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LIBERIA ENVIRONMENTAL THREATS AND OPPORTUNITIES ASSESSMENT (LETOA)

QUARTERLY REPORT: MAY 21 THROUGH SEPTEMBER 30, 2008

OCTOBER 2008

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LIBERIA ENVIRONMENTAL THREATS AND OPPORTUNITIES ASSESSMENT (LETOA)

QUARTERLY REPORT

MAY 21 THROUGH SEPTEMBER 30, 2008

Submitted to:

USAID/Liberia, Office of Economic Growth

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Conserving Ecosystems Indefinite Quantity Contract (PLACE IQC)

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The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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ACRONYMS

ARD	Associates in Rural Development
CCC	Civilian Conservation Corps
CI	Conservation International
CRS	Catholic Relief Services
DAI	Development Alternatives Inc.
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
ETOA	Environmental Threats and Opportunity Assessment
FAA	Foreign Assistance Act
FAF	Foreign Assistance Framework
FAO	Food and Agricultural Organization
FDA	Forestry Development Authority
FFI	Fauna and Flora International
FFI	Fauna and Flora International
GIS	Geographic Information Systems
IP	Implementing partner
IRG	International Resources Group
IUCN	The World Conservation Union
LCIP	Liberia Community Infrastructure Program
LEAP	The Liberia Energy Assistance Program
LETOA	Liberia Environmental Threats and Opportunities Assessment
LIAP	Liberian Integrated Assistance Program
LISGIS	Liberia Institute of Statistics and Geo-Information Services
LOE	Level of effort
LRCFP	Land Rights and Community Forestry Program
NGO	Non-governmental organizations
NIMAC	National Information Management Centre
PLACE	People, Livelihoods, and Conserving Ecosystems
PMP	Performance Monitoring Plan
SDI	Sustainable Development Institute
SEA	Strategic Environmental Assessment
STCP	Sustainable Tree Crops Program
STEWARD	Sustainable and Thriving Environment for West African Regional Development
TAMOA	Technical Assistance to the Ministry of Agriculture
UL	University of Liberia
USAID	United States Agency for International Development
WFP	World Food Program

LIBERIA ENVIRONMENTAL THREATS AND OPPORTUNITIES ASSESSMENT (LETOA)

QUARTERLY REPORT: MAY 21 THROUGH SEPTEMBER 30, 2008

A. INTRODUCTION

Development Alternatives Inc. (DAI) hereby presents the Quarterly Report for the Liberia Environmental Threats and Opportunities Assessment for the period of May 21 through September 30, 2008. DAI was awarded the LETOA Task Order under the People, Livelihoods, and Conserving Ecosystems (PLACE) indefinite quantity contract (IQC) on May 21, 2008. The implementation period for the LETOA is 480 days, with a programmed Task Order completion date of October 13, 2009.

The objectives of the LETOA are to:

- Identify key environmental threats and their underlying causes across ecosystems - green (forests, agricultural systems), brown (urban, industrial systems) and blue (marine and freshwater systems) - and examine interactions between these ecosystems;
- Identify synergies and other opportunities to integrate environmental issues into existing or planned Mission activities;
- Provide educational tools, maps, and training sessions which can help to inform Mission staff, the Government of Liberia, and others on present trends and recent data on Liberia's tropical forests, biodiversity and environmental issues.
- Develop and produce an environmental report composed of three distinct sections including: 1) a State of the Environment report; 2) a Tropical Forests and Biodiversity Report (Foreign Assistance Act Sections 118/119); and 3), an environmental data collection, monitoring and adaptive management plan.

The document which follows is organized into four sections: 1) accomplishments; 2) Performance Monitoring Plan (PMP) results; 3) issues affecting implementation; and 4) a project pipeline analysis. A brief report on two Geographic Information Workshops held during the quarter is presented in Annex A.

B. ACCOMPLISHMENTS DURING THE REPORTING PERIOD

B.1 CROSS CUTTING ACTIVITIES

B.1.1 STAKEHOLDER CONSULTATIONS AND ANALYSIS

Benchmark:

- Stakeholder consultations and analysis completed by July 3, 2008.

Status:

Completed. With the exception of the United States Forest Service's (USFS) Sustainable and Thriving Environment for West African Regional Development (STEWARD) program, all stakeholder consultations and analyses were completed on schedule. The ETOA team met with over 130 stakeholders during the course of the assessment, representing a wide cross section of GOL, NGO and private sector organizations. The complete list of contacts is found in Annex C of the ETOA Final Report.

B.1.2 NATIONAL LEVEL WORKSHOPS

Benchmarks/Deliverables:

- Preparatory workshops (EPA and FDA group meetings and USAID implementing partners) completed by June 5, 2008;
- Tentative list of participants for the first workshop submitted to USAID by June 6, 2008;
- Agenda for the first national workshop submitted to USAID by June 16, 2008;
- First national stakeholder workshop held on June 24, 2008;
- Draft ETOA report submitted to USAID and stakeholders by July 25, 2008;
- Tentative list of participants and agenda for the second national workshop submitted to USAID by July 25, 2008;
- Second national stakeholder workshop held on August 7, 2008;

Status:

Completed. A total of three workshops were held during the reporting period.

