entirely new roles. "The whole sense of urgency and sense of priority around a lot of these issues must change dramatically. 4. The challenge that currently dwarfs all other environmental challenges in Liberia is deforestation. It should be such that few companies should escape strong legislations aimed at reducing deforestation, in Liberia. 5. Improving energy efficiency/reducing carbon footprint" as a high priority among an array of environmental objectives. Only financing such environmental regulations is more often cited as a high priority. 	<p>issues requires the development of new and effective policies in which economic instruments have an important role to play.</p> <ol style="list-style-type: none"> 2. The importance of economic instruments for environmental policy is emphasized in both the Rio Declaration and Agenda 21, where it was stressed that the use of economic instruments represents a tool for national authorities to promote the internalization of environmental costs and to apply the polluter-pays principle in the most efficient manner. They provide a means of enhancing the capacity of governments to deal with environmental and development issues in a cost effective manner, promoting technological innovation, influencing consumption and production patterns, as well as providing an important source of funding. 3. The divorce of environmental policy from economic policy and from efforts to achieve sustainable development is meaningless and potentially disastrous both economically and environmentally for Liberia. The standards of living are unacceptably low, poverty is a major source and victim of environmental degradation, natural resource exploitation is the engine of growth, the formerly planned economy struggle to restructure and recover, imposing constraints on economic activity to protect the environment for its own sake rather than as an input in sustainable development has very limited appeal. Under these conditions, environmental policy cannot be divorced from economic policy and development strategy. Moreover, under conditions of (desired) rapid economic growth and massive structural change, mandated standards and technologies that allow no room for differential response and adjustment to rapidly changing circumstances are both very costly and difficult to enforce. Command-and-controls require the generous use of resources such as capital, government revenue, 	<p>finding measures to invest in environmental protection. Create state budget revenues invested back projects for environmental protection.</p> <ol style="list-style-type: none"> 3. Ministry of finance should provide resources to establish, implement, maintain and improve the Environmental Management System including human resources and specialized skills, organizational infrastructure, technology and financial resources 4. Designate an Environmental Management System management representative to the EPA 5. Encourage and attract investments and projects, environmental protection program, climate change and sustainable development, to share the burden of managing and protecting the environment. 6. Help businesses seeking cost effective alternatives in order to achieve their economic effects associated with environmental protection issues 7. Economic instruments raise large amounts of revenue that can be spent either on public goods that improve environmental quality or can be used to reduce distortionary taxes such as income taxes, which reduce the incentive for work, or sale taxes which distort consumption decisions. In a narrow sense: Financial policies/institutions include the particular mechanism, policy and financial solutions to resolve a problem in a certain given period. In the field of environment protection and climate change responding, financial mechanisms and policies are also effective ways to ensure environmental protection and limit the negative impacts of climate change. 8. Fiscal instruments such as taxes and subsidies could be used to bridge the gap between private and social costs/benefits. For example, the prices of polluting products such as gasoline, plastics or pesticides do not incorporate the social costs of damage to peoples' health and other activities which arise from their use because these costs are external to the decision maker (producer or consumer). Hence polluting inputs and final products are generally underpriced, both absolutely (in terms of social costs) and in relation to non-polluting or less polluting products. This results in overproduction and overconsumption which in turn result in environmental damage at a higher than socially optimal level. Emission and effluent taxes can be structured in such a way as to provide a progressive incentive
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					<p>management skills, administrative and enforcement capabilities, the very factors that are in scarce supply in Liberia, a least developing economy.</p> <p>4. The challenge for Liberia is to identify and adopt instruments that integrate environmental and economic policy and that are parsimonious in their use of scarce development and management resources; instruments that allow differential response by economic units and adjust flexibly to changing circumstances. The search for instruments of environmental management in developing countries and transitional economies is a search for instruments of sustainable development. Economic instruments meet most of these conditions and are uniquely suited for the integration of environmental and economic policy and can be designed to advance sustainable development.</p> <p>5. The challenge for Liberia is to identify and adopt instruments that integrate environmental and economic policy and that are parsimonious in their use of scarce development and management resources; instruments that allow differential response by economic units and adjust flexibly to changing circumstances. The search for instruments of environmental management in developing countries and transitional economies is a search for instruments of sustainable development. Economic instruments meet most of these conditions and are uniquely suited for the integration of environmental and economic policy and can be designed to advance sustainable development.</p>	<p>for pollution control.</p> <p>9. An interesting tax credit incentive which operates in Costa Rica is known as the transferable reforestation tax credit. Land owners who chose to keep their land under forestry (or plant native species) receive a tax credit (i.e., they can deduct part of the costs from their taxes). This scheme benefits in particular, big, wealthy land holders who pay a significant amount of tax. To enable small land holders to share in the benefit of the scheme, the government introduced a transferable tax credit system: small-holders who keep their land under forestry earn tax credit which they can sell to wealthy taxpayers with high taxes to offset.</p> <p>10. Legislation on financial policies, institutions relating to environmental protection aims to adjust acts as taxes, charges, fees or directly financial mechanisms and policies; and tools to support to activities of environmental management and protection;</p> <p>11. One of solutions is to increase financial resources for the implementation of sustainable development, increasing efficient investment and use of funds from the state budget, increasing spending from the state budget to develop and improve the systems of institutions, policies and legislation on sustainable development;</p> <p>12. Spending for the national target program to respond to climate change (investment spending).</p> <p>13. Recurrent expenditure, including: Spending for operation of the Environmental Protection Agency and the other environmental agencies, climate change and sustainable development at the national and local level;</p> <p>14. The Ministry of Finance should put aside funds for co-financing of GEF and GCF Projects which require Government contribution.</p> <p>15. Enterprise Income Tax: Enterprises operating in the field of environmental protection are applied the tax rate of a special lower tax rate; Newly established enterprises operating in the environmental sector could be exempted from tax not exceed for a number of years and 50% reduction of the tax payable after the exempt period;</p> <p>16. - Exemption from tax on natural water used for hydropower generation by households and individuals living in service production;</p>
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						<ul style="list-style-type: none"> - Tax exemption for natural water by households, individuals living service operators; - Tax exemption for land that exploiting and using in place that is allocated or leased land to mining reclamation, construction of security, military and dikes; <p>17. Value Added Tax: Objects that should not have to pay VAT are:</p> <ul style="list-style-type: none"> i. Service maintenance of zoos, gardens, parks, street greenery, public lighting, funeral services; ii. Export products are natural resources, except mineral resources. iii. The business enterprises of above goods and services on the nondeductible; <p>18. The Government should exempt goods export and import tax in case of:</p> <ul style="list-style-type: none"> i. Imported goods are equipment and machinery, accessories, raw materials and supplies which cannot be produced ... to create fixed assets of investment projects in the field of preferential import tariffs to include the following areas: manufacturing, new renewable energy materials including Liquefied Petroleum Gas equipment, sustainable charcoal production equipment; protect the ecological environment (e.g. solar equipment, hydropower equipment, electric vehicles; <p>19. Special Consumption Tax:</p> <ul style="list-style-type: none"> i. Gasoline-powered cars combine electrical energy, bioenergy ii. - Cars powered by bioenergy tax rate. <p>20. University and Training fees: Charges in the fields of environmental science, technology, climate change including environmental science, Agriculture, conservation etc. should be reduced by 50% or more;</p> <p>21. Appraisal fee reporting environmental impact assessment; Cleaning fee; Fee for prevention of natural disasters; Charges for use of radiation safety services; Appraisal fee of radiation safety; Appraisal fee operational conditions of science and technology; Appraisal fee contract of technology transfer ...</p> <p>22. Investors build and implement Clean Development Mechanism (CDM) projects in Liberia should be entitled to tax incentives; land use fees and land rent; Depreciation of fixed assets; investment credit of the state and is considering subsidies for products of CDM project in</p>
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						the priority areas.
