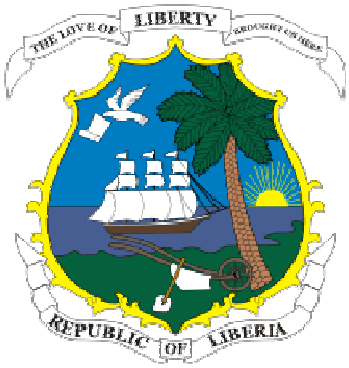


Republic Of Liberia

Submission to the World Bank

Forest Carbon Partnership Facility

Readiness Program Idea Note (R-PIN)

for

Reducing Emissions from Deforestation and Degradation (REDD)

May 30, 2008

1. GENERAL DESCRIPTION OF R-PIN SUBMISSION

(a) Submitted by:	Antoinette Sayeh, Minister of Finance Ministry of Finance, Broad Street, Monrovia <libfinancemin@yahoo.com>
Focal point for the FCPF	Hon. John T Woods, Managing Director, Forestry Development Authority (FDA), P.O. Box 10-3010, Monrovia, Liberia. Telephone: +231-6-564070, <johntwoods38@yahoo.com>
(b) R-PIN contributors	**John Woods**, Managing Director, FDA **Augustine Johnson**, Manager, GIS and Remote Sensing, FDA **Bledee Dagbe**, Manager, Socio-economic Development and Planning, FDA **Jessica Donovan**, Program Director, CI-Liberia **Ben Vitale**, Senior Advisor, Conservation International **Marc Steininger**, Scientific Director, Conservation International
(c) Consultation Process	The National Carbon Working Group was the main consultative body for this document. See list of members attached in Annex 1. Other Consultations include: • Susan Braatz, FAO • Adrian Whiteman, FAO • Matthew Hansen, South Dakota State University • Sandra Brown, Winrock International • Jurgen Blazer, Intercooperation • Olaf Zerbock, Conservation International • Celia Harvey, Conservation International • David Tepper, Technical Advisor, McCall MacBain Foundation • The McCall MacBain Foundation • Ministry of Finance

2. INSTITUTIONAL MANDATES

(a) Forest monitoring and forest inventories: **b) Forest law enforcement:** **(c) Forestry and forest conservation**	Forestry Development Authority (FDA)
d) Coordination across forest and agriculture sectors, and rural development:	Economic Revitalization Committee of the Cabinet and Economic Revitalization Pillar of the Liberia Reconstruction and Development Committee (LRDC) *In close coordination with:* Ministry of Agriculture Ministry of Planning and Economic Affairs LRDC Secretariat Forestry Development Authority (Chairman is Minister of Agriculture) Environmental Protection Agency Ministry of Lands, Mines & Energy Ministry of Internal Affairs

	Ministry of Finance National Investment Commission

3. CURRENT COUNTRY SITUATION

3 (a) Current Status of Deforestation and Forest Degradation in Liberia

Liberia's President Ellen Johnson-Sirleaf has demonstrated political will for REDD through her support for national forestry, environment, conservation and development policies that have positioned Liberia in the forefront of global thinking on reducing emissions from deforestation and degradation.

Liberia contains 4.5 million hectares of lowland tropical forest that comprises 43% of the remaining Upper Guinea forests of West Africa. These forests are immensely important for their biological diversity, (they contain the last long-term viable populations of several endemic species), ecosystem service provisioning, and potential to contribute to the country's development goals. As Liberia recovers from the devastating impacts of a 14-year civil war, the government is working to increase funding and capacity to effectively manage natural resources for the benefit of the population and biological diversity. The government of Liberia has designed its national forest strategy based on the "3C" approach, integrating community, conservation, and commercial uses of the forest, while emphasizing job creation and community incentives. This strategy is consistent with proposed national-level REDD implementation plans, and the World Bank Forest Carbon Partnership Facility has the unique opportunity to assist Liberia to realize the potential of REDD and to support a replicable example in Africa.

Over 15 years between 1990 and 2005, forest area has been reported as being reduced by 22% *(FAO Global Forest Resource Assessment, 2005)* Countrywide, it is estimated that roughly 25% percent of Liberia's forests has been recently logged. A 2008 forest change analysis in Liberia performed by a partnership between the Forestry Development Authority (FDA), Conservation International and South Dakota State University (SDSU) notes the average deforestation rate increasing from 0.2% in 1986-2000 (*Christie et. al. 2007*) to 0.35% in 2000-2006. The new estimate is from a recent collaboration to update the deforestation information for Liberia, conducted by CI, the FDA and South Dakota State University (SDSU).

Deforestation rates have been held relatively low in Liberia during the past two decades due to the civil conflict. Recent clearing activity is mostly concentrated in ten or so sectors of the country. Most places that showed clearing from 1986 to 2000 showed continued clearing after 2000. Almost all clearing is in the form of numerous small (<10 hectare) clearings around towns and roads near towns in Liberia's forest regions. This indicates the strong relationship between patterns of settlement, road access and forest clearing in Liberia.

The civil conflict that forced many to leave the countryside and immigrate to the capital and elsewhere explains much of the low historical deforestation rates. This was also a period of relatively low international timber and agricultural exports. Now that peace has been restored, there is a general return of the population to rural areas, assisted by extensive infrastructure rehabilitation of road and bridges. These domestic factors, coupled with expanding global markets for tropical agricultural products, biofuels and timber will exert considerable pressure on land use conversion from forests.

3 (b) Estimate of greenhouse or carbon dioxide emissions from deforestation in Liberia

By combining data on recent deforestation and forest biomass, the FDA estimates that annual emissions from clear-cutting in Liberia averaged over 7.6 Mt CO_2e per year from 2000 to 2006. This does not include additional emissions from degradation, nor does it represent the potential future emissions from both deforestation and degradation in Liberia. *(Unpublished analysis by FDA, CI, SDSU in 2008)*

3 (c) Availability of data for estimating deforestation and/or forest degradation.

To support the country-wide spatial planning and modeling, FDA has developed a GIS database on natural and

infrastructure conditions, in which all data layers have been re-projected or co-registered to UTM Zone 29North WGS84 (Annex 5).

Two main studies provide data on recent change in Liberian forests. The first is a study of forest type, produced by the Liberia's Forest Re-assessment Project (LFR) which covers the forests in the entire country. This map is based on Landsat image analysis and has a 28.5-meter resolution and a five-hectare minimum mapping unit (MMU). It includes four types of natural forest, plus a degraded or logged forest class. It also includes an agriculture–forest mosaic class for areas of fallow agriculture. This map, in combination with the biomass plots, can be used to map biomass stocks in forest and non-forest across the country, including the difference between intact and degraded forest. It also provides a baseline for the area of forest that has recently been logged.

The second map of forest status is an estimate of forest cover and fragmentation with a MMU of two hectares, thus revealing smaller patches of forest and clearings, and deforestation between circa 1986 and circa 2000 (*Christie, et al. 2007*). The map was validated using GPS-linked aerial photography and videography, with an estimated accuracy of 86 percent for forest cover in 2000. The Liberian government has since partnered with CI and South Dakota State University (SDSU) to modify this map to include deforestation up to 2006 (Annex 3).

Additionally Liberia has established permanent monitoring plots and has done some very initial biomass estimates. These would be built upon in Liberia's readiness plan.

Field plots: Liberia has implemented a ground-based monitoring strategy based on permanent plots. This was commenced in 2005 with the assistance of the Deutsche Forest Service. This sample is stratified among 5 types of forest, including logged forest, and agriculture-forest mosaics. The plots are arranged in a regular grid across the country (Annex 6). Thus far, all plot locations have been mapped and the forest type of each has been identified in the field. Half of the plots have been measured. Measurements made are dbh and height to the tree top for all trees of > 40 cm dbh. The dates associated with these plots are 2005 to 2007, and a re-census is planned for 2010 and every 5 years following. No below-ground biomass or organic carbon measurements have been made, yet we plan to follow the IPCC guidelines for estimating the below-ground biomass based on the above-ground biomass using the equation of Cairns, et al. (2002). Liana, dead woody vegetation and litter have not been measured. In the 2010 survey we plan to begin measurements of these components in sub-plots. We also will decrease the minimum dbh for measurement to 30 cm and will measure a sub-sample of trees in smaller dbh-classes, following the recommendations of the IPCC and the recent GOFC-GOLD draft Sourcebook on REDD (Brown, et al. 2008).

Biomass estimation: Tree level data on dbh and height are used with the allometric equations recommended in the IPCC Good Practice Guide. First an estimate is produced based on the measured data, ie all trees >40cm dbh. Then the additional biomass of the smaller dbh classes is estimated based on the trend in tree density among the measured dbh classes (eg. Brown, et al. 2008). This requires determining the trend in density over dbh classes ranging 10 to 15 cm, for example 40 to 55 cm dbh. This trend is then extended into the lower dbh classes. Using the mid-point dbh, 47.5 in the above case, an average biomass is calculated for each tree and these are summed to estimate total biomass for that dbh class.

The immediate and high risks pressurizing Liberia's deforestation and resulting emissions cannot be over emphasized. A key significant technical challenge in measuring Liberia's emissions from deforestation and degradation is the fact that Liberia's recent low relative deforestation and degradation emissions do not accurately predict expected future higher emissions. These circumstances must be reflected technically in Liberia's reference scenario by modeling the future projected emissions. This analysis will produce maps of deforestation patterns and will be based on both spatial (e.g. land-use plans, infrastructure improvements, population shifts, and demographic data) and non-spatial (e.g. policy enforcement effects, 3-year poverty reduction strategy and economic development plans) data inputs and assumptions used to estimate likely land-use change. In addition, substantial technical work must be undertaken and funded by the FCPF to measure

forest degradation and resulting emissions. This globally-relevant technical analysis and new methodological work can be used by many other countries with similar national circumstances.

Liberia is moving forward slowly with the deforestation analysis, forest data gathering, and monitoring requirements, however degradation is much more complex and requires significant time and resources to accurately assess, quantify, and reduce. Some FCPF Readiness funding would be allocated to these key activities in the Readiness Plan.

3 (d) Main causes of deforestation and/or forest degradation in Liberia

Historically, the main drivers of deforestation have included: (i) unplanned and unorganized slash and burn agriculture; (ii) uncontrolled, illegal small-scale chain saw operations for local markets and fuel wood production; (iii) mining (both commercial and artisanal); (iv) and post conflict population migrations. Fifthly, a major driving force in previous years was extensive and excessive commercial logging which partially funded armaments during the civil war period.

However, as Liberia implements its Poverty Reduction Strategy (PRS) and begins its economic recovery with a focus on natural resource extraction, agricultural expansion and infrastructure development, it is important to ensure there is no increase in deforestation and environmental degradation. It is important, then, that these activities are properly planned and implemented, to ensure this development strategy does not have a detrimental impact on Liberia forest cover in the next 5-10 years. Implementing a National REDD strategy alongside the PRS presents an opportunity to ensure that this impact is minimized and managed.

The area under commercial forestry will rise to around 2.5 million hectares over the next six years, of which around 10% (the total Timber Sales Contract Area in forest category 3.1) may potentially be converted to other land use after harvesting. The pressure for conversion will arise as investors in rubber and oil palm plantations, including biofuels, seek areas for new concessions.

Of particular significance will be the rehabilitation of roads and bridges that increase accessibility and enable the movement of goods and people. This will challenge the forest authorities to integrate their forest protection activities with the infrastructure programme to ensure that the integrity of forests is maintained.

3 (e) Forest law enforcement and forest sector governance

In fulfillment of conditions attached to the lifting of UN timber sanctions in 2006, Liberia embarked on a forest reform process which has included the revocation of all previous timber concessions, a new forest policy, revised forest legislation and the issuing of supporting regulations. Currently, a chain of custody system governing all commercial log and wood export is being inaugurated.

The new forest law requires unprecedented transparency concerning forest revenues and is further reinforced by Liberia's inclusion of forestry in its Extractive Industries Transparency Initiative (EITI). The 3 C approach, which integrates community, conservation and commercial use is incredibly forward thinking and is consistent with the governments plans to implement a national level REDD strategy.

A new Community Rights Law is currently being formulated which will provide for an increased role for communities in forest governance.

Throughout the reform process, the Forestry Development Authority has been assisted by partners in the Liberia Forest Initiative (LFI). The LFI is a partnership of government, NGOs, and donor agencies collaborating to support the rehabilitation and reform of Liberia's forestry sector and enhance cooperation and coordination of activities for the promotion of sustainable forest management, improved conservation, and strengthened community forestry practices. Some of the major partners include the US government (reform, commercial & community forestry), World Bank (reform & institutions), FAO (technical support), Conservation International (protected areas and communities), Fauna & Flora International (protected areas and communities).

