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ENGINEERING SERVICES FOR RURAL ROADS REHABILITATION CONTRACT NO: EDH-I-00-08-00023

ENVIRONMENTAL MONITORING, LESSONS LEARNED, & RECOMMENDATIONS – FEBRUARY 2016

March 11, 2016

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ENGINEERING SERVICES FOR RURAL ROAD REHABILITATION (ES3R)

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FEBRUARY 2016

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March 11, 2016

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Acronyms

A & E	Architect and Engineer
EO	Environmental Officer
ESMMP	Environmental & Social Mitigation & Monitoring Plan
ES3R	Engineering Services for Rural Roads Rehabilitation
FED	Food and Enterprise Development
MPW	Ministry of Public Works
USAID	United States Agency for International Development

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1. PURPOSE

This document was compiled to:

- Report on environmental and social monitoring oversight visits during February 2016;
- Document lessons learned from environmental and social monitoring of ES3R implementation; and,
- Provide mitigation, monitoring, and reporting recommendations for the remainder of ES3R and for follow-on activities.

2. METHODOLOGY

I conducted environmental and social monitoring oversight visits in Bong, Nimba, and Lofa Counties from February 8 through 12, 2016 along the following roads:

- Bong County - Gbondoi to Gbarnla and Taylorta to Yendewoun
- Nimba County - Gogein to Zuaplay
- Lofa County-John's Town to Bulor

For the visits in Nimba and Lofa counties, the Construction Contractors' Environmental Officers (EO) and other staff, as well as ES3R staff, accompanied me. The Westwood (Bong County) EO was out of the country for training and unable to participate in our site visits. The other EOs are:

- 21st Century (Nimba County) EO: Nakie Kang Suh (suh.nakie@yahoo.com, 0886-945-216)
- SSF (Lofa County) EO: Emmanuel Tucker

Rather than visit each road to monitor construction activities (as in previous visits), I focused on mentoring the EOs so that they can better undertake

their environmental monitoring and reporting responsibilities. With the EOs, we expanded on discussions from the February 9, 2016 Environmental Compliance Workshop and applied what they learned to conditions and situations along the roads. In addition, I emphasized our different roles: ES3R's role in oversight of environmental/social monitoring and reporting and the Construction Contractors' EOs, who are directly responsible for environmental and social monitoring, and based on their findings, are required to report to the United States Agency of International Development (USAID) monthly.

3. OVERSIGHT OF ENVIRONMENTAL/SOCIAL MONITORING: FINDINGS

3.1Environmental/Social Issues at Specific Roads

(1) On the Gogein to Zuaplay road, several culverts are blocked (see picture of one example below) and water flow is restricted. See remedial action needed below.

[Gogein to Zuaplay road: culvert blocked.]

(2) On the John's Town to Bulor road (see picture below), material has been moved into and stockpiled on swampy areas (wetlands). In this case, there may be no other practical place to stockpile soil, but wetland vegetation and hydrology may have been damaged as a result of temporary stockpiling. See remedial action needed below.

[John's Town to Bulor Road.]

3.2Environmental/Social Issues Common to all Firms/Roads

(1) The Environmental and Social Mitigation Monitoring Plan (ESMMP) requires mitigation for erosion control **during construction**, as well as once construction is complete. The concern during the construction phase is that even in the short-term, erosion could affect aquatic habitat, drinking water quality, and cultural uses of the water. In addition, even though soil may be exposed and potentially erode for only a short time during construction, the effects of sedimentation on aquatic resources can be permanent.

It appears that short-term (construction phase) erosion control measures are rarely used to mitigate potential siltation of wetlands and waterways. At water crossings and when material is stockpiled adjacent to (or sometimes in) wetlands, I observed no erosion control measures (see picture below, Gogein to Zuaplay, Nimba County).

[On the Gogein to Zuaplay road, showing two issues: no erosion control measures and soil pushed and stockpiled in watercourse/wetlands.]