FDA	The Forestry Development Authority is responsible for the sustainable management of forest and forest resources, and is charged with ensuring the effective governance and management of the country's protected areas system.	<p>The Forestry Development Authority Act (1976)</p> <p>Revised National Constitution (1986)</p> <p>The New National Forestry Law (2000)</p> <p>The National Forestry Reformed Law (2006)</p> <p>New Wildlife and National Parks Act (2017)</p> <p>Land Rights Law (2018) Article 42: and Article 43: Forest Lands</p>	<ol style="list-style-type: none"> The "3 Cs" approach of forest governance emerged during the forestry sector reform process that began in 2004. It aims to ensure a balance of different approaches and use of forest resources, by recognizing the equal importance of these different uses of forests, and the linkages and trade-offs between them. Although the FDA was initially established with a wide remit including conservation and research, its activities were dominated by facilitating commercial logging activities. The National Forestry Reform Law, National Forest Policy and National Forest Strategy (2006/2007) reflect the "3 Cs" approach and emphasize the importance of different aspects of forestry. The FDA was also restructured, creating three distinct departments each responsible for one of the "Cs", in addition to cross-cutting units of law enforcement, planning, research and development. The principle that forest use should be shared between three complementary approaches was also reflected in a land use mapping and forest use suitability assessment conducted in 2004. The assessment identified areas which, based on a number of criteria, were recommended to be used for the purposes of commercial forestry, proposed protected areas, and areas suitable for community forest management. Liberia is a signatory to the United Nations Convention on Biological Diversity treaty (ratified November 8, 2000), in which it pledged to "set aside at least 10% of the land area for Strict Protection and 30% of the land area for protection and multiple-use for partial protection". Thus, since Liberia's total land area is approximately 9.59 million hectares, the study used an area of 950,000 hectare (or 10%) as the minimum size for the protected area network. The study identified a total protected area network of 1.14 million hectares including 193,500 hectares of existing protected areas. 93.6% of this area is suitable conservation management while 65.4% and 17.6% of this area is suitable for commercial and community management respectively. The form of management of these conservation areas has not been established; it could take the form of traditional state-run Park's management in combination with community-led conservation initiatives or controlled commercial activities. Liberia is a signatory to a number of international agreements which affect the management of forests and also contribute to wider land use planning and sustainable use of resources: <ol style="list-style-type: none"> The United Nations Convention on Biological Diversity (see box above). The Convention sets out a commitment by governments to undertake to conserve and sustainably use biodiversity. Under the Convention, the government is required to develop a national biodiversity strategy and action plan, and to 	<ol style="list-style-type: none"> A concern has been raised that the "3 Cs" are operating in parallel, but not being integrated in the management of the sector. The land areas deemed suitable for each "C" were set out in the National Forest Management Strategy of 2007, but are difficult to interpret as large areas of land were identified as suitable for "mixed use", without a clear indication of how this would be effectively managed by the "3Cs" structuring of the FDA. The areas identified as "long term multiple sustainable use" include areas that include forest suitable for any/all of the three "C"s, but a significant amount of this land area has since been allocated as Forest Management Contracts, which are allocated to logging operators to be managed as permanent forest cover, but don't clearly meet conservation principles and have limited involvement of communities. The land use suitability assessment also refers only to potential uses of forest and does not reflect on ownership of the land areas. The different legal provisions for state-owned land (regulated according to the NFRL & Ten Core Regulations), as opposed to land for which communities hold deeds (which is covered by the provisions of the CRL), add an additional layer of complexity in determining how land will be used, and may complicate planning of how the "3Cs" will be balanced in a particular area. This reinforces the importance of participatory processes in determining land use strategy, taking into account all owners and users of the land in question. The conservation aspects of the forestry sector are framed into a number of elements of legislation, including the NFRL. The Protected Forest Areas Network Law (2003) was upgraded to Wildlife Conservation and National Parks Law (2017), built on the commitments in the Environmental Protection & Management Law (EPML; 2002), and enshrined a commitment to conserve 30% of Liberia's forest areas into the national legislation. The Protected Forest Areas Network Law expanded the existing area of Sapo national park, established the East Nimba Nature Reserve, and identified nine other areas of forest to be considered for some form of protected area status (including a range of options offering varying degrees 	<p>Greater attention must be given to governance issues (e.g. policy and legislation, links to development assistance) and treating the high-value bush meat trade as an aspect of the national economy.</p> <p>Local empowerment of resource users is a potential key strategy to achieve long-term sustainability.</p> <p>Lack of access to benefit sharing</p> <p>The third objective of the Convention on Biological Diversity provides for "the fair and equitable sharing of the benefits arising out of the utilization of genetic resources..."</p> <p>The properties of some genetic resources from timber and non-timber forest products have contributed to the development of a broad range of products, including pharmaceuticals and cosmetics.</p> <p>The Convention establishes that a person or institution seeking access to a biological resource in a foreign country in order to use its genetic material, should seek the prior informed consent of the country in which the resource is located.</p> <p>The sharing of benefits, through technology transfer, research results, training, and profits can contribute to poverty reduction and sustainable development in biodiversity rich developing countries.</p> <p>Sharing of benefits can take the form of payment of royalties, joint ownership over property rights, provision of equipment, etc.</p> <p>Genetic Resources from Timber and Non-Timber Products</p> <p>The properties of some genetic resources from timber and non-timber forest products have contributed to the development of a broad range of products, including pharmaceuticals and cosmetics. Some examples include: In Liberia the abundance of Phyllanthus, known to cure acute Hep B infections could be developed to help the millions of people infected with the HBV virus;</p> <p>Cussonia zimmermannii, a tree found in Tanzania, Kenya, Uganda and Mozambique and widely distributed in South Africa is used as a remedy for mental disorders;</p> <p>The bark of the Prunus Africana tree, in sub-Saharan Africa has been used by</p>	<ol style="list-style-type: none"> In the past 30 years there has been a major development in forestry policy in Liberia. Today it may be said that such a policy has become transformed into a discipline with a properly scientific foundation. However, it is still doubtful whether this discipline has actually been a positive element in the development of forest reality and related matters. Several components of forestry policy are showing real progress and some are lagging behind, notwithstanding their present status of a scientific discipline. There do not seem to be any doubts that the process of policy formation has shown major advances in recent times, a point substantiated by the technical and political debate on forestry policies which