While good progress has been achieved over the past two years, many elements must still be strengthened and

funded over the next few years particularly to create clear ownership to carbon rights, determine added costs to reduce emissions from deforestation and degradation (REDD), and to equitably distribute these incentives and benefits.

The most pressing issue affecting all land use in Liberia is the lack of legal clarity on property ownership and use rights. Security of land tenure in today's Liberia is weak to nonexistent and its restoration is essential to the development of Liberia's economy and democracy. Rights of access to and use of natural resources, including land, minerals, forests, and water, are shrouded in a state of tenure insecurity, vague and ambiguous legislation, conflicting and competing tenure arrangements and constant and persistent clashes of customary and statutory rights over the management, authority and control of these resources.

Although the 2006 Forest Reform law provides that "All Forest Resources in Liberia… are held in trust by the Republic for the benefit of the people", there is a need to re-examine the provisions of the laws concerning public land and its alienation; the law concerning ownership of natural forests, and the rules and regulations on the "hinterlands". The Governance Commission was directed in early 2007 to address land issues. It has recommended the establishment by July 2008 of a Lands Commission to facilitate reforms in land policy and law.

Support for REDD Readiness will therefore ensure that carbon rights may be included in the resolution of land resource rights in general. Further information on Key National Reform Milestones is included in Annex 9.

3 (f) Forestry and the Poverty Reduction Strategy

The Liberian economy went into freefall between 1987 and 1995, whilst the formal economy collapsed and GDP per capita imploded. GDP fell a catastrophic 90%, one of the largest economic collapses ever recorded in the world, and the World Bank estimates that Gross National Income per capita is hovering around $140. Since 2005, there has been an economic rebound and growth is estimated to have reached 9.4 percent in 2007, however 67.7% of the rural population lives below the poverty line. The Poverty Reduction Strategy (PRS) is predicated, inter alia, on exploiting Liberia's rich natural resource base. It foresees that forestry will contribute 14-15% of real GDP during the PRS period, and will be one main component of rural economic growth in that period. Forestry production is projected to grow substantially over the next six years from 30,000 cubic meters (M3) to more than 1,300,000 M3. This growth will be based on the progressive reintroduction of commercial logging in all regions. It will be at least five years before commercial forestry reaches its sustainable output level. Meanwhile, secondary and higher processing of logs is expected to become a significant source of value-added and jobs from 2009 onwards. Besides the direct impact of logging and value-added on rural economic activity through local multipliers, the sector is expected to help broaden the tax base and help fund overall development needs through increased government revenue. However, it is highly likely that these activities will generate significant emissions from deforestation that might be avoided with sufficient incentives for forest protection and implementation of sustainable practices.

In addition to forestry, Liberia through its PRS intends to substantially increase other economic sectors of the economy. Total agricultural production is expected to expand by 6 percent by the end of 2010 and in 2011. The current focus is on revitalization of food crop sector including; rice and cassava, non-traditional export crops such as vegetables, the tree crops such as cocoa, coffee and oil palm, and in the long term, revitalization of rubber production. Mining and panning activities are also expected to grow rapidly during the PRS period, from near zero production in 2005/06 to nearly 12 percent of GDP. One major contributor to this growth will be the resumption of the mining and exporting of iron ore. In the medium-to-long term Liberia will aim to diversify the economy and encourage private sector investment and development in manufacturing, trade, and services. While each of these sectors will serve to diversify Liberia's economic resource base, they may also impact forest cover through land conversion and infrastructure development. Cross-sectoral planning that considers REDD incentives as an alternative should therefore be integrated into Liberia's national and local strategies. Liberia wants to avoid the traditional development path seen in Africa - one that often involves significant deforestation and degradation causing higher carbon emissions – but to do so will require sufficient

capacity and may be aided by incentive funding.

4. FOREST DWELLERS

A new census is currently (March 2008) underway. Based on pre-conflict census, Liberia's population of 3.6 million people use English as the official language although numerous ethnic groups speak over 16 different indigenous languages. The ethnic groups have strong historical and regional ties and the most prevalent groups are the Kpelle (20%), Bassa (16%), Gio (8%), and Kru (7%) with the remaining 49% split between 12 other ethnic groups. The latest estimate is that urbanization is low at around 30% (CWIQ Survey, LISGIS 2007). Given the relatively high forest cover, it must be assumed that a high percentage of rural people lives in and around forested areas, and relies on forests for some aspect of their livelihood which typically includes timber for local use, bushmeat for sale or local consumption, and gathering of plants and non-timber forest products for food, medicinal and other uses. It should also be noted that forests cover significant mineral deposits, and that artisanal mining of gold and diamonds is common as a source of cash income for local people, IDPs, ex-combatants and foreigners.

Specific surveys of forest dwellers and forest-dependent people have been undertaken to assess environmental and social impacts of various forest initiatives. These include socio-economic surveys undertaken by Fauna & Flora International (FFI) around Sapo National Park and the proposed new Protected Areas of Wonegizi, Gola and Lake Piso. The progressive roll-out of commercial logging concessions planned for the next few years requires prior assessment of affected communities, and this process has already begun to yield localized information throughout the country.

A broader framework for assessing the relationship between forests and people is currently being formulated with the ongoing Strategic Environment Assessment being undertaken by the IUCN. This will more accurately reflect the trade-offs between alternative forest uses and the impacts on livelihoods of forest dwellers.

Community forest management is expanding in a small pilot project manner as the Community Forestry Law is not yet in place. In addition, the REDD Readiness funding will be used to strengthen this component of the "3C" strategy, and to ensure equitable distribution of REDD benefits across regions, ethnic groups, and within communities. The local chiefs have retained significant respect and authority over local decisions and they will be key ambassadors for their community forest plans and REDD incentive interests.

Cognisant that ethnic tensions across borders were exploited during Liberia's civil conflict, the government has identified Peace Parks in its strategy to reduce cross-border ethnic tensions. A national-level REDD program has the potential to aid the establishment of two or three trans-boundary protected areas as 'peace parks' such as the Gola border area with Sierra Leone. These peace parks may well be one of the central and most important outcomes of Liberia's national protected area network.

5. CURRENT FOREST MANAGEMENT STRATEGY

5 (a) Stakeholder Consultation Processes

The government conducted a national forest management outreach in 2006 prior to completing the Forest Reform Law in 2006. The process was conducted over several months because access to the forest dependent communities is difficult and the time to gather the principle audience target (Youth, Women, Elders, Civil Society, NGOs, Marketers and County Authorities) was time intensive.

The various new Regulations based on the 2006 Law require public communication through radio and newsprint media, as well as consultation in affected communities. In practical terms, this means that communities in or around proposed timber concessions of protected areas must be fully consulted in an Environmental and Social Impact Assessment. This has recently been done for six Timber Sales Contract Areas

and three Forest Management Concessions, and will form the basis of Social Agreements to be negotiated between the communities and concessionaires.

A similar process has recently been used to validate draft proposals for an expanded network of protected areas, possibly to be financed through GEF. For example, in order to increase public awareness, gather data and solicit feedback for establishing the three protected areas (Lake Piso, Gola, Wonegizi), the following process was developed and is being used::

1. Public Notice on the establishment was issued by the FDA through the various local media, including radio and newspapers, to solicit the public views/reactions.
2. Local level meeting: 19 community level meetings, with 1,350 persons attending, were held in the proposed Lake Piso Multiple Sustainable Reserve. Attendees included farmers, hunters, fishermen and local residents.
3. Regional level meetings: three meetings were held on Lake Piso (2 in Grand Cape Mount County and 1 in Bomi County). A total of 210 persons, including county officials, traditional local leaders, from the two counties attended..
4. National level meeting: involving central government officials, concessionaires, etc. will be held to solicit feedback. It is pending the completion of 1 & 2 at Gola and Wonegizi.

During the consultation processes the FDA received feedback from communities about how forest management was conducted in the past and recommendations for changes in the future. Most notably participants in the consultations raised concerns over the lack of local in past forest management and suggested that MOUs be developed between FDA, concessionaires and the communities to clearly articulate their respective roles in implementing the forest management strategy. Concerns were raised as to how concession agreements were allocated in the past without the approval of local authorities. Participants also stressed the importance companies having a physical presence near local communities to share infrastructure and facilities. Local job creation and appropriate remuneration, the need for alternative livelihood options and training in those activities, increased law enforcement were all requested by participants either from the FDA or the individual companies. Each of these experiences has led to modifications in the documents based on feedback from a broad base of stakeholders. The FDA has also committed itself to regular meetings with local communities to encourage information exchange and local buy to its activities within all 3C (see section 5b). These processes demonstrate the capacity the FDA has for public outreach and consultation which would be used and built upon during the REDD Strategy development. Readiness funding would provide an opportunity to formalize these processes for REDD and carbon activity development.

Moreover, consultations under the ongoing Strategic Environment Assessment (SEA) will inform the process leading to a new community rights law on forest lands, so as to ensure minimum forest degradation and deforestation following community empowerment.

5 (b) Forestry Programmes and Policies

In 2006 Liberia adopted a new Forest Policy which seeks to harmonise Community, Conservation and Commercial uses of her forest resources – the so-called 3C approach, responsibility for which has been assigned to corresponding FDA Departments. Sustainable Forest Management is explicitly stated as the overall aim of the new Forest Policy, and Conservation is embedded in the 3C approach through the 1st specific policy objective which ensures that commercial, community and conservation forestry activities are integrated and balanced. This policy therefore provides a sound basis for maintaining forest cover for future generations, and is supportive of reducing and maintaining low emissions from deforestation and other land-use change.

In 2007, a new Forest Management Strategy was formulated and validated through public consultation. This strategy is complementary to REDD, which could potentially enable Liberia to fund the conservation of protected areas, and creation of jobs and income opportunities in community forests, while providing market

incentives for retaining forests targeted for private sector use and improving sustainable forest management.

6. OPTIONS TO REDUCE DEFORESTATION AND FOREST DEGRADATION IN LIBERIA

6 (a) Addressing the main causes of deforestation

Liberia recognizes that deforestation and forest degradation are symptoms of poverty and that payments for environmental services represent an opportunity to create compensatory revenue sources for communities as a basis for their involvement in community forest management. Uncontrolled small-scale mining, unsustainable chainsaw operations of individuals, conversion to agriculture, and timber harvesting for construction and fuelwood are the main drivers of deforestation in Liberia. These factors, compounded by increased investment in road improvements, large-scale timber sales, increases in rural population relocation after the conflict period ended and county development agendas that call for expanding all of these activities, are increasing the threats to and conversion of Liberia's native forests. With increased technical analysis made possible by FCPF Readiness funding, the current and future emissions from these deforestation and degradation drivers will be measured, and solutions will be designed to engage communities to improve their county development agendas. At the local level projects will be developed to promote alternative livelihoods within forest fringe communities currently engaged in unsustainable practices. (see 10a). Overall, commercial logging in Liberia will be sustainably managed in efforts to reduce deforestation and degradation. In the Forest Management Concessions (FMCs), which will comprise 90% of the areas allocated, only 4% of the area will be subject to harvesting in any year. Harvesting will be selective and designed to encourage the rapid growth of succession from smaller sizes. The design of FMCs includes approximately 20% set-aside areas (e.g. slopes, sacred areas, watercourses, etc) which are excluded from logging. This amounts to an aggregate area of about one third of the total designated protected areas of Liberia. Other potential factors related to Liberia's ongoing development plans would be addressed through land use planning which incorporates REDD considerations.

In September 2007, Liberia's government formed a National Carbon Working Group to: (i) document the potential of carbon financing to help protect Liberia's forests consistent with the recently passed forest reform law; (ii) provide coordination between government institutions whose policies will have impacts on forest cover; (iii) prepare for the showcase opportunity and challenges that a national REDD strategy represents for Liberia at the UNFCCC meeting in Bali; and, (iv) lay the groundwork for pilot carbon projects that integrate community development and biodiversity conservation goals. To date Liberia has been able to accomplish a significant portion of these objectives and was able to showcase the country's REDD potential both through the delegation's support for the UNFCCC's national level REDD approach and through a side event co-hosted by the government and Conservation International where the 3C strategy was presented along with Liberia's readiness to achieve this vision by developing climate mitigation programs.