- Visioning/ validation workshop. As noted in the FY 2008 Work Plan, we had originally intended to conduct a "visioning/validation" workshop in collaboration with the SEA team early on in the ETOA process. However, with USAID approval, this workshop was replaced a two day series of group meetings with Environmental Protection Agency (EPA) and Forestry Development Authority

(FDA) staff on the team's arrival in country, and a presentation on the ETOA for USAID's Economic Growth implementing partners held on June 5, 2008 which served to bring this set of stakeholders into the ETOA process.

- ETOA initial findings, conclusions, and recommendations workshop. The preliminary results of the ETOA were presented to about 40 stakeholders during a one day workshop held at the Mamba Point Hotel on June 24, 2008.
- Draft report review workshop. Stakeholder comments and suggestions from the above workshop were incorporated into a revised draft report which was circulated to selected stakeholders – including USAID – on July 26, 2008. Based on comments received from stakeholders, a second draft was developed and presented to seven key stakeholders from EPA and FDA (with a copy to USAID) during a one half day workshop held on August 5, 2008. Electronic copies of this draft were provided to participants for additional review and comment.

Deliverables:

- Final ETOA report submitted to USAID by August 18, 2008.

Status:

Completed. In order to enable us to incorporate Mission comments into the draft reports while providing sufficient time for DAI's Publications Department to produce the final version, the Mission approved a request for an extension of the final report delivery date to September 26, 2008. The report was submitted on September 26, 2008, but at the Mission's request, the ETOA Team Leader undertook one final review of the report, with the final version submitted in both PDF and MSWord versions on October 4, 2008.

B.1.3 SITE VISITS

Benchmark:

- Site visits completed by June 21, 2008.

Status:

Completed. Per the schedule of site visits presented in Table 1 below, all site visits were completed on schedule.

Table 1: Schedule of site visits

Date(s)	Site(s)	Team	Issues/Opportunities
May 30, 2008	Marshall wetland/ Margibi Mangrove (proposed new protected area)	Seyler and Kpadehyea	Issues: Marshall wetland pollution (Ramsar site). Mangrove dieback, pollution, charcoal, cheap land sales and land fills Opportunities: Coastal zone management, ecotourism, fisheries. Public-private partnerships, environmental management plans
May 31, 2008	Monrovia waste management and landfill sites	Krahl, Goodnough and Conneh	Issues: Urban pollution Opportunities: Environmental impact assessments (EIAs)
	Mesurado wetland	Krahl, Goodnough and Conneh	Issues: Urban pollution, pharmaceutical waste, charcoal, over-fishing Opportunities: Management plan, public-private partnerships
June 2–3, 2008	Lake Piso (proposed protected area)	Seyler, Thomas, Krahl, Goodnough, Kpadehyea (FDA) and Conneh (EPA)	Issues: Dredging (gold and diamonds) proposals, proposed road rehabilitation (LCIP), charcoal, multiple-use issues Opportunities: Ramsar site and proposed protected area, coastal zone management and stabilization, old growth mangroves, ecotourism, landscape management (ridge to reef), improved fisheries
	Guthrie rubber plantation	Seyler and Goodnough,	Issues: Expansion into critical habitats, biofuel issues, problems Opportunities: Public-private partnerships for conservation
	West Africa Agricultural Company (Palm oil)	Seyler and Goodnough,	Issues: Expansion into critical habitats, biofuel issues, tenure problems Opportunities: Public-private partnerships for conservation
June 4–5, 2008	Buchanan	Krahl and Conneh	Buchanan Renewable Energies –chipping, conversion and export of rubber chips Equatorial Biofuels – palm oil to biodiesel (expansion, etc) Liberia Agriculture Company – rubber (land tenure issues) LCIP – Buchanan Greenville Road Oil palm issues (plantation expansion, Liberia Agriculture Corporation, social issues with regard to oil palm—land expropriation);
June 9–13, 2008	East Nimba Nature Reserve and West Nimba National Forest	Seyler, Goodnough and Conneh	Issues: Iron ore mining concession (ArcelorMittal Steel), agriculture encroachment, bushmeat trade Opportunities: Environmental management plans, IUCN FDA capacity-building initiatives, multiple use
	Reserve Buffer Zone areas	Seyler, Goodnough and Conneh	Issues: Encroachment, mining, lack of alternative incomes Opportunities: Sustainable Tree Crops Program including cocoa production/cocoa as alternative income; shade grown cocoa and biodiversity; farmers field schools and farmer-