has taken place in different quarters of Liberia and which confirms growing participation by interest groups. Particularly important is the fact that this process shows, at least on paper, the interest - and even the participation - of non-forestry sectors in the debate. In the formation of forestry policies in Liberia account is taken today of non-forestry policies such as agricultural, environmental, industrial, fiscal, commercial, etc. policies whose effects are significant as far as forestry is concerned. Forest planning has made very rapid strides in recent years in Liberia, at least since 2006. One of the reasons accounting for this advance is thought to be the development of a growing feeling of frustration from the local and international community resulting from planning with outdated policy or regulations having lost its image of being an effective tool in the decision-making process. The command and control nature of the instruments and exclusion communities that depend on the forests was a strong weakness of the previous instruments. Advances during the last thirteen years in the application of methodologies with an increased technology or hardware element have resulted in doubt still existing as to whether better decision-making is being achieved. Forestry hardware are seen as destructive to the environment in the absence of environmental policies and consideration on their use. What is lacking in the current policy is

			<p>integrate these into broader national plans for environment and development. The focal point for this convention is housed within the EPA.</p> <p>ii. Liberia acceded to the Convention on International Trade in Endangered Species (CITES) in 1981, which regulates trade in a number of species that would form part of the commercial timber or bushmeat trade. The focal point for CITES is based within the Conservation Department of the FDA.</p> <p>iii. Most recently, Liberia has negotiated a Voluntary Partnership Agreement (VPA) on Forest Law Enforcement, Governance and Trade (FLEGT) with the European Union. This agreement aims to establish a system for traceability and verification of legality of timber, to a nationally-agreed definition. The system is now fully operational, the system is used to issue FLEGT licences, and only timber with a FLEGT licence allowed to be exported from the country. The intention is that the system is also being adapted to strengthen governance and law enforcement in the domestic timber sector. The VPA has been ratified by Liberia and is in force</p> <p>iv. There is “A New Wildlife and National Parks Act” Repealing chapters 1, 2, 3, and subchapters of volume 5 of the Liberian code of laws of 1956, relating to conservation of forests, forest reserves, conservation of wildlife and fish resources and national parks.</p> <p>v. All government ministries, agencies, corporations, subdivisions of local government and other bodies shall cooperate with the Authority in carrying out the objectives of the Authority</p> <p>vi. Manage wildlife and natural areas for the benefit, utilize and enjoyment of all people in accordance with international accepted principles of ecologically based management;</p> <p>vii. Conserve wildlife as a source of protein, revenue and employment; Protect, preserve and manage those animal and plant species threatened or endangered by extinction in Liberia;</p> <p>viii. Preserve areas of outstanding scenic, natural, scientific recreational and other value through the establishment of National Parks, Nature Reserves and other protected areas.</p> <p>ix. Promote and provide education about wildlife and nature conservation.</p> <p>x. All government ministries, agencies, corporations, subdivisions of local government and other bodies shall cooperate with the Authority in carrying out the objectives of the Authority</p> <p>xi. Forestry is affected by the LRL: Under Article 42: Land Rights Law (2018)</p>	<p>of restriction on permitted activities). The Wildlife Conservation and National Parks Law placed in policy the new parks including the Gola Rainforest National Park shared with Sierra Leone. The National Forest Management Strategy repeats the commitment for some 30% of Liberia’s forest to be placed under some form of protection, and currently several different mechanisms are in place including one National Park, one strict nature reserve, multi-use reserves and identified areas of national forest. The establishment of the Lake Piso multiple-use reserve in 2011 and the Gola Rain Forest National Park in 2016 is seen as a major success in developing the network of protected areas across Liberia. Consultations are underway regarding the creation of additional reserves and protected areas in a number of forested areas, including Gola forest, Wonegisi, Grebo hills, and west Nimba. Progress in gazettement any of these proposed protected areas has been very slow. As is reflected in the Strategy, a mixture of different tools would likely be necessary to find mechanisms to protect the forest that also respect the rights and demands of communities living in these areas.</p> <p>3. Harmonizing new laws with the CRL and its regulation (Land rights, local governance act)</p> <p>4. Potential overlap might ensue CF Process</p> <p>5. CRL Procedural difficulties</p> <p>6. Logging procedure of CFMA not explicitly covered by VPA</p> <p>7. Question of Immediate versus Long Term Benefits</p> <p>8. Scramble over Forest for Conservation and Commercial purposes</p> <p>9. No proven alternative livelihood approach to oust timber extraction</p> <p>10. Lack of structural and institutional reform to correlate with new laws and regulations</p> <p>11. The act does not promote non timber products</p> <p>12. In the New Wildlife and National Parks Act, the Authority gives no level of autonomy to the conservation department; instead the Authority is still responsible for the management and administration of wildlife, National Park, Nature Reserve and other protected areas and for the administration of this Act and</p>	<p>local communities for the treatment of a variety of illnesses, including malaria, syphilis, high blood pressure, Asthma, etc.</p> <p>All parts of Moringa Olefera, a plant species that grows and produce in every landscape in Liberia, and known to be a solution to malnutrition and capable of curing hundreds of known diseases Liberia</p> <p>Communication, education and public awareness</p> <p>One of the core principles of Sustainable Forest Management (SFM) is that it reflects a diverse range of societal values in reference to forest conservation and use.</p> <p>Public awareness raising and communication activities play a critical role in informing and educating the public, thereby allowing them to more effectively participate in SFM decision-making.</p> <p>SFM requires the support at varying times and places from different government departments, NGOs, indigenous and local communities, business and industry, scientists, women’s groups, youth, and community-based groups.</p> <p>To work with these different groups, communication, education and public awareness (CEPA) are crucial instruments to build trust, understanding and shared agreements for action and to reduce conflict.</p> <p>CEPA is needed to help people work together and innovate, and spread information, knowledge, values and goals.</p> <p>The CCCD has now prepared a communication and awareness raising plan for all sectors implementing activities connected with the Rio Conventions</p> <p>Under the Land Rights Law (2018)</p> <p><u>Article 43: Forest Lands</u></p> <p>1. A portion of Customary Land shall be considered and used as forest land if it is not: (i) a Residential Area; an agricultural area; a cultural shrine or a Protected Area; and (ii) has timber as its primary cover.</p> <p>2. A Community may use its forest lands and harvest all timber and non-timber products thereon,</p>	<p>lack of development of human resources, education and training. The FDA needs to adopt a new paradigm for sustainable forestry development, based on the definition given by the Brundtland Commission stating that "sustainable development attempts to satisfy current needs without compromising the ability of future generations to fulfil their own needs". In this connection, it is pointed out that current needs will have to be relativized for the benefit of future generations. Along the same lines, reference is made to the fact that most cultures believe that a country’s level of development is directly proportionate to the level of education and training achieved by its workforce and the population, the latter term being taken in its broadest sense.