Currently there are some activities currently ongoing to develop economic alternatives to address local deforestation threats. These include activities funded by the European Commission, World Bank and USAID for pilot communal forestry activities, some of which border Liberia's two protected areas, Sapo and Nimba. However these demonstration activities must be scaled-up and deliver equitable benefits to local communities in order to be successful. A recent analysis conducted by Forest Tends based on current conditions and market viability has outlined several possible options for demonstration activities which will be further developed during the Readiness phase. These include: non-timber forest products for export, agro-forestry such as oil palm, cocoa, and rubber, timber and non-timber product harvesting, and community ecotourism enterprises. To do this the national-level REDD strategy must focus on developing demonstration projects and conducting community outreach and public awareness. Local people must understand the potential benefits and revenue that natural resource management may afford them so that they can prioritize these activities within their County Development Agendas (CDAs) with an eye toward becoming better stewards of their forested areas.

6 (b) Cross-sectoral Programmes

As each sectoral ministry has struggled to get a grip on its own mandate, inter-sectoral programmes have not received high priority in Liberia. There has been some interaction on a bilateral basis to address specific areas of concern such as mining in protected areas (Mining and Forestry), timber exports (Ports and Forestry) and agricultural marketing (Agriculture and Roads). However, these do not constitute a programmatic approach.

The FDA Board does include members from other sectors, notably Agriculture, but is mandated to defend forest land. The Land Commission (to be set up by July 2008) could provide a catalytic role for a more open forum in which to discuss land-use planning. This Commission will, if established, likely play a lead role in the debate on determining the criteria for land use change from forestry to mining and agriculture, including bio-fuels. The REDD strategy will therefore provide technical and financial support to increase the coordination and decision making capacity among institutions and to ensure integrated land use planning. Strengthening the role of the EPA will also be critical in this regard.

6 (c) Incorporating REDD into Development

As Liberia implements its Poverty Reduction Strategy (PRS) and begins its economic recovery with a focus on natural resource extraction, agricultural expansion and infrastructure development, it is important to ensure there is no increase in deforestation and environmental degradation. It is important, then, that these activities are properly planned and implemented, to ensure this development strategy does not have a detrimental impact on Liberia forest cover in the next 5-10 years. Implementing a National REDD strategy alongside the PRS presents an opportunity to ensure that this impact is minimized and managed. Liberia through its Poverty Reduction Strategy (PRS) intends to substantially increase the output of other economic sectors. While each of these sectors will serve to diversify Liberia's economic resource base from forestry, the impact that they will have on forest cover through land conversion, infrastructure development etc. will likely have an impact on Liberia's forest cover either through additional loss or degradation and will need to be considered in a national REDD strategy. The government agencies represented by the National Carbon Working Group will develop REDD plans that addresses the potential cross-sector economic tradeoffs and mechanisms to resolve sectoral conflicts particularly around land-use zoning, permitting and al.

There is an opportunity to address deforestation and forest degradation both at the national and regional levels particularly through the County Development Agendas (CDAs). Through the national REDD strategy Liberia will seek opportunities to incorporate alternative livelihood activities for forest fringe communities (such as those mentioned in 6a). Additional agroforestry and reforestation programs will also be considered to enhance job creation, increase carbon sequestration and to help relieve pressure on existing forests for fuelwood and timber. The CDAs are in draft form, and so they can be updated to incorporate these new REDD considerations. However, the REDD incentives will take some years to develop, particularly because there is no significant market for emission reductions from REDD. Partners may need to fill this time gap in Liberia because of the urgency to create jobs and livelihoods particularly in the rural areas.

6 (d) Technical Assistance received on REDD

The technical assistance provided to Liberia on REDD to date has been successful; however the scale must be increased exponentially across a number of different disciplines quickly. This may be one of the single largest challenges facing Liberia, in addition to providing rapid access by communities to incentives offered by REDD.

Technical data analysis training and assistance was provided to the FDA to develop detailed forest change detection, create new approaches for projecting emissions based on other inputs since the national and local factors causing the low historical deforestation are changing rapidly. Liberia will collaborate with other national and sub-national REDD programs to implement future emission scenario estimates to incorporate into the baseline reference scenario. The McCall MacBain Foundation supported the collaboration between the FDA, Conservation International, South Dakota State University and Clark Labs. CI also supported training of one of its own in country staff and the FDA's GIS technical manager during a one week carbon project

development course in Quito, Ecuador. This is only the beginning and significant technical support is required for reference scenario development, assessing degradation emissions, and the modeling of future emissions from suitable land-use patterns and development alternatives.

In addition, the understanding of government agencies, LFI partners, and Liberian NGOs is being built informally through numerous meetings and presentations that have been communicating the REDD opportunity in the Liberia context. A key outcome of this activity was the expanded participation of the Liberian delegation at the UNFCCC conference in Bali. The protected areas program of work also included a small element on the possible role of climate change mitigation in the expanding protected area network. This resulted in an improved protected area strategy and expansion that is heavily reliant on carbon revenue as an immediate source of financing.

Currently, the Liberia Government is inundated with requests for voluntary carbon agreements and for expansion of oil palm plantations for biofuel production, for which Liberia possesses ideal agro-ecological conditions. The Forest Carbon Working Group, which serves as an advisory body to Government through EPA and FDA, needs technical assistance in analyzing, evaluating and responding to these requests

7. STAKEHOLDER CONSULTATION FOR REDD

7 (a) FDA's consultation procedures

In implementing the National Forest Management Strategy and New Forestry Reform Law, significant emphasis has been placed on public vetting and community outreach. This is clearly evident in several of the first 10 Forest Regulations:

- Regulation No. 102-07: Forest Land use Planning: calls for national and regional consultations, public feedback and local validation for forest land use planning;
- Regulation No. 105-07: Pre-felling Operations: provides details on the requirements for social agreements will all affected communities in areas to be logged under Forest Resource licenses;
- Regulation No. 106-07: Benefits Sharing: includes information on community benefit sharing from logging activities which could be used to guide the appropriate benefit sharing schemes under a REDD Strategy.

A communications and outreach program is used and includes many different methods including distributing and discussing key messages in Simple English with teams during the meetings, conducting city an town hall meetings that used interpreters, posting flyers depicting key messages in the local vernacular in the community consultation areas, and radio broadcasting to mobilize workshop attendance and convey messages to the general public. This communications infrastructure can be used for the basis of a communication strategy focused on climate change and REDD.

7 (b) Consultations on REDD or reducing deforestation

Consultations on the Forest Management Strategy and in relation to Protected Areas involved discussions on the causes and mitigation of deforestation, although without explicit mention of a potential REDD funding mechanism. Chapter 9 of the Forest Reform law spells out detailed consultation requirements before establishing new protected areas. These consultations will provide an opportunity to discuss incorporating REDD into protected area establishment and planning with stakeholders at all levels.

Initial discussions have recently taken place at county level where great interest was expressed in REDD however a detailed plan and supporting materials must be developed and communicated during the REDD Readiness Plan implementation phases.

7 (c) Mechanism for discussion at central government level

FDA has set up several cross-sectoral working groups to help increase coordination and secure buy-in at all levels. These include the Protected Areas Working Group, the Community Forestry Working Group, and the recently established Carbon Working group. Each group has a distinct role and purposed aimed at achieving various elements of the government's strategies and has been formed as a direct response to a task at hand, such as developing a national protected areas strategy, a community rights law, and most recently a national REDD strategy. . These working groups have created new partnerships to assist the FDA in achieving its mandate. (See Annex 7 for an accompanying diagram on roles.) Each group is slightly different in is make up but often involves both a larger consultative group for decision making and information sharing, and several sub-committees tasked with carrying out much of the technical analysis. The momentum for each of these groups has remained strong while the task was at hand, demonstrated by relatively constant participation in scheduled meetings and consultations. However, to maintain such interactions there must be a clear set of policy objectives which participants see value in contributing to. A national REDD plan will provide an opportunity to coordinate not only among these groups but more broadly with other working towards Liberia's reconstruction and development.

The Carbon Working Group has been recognized as Government's main advisory group on all issues connected with Carbon and is jointly chaired by FDA and EPA. This group includes the Ministry of Agriculture, Ministry of Lands, Energy and Mining and National Investment Commission. The role of EPA is crucial in proceeding to REDD Readiness since it has the mandate to bring other important sectors into a forum with FDA to address their influences on deforestation and forest degradation. The capacity of EPA to undertake this role, as well as that of Designated National Authority, is currently limited but could be adequately strengthened through REDD and potential WB support under its Infrastructure Programme.

7 (d) Mechanism for discussion at local government levels

Liberia has implemented a consultation process based at the county level to develop the PRS. Information was gathered at the town, chiefdom and district levels and then used to generate County Development Agendas (CDAs). CDA meetings were held across the nation, and were an opportunity for interested parties (such as the Carbon Working Group) to feed information into the PRS from the local level. Working group members attended several of the CDA meetings to learn more about the process and to see where REDD discussions could be included. National consultations related to the PRS were another opportunity in which participants were able to encourage further land-use planning and REDD.

7 (e) Consultations with stakeholders on forest and agriculture lands and sectors,

FDA's consultation procedures described in 7(a) are inclusive of all stakeholders. Additionally, NGOs and the private sector participate in the FDA Working Groups, including the Forest Carbon Working Group, as described in 7(c). Consultations regarding the need for land reform are also ongoing and have led to the development of a TOR for a Land Commission that the government intends to establish in June 2008.

7 (f) Indigenous forest dwellers

Strictly speaking, there are no communities in Liberia which are classified as indigenous forest dwellers. However, forest-dependent peoples are consulted and integrated into the FDA procedures described in 7(a). As mentioned in section (4), specific surveys are undertaken by FDA relating to Protected Areas and commercial logging which serve as a conduit for consultation with forest dwellers. Such consultations are conducted over several months because access to the forest dependent communities is difficult – especially during the rainy season - and encompasses several target groups (Youth, Women, Elders, Civil Society, NGOs, Marketers and County Authorities) was time intensive.

8. IMPLEMENTING REDD STRATEGIES

8 (a) Overcoming constraints and challenges to implementing REDD in Liberia

The importance of establishing control and proper management of Liberia's forests cannot be under-estimated. Liberia is an example of a resource dependent country where, in the past, natural resource management had gone wrong at the expense of peace and economic development (e.g., during the civil conflict). Many countries rich in resources suffer from the "resource curse", where the opportunities for profitable extractive sector are squandered (Sachs and Warner, 2001). In fact, "Resource dependence is generally characterized by poorer economic growth and lower standards of living [and] higher levels of inequalities and corruption. Resource-dependent countries are also among the most conflict-ridden" (Le Billon, 2003). The forecast for such countries as they emerge from conflict is not good -- as Collier and Hoeffler found that 25% of the risk of returning to war is explained by one third of GDP being reliant on primary commodity exports (2001). Therefore, forest sector reform is a critical element in any strategy for consolidating peace in Liberia and achieving REDD goals and objectives.

Reflecting the new Forest Policy, FDA's forestry programs are currently aligned under the 3C strategy. Rather than introduce a 4th C, the National REDD strategy, will integrate carbon considerations in each of the 3 Cs. The fundamental elements required for organizing Liberia's REDD planning processes are in place but they require significant strengthening, coordination and long-term financing.

The 3C approach has led to the designation of multiple suitability of forest land for Conservation, Commercial, and Community forestry uses. But, this has not been extended to land use suitability outside forest areas. There are no current criteria for determining change of land use from forestry to mining and agriculture, particularly tree crops such as oil palm thus there is strong potential for land use change to affect forest lands. This issue must be addressed within the national REDD Strategy. High level land-use planning coordination will be needed among the various government entities to ensure that these programs will incorporate REDD and will be the primary delivery vehicle for integrating existing natural resource policies. Such issues will need to be thoroughly addressed in Liberia's Readiness Plan consistent with the rules and regulations governing the forests zoned for commercial, conservation and community programs.

Thus, there is a need in Liberia for overall land-use planning coordination among the various government agencies to ensure consistency with natural resource policies in their approach to REDD. Such issues will need to be addressed in Liberia's Readiness Plan consistent with the rules and regulations governing the forests zoned for commercial, community and conservation programs.

The National Carbon Working Group formed in 2007 is functioning and can provide information and advice to Government on the impacts of land use change from, for example, forest cover to oil palm plantation.

The REDD readiness plan could potentially strengthen the role of the Working Group in a number of areas; for example: (i) forest carbon accounting, particularly with regard to degradation and sustainable forest management; (ii) REDD methodological and policy considerations; (iii) institutional options for managing carbon financing; (iv) creating cross-ministerial decision making processes to handle development tradeoffs and land-use planning; and, particularly, (v) integrating REDD incentives and carbon financing into creation of agricultural alternatives and rural development plans.

During the REDD Readiness Plan implementation, particular attention will be paid to the field capacity required for expanding demonstration initiatives. This capacity is required for community activities and protected areas in particular, and is lower than in other countries due to the recent civil conflict. The organizing structure for REDD Readiness Plan development is noted in Annex 7.