Table 1: Schedule of site visits

Date(s)	Site(s)	Team	Issues/Opportunities
			to-farmer extension for biodiversity/conservation
	Sanniquellie—LRCFP community forestry sites	Seyler, Goodnough and Conneh	Issues: Impact on threats, community access to natural and financial resources, open access Opportunities: Markets
	Gbedin and Kpatawee wetlands (Ramsar sites)	Seyler, Goodnough and Conneh	Issues: Hydropower proposals (Kpatawee), endangered migratory birds Opportunities: Ecotourism, swamp rice production
	LIAP sites en route and around Gbarnga and Ganta	Seyler, Goodnough and Conneh	Issues: Land degradation, lack of alternative incomes/livelihoods Opportunities: Multifaceted approach to food security
	Gbarnga town	Seyler, Goodnough and Conneh	Issues: Data collection and management at the county level Opportunities: LISGIS roll-out of information management to the counties; county statistics officer
June 9–13, 2008	Wologizi and Wonegizi (proposed protected areas)	Thomas, Krahl and Kpadehyea	Issues: Iron ore mining concession (BHP Billeton), bushmeat trade, forest management and timber sale concessions Opportunities: Public-private partnerships, elephant corridors, transboundary initiatives with Ziama Reserve in Guinea, multiple use, other non-timber forest products
	Buffer zones—LCIP sites around Wologizi and Wonegizi	Thomas, Krahl and Kpadehyea	Issues: Encroachment, mining, lack of alternative income Opportunities: Shade-grown coffee and cocoa and <i>Arabica liberica</i> niche market; alternative incomes
June 16–20, 2008	Greenville area	Krahl, Thomas and Kpadehyea	Issues: LCIP (Buchanan to Greenville Road—environmental impact); Opportunities: county collaboration for wider landscape issues
	Senkwehn proposed protected area	Krahl, Thomas and Kpadehyea	Issues: Illegal logging, bushmeat trade, incursion, mining Opportunities: Senkwehn proposed protected area, ridge to reef management
	Sapo National Park (CI/ActionAid Civilian Conservation Corps activities in Jallay and Chiebioh Towns, and in Keh and Putu Jawaordee)	Thomas and Kpadehyea	Issues: Artisanal gold mining, heavy commercial bushmeat trade, Opportunities: Lessons learned/replicability, alternative incomes (cassava)
June 21, 2008	Todee Road (LCIP)	Bouvier	Issues: Environmental impact Opportunities: Integrated road building and development program

B.2 TASK NUMBER 1: STATE OF THE ENVIRONMENT REPORT AND TASK NUMBER 2: TROPICAL FORESTS AND BIODIVERSITY REPORT (FAA SECTIONS 118/119)

As noted in the FY2008 ETOA Work Plan, these two tasks were combined for planning purposes

B.2.1 CONDUCT COMPREHENSIVE LITERATURE REVIEW AND PRODUCE LIST OF REFERENCES

B.2.2 IDENTIFY THE ARRAY OF ENVIRONMENTAL/CONSERVATION ISSUES AND INTEREST GROUPS

Benchmarks:

- List of references for the draft ETOA report produced by July 15, 2008;
- Reference CD produced and distributed by August 1, 2008.

Status:

Partially completed. A list of documents reviewed and referenced was completed and included as an annex (Annex D) in the final ETOA report. An initial reference CD has been produced but has not been finalized for distribution as it does not take into account additional references collected in August and September. The CD will be finalized by November 30, 2008 and had carried to stakeholders by the GIS specialist in January 2009.

B.2.3 CONDUCT POLICY, LEGAL AND REGULATORY REVIEW

Benchmark:

- Draft policy and legislation sections of the ETOA report completed by June 30, 2008.

Status:

Completed. A comprehensive review of the National Environment Policy, the National Forestry Policy, the Draft Food and Agriculture Policy and Strategy, the Draft Mining Policy, the Land Rights and Land Tenure Policy, the Draft National Integrated Water Resources Management Policy, along with their legislative frameworks was undertaken with findings incorporated into the ETOA final report. Liberia's International Policy Commitments were also reviewed.

B.2.4 IDENTIFY AND PROMOTE THE USE AND REPLICATION OF ENVIRONMENTAL AND CONSERVATION BEST PRACTICES

Benchmark:

- Best practices (opportunities) identified and disseminated by June 25, 2008.

Status:

Completed. During the course of ETOA implementation, the Team identified a number of approaches and interventions used by USAID's implementing partners and other stakeholders which appear to merit wider replication. These are summarized in Section Seven of the ETOA's State of the Environment Report.

Additionally, the Team provided guidance to implementing partners and GOL stakeholders on other best practices – including the use of value chain analysis for alternative livelihood activities, collaborative management, environmental impact assessments, community-based natural resource management – through informal discussion and internet links to best practice guidelines and key information web sites.

B.2.5 IDENTIFY AND PRODUCE PLAN TO HARNESS PRIVATE SECTOR PARTICIPATION IN ENVIRONMENTAL PROTECTION AND BIODIVERSITY CONSERVATION

Benchmark:

- Public-private sector partnership opportunities identified and guidelines for forging partnerships produced and incorporated into the draft ETOA report by June 30, 2008.

Status:

Partially completed. The Team identified a number of potential conservation partnerships including possible joint ventures in the agro industrial crops sector (rubber and oil palm), the mining sector (BHP Billiton and ArcelorMittal), ecotourism and with coffee and cocoa buyers. Details of these possibilities are included in Section 9 of the Actions Necessary and Planned to Conserve Tropical Forests and Biodiversity report. However, time constraints and difficulty in accessing some potential partners precluded the Team from identifying concrete opportunities and developing guidelines for forging partnerships for these opportunities.