</p> <p>6. The concepts of sustainable development expressed by Brundtland lead to the need to establish sustainable societies. The foregoing entails an ethical attitude in which the attitude to forest resources is included. This can only be achieved through education, training, research and overcoming problems.</p> <p>7. The materialization of the concept of sustainable society demands a permanent exchange of knowledge, an exchange with other societies with great respect for the environment, an educational process right from the first level, appropriate means for the exchange of information and access to the latter and the effective exploitation of the experience and talents of native peoples and minorities.</p> <p>8. Following this line of thought, challenges of great magnitude arise for forestry research which are linked to the need to identify formulas for objectively contributing to people's well-being.</p> <p>9. In Liberian forests, the generalized methods of exploitation have proved to be unsustainable. This situation stems from various factors, among which may be mentioned: abject poverty as a result of macroeconomic policies, soil use, structural and institutional deficiencies, shortcomings or inadequacies in education and training, lack of research, conflicting laws (such as the Land Rights Law and the Forest Management Law) flaws in the transfer of technology, poor communication with local communities and others.</p> <p>10. In the face of this situation, it is suggested that the solution must be achieved through the improvement of education,</p>
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Protected Areas within Customary Lands may include forest, wetlands, major water sources and land set aside by a Community for ecotourism. 5. Any portion of Customary Land established or set aside as a Protected Area shall not be sold, leased, or granted as a Concession, but a limited use rights may be granted to Community Members for livelihood activities, provided that the use is consistent with the conservation and management provisions of the National Forestry Reform Law of 2006 or any successor legislation. 6. The Government shall provide reasonable resources and technical assistance to build the capacity of Community Members to manage Protected Areas within Customary Land to enable the Government to monitor area's biodiversity and the Community Members' compliance with the conservation and management provisions of the National Forestry Reform Law of 2006 or any successor legislation. 	<p>any regulations issued under this Act</p> <ol style="list-style-type: none"> 13. The Wildlife Act does not sufficiently address hunting which is a serious threat to wildlife and biodiversity conservation; Hunting for food in Liberians forests is an issue of concern as the scale of hunting occurring in Liberia threatens many forest species; it is also linked to the food security and livelihood of numerous Liberia's forest-region inhabitants, who have few alternative sources of protein and income 14. The fines or penalty for killing animals under the act are not deterrents (USD 500-1000 for elephant or leopard; 250-500 for other animals; For other violations is USD 50 -150 including lighting up a fire 15. Species protection seem to be given attention in protected areas but research show that over 60% of biodiversity resides outside protected areas. 	<p>directly or indirectly in keeping with the provisions of the Community Rights Law of Liberia and the Forestry Development Law of 2006. How this is regulated is not clear.</p>	<p>training and the intensification of research in its perspective as relating to sustainability, the need for more technical cooperation, adequate levels of participation and appropriate policies and legislations. The primary law is too centralized and of a control and command nature.</p> <ol style="list-style-type: none"> 11. The factors which have had an impact on the improved development of forest planning in Liberia are numerous, although Contreras singles out the following main ones: <ol style="list-style-type: none"> i. A displacement of the center of gravity of the planning process from economic and commercial matters to environmental considerations. ii. Project planning has been sustained by greater skill in measuring and evaluating the externalities of forest resources at the local, national and global level. iii. The incorporation of social aspects, which has allowed a better understanding of the different perspectives of the different interest groups with a relevant role in the sustainable management of forest resources. iv. The understanding that most of the factors which have had an effect on the deterioration on forest resources have led to recent efforts to study the link between the management of forest resources and the development which has taken place in allied areas of economic activity. v. The acceleration of the process of the globalization of the world economy has also meant that planning is necessary in order to restructure institutional models, both at the national and international level, and the mechanisms to face new demands. vi. In the authors' opinion, the factors pointed out by Contreras (1997) are of great importance and substance. All have a common denominator that the postulates of sustainable forest development will only be able to materialize insofar as an objective which is even broader, such as sustainable global development, is a reality. Forest development must contribute towards this end, incorporating the political, social and economic variables of its environment in its rationality. vii. Contreras (1997) refers to a number of aspects which have had an effect on the limited results of forest planning,
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						<p>mentioning among them the uncertainty surrounding certain unclarified aspects in relation to the physical effects of certain policies or measures, such as forest exploitation, and limitations with regard to the methodology for the valorization of certain services, such as biodiversity. He also refers to institutional factors and, especially, the negative effects of corruption.</p> <p>viii. Planning and evaluation methodologies need to be applied which are stable in terms of time and which consider the negative or positive impact in the long term. It is possible that certain programmes entail social deterioration and even, initially, an aggravation of the situation of poverty.</p> <p>ix. In addition to the above needs several pressing needs to be met by the Forestry Policy such as follows:</p> <ul style="list-style-type: none"> i. Sustainable forest sector development management, with an emphasis on generating employment for rural forest dependent communities, could be an important part of a strategy to address stubborn rural poverty. ii. Embark on REDD+ and forest Carbon to raise funds for rural livelihood and for operationalizing the forestry development and biological diversity conservation strategies. Although REDD+ Readiness program is almost complete the scheme is not legislated for constructive regulation by players; ii. According to the World Bank, Devolving forest management rights and responsibilities could be a strong driver for breaking the rural poverty nexus. iv. Strengthen the capacity and effectiveness of the FDA and improve the quality of forest governance; As FDA is a state enterprise, the conditions of service of personnel will either attract or repel skillful and expert professionals. v. Greenhouse gas mitigation: Utilize the overlap between Liberian and global interests to manage the forests sustainably; vi. Develop a staff retirement plan and secure funding for retirement packages. In parallel, develop a staff recruitment plan with high wages to attract good professionals; ; ii. Strengthen the monitoring and law enforcement capabilities of the FDA (through increased surveillance capacity), including those required to tackle illegal logging and hunting by training with the