Liberia's forestry activities have been progressing since the passage of the Forest Reform Law in 2006. However, the REDD carbon activities were not anticipated and so additional funding is required to address these activities in addition to the current committed funding. These funds will add REDD carbon components

to the World Bank forest sector funding, the USAID community program funding, and protected areas forest conservation funding from the GEF and other donors. The required high-level REDD Readiness Plan activities are outlined in Annex 8 in this document. The final Readiness Plan will fully detail the synergies and coordination mechanisms between the existing programs and new REDD activities.

However there are several critical gaps within the current implementation of the 3C strategy which would need to be addressed through the REDD Readiness plan in order to ensure overall reductions in deforestation. For commercial extraction, the chain of custody must be established and fully functional to be self sustaining, however it does not currently account for any third party monitoring as is required by law. Monitoring of commercial activities is absolutely critical both from the FDA and third parties and therefore capacity building for monitoring will be required in the REDD Readiness Plan. The Community Forestry Department at the FDA is still very new and needs significant support to be fully operational. While donors and partners will be focused on building the department's capacity for pilot projects within a national REDD strategy there is still a funding need for more holistic coordination on decision making regarding local land rights, tenure arrangements and carbon considerations. Through the REDD Readiness plan these issues will need to be coordinated with the governments planned Land Commission.

Moreover the capacity for local civil society organizations to lead activities in the field is very low. While many partners (ARD/IUCN/ NCRC/ Forest Trends etc.) have plans to build local capacity coordination between these groups is essential to be successful. The Carbon and Community Forestry working groups will need to take a lead in ensuring this coordination and scaling-up within the overall REDD Readiness Plan.

See Table 1 below for more information on ongoing capacity building efforts in forest management and the donors and partners who are currently involved. .

8 (b) The role of REDD payments in providing an incentive to reduce deforestation

Since Liberia has committed 30% (1.5 million ha.) of its forest area to its Protected Area network, this offers the biggest opportunity for (up-front) incentive payments under REDD. Preliminary estimates suggest a relatively meager investment to protect permanently the heart of the West African hotspot may be roughly $5 million in start-up costs, with annual recurrent costs of less than $5 million. The annual foregone opportunity costs are estimated to be at least $6.4 million annually. The protected area network will contain over 1/3 of Liberia's forest carbon or roughly 1.3 $GtCO_2$. If these potential future emission reductions were monetized over a period of between 30 to 200 years at an average $10 price per tCO_2, then between the Net Present Value may be between $3 billion and $450 million assuming constant emission reductions and a discount rate of 15%. This level of REDD incentives could easily cover the management and transaction costs of the protected area network of roughly $90M NPV at 15% over 100 years. In the lowest value incentive scenario, less than 20% of the REDD incentives would be required for covering the perpetuity costs of the protected areas network, thus freeing up significant incentives to neighboring communities for forest protection. These analyses apply to the community managed areas depending on the level of utilization allowed, and this assumes that the Liberia policy to preserve current forest cover is effective in all commercial, community and conservation forest areas.

However, the great majority of Liberia's closed-dense and open-dense forest areas will lie outside the protected areas network and be available for extensive timber harvesting. The World Bank forest-use suitability analysis conducted recently indicates that the great majority of Liberia's closed-dense and open-dense forest areas are suitable for extensive timber harvesting. The economic results of these findings and resulting current policies are accelerating the commercial forest sector in Liberia and driving the value of the forests higher. Under current ratios of carbon to timber prices, it is not conceivable that REDD could challenge the underlying economic competitiveness of commercial forestry. Consequently, REDD incentives must be high enough to compensate Liberia for the management, transaction and opportunity costs of REDD alternatives at the margin for the sustainable commercial, community and conservation use of forests. Up to 20% (0.5 million ha.) of the 2.5 million hectares allocated for commercial logging concessions is likely to be 'set-aside" for protection and buffer strips, which constitutes a significant additional area available for REDD. Beyond that, there exists a

potential trade-off within the commercial concessions (up to 2.0 million ha.) to negotiate lower timber harvest off-takes as a trade-off for REDD, particularly in areas with excessive roading and access costs. Such payments in the commercial sector would likely be based on performance (after the fact).

Table 1:

Liberia Capacity Strengthening	**Current Partners**
Technical Strengthening, Forest Inventory Update, Monitoring Planning	US Forest Service, CI, South Dakota State University, Clark University, CIFOR, FAO, EU, World Agroforestry Center
Demonstration Initiatives	FFI, US AID, ARD, CI, Forest Trend, NCRC, IUCN, local NGOs (to be determined)
Governance and Financial Structure	World Bank, EU, US Forest Service, Forest Partners International, UNEP, IUCN
Stakeholder Outreach and Community Engagement	CIFOR, IUCN, Forest Trends, NCRC, SDI, Green Advocates

9. REDD STRATEGY FOR MONITORING IMPLEMENTATION

9 (a) Monitoring forest cover and land use change

The FDA has a department that is responsible for monitoring Liberia's forests, extraction rates, and forest change detection. Liberia is one of a small number of countries that have updated their forest change detection information across at least two reference periods at the full national scale. These techniques will be expanded in the Readiness Plan to include degradation and they will be used for verification purposes every 5 years.

Liberia has implemented a ground-based monitoring strategy based on a sample of 703 permanent forest plots. This was commenced in 2005 with the assistance of the Deutsche Forest Service through the World Bank funded Liberia Forest Inventory project. This sample is stratified among 5 types of forest, including logged forest, and agriculture-forest mosaics. The plots are arranged in a regular grid across the country (Annex 6).

Thus far, all plot locations have been mapped and the forest type of each has been identified in the field. Half of the plots have been measured for commercial purposes. Measurements made are dbh and height to the tree top for all trees of > 40 cm dbh. Trees are labeled and identified with vouchers. Multiple plot sizes (1, 3, 6 and 1 metres) are used for small regeneration, large regeneration, small trees and large trees, respectively.

The dates associated with these plots are 2006 to 2007, and a re-census is planned for 2010 and every 5 years following provided there is funding available. REDD monitoring will take advantage of remote sensing technology combined with validation of aerial photography and site based monitoring as required.

Within the commercial department the FDA has implemented a chain of custody system which is being implemented in partnership with METI-SGS. While the chain of custody is intended to be self sustaining additional capacity will need to be built within the FDA to ensure proper monitoring. FDA has significant GIS capacity in house which could be built upon to ensure that the appropriate monitoring systems are in place to manage national REDD implementation. The FDA has recently proposed that the GIS unit be expanded to a forest cover monitoring unit which would then be responsible REDD and other components of the Forest Management Strategy. Additional funding would be necessary through REDD Readiness to achieve this goal. Additionally scaling up FDA field capacity and presence will be necessary at all levels to ensure the Forest Management Strategy is fully implemented and contributing to a national REDD strategy.

9 (b) Constraints of current monitoring system

No below-ground biomass or organic carbon measurements have been made, yet we plan to follow the IPCC guidelines for estimating the below-ground biomass based on the above-ground biomass using the equation of Cairns, et al. (2002). Liana, dead woody vegetation and litter have not been measured. In the 2010 survey we plan to begin measurements of these components in sub-plots. We also will decrease the minimum dbh for

measurement to 30 cm and will measure a sub-sample of trees in smaller dbh-classes (5-10cm).

9 (c) Monitoring of REDD impacts on deforestation and forest degradation

The monitoring system described in 9(a) can be improved as noted in 9(b) and serve as the basis for REDD monitoring.

To develop biomass estimates, tree level data on dbh and height will be used with the allometric equations recommended in the IPCC Good Practice Guide. First an estimate will be produced based on the measured data, i.e. all trees >40cm dbh. Then the additional biomass of the smaller dbh classes will be estimated based on the trend in tree density among the measured dbh classes (e.g. Brown, et al. 2008). This will require determining the trend in density over dbh classes ranging 10 to 15 cm, for example 40 to 55 cm dbh. This trend will then be extended into the lower dbh classes. Using the mid-point dbh, 47.5 in the above case, an average biomass will be calculated for each tree and these summed to estimate total biomass for that dbh class.

As noted in 3(a) above, there are major reasons why historical trends in deforestation and degradation are not robust surrogates for potential future trends. One aspect of the proposed work in this PIN is to develop the national REDD baseline by adding emissions estimates from degradation to those of deforestation and to project forest changes into the future using econometric and spatial modeling. A critical aspect is to build capacity within the Liberian government to conduct monitoring and spatial modeling in support of the national REDD program. These proposed activities for baseline development and capacity building are described in Section 13.

The overall baseline approach is one that can be applied to any country with emissions from deforestation and forest degradation. The approach also fits the criteria of most of the proposed national-level baseline approaches submitted to the UN FCCC. None of the national-level proposed approaches describe the details of how the modeling should be done, other than baselines should be conservative, so Liberia has the opportunity to create innovative methods that can be replicated in other countries.

We have the necessary data and modeling tools to produce a baseline according to any of the proposed approaches. The same is true for approaches used for site-level baselines. Our partner, CI, is part of the Voluntary Carbon Standards working group on REDD baseline methodologies, which ensures that we can assess the level of compatibility of our approach with any others that may be proposed at the national or site level. Partnering with Clark Labs also ensures that we are applying the most robust modeling approaches

10. ADDITIONAL BENEFITS OF POTENTIAL REDD STRATEGY

10 (a) Non-carbon benefits from REDD

The Upper Guinea Forest Biodiversity Hotspot extends from Guinea to Togo and is one of 34 such critical areas for global biodiversity conservation (Mittermeier, 1999). Forests in this region have been reduced to an estimated 14.3% of their original extent with Liberia maintaining 43% -- approximately 4.52 million hectares -- of what remains in two large blocks of forest including evergreen lowland forests in the southeast and the semi-deciduous mountain forests in the northwest. Despite its exceptional importance for biodiversity conservation, only 4% (193,000 hectares) of Liberia's forests are contained in two protected areas. Liberia has plans to establish as much as 1.5 million hectares of protected areas; however there are key capacity and funding limitations preventing this network establishment. Liberia is the "heart of the hotspot" – critical to successful conservation in the region, and in need of immediate conservation action. Consolidating Liberia's protected area network will be critical to reducing deforestation rates nationally. As such the protected areas network will be a key component of the overall national REDD strategy. Liberia intends to market reduced emission credits generated by the PA network, thus securing financing for the long term protection of these areas. REDD incentives may be the key to provide revenue to cover management costs for protected area expansion and compensation to communities for foregone opportunities of forest exploitation.

Biologically, Liberia is exceptionally diverse, with high rates of endemism and many species that are nearly extinct outside the country. Liberia is home to approximately 125 mammal species, 590 bird species, 162 native fish species, 74 known reptiles and amphibians and over 1000 described insect species.

In December 1999, The West African Conservation Priority-Setting Exercise for the Upper Guinean Ecosystem (funded by the Global Environment Facility) identified Liberia as by far the top priority country in humid West Africa for conservation. However, rapid penetration by logging and hunting into previously inaccessible forest is quickly undermining the forests' ecological balance. The 'empty-forest' syndrome, which results from over-hunting, has been recorded since 2002 in several forest areas thought to be wildlife strongholds. Botanical knowledge of Liberia is poorer than for any other country in the Upper Guinean Ecosystem. Given that no systematic inventories have ever been carried out of southeast and northwest Liberia's flora, or its insects, amphibians, arachnids, gastropods or other animal species displaying a high degree of dependence on specific plant hosts, the uniqueness of Liberia's flora and fauna can only be surmised. Investments in assessing and monitoring the biodiversity outcomes from conservation are planned as a component of the national protected area system which requires financing and technical support for expansion plans.

In addition to increased habitat for biodiversity conservation, the national REDD strategy will also provide for the maintenance of key ecosystem services such as hydrological flows, pollination and soil creation. Maintaining intact forests will help buffer local communities from extreme weather changes.

The economic and social benefits have been articulated in early sections on community forestry as well as how REDD incentives may help finance County Development Agenda goals. The REDD strategy will include diversified sources of income through the provision on biodiversity friendly alternative livelihood activities. Through this strategy Liberia intends to enhance the environmental and social well being of communities living around conserved forest areas. The REDD represents a novel and welcome additional flow of funds for them.

That said, the benefit sharing scheme which would facilitate economic development and social well being based on carbon flows has yet to be defined here in Liberia. The FDA currently has examples based on the social agreement requirements within the Timber Sales and Forest Management Contracts. However during the Readiness Phase the applicability for REDD incentives will have to be examined. The Carbon Working Group and other stakeholders will examine both existing Liberian models and current practices in other countries when developing an appropriate scheme for Liberia. Efforts will also be made to coordinate with the Land Commission so that carbon ownership is clarified in conjunction with the possible revision of the land tenure system.