B.2.6 DEVELOP PMP WITH INDICATORS AND BENCHMARKS RELATED TO REDUCTION OF THREATS TO BIODIVERSITY

Benchmark:

- PMP recommendations will be finalized by June 30, 2008 and incorporated into the draft ETOA report by July 25, 2008.

Status:

Completed: A framework, set of indicators and possible targets for monitoring environmental damage/health in Liberia (land, biodiversity, water and air) was developed and incorporated into the ETOA final report (Section 9 of the State of the Environment Report).

B.3 TASK NUMBER 3: ENVIRONMENTAL DATA COLLECTION MONITORING AND ADAPTIVE MANAGEMENT

B.3.1 IDENTIFY GAPS IN DATA

Benchmarks:

- Data collection form developed by May 31, 2008;
- Data set inventory and additional data sets obtained from FDA and EPA by June 8, 2008;
- Database for housing the field data and photographs developed by June 8, 2008.

Status:

Partially Completed. The Data Collection form was completed and used to inform the photograph captions, and the database is complete. With regard to obtaining additional datasets from FDA and EPA, there exists a current trend toward “locking down” data from public and inter-ministry consumption as a result of an unpleasant experience for the FDA. The authority had previously adhered to an open data sharing policy until a recent distribution of forest concessions landed their organization in the newspaper with negative publicity. Since then, sharing data externally requires board approval, which the program did not receive.

B.3.2 VALIDATE EXISTING GEOSPATIAL DATASETS WITH LOCAL EXPERTS AND FIELD VISITS

Benchmarks:

- Final selection of datasets made by June 6, 2008;
- At least four datasets spot-validated by June 21, 2008.

Status:

Completed. The program is using existing datasets obtained prior to the “lockdown,” and datasets were spot validated. All of these datasets will need further spot checking but were generally on mark, with the exception of some discrepancies (e.g., some mountains missing in Nimba county and some landcover classified as forest that was in reality rubber tree plantations). **Thus, it is critical that any datasets used for planning purposes be validated prior to making decisions.**

B.3.3 DEVELOP AND PRODUCE GIS MAP-BASED VISUALIZATION TOOL

Deliverables:

- A draft version of the tool will be submitted with the draft ETOA on July 25, 2008, with the final version submitted on August 18, 2008. Increased functionality will be integrated throughout the remainder of the contract;
- At least 50 high-resolution photographs will be included in this visualization tool as well as specific areas of interest, base datasets relevant to the ETOA.

Status:

Completed. A static visualization tool and several data layers which can be overlaid on GoogleEarth, Whirlwind, etc. were provided and options for making this tool live were discussed. Over 100 georeferenced photographs were provided and integrated into the static visualization tool.

B.3.4 CONDUCT ASSESSMENT OF CAPACITY OF LIBERIAN INSTITUTIONS COLLECTING AND MANAGING DATA

Benchmark:

- GIS capacity assessment report on current data collection and management processes completed by July 8, 2008.

Status:

Completed. The report was submitted as part of the ETOA final report (see Section 3.3 - 3.3 (CAPACITY OF LIBERIAN INSTITUTIONS COLLECTING AND MANAGING DATA))

B.3.5 DEVELOP WORK PLAN FOR BUILDING CAPACITY OF LIBERIAN INSTITUTIONS TO COLLECT/MANAGE DATA

Deliverable:

- Workplan for GIS capacity building submitted to USAID/Liberia by August 30, 2008.

Status:

Delayed until November 2008. This activity was delayed pending completion of the ETOA and a subsequent pipeline analysis to determine remaining funds. This plan will be completed and submitted to the Mission by November 15, 2008.

B.3.6 GIS WORKSHOPS

Benchmarks:

- Workshop participant list and agenda submitted to USAID by August 1, 2008;
- Mapping/decision making workshop held by August 7, 2008;
- Metadata workshop held on August 14, 2008.

Status:

Completed. These workshops focused on process for managing existing spatial data sets and introducing the participants to Open Source GIS software that can be used to develop, package and distribute spatial data to government agencies that cannot access information on-line. A DVD with these applications along with reference material was distributed to the participants. A brief introduction and practical exercises exposed the participants to using open source GIS to support GOL initiatives. Additional details on these workshops are provided in Annex A.

B.3.7 DEVELOP RECOMMENDATIONS FOR A METADATA CATALOG

Benchmark:

- Workshop consensus report on metadata produced by September 15, 2008.

Status:

Completed. The meta data workshop participants reached consensus on the following points:

1. The leadership role of a proposed Liberian Geospatial Data Committee (LGDC) should be shared among the GOL agencies that develop and/or use geospatial data under a LISGIS chair. Senior geospatial technical specialists associated with each GOL agency should be invited to help define and draft LGDC policies.
2. A LGDC should be responsible for creating and implementing common methods and standards for spatial/attribute data collection. Complying with LGDC standards should be a budget approval criterion for spatial data development at the national, local and private sector level. The LGCD should convene as a GOL geospatial budget advisory committee to insure a coordinated and coherent national geospatial effort.
3. Formation of GOL national and local administrative partnerships for cost-sharing purposes based on cooperative research and development agreements could result in geospatial data development for multi-sectoral program planning.