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						<ul style="list-style-type: none"> ii. national police in the use of light arms and being armed. ii. Promote devolvement of responsibility for forest management to local levels and to communities and improve transparency through the greater involvement of civil society organizations (CSOs) and nongovernmental organizations (NGOs) in decision making; ix. Support the Committee on Natural Resources Management to undertake their monitoring role. x. Support the Liberia Land Authority to promote responsible land governance and land-use planning to improve tenure security of land and forest resources; xi. Develop legislative and regulatory frameworks and corresponding operational guidelines to bring chainsaw milling, charcoal manufacture, and artisanal mining activities into the formal sector; ii. Revise the action plan prepared as part of the forest governance diagnostic exercise, taking into consideration the support provided through various initiatives and mainstream into the FDA reporting systems to the Government and external partners; ii. Protection of Biodiversity in production forests: The International Tropical Timber Organization (ITTO) and the International Union for Conservation of Nature (IUCN) have developed “Guidelines for the conservation and sustainable use of biodiversity in tropical timber production forests” (ITTO and IUCN 2009). iv. establish a forest management plan in which biodiversity conservation objectives are clearly and explicitly identified for each area of forest under management. iv. In preparation of harvesting plans, pay particular attention to the local occurrence of species or habitats of special conservation concern and species that perform vital ecological functions. vi. Plan the allocation of tropical production forests at a landscape scale and plan harvesting blocks in ways that do not disrupt the continuity of mature forests. ii. Raise public and political awareness on international/national laws and disseminate biodiversity information and strategies using various media. ii. Coordinate actions of forest owners, users and managers across landscapes to best ensure the maintenance of sufficient high-quality connected habitat for species.
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						<p>and IUCN</p> <p>iv. Biodiversity offset mechanism for large-scale mining and Agricultural projects</p> <p>Establish an Autonomous National Wildlife and Protected Area Authority</p> <p>Protected areas alone are not enough to save Liberia's threatened species. Liberia aims to reach an international target of having 17 percent of its land covered by protected areas such as national parks, as a strategy to halt biodiversity declines. However, research evidence shows that well managed protected areas would address all major threats facing almost only half of threatened species. But over half of Liberia's threatened species present a serious need to look beyond protected areas to effectively deal with some of the major problems threatening their survival. Given this fact, the current law does not accord protection of species living outside protected areas.</p> <p>It is vital that lands outside national reserves and protected areas are managed in ways that promote biodiversity conservation, especially in the face of the current rate of loss of species. The Laws and policies should also aim at conserving species populations or assemblages occurring outside protected areas; off reserve management. <i>In situ</i> conservation of species outside the formally protected areas is also known as off-reserve management. A range of policies and laws must be employed to implement protected area systems and offer a higher degree of protection for species outside protected areas. Such actions may depend on engaging private landowners in conservation process and include methods and instruments to contain and reduce threats to species outside protected areas such as:</p> <ul style="list-style-type: none"> i. Conservation easement (both voluntary and legal) ii. Incentive based schemes iii. Local conservation strategies iv. Public and private collaboration for conservations v. Special cases such as conservation in vegetation fragments and micro reserves vi. Habitat conservation planning and mitigation banking vii. In consideration of the new Customary Land Ownership Policies and Laws, conservation easement should be introduced as voluntary agreements between private land owners and the FDA for the
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						<p>preservation of a certain area or species.</p> <p>viii. Marine and aquatic biodiversity Marine biodiversity concerns are focused on the diverse estuarine and near-shore marine ecosystems most threatened by human exploitation and settlements, but the conservation law of Liberia is silent on marine biodiversity.</p> <p>ix. To be able to carry out its mandate under the UNCBD, Liberia wildlife management system should carry out the following additional functions, which compels the Government to amended Wildlife Conservation and National Parks Act again: The conservation department should become an Autonomous Authority with additional responsibilities to –</p> <ul style="list-style-type: none"> a) ensure the protection of <u>natural ecosystems</u> as defined by the Aichi Targets and threatened biodiversity throughout Liberia including the continuing establishment and maintenance of representative and sustainable samples; b) act as the watchdog for ecosystem sustainability, ensuring it takes the action necessary including filing complaints to the EPA enforcement of the EPA Environmental Management Act; invoking the precautionary principle c) oversee the management of local and private nature reserves and sanctuaries throughout Liberia including zoos and wildlife rescue and rehabilitation centers; d) supervise the management of wildlife outside conservation areas; e) regulate wildlife conservation and management throughout Liberia in accordance with an appropriate amendment of the current Act; f) Establish Biodiversity offset payment (cash/in kind) to benefit biodiversity management g) collaborate with other stakeholders including private land owners and community land owners, the EPA, MOA etc. in developing a national REDD+ Strategy and promoting REDD+ Projects in Liberia as a source of sustainable financing for Conservation of wildlife Protected Area Management; h) enter into public-private partnership agreements for the management of National Protected Areas; i) (m) sensitize local communities and address local stakeholders’ interests on land conservation and socioeconomic issues;
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						<ul style="list-style-type: none"> j) prepare detailed inventory and mapping of fauna and flora every 5 years; k) establish a detailed biodiversity monitoring programme including, camera trapping, tagging of (elephants, pigmy Hippos and other species as relevant), a GIS unit that would store and disseminate data on the status of biodiversity in Liberia; l) carry out such other functions and programmes as may be necessary for the attainment of the objects of the department/new Authority including; m) development and approval of management plans, zoning and National Protected Area regulations; (iii) development of national biodiversity and conservation policies in line with international best practices; n) preparation of national strategic action plans for the conservation of key biodiversity species such as Pygmy Hippopotamus; o) evaluation and approval of National Protected Areas annual operation plans and budgets; <ul style="list-style-type: none"> i. representing the Government of Liberia in international conventions and conferences; ii. undertake capacity building initiatives for National Protected Areas staff including housing, observation posts, hardware, PPG; iii. Provide for the carrying of light firearms (short guns) for personal protection from aggressive animals and as deterrent from aggression by poachers iv. overseeing the implementation of CITIES; v. undertaking biodiversity gap analysis and preparing proposals for the establishment of new National Protected Areas; vi. developing policies and strategies for adapting the National Protected Areas system to the impacts of climate change and sustainable land management; vii. promoting policies for enabling by local forest edge communities to participate and co-manage national resources inside and outside National Protected Areas; viii. developing and promoting National Protected Area corridors and buffer zones conservation strategies based on the principles of multiple use and Eco management; and ix. introducing exotic game for touristic purposes for a designated are such as zebra, giraffe emulating Kenya,