10 (b) Monitoring Conservation of biodiversity

To date systematic monitoring of biodiversity has been limited in Liberia to the two existing protected areas, Sapo National Park and Nimba Nature Reserve. These are currently the only two areas in the country with trained FDA rangers who conduct ongoing periodic patrols. At Sapo Park Rangers were trained extensively in bio-monitoring techniques provided under a 1 year Technical Assistance program by Fauna & Flora International, while Rangers at Nimba have received ongoing technical assistance from Conservation International. It should be noted that at present these techniques have not been harmonized nationally and that there is not a central database used in biodiversity monitoring.

At a national level, through the Liberia Forest Reassessment project in 2003 rapid faunal surveys were carried out through much of Liberia's forest area which could provide a baseline for future biodiversity monitoring plans.

10 (c) Approaches to monitoring impact of REDD on biodiversity conservation

The biodiversity monitoring will be built into the protected areas planning work program. At the project-level, the Climate, Community and Biodiversity Standards may be used to ensure both biodiversity and community

benefits are planned and monitored as a result. Some indicators to be used are: (a) change in threatened status of species; (b) change in protection status of each proposed protected area of the network; (c) change in natural habitat extent in each PA using remote sensing; and (d) change in habitat fragmentation in buffer zones around each PA using remote sensing.

10 (d) Monitoring rural livelihoods

A Core Welfare Indicator Questionnaire (CWIQ) Survey was implemented in 2007 by the Liberia's Institute of Statistics and Geo-Information Services (LISGIS). The CWIQ estimated the level of poverty and vulnerability in the country, based on consumption per equivalent adult. It consists of two questionnaires with data inter alia on socio-demographic variables (household composition, health, education and employment of the members of the household), housing characteristics, level of access to the basic services, subjective poverty perceptions, household consumption (including auto-consumption, purchases and gifts) and household income.

The CWIQ used a two-stage sample design. The first stage involved selecting 300 sample points or clusters from the list of 4,602 enumeration areas covered in the 1984 Population Census with probability proportional to estimated size. In view of the dramatic demographic shifts since 1984, a fresh listing of the households residing in the selected sample points was then conducted, along with identifying the geographic coordinates (latitude and longitude) of the center of each cluster (GPS coding). The second stage of selection involved the systematic sampling of 12 of the households listed in each cluster.

Although a one-off survey, CWIQ will be repeated as part of the monitoring and evaluation of the PRS and thus could be integrated in ongoing REDD monitoring. Further collaboration will be required under REDD Readiness to ensure that rural livelihoods and their dependence on forest resources will be monitored.

10 (e) Approaches to monitoring impact of REDD on rural livelihoods

The sampling frame used in the CWIQ could serve as a basis for expanded questionnaire which included questions on reliance on natural resources and the impacts of deforestation and forest degradation. At the project-level, the Climate, Community and Biodiversity Standards may be used to ensure both biodiversity and community benefits are planned and monitored as a result.

11. ASSISTANCE REQUIRED FROM FCPF READINESS MECHANISM

(a) REDD Readiness Plan

Initially, the Liberia government is requesting initial investment of $650,000 from the World Bank Forest Carbon Partnership for the first 9 months of activities required to complete the Liberia REDD Readiness Plan, which will include:

- REDD Strategy and Planning Process
- Technical Strengthening, Forest Inventory Update, Monitoring Planning
- Stakeholder Outreach
- Governance and Financial Structure
- Demonstration Initiatives
- Cross-Sectoral Integration

Liberia's multi-level REDD program is being developed and will require funding for dedicated resources, additional technical and methodological support to develop the national accounting system and registry, stakeholder outreach that builds on the prior forest consultation infrastructure, REDD governance structures including FDA and EPA capacity for REDD, financing and incentive alternatives, and with some limited REDD components of field demonstration initiatives.

(b) REDD Planning Process

The Liberia Readiness planning process will require approximately 9 months to develop the REDD Readiness plan, assuming that funds are made available for the proposed activities, that builds on the momentum established by the Liberia Forest Initiative and the workplans developed by the National Carbon Working Group and the Community Forestry Working Group. The planning process will require: (i) cross-ministry coordination; (ii) technical strengthening on REDD; and, (iii0 a significant outreach and communication process. The process will also tie into the UNFCCC COP and SBSTA timelines, rule setting, and methodology discussions. See Annex 7 for the overall structure and Annex 8 for roadmap.

(c) REDD Plan Implementation

The Government of Liberia has the political will to implement a national-level REDD program and has developed a basic foundation for REDD planning. The poor economic environment is both a threat and an opportunity because the REDD incentives may accomplish more outcomes due to the relatively low opportunity costs. Many key aspects require investments such as the land tenure and forestry governance systems, however, the biodiversity and sustainable development contributions of Liberia's REDD program are clear and compelling.

These activities would be followed by a 2 to 3 year process to implement the plan that would require extended funding (as yet undetermined) across these current categories with particular focus on field capacity building, cross-sectoral integration, and threat analysis including complex subjects like measuring emissions from degradation to complete national-level accounting activities. The broad categories of the 3 year REDD Readiness Plan are outlined in Section 13 of this document.

(d) Readiness Plan Budget	**FCPF Request**
REDD Strategy and Planning Process	$200,000
Technical Strengthening, Forest Inventory Update, Monitoring Planning	$150,000
Stakeholder Outreach	$150,000
Governance and Financial Structure	$75,000
Demonstration Initiatives	$75,000
Cross-Sectoral Integration (Agriculture, Mining, Development Planning, Land-use Planning)	None in year 1
Threat Analysis and Emissions Profiles	None in year 1
Total	**$650,000**

12. INTERNATIONAL REDD PARTNERS

LFI partners and donors as described above had made significant contributions to Liberia's Forest management strategy which is fully in line with REDD. In the last year additional funding has been secured through Conservation International and partners such as Forest Trends (both sponsored by the McCall MacBain Foundation) to support the development of a national level REDD strategy. This funding has provided for the establishment of the Carbon Working group, Liberia's participation in the UNFCCC meeting in Bali, capacity building for government agencies, and a preliminary analysis of possible demonstration project activities.

In future we expect to expand support for REDD activities and capacity building by engaging partners such as ARD (with funding from USAID) and the IUCN in support of demonstration activities. We will also be looking into additional World Bank resources such as CF Assist and PROFOR. ITTO will also be providing assistance by supporting Liberia's participation in carbon-focused technical meetings.

13. POTENTIAL NEXT STEPS AND SCHEDULE

Readiness Plan Components	9 mths	Year 1	Year 2	Year 3
Technical Strengthening: Methodology and Measurement				
Assessment of historical emissions from deforestation	X	X		
Assessment of historical emissions from degradation			X	
Projection and modeling of future emissions from deforestation	X	X		
Projection and modeling of future emissions from degradation			X	
Update biomass field estimates across all land-uses including deforestation and degradation	X	X		
Create a national-level carbon methodology that includes project-level activities		X	X	
Develop carbon, biodiversity and social criteria and spatially-explicit dataset to target incentives to the highest outcome potential			X	X
Establish national level permanent biomass monitoring plots representative of all geographic regions and forest types, and create monitoring plan and protocol		X		
Establish a capacity building plan for biomass monitoring activities	X			
Develop a capacity building plan for GIS and remote sensing activities	X			
Create an informational platform to integrate monitoring data at the national level		X	X	X
Increase engagement in UNFCCC SBSTA and other key meetings to build support for Liberia's baseline and methodology	X	X	X	X
Facilitate workshop with other countries to exchange experiences on Remote Sensing and monitoring plans		X		
Demonstration Initiatives				
Determine structure for implementation of pilot activities including administration, funding, and implementation	X			
Community outreach, communication and education on climate change, carbon project design and REDD incentives		X		
Undertake capacity building for Carbon and Community Forestry Working Groups regarding selection of pilot sites	X			
Facilitate study tours with other counties to exchange experiences on potential field demonstration projects	X			
Establish clear criteria for evaluation and selection of pilot projects	X			
Identify pilot activity candidates and make selection based on criteria	X			
Develop and implement capacity building plan for field teams and local partners to implement pilots		X	X	X
Define and launch initial pilot-projects to be used as demonstration projects		X	X	X
Implement permanent site level monitoring plots, monitoring plan and methodology		X	X	X
Define and implement socio-economic monitoring plans and methodology		X	X	X
Analysis and testing of alternatives that address each deforestation and degradation driver (Slash and burn agriculture, illegal chain sawing operations, etc)			X	X
Integration of REDD and broad land-use planning into the County Development Agendas			X	X
Governance and Financial Structure				
Strengthening the FDA, EPA, MoF, NIC, MoA and DNA	X	X	X	X

Develop and implement capacity building plan for government agencies and civil society on issues related to climate change and forest carbon	X	X		
Collaborate with government agencies working to clarify land tenure arrangements		X	X	X
Review and clarify carbon ownership across different tenure and management options		X	X	
Implementation of national and project-based carbon accounting and registry capabilities			X	X
Institutional frameworks including carbon marketing and negotiating unit			X	X
Creation of transparent benefits sharing arrangements for targeted financial incentives for REDD			X	X

14. LIST OF ANNEX ATTACHEMENTS

1. Carbon Working Group Terms of Reference and List of Members
2. Country Profile -Geography, Peoples, Government & Economy
3. Referenced Figures
4. Baseline Development Plan
5. Spatial Data Layers
6. Inventory Plot Map
7. Liberia Readiness Possible Structure
8. Readiness Plan Timeline
9. Key Reform Milestones

Annexes for Liberia PIN

Annex 1. Carbon Working Group Terms of Reference and List of Members

The Carbon Working Group is responsible for developing a cohesive national strategy for carbon activities in Liberia. The TOR includes but is not limited to the following:

- In the short term -conduct the necessary activities and prepare materials (documents, presentations, displays etc) to prepare Liberia to showcase itself during the UNFCCC meeting in Bali, Indonesia in December
- Prepare a Conceptual note/ Framework Document on "Liberia's Carbon Initiative" for the UNFCCC meeting in Bali
- Maintain overall responsibility for developing a medium-long term carbon strategy for the country including defining a "Carbon Readiness Plan" which would outline short, medium and long term revenue generating opportunities from carbon credits
- Coordinate a sector wide approach towards a single national carbon management strategy- harmonizing the government's plans for carbon financing and other carbon related projects- this would include harmonizing plans of the Environmental Protection Agency, Forest Development Authority, Ministry of Agriculture, and other government agencies/ministries
- Conduct a literature review, evaluation, and education session of pros/ cons carbon credits for Liberia
- Develop a position paper describing Liberia's vision for engaging in carbon trading
- Determine approaches and criteria for identifying sites to be used as pilot carbon projects
- Define budget needs for technical and logistical support in preparation to meet the minimum requirements for Bali and long term funding for carbon projects including the readiness plan for the World Bank's Forest Carbon Partnership Fund
- Constitute a Core Team which is charged with carrying out the activities necessary to achieve the above and develop the necessary documents for the Working Group to review and endorse and to carry out regular briefings with members of the Working Group

    - The Working Group consists of members from:
        - Forest Development Authority
        - GEMAP/FDA
        - Fauna and Flora International
        - Conservation International
        - United States Forest Service
        - World Bank
        - Environmental Protection Agency
        - Green Advocates
        - NGO Coalition
        - National Investment Commission
        - Ministry of Internal Affairs
        - Ministry of Agriculture
        - Private Sector
        - Ministry of Finance
        - Liberia Reconstruction and Development Committee

Annex 2. Country Profile

GEOGRAPHY: Area: 111,369 sq.km. (43,000 sq.mi).

Cities: Capital-Monrovia (est.1000, 000 to 1,500,000). Principal towns-Buchanan (est. 300,000), Ganta (est. 290,000), Gbarnga (est. 150,000), Kakata (est. 100,000), Harbel (est. 136,000).

Terrain: Three areas: Mangrove swamps and beaches along the coast, wooded hills and semi deciduous scrublands along the immediate interior, and dense tropical forests and plateaus in the interior. Liberia has 42% of West Africa's remaining rain forest.

PEOPLE: Nationality: Liberian (s). Population (2006): 3.6 million. Annual growth rate (2006): 2.9%. Ethnic groups: Kpelle 20%, Bassa 16%, Gio 8%, Kru 7%, 49% spread over the 12 other ethnic groups. Religions: Christian 50%, Muslim 20%, animist 30%. Languages: English is the official language. There are 16 indigenous languages. Education: Literacy (2003): 20%, Health: Life expectancy (2005): 42.5 years. Workforce: Agriculture/Forestry: 70%, Industry: 15%, Services: 2%. Employment in the formal sector is estimated at 15%.