C. PERFORMANCE MONITORING PLAN

C.1 MONITORING CRITICAL ASSUMPTIONS

There were no substantive changes to our critical assumptions during the reporting period as indicated in Table 2 below.

TABLE 2: LETOA – CRITICAL ASSUMPTIONS

INDICATOR	INDICATOR DEFINITION/ UNIT OF MEASURE	STATUS
Political stability/ security	Political and security situation in Liberia remain conducive to program implementation	No substantive change
Environmental stability	Environmental conditions in Liberia remain conducive to program implementation with no significant deterioration in climatic trends/natural disasters and repatriation trends.	No substantive change
Continued Government of Liberia and USAID support for the LETOA	Support for the LETOA from the Government of Liberia and USAID is maintained over the duration of the program.	No substantive change
Continued international support for Liberia environment, conservation and development initiatives	International support for forest conservation and linked rural development remains strong: stable funding, staffing levels, and mandate.	No substantive change

C.2 OVERARCHING “F” INDICATORS

TABLE 3: LETOA F INDICATORS

INDICATOR	TARGET	PROGRESS TOWARDS TARGET
Indicator 5: Number of policies, laws, agreements or regulations promoting sustainable NRM and conservation that are implemented as a result of U.S. Government assistance	DRAFT METADATA POLICY PRODUCED (FY 2009)	Ongoing. The current trend toward “locking down” GIS data from public and inter-ministry consumption is currently hampering achievement of this result. Despite this setback, meta data workshop participants reached consensus on the following points: 1. The leadership role of a proposed Liberian Geospatial Data Committee (LGDC) should be shared among the

INDICATOR	TARGET	PROGRESS TOWARDS TARGET
		<p>GOL agencies that develop and/or use geospatial data under a LISGIS chair. Senior geospatial technical specialists associated with each GOL agency should be invited to help define and draft LGDC policies.</p> <p>2. A LGDC should be responsible for creating and implementing common methods and standards for spatial/attribute data collection. Complying with LGDC standards should be a budget approval criterion for spatial data development at the national, local and private sector level. The LGCD should convene as a GOL geospatial budget advisory committee to insure a coordinated and coherent national geospatial effort.</p> <p>3. Formation of GOL national and local administrative partnerships for cost-sharing purposes based on cooperative research and development agreements could result in geospatial data development for multi-sectoral program planning.</p>
Indicator 7: Number of people receiving U.S. Government-supported training in NRM and/or biodiversity conservation	PARTICIPANTS FROM GIS TRAINING SESSIONS	A total of 6 men and 3 women were trained during the mapping/decision making workshop held by August 7, 2008, and the metadata workshop held on August 14, 2008. Part of the reason we didn't reach our goal yet is that the goal was set with the understanding that implementing partners would attend. Until we can get some of the spatial data standards ironed out with the Liberian agencies, we don't have a lot we can work on with the local staff of our implementing partners.
Number of women	6 (FY 2008)	3
Number of men	6 (FY 2008)	6

C.3 IMPACT INDICATORS

TABLE 4: LETOA IMPACT INDICATORS

INDICATOR	INDICATOR DEFINITION/ UNIT OF MEASURE	FY 2008 TARGET	PROGRESS TOWARDS TARGET
Liberian agencies utilize technical findings and technology to identify new areas of interest vis a vis NRM, improving transparency in decision-making	The number of Liberian agencies that provide updates to the visualization tool for monitoring purposes, request the tool for review, and/or use the ETOA report and/or visualization tool to identify locations of environmental interest	1	Results of the ETOA have yet to be released pending USAID determination of the most appropriate method
USAID and other implementing partners requesting additional information in GIS tools and applications	Number	2	Results of the ETOA have yet to be released pending USAID determination of the most appropriate method
USAID implementing partners adopting best practices in environmental/natural resource management	Number	1	The Liberia Community Infrastructure Project (LCIP II) has requested DAI home office support for training in value chains and in revising its Initial Environmental Examination
Active stakeholder participation in workshops	Percent of invited workshop participants who actually attend	90%	National ETOA Workshop – 67% Draft ETOA report review workshop – 100% GIS Workshop – 100% Average – 89%

C.4 MONITORING CUSTOMER SATISFACTION

TABLE 6: MONITORING CUSTOMER SATISFACTION – INDICATORS

INDICATOR	INDICATOR DEFINITION/ UNIT OF MEASURE	FY 2008 TARGET	PROGRESS TOWARDS TARGET
Number of partner organizations and clients receiving requested technical support services for implementation activities and sustainable	Stakeholders rate LETOA information exchange and liaison as good to excellent	10	Results of the ETOA have yet to be released pending USAID determination of the most appropriate method

development practices			
Partners that rate LETOA capacity building and support services as good to excellent	Percentage of stakeholders that rate LETOA information exchange and liaison as good to excellent based on an annual survey	50%	Results of the ETOA have yet to be released pending USAID determination of the most appropriate method

D. ISSUES AFFECTING IMPLEMENTATION

The biggest issue affecting implementation is the GOL's – particularly FDA's - current trend toward “locking down” data from public and inter-ministry consumption. The absence of an open data sharing policy prevents validation of data sets and moving forward with an inter-agency data-sharing protocol. We believe that this issue can be resolved only at the highest levels of government and then, only with some gentle nudging from USAID and other members of the donor community. The Liberia Forest Initiative might be the best vehicle to move this agenda forward.