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						<p>Zimbabwe, Tanzania,</p> <p>i. The conservation department continues to concentrate on protected area management but with little freedom and flexibility and resources from the supervising Authority, hence the Liberia Government should be compelled as previously done with (FDA and NaFAA in the MOA) to establish a modern Wildlife Conservation and Protected area Authority.</p>
LLA	<p>The Liberia Land Authority (LLA) is a product of the policy, legal and institutional reform of the land sector of Liberia led by the erstwhile Land Commission. The LLA, established by an Act of the National Legislature on October 6, 2016, as an autonomous agency of the Government with operational independence, subsumes land functions that were performed by several agencies of government...</p> <p>The Land Authority proposes, advocates and coordinates reforms of land policy, laws, and programs with the ultimate aim of ensuring equitable and productive access to the nation's land, both public and private, security of tenure in land and the rule of law with respect to landholding and dealings in land, and effective land administration and management.</p>	<ol style="list-style-type: none"> 1. Liberia Land Authority Act 2. Land Rights Law Of 2018 	<p>PART FIVE OF THE LAND RIGHTS ACT: MATTERS COMMON TO ALL CATEGORIES OF LAND RIGHTS</p> <p>CHAPTER 14: PROTECTED AREAS</p> <p>Article 59: Conditions Pertaining to Protected Areas</p> <ol style="list-style-type: none"> 1. There shall be co-extensive with but independent of the four (4) land ownership categories established in Article 7 of this Act a unique land use category called Protected Area, which shall include all Land designated by the Government for protection or restricted use. 2. A Protected Area may be created by the Government in or on Private Land and Customary Land after complying with the provisions of Article 42 and Article 54 of this Act. 3. Where Private Land or Customary Land is acquired under the provisions of Article 42 or Article 54 of this Act and is thereafter designated as a Protected Area, the Land shall be conserved and managed in accordance with the National Forestry Reform Law of 2006 or any successor legislation for the benefit of all Liberians 4. A Protected Area may be a full nature reserve or a partial nature reserve. A full nature reserve Protected Area may not a subject of a license or permit to use or utilize in any way, including extraction of any resource(s). 5. These provisions pertain to sustainable land management 			<p><u>Key development gaps that need to be enforced by law:</u></p> <ol style="list-style-type: none"> 1. Lack of land use policy and planning; land use planning and mapping (LUPM) is a government's most powerful tool to achieve orderliness and realize goals in biodiversity conservation and sustainable land management.it promotes every sector a benefit to communities and industry alike. 2. The Lead on LUPM should be LLA but all natural resource management sectors must participate in the process in order to produce plans of high 'resolution' and to be well accepted. Land use planning and mapping is also an urgent intervention that needs to occur and the law makers can accelerate this.
MoPW	<p>The Ministry of Public Works provides basic social and physical services such as feeder roads, improved sanitation and piped water as a means to improve the livelihood of rural peoples.</p>			<p>*No person shall undertake or cause to be undertaken any of the projects set out in the ESHIA Schedule unless he/she holds a valid license in respect of such project*. This should be the spirit of the Ministry of Public Works</p>	<p>The unprecedented and irreversible loss of biodiversity in modern times is caused primarily by the elimination or degradation of natural habitats around the world. Since the construction and improvement of roads sometimes leads, directly or indirectly, to the loss and degradation of natural habitats, road construction and biodiversity aims are often at odds. However, many potentially serious conflicts between road projects and biodiversity conservation can be avoided by strong policies and laws.</p>	<p>Required Policy Direction</p> <p>Induced negative impacts of road projects on biodiversity can be minimized by careful project siting, taking special care to avoid passing through protected areas and other critical natural habitats, including forested areas (which are especially vulnerable to induced impacts). Where some natural habitat loss is inevitable, appropriate mitigation may include the establishment of strict protection zones alongside the road, or compensatory protected areas elsewhere to offset the expected road-related natural habitat loss (as is typically required under the World Bank's Natural Habitats Policy). This kind of mitigation requires effective inter-agency collaboration-- for example, between the agencies responsible</p>

						for roads and protected areas. Direct adverse impacts of road works on biodiversity can also be significant, but they are generally simpler to avoid or mitigate, because they are more fully under the control of road construction agencies, contractors, and concessionaires. Biodiversity loss and environmental damage can be considerably reduced when planners and road construction agencies site roads adjacent to existing railways, pipelines, or transmission lines; practice sound road engineering; maintain good drainage and natural water flows; minimize roadside habitat loss; and, exercise care in the siting and design of borrow pits, construction camps, and other complementary facilities. Environmental rules for contractors, including transparent penalties for noncompliance, need to be incorporated within bidding documents and contracts. Most important: Undertake Environmental and Social Impact Assessment (ESIA) for all construction activities
LMA	<p>The Liberian Maritime Authority Act establishes the Liberia Maritime Authority, an autonomous body with responsibility for the registration of ships and other vessels, the licensing and safety of maritime personnel and for the regulations and development of maritime, coastal, inland water transport and other connected matters.</p> <p>The Liberia Maritime Administration has certain functions with a clear environmental and natural resource management focus. Section 4(2) of the Act provides that the Administration is responsible for ensuring in collaboration with such other public bodies as the Board may determine, the prevention of maritime pollution, protection of the marine environment and response to marine environment incidents. It is also tasked with pursuing the ratification or accession and implementation of international maritime conventions in conjunction with other appropriate agencies of Government. Most of the international maritime conventions relate to protecting the marine environment from pollution derived from ships and therefore have a strong environmental component.