GOVERNMENT: Type: Republic, Independence: From free slaves (American Colonization Society July 26, 1847). Constitution: January 6, 1986, Political Parties (1997): 30 registered political parties.

ECONOMY: GDP (World Bank 2006 est.). US $ 631 million, Real GDP growth rate (2006): 8%. Per capita GDP (2006): US $ 185.50. Average annual inflation (2006): 7.2%. Natural resources: Iron ore, rubber, timber, diamond, gold, and tin. Government believes sizable deposits of crude oil along the Coast of Atlantic Ocean.

Annex 3. Referenced Figures

Figure A1. Location of Liberia and its major cities and towns.

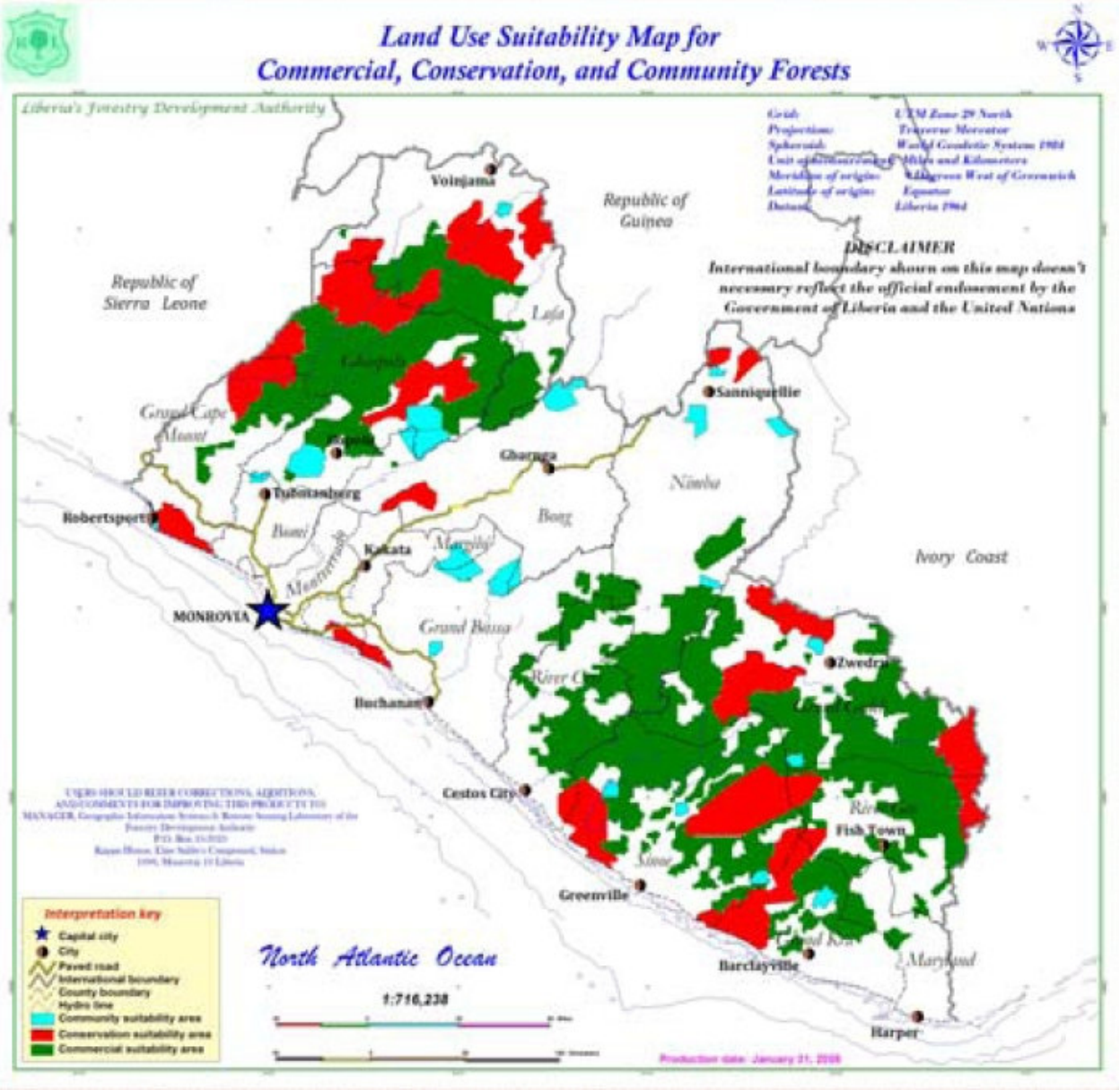


Figure A2. Map of land suitability for conservation and commercial activities for Liberia.

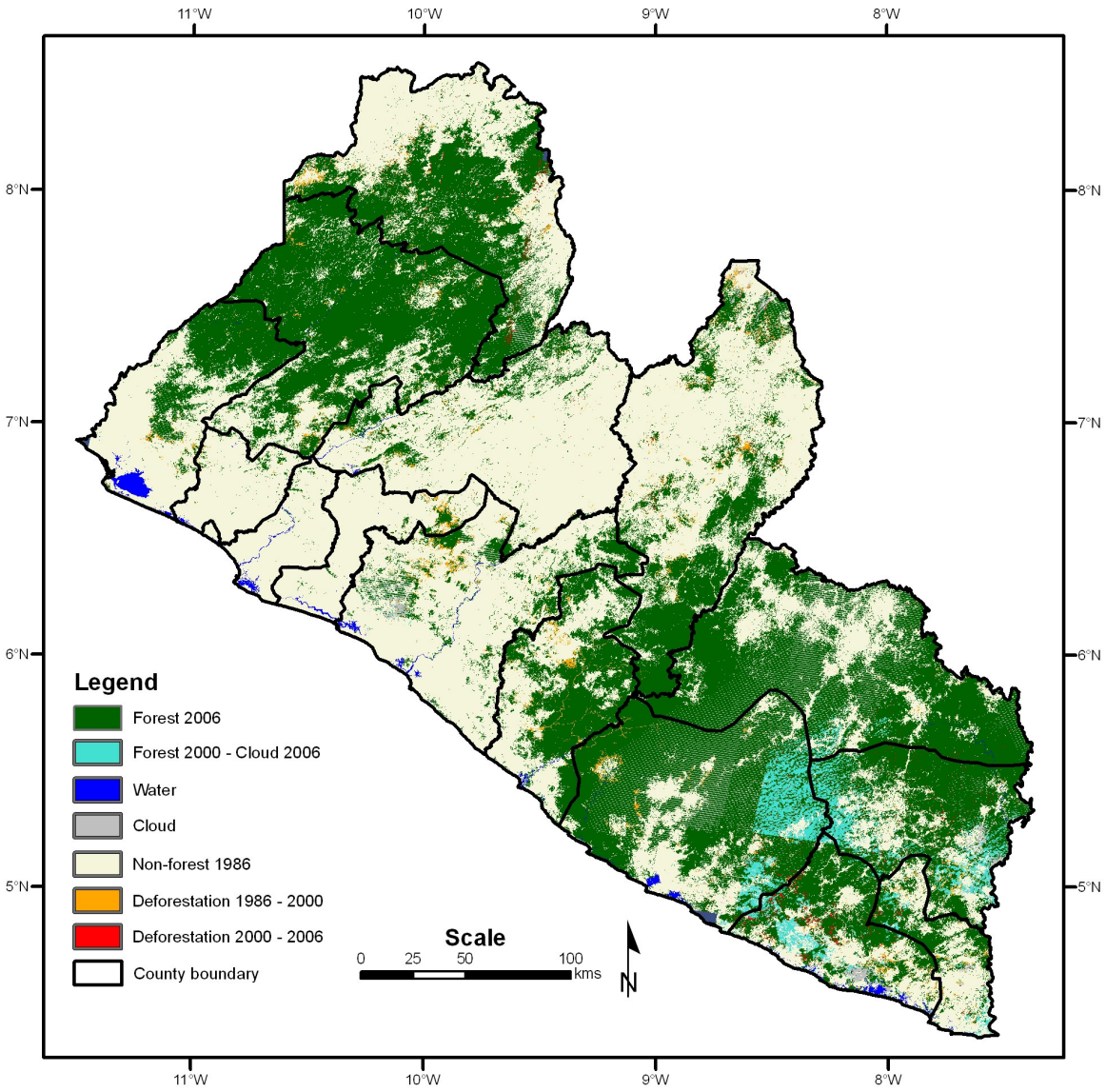


Figure A3. Forest cover and deforestation in Liberia from circa 1986 to circa 2000 to 2006. Data are from Christie, et al. (2007) and an unpublished update of this analysis produced by S. Dakota State U., CI and the FDA. Data are from analysis of Landsat data and have a minimum mapping unit of two hectares.

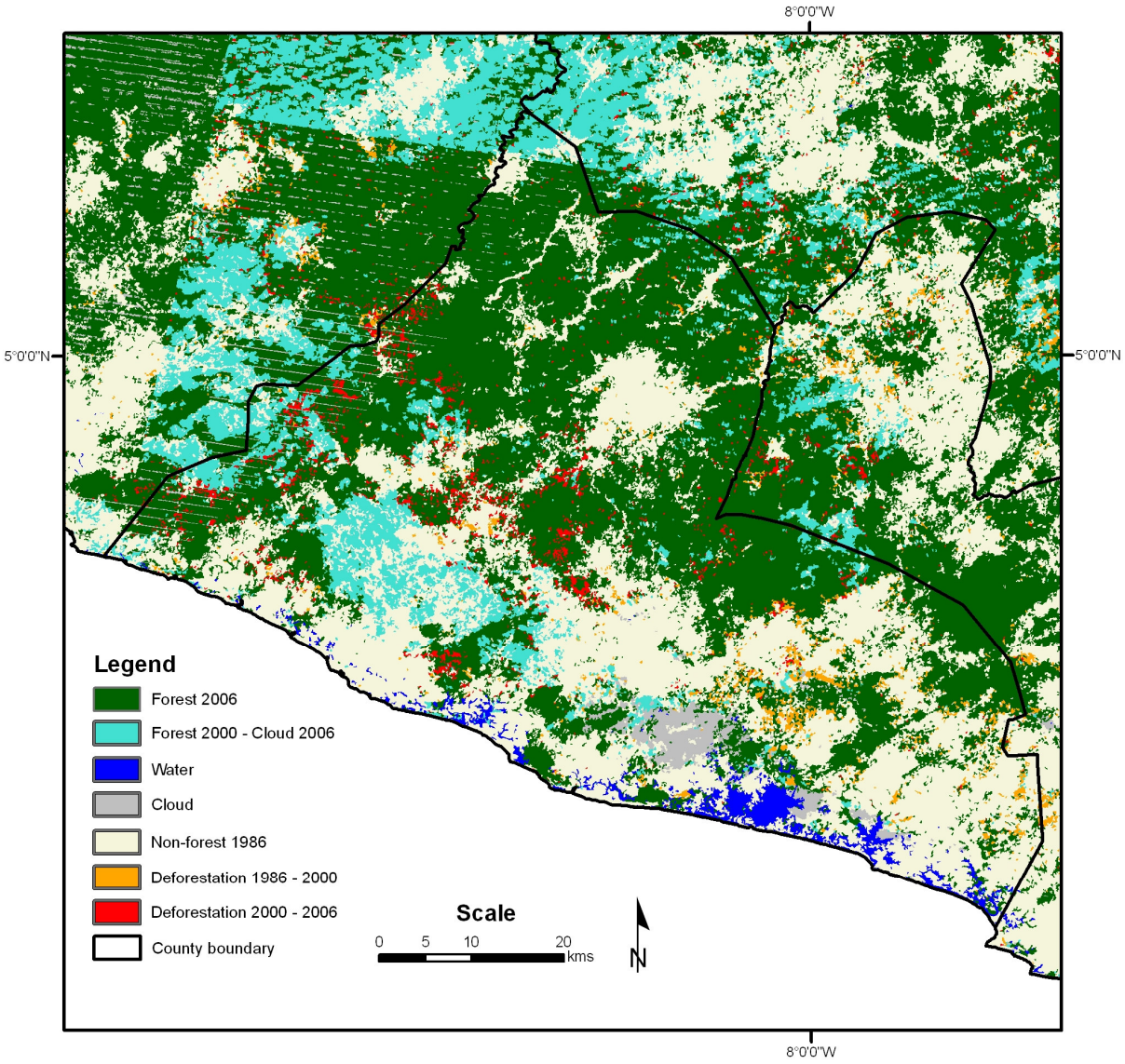


Figure A4. Detail of the Liberia deforestation map for Sinoe country in south-eastern Liberia.