E. PIPELINE ANALYSIS

Table 7: ETOA Pipeline Analysis

Line Items	Contract Budget	Amount obligated as of 05/21/08	Invoiced through 09/30/08	Accrued	Projected Expenditures 11/01/08 - 9/22/2009	Total Expenditures	Contract Funds Remaining
Salaries and Wages	\$82,587.00	\$82,587.00	\$36,486.26	\$1,386.22	\$11,252.47	\$49,124.95	\$33,462.05
Fringe	\$20,115.00	\$20,115.00	\$14,607.49	\$561.42	\$4,557.25	\$19,726.16	\$388.84
Overhead	\$36,426.00	\$36,426.00	\$26,670.93	\$1,016.67	\$8,252.67	\$35,940.27	\$485.73
Labor	\$139,128.00	\$139,128.00	\$77,764.68	\$2,964.31	\$24,062.39	\$104,791.38	\$34,336.62
Travel	\$77,103.00	\$77,103.00	\$60,823.60	\$3,827.57	\$7,800.00	\$72,451.17	\$4,651.83
Allowances	\$11,721.00	\$11,721.00	\$3,833.20	\$0.00	\$2,635.23	\$6,468.43	\$5,252.57
Other Direct Costs	\$40,230.00	\$40,230.00	\$44,782.51	\$1,560.00	\$500.00	\$46,842.51	(\$6,612.51)
ODCs	\$129,054.00	\$129,054.00	\$109,439.31	\$5,387.57	\$10,935.23	\$125,762.11	\$3,291.89
G&A	\$24,405.00	\$24,405.00	\$17,035.74	\$760.02	\$3,184.78	\$20,980.37	\$3,424.63
<i>Total Cost</i>	<i>\$292,587.00</i>	<i>\$292,587.00</i>	<i>\$204,239.73</i>	<i>\$9,111.90</i>	<i>\$38,182.41</i>	<i>\$251,534.04</i>	<i>\$41,053.14</i>
Fixed Fee	\$23,407.00	\$23,407.00	\$16,384.33	\$728.95	\$3,054.59	\$20,167.87	\$3,239.13
TOTAL	\$315,994.00	\$315,994.00	\$220,624.06	\$9,840.85	\$41,237.00	\$271,701.91	\$44,292.27

ANNEX A
GIS WORKSHOP REPORT

ANNEX A GIS WORKSHOP REPORT

Support to the Environment Threats and Analysis Task Order (ETOA) included several Geographic Information System (GIS) workshops held from Sept 7 – 11, 2008. These workshops focused on process for managing existing spatial data sets and introducing the participants to Open Source GIS software that can be used to develop, package and distribute spatial data to government agencies that cannot access information on-line. Coordinating Liberian development activities depends on reliable information that program managers can use to make informed decisions. Mapping program activities allows decision makers to evaluate where resources are allocated in context of ancillary information such as current socio-economic and/or biophysical data sets. Maps help to promote a transparent process through transforming simple to complex data relationships into readily understood graphical features including points, lines, and polygons described by different shades of color. The quality of resource allocation decisions is reliant upon the quality and availability of data available to program managers.

Open Source Geospatial Software

Budgetary limitations will restrict use of licensed geospatial information system software at the decentralized administrative level in Liberia. Adopting the use of free and open source geospatial software can foster the utilization of spatial data at the decentralized administrative level. Free and open source software (FOSS) has undergone rapid evolution and maturation over the past few years and has received much support from the international software development community. Several FOSS websites such as open source GIS (<http://opensourcegis.org/>) and free GIS (<http://freegis.org/>) inventory and provide access to hundreds of open source GIS projects and applications. The OSGEO Foundation (<http://www.osgeo.org/>) was established to offer a point of contact for the rapidly growing FOSS. The OSGEO has been founded to support and build high-quality open source geospatial software. Through deploying open source GIS initially, the Liberian Geospatial community can conduct cost-effective assessments specific to each agencies capability to adopt geospatial data methods and processes for decision support. Recommendations can be drafted that address further deployment of open source software or procurement of robust commercial licenses. This will depend on individual agency objectives for developing, managing, and distributing geospatial data.

The Open Geospatial Consortium (<http://www.opengeospatial.org/>) or OGC is an international trade association of 334 companies, government agencies and universities taking part in a process aimed at establishing publicly available geo-processing specifications. Open interfaces and set of rules defined by OpenGIS Specifications support interoperable applications allowing developers to deliver complex spatial information and make services accessible and useful with a variety of programs. The Liberian geospatial community can and should become OGC members to leverage support and GIS software developer resources.