</p> <p>The Act gives responsibility to the Maritime Authority to protect the marine environment and prevent marine pollution. Although this mandate seems wide, the responsibility of the Maritime Authority is restricted only to maritime source pollution and excludes responsibility for pollution of the marine environment from land-based sources. Act empowers the Board of the Maritime Authority to make such rules and regulations necessary for</p>	Liberia Maritime Authority Act 2010	Pursuant to Section 5(4) of the Maritime Authority Act the Authority has established a Department of Marine Environmental Protection. This department is clothed with the responsibilities of developing and implementing an integrated system for the protection of the marine environment as well as the National Maritime as well as implement public policies associated with the protection of Liberia's marine environment in accordance with national and international regulations; develop policies governing the protection from pollution that could cause environmental damage to the marine environment; coordinate with other relevant government agencies for the establishment of a national system for immediate response to marine pollution incidents, reducing the risks and threats posed for such incidents; contribute to capacity building of personnel of all stakeholders in marine emergency response, damage assessment and identify measures needed to address them; participate in raising public awareness of citizens about the protection of the marine environment and to combat marine pollution; provide marine environmental advice to the Commissioner (Board Members) and the Board of Directors; Commission (now LLA) studies and tests necessary for the protection of the marine environment, and contribute to the field of environmental studies at the national level in the legal scope of the Commission (LLA); develop systems and technical procedures for inspection of environmental marine facilities; establish sets of rules and regulations that ensure the existence of effective compensation for damage to persons or property or the environment itself in the exercise of maritime activities, both within private enterprises (coastal and marine) or on the sea; organize and		<p>There are no formal mechanisms for cooperation between the Liberia Maritime Authority and the Environment Protection Agency. Currently the Board of Directors of the Environment Protection Agency does not include a representative of the Maritime Authority because the Authority was established 7 years after the establishment of the EPA. Meanwhile, the Authority does not name the EPA in Section 4(2) the list containing the Agencies to collaborate with the Authority and this is a serious oversight.</p> <p>The Maritime Authority's mandate covers only maritime source pollution while the Authority should suggest a broader interpretation. The Department of Marine Environmental Protection should sought to include outside sources of marine pollution (e.g. plastic pollution to name just one) because it refers also to protection of the marine environment.</p>	<ol style="list-style-type: none"> 1. There should be avenues for closer cooperation between the Authority and the Agency particularly given the fact that the Environment Protection Agency has a responsibility to coordinate with other Government Agencies on matters of environmental protection. 2. There should be formal and permanent means for cooperation and collaboration in order to address emerging issues of marine pollution, plan for the effective implementation of the International Maritime Organisation Conventions and to devise strategies and activities to control growing pollution of the marine environment. 3. Emerging factors such as the development of the oil and gas sector, the increase in inland maritime traffic due to the transport of mined ores will lead to increased scope for marine pollution and related environmental issues. It is advisable that the Authority be included as part of the Board of Directors of the Environment Protection Agency. 4. Given that existing members of the Board of Directors represent Ministries and <i>ex officio</i> members whose mandate contain environmental or natural resource components, its seems an oversight that

	giving effect to the provisions of the Act. The Board therefore has authority to make regulations specific for the governance of the marine environment and to deal with matters of marine pollution stemming from maritime sources.		coordinate operations to combat marine pollution in all its forms, and follow up implementation of plans and control techniques adopted in the Commission(LLA) and develop follow-up actions necessary to implement a national contingency plan for dealing with oil pollution of the marine environment in accordance with international standards. The Marine Environmental Protection department also handles Integrated Coastal Management Program, Liberia Coastal Zone, programs that safeguard Liberia's marine and waterways from invasive species through the development and implementation of an effective ballast Water Management policy			the Authority which has wide responsibility for the maritime and marine sector should be missing from the Board of the EPA.
MOE	The Ministry of Education Liberia works to build a better future for the country's children by delivering quality and affordable education		The education system of Liberia does not have a "purpose built environmental education curriculum" that is delivered in schools and universities. This has led to low intellectual capacity in the environmental discipline. The Environmental Protection Agency, in collaboration with the EPA has recently launched Environmental Science at Masters Level in the University of Liberia and the courses are to start in 2019/2020 academic year. The aim of this move is to fill the critical capacity in the EPA and other environmental related entities.	Environmental education is a process that allows individuals to explore environmental issues, engage in problem solving, and take action to improve the environment. As a result, individuals develop a deeper understanding of environmental issues and have the skills to make informed and responsible decisions. The components of environmental education are: 1. Awareness and sensitivity to the environment and environmental challenges 2. Knowledge and understanding of the environment and environmental challenges 3. Attitudes of concern for the environment and motivation to improve or maintain environmental quality 4. Skills to identify and help resolve environmental challenges 5. Participation in activities that lead to the resolution of environmental challenges Environmental education does not advocate a particular viewpoint or course of action. Rather, environmental education teaches individuals how to weigh various sides of an issue relating to the environment (water, air, land or the atmosphere) through critical thinking and it enhances their own problem-solving and decision-making skills.	1. Threats to human health and environmental quality are increasingly complex, involving a wide range of conventional and toxic contaminants in the air and water and on the land. 2. There is growing evidence of international environmental problems, such as global warming, ocean pollution, and declines in species diversity, and that these problems pose serious threats to human health and the environment on a global scale. 3. Environmental problems represent as significant a threat to the quality of life and the economic vitality of urban areas as they do the natural balance of rural areas. 4. Effective response to complex environmental problems requires understanding of the natural and built environment, awareness of environmental problems and their origins (including those in urban areas), and the skills to solve these problems. 5. Development of effective solutions to environmental problems and effective implementation of environmental programs requires a well-educated and trained, professional work force. 6. Current Federal efforts to inform and educate the public concerning the natural and built environment and environmental problems are not adequate. 7. Existing government ,support for development and training of professionals in environmental fields is not sufficient. 8. The Government, acting through the Environmental Protection Agency, should work with local	Environmental Education: 1. Increases public awareness and knowledge of environmental issues in Liberia 2. Does teach individuals and citizens of Liberia critical-thinking 3. Does enhance individuals' problem-solving and decision-making skills 4. Does not advocate a particular viewpoint but advocates participation, collaboration and inclusion 5. The EPA should prepare through parliament a National Environmental Education Act of which will require it (the EPA) to provide national leadership to increase environmental literacy. EPA should established the Office of Environmental Education to implement this program. 6. It should be a new policy of the Government of Liberia to establish and support a program of education on the environment for students and personnel working with students, through activities in schools, institutions of higher education, and related educational activities, and to encourage postsecondary students to pursue careers related to the environment. A law should implement: ENVIRONMENTAL EDUCATION AND TRAINING PROGRAM. The purpose of the program should be to train educational professionals in the development and delivery of environmental education and training programs and studies. (b) The functions and activities of the program shall include, at a minimum- 1. classroom training in environmental education and studies including environmental sciences and theory, educational methods and practices, environmental career or occupational education, and topical environmental issues and problems; 2. demonstration of the design and conduct of environmental field studies