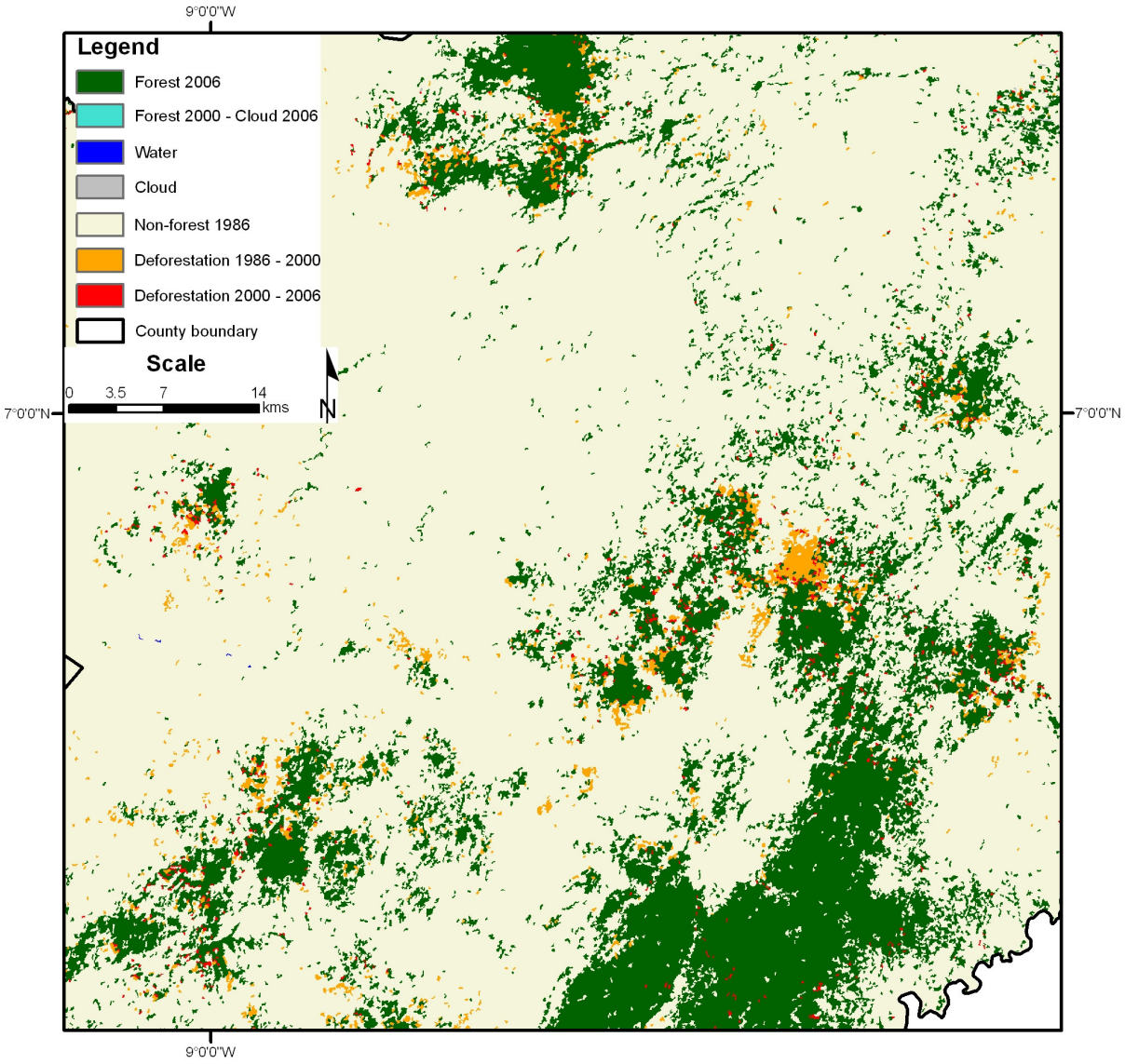


Figure A5. Detail of the Liberia deforestation map for Nimba country in northern Liberia.

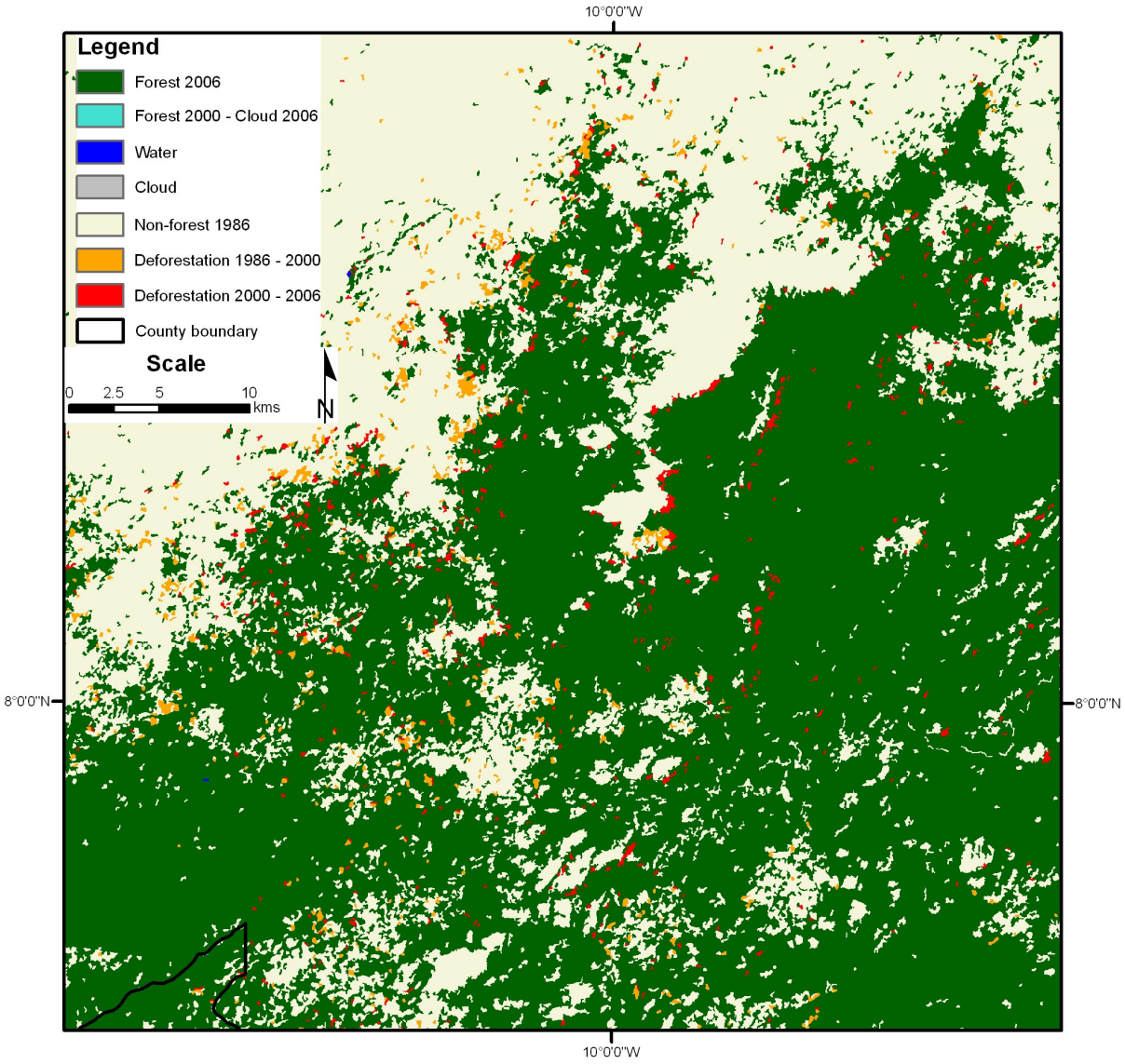


Figure A6. Detail of the Liberia deforestation map for Lofa country in western Liberia.

Annex 4. Baseline Development Plan

Why a historical baseline is inappropriate

By combining data on recent deforestation and forest biomass, we estimate that annual emissions from clear-cutting in Liberia averaged over 7.6 Mt CO2e y-1 from 2000 to 2006. This does not include additional emissions from degradation. It also does not represent the potential future emissions from both deforestation and degradation in Liberia.

Deforestation rates have been relatively low in Liberia during the past two decades. Recent clearing activity is mostly concentrated in ten or so sectors of the country. Most places that showed clearing from 1986 to 2000 showed continued clearing after 2000. Almost all clearing is in the form of numerous small (<10 hectare) clearings around towns and roads near towns in Liberia's forest regions. This indicates the strong relationship between patterns of settlement and road access and forest clearing in Liberia.

Much of the explanation for low deforestation rates is the civil conflict that forced many to leave the countryside and immigrate to the capital. This was also a period of limited international activity that may have supported agricultural exports. Expanding global markets for tropical agricultural products and now biofuels also will change the pressure for converting forest to farmland. Finally, Liberia must strengthen their economy, and this includes the potential for large logging concessions in much of the country.

All of the above are major reasons why historical trends in deforestation and degradation are not robust surrogates for potential future trends. One aspect of the proposed work in this PIN is to develop the national REDD baseline by adding emissions estimates from degradation to those of deforestation and to project forest changes into the future using econometric and spatial modeling. A related aspect is to build capacity within the Liberian government to conduct monitoring and spatial modeling in support of the national REDD program. These proposed activities for baseline development and capacity building are described in the following sub-sections.

Baseline development plan

Numerous modeling tools exist to predict future trends and patterns of land use change, and they are often used for baselines for site-level REDD carbon projects. They typically have two requirements. First is estimation of the total amount of future change by the actors who potentially could affect the project site, in the non-project scenario.

This is typically done with econometric models supported by geographical data and assumptions must be made about expected future changes in population, markets, policy and infrastructure.

Second is the estimation of where the changes would occur and how much would occur in the site being considered for REDD. This is typically done with spatial modeling, if not, then by applying the first step for sub-units of the study area. Several GIS modeling tools exist for these analyses, the strongest being IDRISI, with the Geomod tool and the Land Change Modeler (LCM) tool. These models are based on the relationship between historical patterns of change and other features, such as soils, terrain, roads, infrastructure and market distance. They predict where future changes would most likely occur.

We have most of the relevant socio-economic and land-use data already in FDA, much in GIS format. Assumptions will be determined in user workshops, based on planned national policy if REDD is not implemented, as well as based on expected changes in population, resettlement, and demand for agricultural and forest products. Spatial modeling will be done using IDRISI's LCM, in partnership with CI and Clark Labs in Massachusetts. Clark Labs created IDRISI, and some of the modeling components in LCM were created with

CI. LCM is a more robust and flexible modeling tool than Geomod, yet both are capable of producing valid results.

The general steps in our approach are:

Biomass
- Complete biomass surveys, assign average biomass values to forest type map
- Apply IPCC defaults and guidelines to estimate other carbon stocks (below-ground biomass, dead standing biomass, litter and soil organic C)

Non-project baseline of deforestation
- Obtain best estimates of future demand for agricultural products at the national level
- Obtain best of population trends, including rural migration
- Use the above with historical trends to estimate projected total deforestation
- Conduct spatial modeling of areas varying deforestation probability
- Apply model results and the total rate projections to map probable deforestation patterns
- Combine deforestation and biomass maps to produce emissions estimates, the *without-project deforestation baseline (A)*

Non-project baseline of degradation
- Obtain best estimates of future demand for forest products at the national level
- Obtain maps of planned logging concessions for the without-project scenario
- Obtain data on logging extraction rates per hectare for Liberian forest types
- Apply IPCC guide and GOFC guide on mortality from logging damage to surrounding trees
- Combine projected logging rate and biomass for each concession to estimate total logging emissions, the *without-project degadation baseline(B)*

Project baseline of deforestation and degradation
- Define national goal for reductions in deforestation, and which regions will be focus areas for REDD
- Combine planned lowered deforestation with biomass to estimate REDD emissions, the *with-project deforestation baseline (C)*
- Define national goal and focus areas for exclusion of logging and for reduced-impact logging
- Combine planned excluded and reduced logging impacts with biomass to estimate REDD emissions, the *with-project deforestation baseline (D)*

REDD benefits
- Estimate REDD benefits: (A + B – (C + D)
- Define monitoring plan, build capacity and implement in Liberia

Global Applicability of the Baseline Methodology

Our overall baseline approach is one that can be applied to any country with emissions from deforestation and forest degradation. The approach also fits the criteria of most of the proposed national-level baseline approaches submitted to the UN FCCC. Exceptions are the stock approach submitted by Joenneum Research and the EU JRC submission, which uses a fraction of the global average of deforestation for low-deforestation countries, rather than a modeling approach. All others propose negotiated baselines based on assumptions and models future changes. None of the national-level proposed approaches describe the details of how the modeling should be done, other than baselines should be conservative.