According to the GNU (<http://www.gnu.org/philosophy/free-sw.html>) free and open source software can be labeled as *free software* if the related license conditions adhere to the “Free Software Definition,” that grants the following freedoms:

1. The freedom to run the program, for any purpose.
2. The freedom to study how the program works, and adapt it to your needs.
3. The freedom to redistribute copies so you can help your neighbor.
4. The freedom to improve the program, and to release your improvements to the public, so that the whole community benefits.

An introduction to free and open source GIS software provided the focus for the second ETOA workshop. A DVD with these applications along with reference material was distributed to the participants. Project specific spatial data sets can be packaged and distributed along with these software packages to trained end users without having to purchase licenses helping to insure access to spatially referenced information in the public domain or developed through targeted investments. A brief introduction and practical exercises exposed the participants to using open source GIS to support GOL initiatives.

Geospatial Metadata Services

As GOL agencies continue to develop geospatial data the issue of coordinated management of these investments becomes increasingly important. Insuring that agencies have access to and agree on basic spatial data sets such as administrative layers, populated places and transportation infrastructure is critical to inter-agency program development coordination (see Liberian Geospatial Data Committee, LGDC below).

Metadata are important as it helps individuals who use data find what they need and decide how to use it most effectively. In its simplest term, metadata provides documentation about the data, such as the name of the data author, the date it was created, its purpose, methods used, contact name and number. Geospatial metadata includes geographic aspects such as geographic extent and projection information and database elements such as attribute label definitions and attribute domain values etc. Metadata provides important benefits to the data development agency. Oftentimes, key personnel changes in an agency can result in a degradation of data value if documentation is not available. In the absence of metadata, colleagues and replacement staff may have little understanding of the data and how it can be used to inform decisions oftentimes results generated from undocumented data simply cannot be trusted. Distributing metadata across agencies increases awareness relating to other government investments in spatial data and helps to avoid duplication of effort. Industry experts conclude that although it may seem burdensome to include the cost of generating metadata to a data collection budget, in the long run it's worth it. Managing distributed geospatial data resources requires a collective agreement regarding data development and documentation standards. There are several standards

that can be adapted for data management among GOL agencies that develop geospatial data including:

- **FGDC:** The US Federal Geographic Data Committee standard. Per the definition on the FGDC website (<http://www.fgdc.gov/metadata>) *“The FGDC is tasked by Executive Order 12906 to develop procedures and assist in the implementation of a distributed discovery mechanism for national digital geospatial data. Geospatial metadata are critical to data discovery and serves as the fuel for both the Geospatial One-Stop data portal and the NSDI Clearinghouse”*
- **ISO 19115:** The current "best practice" standard for geospatial metadata. ISO 19115 documentation does not explicitly describe geographic metadata. However, the following overview can be found in its "scope" section:

“This International Standard provides information about the identification, the extent, the quality, the spatial and temporal schema, spatial reference, and distribution of digital geographic data.” Further on, it is stated: *“Though this International Standard is applicable to digital data, its principles can be extended to many other forms of geographic data such as maps, charts, and textual documents as well as non-geographic data.”*

The next section describes a key workshop Liberian Geospatial Data Committee (LGCD) recommendation. Managing geospatial data through a LGCD oversight body can be accomplished with open source metadata services. An appropriate example is the FAO Geonetwork: (<http://www.fao.org/geonetwork/srv/en/main.home>) Liberian geospatial data developers and managers can download this utility and customize/configure it for GOL agencies that use GIS resources. This web-based application will allow access to geospatial metadata provided by participating GOL agencies. In some instances geospatial data can be downloaded directly in other instances where data are sensitive or proprietary the ‘owner’ can be contacted directly to determine the availability and official utilization of restricted data. At the very least, a coordinated officially mandated metadata service will better insure that end users have a facility by which to inventory existing GOL investments in geospatial data.

Liberian Geospatial Data Committee (LGDC)

Data sharing was a central theme underscored throughout the two day workshop. A process is needed that will allow for the exchange of validated information across government sectors. Data coordination better insures every agency has access to the same data set by which decisions are made. Identifying gaps, needs and priorities with respect to public resource allocation is an important government task

The Liberian government has a unique opportunity to harmonize and administer partnerships with private industry and state and local governments to create what can be an instrumental information technology aimed at coordinating the Liberian National development process and fostering a smooth transition to democratic processes at

every administrative level. A national spatial data infrastructure (NSDI) describes a digital, spatial (geographic) data designed to eventually replace the traditional yet dated analog map methods.

Digital mapping technology is becoming essential to assessing, analyzing and reporting environmental information and informing threats and opportunities, such as the geographic distribution of endangered species, monitoring of forested areas and, more generally, hydrology, soils, agriculture, climate, geology, transportation, and urban development. A Liberian NSDI can be central to emerging a Liberian information infrastructure investment and future information highway.