					<p>education institutions, State education agencies, not-for-profit educational and environmental organizations, noncommercial educational broadcasting entities, and private sector interests to support development of curricula, special projects, and other activities, to increase understanding of the natural and built environment and to improve awareness of environmental problems. (9) The Federal Government, acting through the coordinated efforts of its agencies and with the leadership of the Environmental Protection Agency, should work with local education institutions, State education agencies, not-for-profit educational and environmental organizations, noncommercial educational broadcasting entities, and private sector interests to develop programs to provide increased emphasis and financial resources for the purpose of attracting students into environmental engineering and assisting them in pursuing the programs to complete the advanced technical education required to provide effective problem solving capabilities for complex environmental issues.</p> <p>9. Liberia's natural resource agencies such as the FDA and the EPA have a wide range of environmental expertise and a long history of cooperation with educational institutions and technology transfer that can assist in furthering the purposes of the Act</p>	<p>and assessments;</p> <ol style="list-style-type: none"> 3. development of environmental education programs and curriculum, including programs and curriculum to meet the needs of diverse ethnic and cultural groups; 4. sponsorship and management of international exchanges of teachers and other educational professionals between member states of the MRU involved in environmental programs and issues; 5. maintenance or support of a library of environmental education materials, information, literature, and technologies, with electronic as well as hard copy accessibility; 6. evaluation and dissemination of environmental education materials, training methods, and related programs; 7. sponsorship of conferences, seminars, and related forums for the advancement and development of environmental education and training curricula and materials, including international conferences, seminars, and forums; 8. supporting effective partnerships and networks and the use of distant learning technologies; and 9. Special emphasis should be placed on developing environmental education programs, workshops, and training tools that are portable and can be broadly disseminated. 10. PROVIDE ANNUALLY ENVIRONMENTAL EDUCATION GRANTS FOR SERVICE PROVISION AS WELL AS A BIDDING MECHANISM. 11. ESTABLISH ENVIRONMENTAL INTERNSHIPS AND FELLOWSHIPS 12. ESTABLISH ENVIRONMENTAL EDUCATION AWARDS 13. ESTABLISH AN ENVIRONMENTAL EDUCATION ADVISORY COUNCIL AND TASK FORCE. 14. ESTABLISH THE NATIONAL ENVIRONMENTAL EDUCATION AND TRAINING FOUNDATION
CARI	The Central Agricultural Research Institute is the only research organization in the country that has			Societal concern is growing about the consequences of climate change for food	1. There are, two important considerations regarding these	1. To overcome the limitation of current agronomic research outputs there are

<p>been carrying out applied and adaptive research covering food and tree crops, livestock, aquaculture, and related areas; Technical and research institutes include national universities and research institutes involved in conservation, agriculture and rural development, and ministerial institutes such as the University of Liberia.</p>	<p>systems and, in a Liberia, for food security. There is also concern that meeting the rising demand for food is leading to environmental degradation thereby exacerbating factors in part responsible for climate change, land degradation, biodiversity loss and further undermining the food systems upon which food security is based. A major emphasis of climate change/food security research over recent years has addressed the agronomic aspects of climate change, and particularly crop yield. This has provided an excellent foundation for assessments of how climate change may affect crop productivity, but the connectivity between these results and the broader issues of food security at large are relatively poorly explored; too often discussions of food security policy appear to be based on a relatively narrow agronomic perspective. The Central Agricultural Research Institute is poorly funded to a point that it can barely just pay its staff and carry out non-ground breaking research</p>	<p>agronomic research contributions to the food security/climate change debate.</p> <ol style="list-style-type: none"> 2. The first concerns scale. Agronomic research at CARI has traditionally been conducted at plot scale over a growing season or perhaps a few years, but many of the issues related to food security operate at larger spatial and temporal scales. Over the last decade, agronomists have begun to establish trials at landscape scale, but there are a number of methodological challenges to be overcome at such scales. 3. The second concerns the position of crop production (which is a primary focus of agronomic research) in the broader context of food security. Production is clearly important, but food distribution and exchange also determine food availability while access to food and food utilization are other important components of food security. 4. The potential for stronger linkages between the results of agronomic research in the context of climate change and the policy environment will thus be enhanced. 	<p>several scientific challenges where further agronomic effort is necessary, and where agronomic research results can effectively contribute to the broader issues underlying food security.</p> <ol style="list-style-type: none"> 2. First is the need to better understand how climate change will affect cropping systems including both direct effects on the crops themselves and indirect effects as a result of changed pest and weed dynamics and altered soil and water conditions. 3. Second is the need to assess technical and policy options for either reducing the deleterious impacts or enhancing the benefits of climate change on cropping systems while minimizing further environmental degradation. 4. Third is the need to understand how best to address the information needs of policy makers and report and communicate agronomic research results in a manner that will assist the development of food systems adapted to climate change. 5. Meanwhile, while agronomic research alone cannot address all food security/climate change issues (and hence the balance of investment in research and development for crop production <i>vis à vis</i> other aspects of food security needs to be assessed), research will nevertheless continue to have an important role to play: <ol style="list-style-type: none"> i. it both improves understanding of the impacts of climate change on crop production and helps to develop adaptation options; and also – and crucially – ii. it improves understanding of the consequences of different adaptation options on further climate forcing. iii. This role can further be strengthened if agronomists work alongside other scientists to develop adaptation options that are not only effective in terms of crop production, but are also environmentally and economically robust, at landscape and regional scales. Furthermore, such integrated approaches to adaptation research are much more likely to address the information need of policy makers.
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