We have all necessary data and modeling tools to produce a baseline according to any of the proposed approaches. The same is true for approaches used for site-level baselines. Our partner, CI, is part of the Voluntary Carbon Standards working group on REDD baseline methodologies, which ensures that we can assess the level of compatibility of our approach with any others that may be proposed at the national or site level. Partnering with Clark Labs also ensures that we are applying the most robust modeling approaches.

Annex 5. Spatial data layers

Many spatial data sets covering all of Liberia have been produced in recent years, addressing climate, economic resources and biodiversity value. The most relevant ones in the context of Liberia Readiness planning are listed in Table A1.

Table A1. Most relevant spatial data sets covering all of Liberia and available in digital format for use in REDD planning and baseline development.

Data Type	Source	Scale / Resolution
Satellite images – Landsat (80s, 90s, 00s)	NASA	28.5 m
Satellite images – ALOS RADAR	NASA / JAXA	50 m
Satellite derived products – MODIS (vegetation indices, NPP, climate)	NASA	250 m – 1 km
Satellite images – Quickbird online views	NASA / Google Earth	4 m
Aerial videography – 2002 survey	CI	1 m
Topography - SRTM	NASA	90 m
Topography – Liberian DTM	FDA	30 m
Towns	FDA	1:250,000
Roads and other transport routes	FDA	1:250,000
River and watersheds	FDA	1:250,000
Population	FDA	1:250,000
Forest types	USFS / FDA	28.5 m
Degraded forest extent	USFS / FDA	28.5 m
Non-forest land use	USFS / FDA	28.5 m
Deforestation ’86 – ’00 – ‘06	CI / SDSU / FDA	28.5 m
Biomass (forest type map linked to field plots)	USFS / FDA	1:250,000
Biodiversity protection priority areas (AZEs, IBAs, KBAs)	CI	1:250,000
Existing and proposed management zones	FDA	1:250,000

Annex 6. Inventory Plot Map

The Liberian FDA is in the process of implementing a permanent plot monitoring network throughout the country. All plot locations and their forest types have been identified. Plot measurements of forest structural parameters needed for biomass estimation is completed for over half of the plots. Figure A7 shows the distribution of the permanent plots across the country.

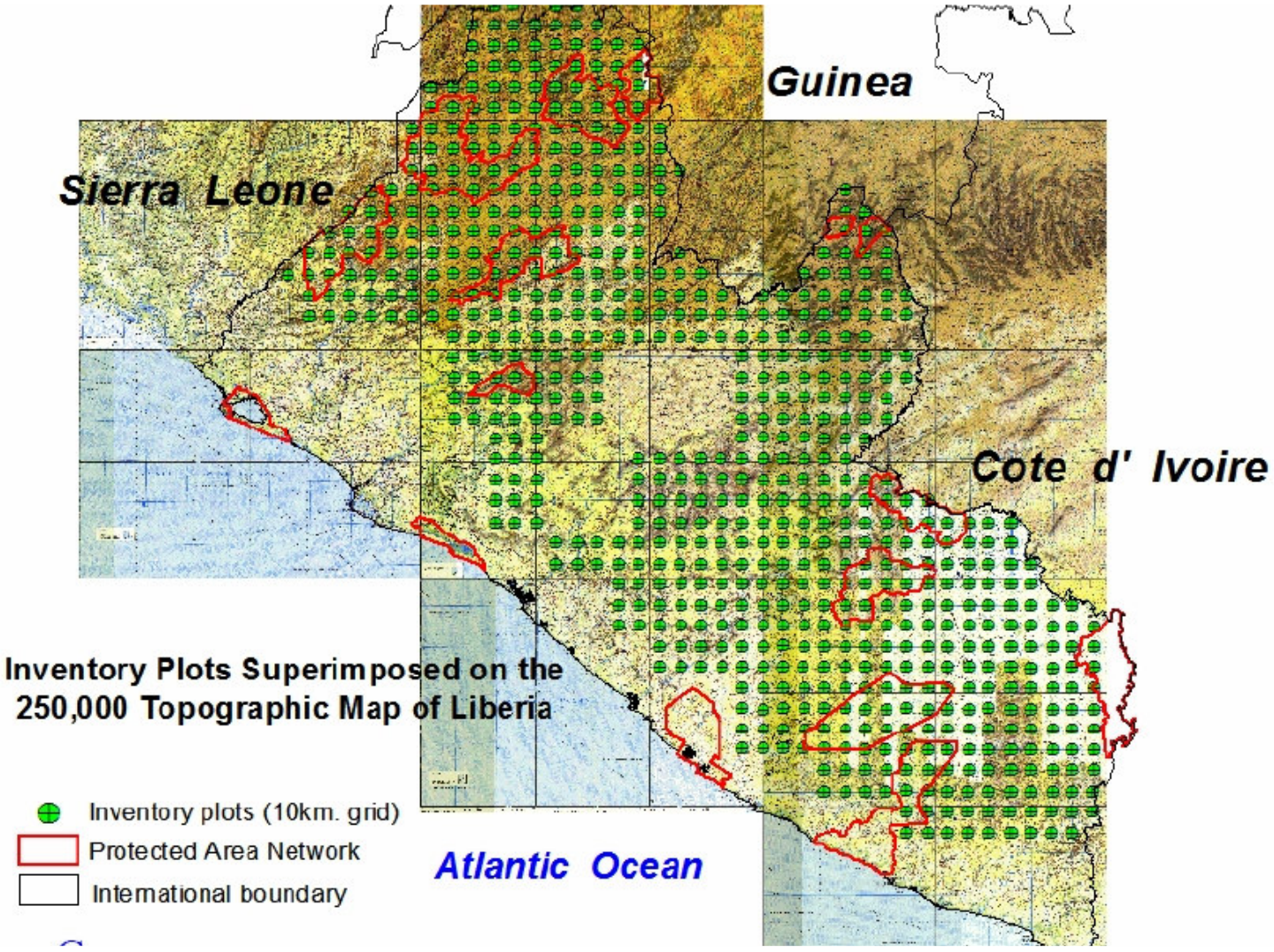
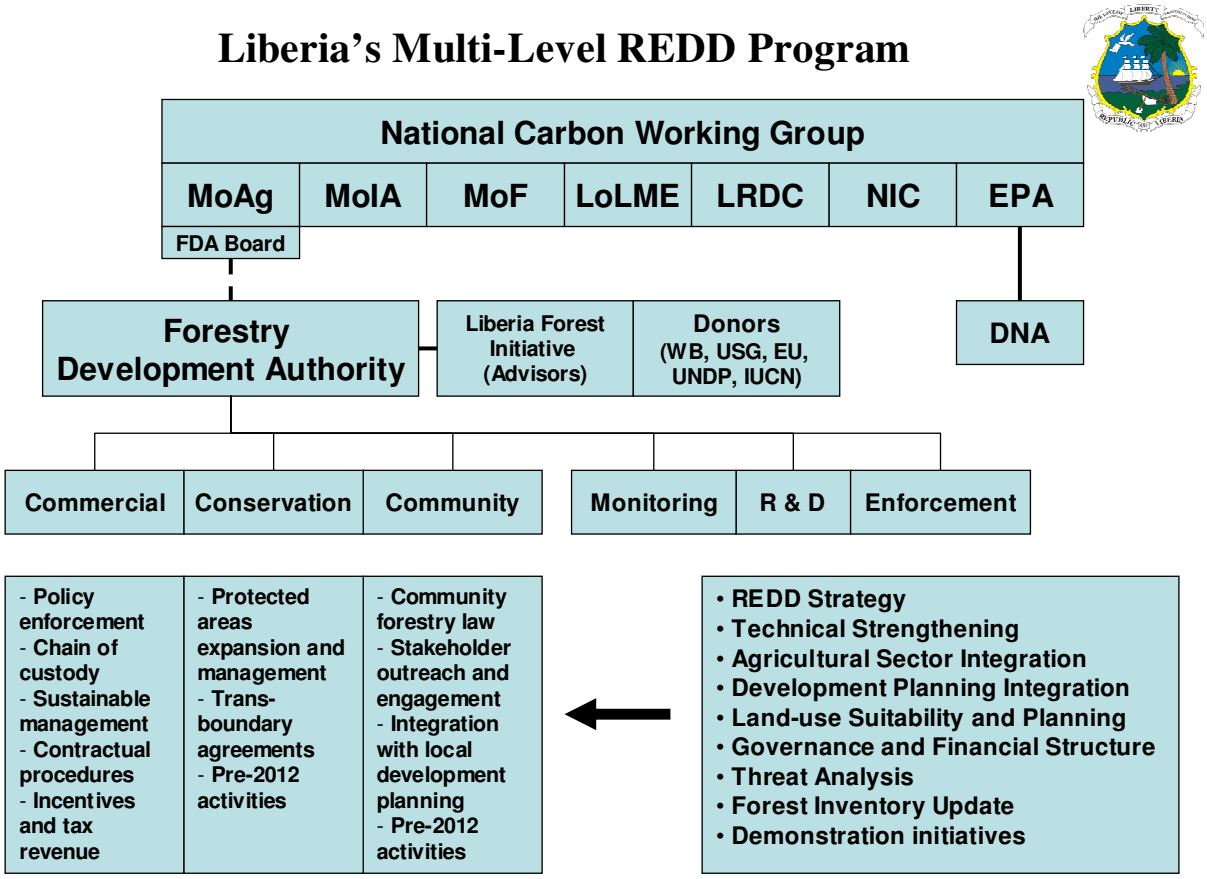


Figure A7. Distribution of Liberia's permanent plot network.

Annex 7. Liberia Readiness Possible Structure



Annex 8. Readiness Plan Timeline

Liberia's REDD Readiness Plan Timeline

	3Q08	4Q08	1Q09	2Q09
Required Enabling Conditions	Sufficient funding	Significant human resource and staffing increases. Methodology support at COP.	Strong local stakeholder understanding. Realistic and strong R-PLAN.	Readiness Plan funding Policy clarity and international expertise availability.
Timeline Roadmap	**Readiness Plan Funding and Development**			**R-Plan Implementation**
		Stakeholder Outreach		
	Technical Strengthening			
			Demonstration Initiatives	
		COP-14		**SBSTA**

Annex 9. Key Milestones:

Key National and Forest Reform Milestones	
2002	Ratified the Kyoto Protocol
2003	Environment Protection Agency established
2004	Liberia Forest Initiative established to support Liberia in forest sector reform (LFI)
2005	Held national elections
2006	Inaugurated a democratically elected government
2006	Launched a new forestry policy based on 3Cs—integrating commercial, conservation and community uses for sustainable forest management
2006	Passed New Forest Reform Law of Liberia
2006	United Nations lifted the imposed timber ban
2006	National Workshop on FLEGT/VPA, FC certification processes to engage GoL, industry and civil society in discussion of Liberia's participation
2006	FLEGT focal person assigned to FDA
2007	Received debt relief from the United States, IMF & World Bank, China, others
2007	Preparation to restart commercial logging
2007	Supported REDD at UNFCCC COP-13 meetings
2008	Bid opening for six Timber Sale Contracts
March 2008	Completion of Poverty Reduction Strategy (PRS)
Planned 2008	Community rights law drafted
Planned 2008	Plans to expand national protected area system

References

Christie, T., Steininger, M.K., Juhn, D. and A. Peal (2007) Fragmentation and Clearance of Liberia's Forests: 1986 – 2000. *Oryx* **41**:539-543.

Gatter, W. (1997) *Birds of Liberia*. Yale University Press, New Haven, USA.

Global Witness (2003) *Logging Off*. Global Witness, Washington, USA http://www.globalwitness.org/

Kunkel, G. (1965) *Trees of Liberia*, German Forestry Mission to Liberia. Report no. 3. BLV Bayerisher Landwirtschaftsverl, Munchen, Germany.

Mittermeier, R.A., Gil, P.R., Hoffmann, M., Pilgrim, J., Brooks, T., Mittermeier, C., Lamoreux, J. and da Fonseca, G. (1999) *Hotspots Revisited*. Cemex, Mexico City, Mexico.

Peal, A. (2000) *Green Spot of West Africa*. Africa Online.