The LISGIS forecasts increased expenditures in spatial and statistical data, however a framework to obtain, catalog, and distribute this information is in an ad hoc, largely disjointed state. A standardized approach to spatial data development and documentation is necessary to insure that investments are cataloged and made public helping to inform strategic decisions regarding new spatial data investments. In the absence of a Liberian NSDI, spatial data development efforts are often duplicated at the national, provincial, local, and private levels for different planning objectives purposes (such as urban development, transportation infrastructure planning, land resource management, etc). Unfortunately, various planning entities such as national and local agencies are often unaware that much needed spatial and/or tabular data have already been developed or procured by a different party. Even when specific spatial data are known to exist, non-standardized development process and lack of easy access typically constrain their use. For example, there are several definitions of Liberia's administrative boundaries there is no official body mandated with defining administrative boundary spatial data layers.

A Liberian NSDI would enable analysts and decision makers to integrate diverse geographic and related statistical data. For example, a local land manager, who is considering possible uses of a given land parcel, could overlay the following digital thematic layers if they were available:

- Administrative boundaries,
- LISGIS demographic data
- FDA forested areas
- Mangroves
- Protected areas
- Urban development
- Transportation infrastructure

Using license-free open source GIS software installed on a local computer, the local land planner could analyze these data to determine a balanced plan for using and protecting land resources. Methods that allow for trade-off assessments can help to optimize land resources planning. Other government agency decision makers, such as a transportation or mine/logging concession managers could use these and other data sources to help inform specific decisions. For applications and coordinated planning,

spatial data along with its documentation should be openly available this would help to insure a non-redundant, multipurpose spatial data for all levels of government. With limited resources, the Government of Liberia would benefit from a NSDI. Efficient government NSDI policy aims to create partnerships that promote cost-sharing and data-sharing across government agencies. All users of spatial data (national, local, private, and public organizations) should play a role in collecting and disseminating these valuable resources, as opposed to creating a single bureaucratic organization to lead an NSDI.

Development and coordinated implementation of an NSDI defines the central role of the GOL. The United States NSDI provides a useful illustrative example. In the United States the Federal Geographic Data Committee (FGDC) under the Department of the Interior (DOI), is authorized by the Office of Management and Budget (OMB) Circular A-16 to manage federal agency participation in NSDI.

To be effective an FGDC needs to be the lead official vehicle tasked with coordinating map, survey, and related spatial data activities. Primary activities handled by the FGDC include:

- Creating metadata standards for data collection and cataloging;
- Drafting a policy for cost-sharing partnership creation;
- Identifying and creating a plan to produce core data sets that will form the basic framework of NSDI;
- Identifying thematic data sets for specific applications; and
- Establish a web-based clearinghouse for inventorying, accessing, and distributing spatial data.

In addition to leading the national effort, the GOL can constitute a major provider of spatial data through its various agencies including the LISGIS, Lands and Mines, FDA, EPA, Defense, Ministry of Interior etc. The FDA is a leader in mapping Liberian natural resources and will be a major player in the evolution of NSDI.

Workshop Participant Recommendations

1. The leadership role of a proposed Liberian Geospatial Data Committee (LGDC) should be shared among the GOL agencies that develop and/or use geospatial data under a LISGIS chair. Senior geospatial technical specialists associated with each GOL agency should be invited to help define and draft LGDC policies.
2. A LGDC should be responsible for creating and implementing common methods and standards for spatial/attribute data collection. Complying with LGDC standards should be a budget approval criterion for spatial data development at the national, local and private sector level. The LGCD should convene as a GOL geospatial budget advisory committee to insure a coordinated and coherent national geospatial effort.
3. Formation of GOL national and local administrative partnerships for cost-sharing purposes based on cooperative research and development agreements could result in geospatial data development for multi-sectoral program planning.

4. Identification of specific thematic data sets of national importance should be defined by the LGCD. The LGCD defines priorities, standards and financing with consideration placed on data collection partnerships. Thematic data are important to informing specific concerns of national importance (mining/forest concessions, mangroves, administrative boundaries etc.)
5. A draft LGCD budget and workplan should be submitted to the GOL aimed at developing national core geospatial data. Core data are information used by geospatial technology specialists to accurately/reliably locate features on the earth's surface including geodetic, topographic, demographic, socio-economic, land survey, hydrographic and transportation infrastructure. These geospatial data constitute the underlying structure by which other data sets can be co-registered or new data can be derived.
6. A geospatial data clearinghouse should be defined by the LGDC the infrastructure to be defined upon a requirements assessment of each GOL agency that uses spatial data. To promote inter-agency data sharing, the LGDC should define an incentive system this will also help to optimize investments by reducing redundancies.
7. Use of Open Source GIS software should be vetted and approved by LGDC members along with recommendations for targeted technical and non-technical capacity building
8. Implementing the above recommendations may require an Executive Order

Possible Implications

An official geospatial organization comprised of representatives from the GOL geospatial data community will promote reliable spatial data development and distribution for national level development activities that foster the transition to a democratic state. A LGDC will foster standards, coordination and consensus building allowing for the creation of general policy. To set clear policy goals, an LGDC will require enforcement authority supported with an annual operating budget. The GOL would play largely a support role in the formation and organization of a LGDC. Available Liberian financial resources are limited hence, cost sharing partnerships that work horizontally across national level agencies and vertically between decentralized county level governments and the private sector to optimize investments made in spatial data development and management.