(2) As above (#1), it appears that measures are rarely used during the construction phase to control erosion of exposed soil on steep slopes (see picture below). While erosion control will be placed on steep slopes prior to completion of the road, during the construction phase, I observed no temporary measures to control erosion (as required by the ESMMP).

[John's Town to Bulor road, Lofa County showing steep slope with exposed soil and no erosion control measures.]

(3) The ESMMP requires that construction material, soils, and vegetation should not be stored in watercourses, swampy areas, or other sensitive areas – **even temporarily**, yet in many places along the road, I observed this material pushed onto healthy vegetation, including in swampy areas, rather than stockpiled or spread in already disturbed sites.

[Taylorta to Yendewoun road (Bong County): soil pushed and stockpiled in swampy area.]

(4) At several borrow pits I observed soil pushed into and piled on adjacent vegetation, including pushed onto the edge of steep slopes rather than piled on bare, already disturbed and relatively flat areas. The ESMMP requires erosion control measures at borrow pits on steep slopes. Also, just as required along the roads, soil and vegetation should be moved onto, stored, and stockpiled only in already disturbed areas and not stockpiled on healthy vegetation, even temporarily.

(5) The ESMMP requires that excavation pits are kept de-watered, however, we observed that most pits have a significant amount of stagnant water (see picture below, Gogein to Zuaplay, Nimba County), an indication that they have not been de-watered for some time. I rarely observed the presence of drainage channels to keep water flowing from the pits. In one case, workers were shoveling water out of an excavation pit.

[Gogein to Zuaplay road, showing two issues: excavation pit not de-watered and no safety measures.]

(6) The ESMMP requires that excavation pits be well-marked and that safety measures are in place to protect people and animals. However, none of the excavation pits that we observed had adequate safety measures (pictures above and below: Gogein to Zuaplay, Nimba County).

[Gogein to Zuaplay road, showing two issues: excavation pit not de-watered and no safety measures.]

For lessons learned and recommendations regarding 1-6 above, see considerations for future USAID road program's ESMMPs below (Section 4.2).

3.3 Issues Related to Site Selection and Design Phases

(1) By choosing roads wisely (i.e., taking into consideration the ES3R environmental criteria) and by incorporating safeguards early on, most environmental impacts can be avoided during the road selection phase. ES3R's road selection prioritization tool includes the following environmental criteria:

- Criterion 1: Route provides direct access to protected area, including protected forest or other environmentally sensitive site (e.g., primary forest): If the answer to this is "yes," the road must be rejected.

- Criterion 2: Route will provide access for increased natural resources extraction (timber, wildlife, or plant collection): If the answer to this is "yes," mitigation measures must be developed and implemented. [The prioritization tool further states that: To determine if improved access will increase extraction, identify whether any extraction is occurring along the road now and whether the poor condition of the road is a constraint to increased extraction of timber/the timber trade, of collection of plants (medicinal, cultural, artisan uses), or of hunting and trading in wildlife.]

It is unclear how the environmental criteria have been taken into account in road selection. Adequate documentation should be readily available describing how the two environmental criteria were evaluated and considered. These criteria are key to showing compliance with the Programmatic Environmental Assessment.

As an example of this issue, along the Gbondoi to Gbarnla road (see picture below) and the Gogein to Zuaplay road, wood is available for sale. From interviews with people along the roads, we were told that pitsawyers are cutting timber; we were unable to ascertain if this was legal harvesting. There was no evidence of larger, commercial harvesting, however, pitsawyers can cause significant damage by taking the most valuable trees, by damaging other trees and vegetation when they cut a tree, and by not following sustainable harvesting guidelines. From speaking to people along the roads, we were told that prior to road improvements, wood had not been for sale, and pitsawyers had been less active along the roads. Recommendations for future USAID road programs are discussed below (Section 4.3).

[Along the Gbondoi to Gbarnla road.]

4. LESSONS LEARNED & RECOMMENDATIONS

4.1 Remedial Actions Needed (prior to completion of ES3R)

(1) Remedial action on Gogein to Zuaplay road (21st Century)

- Culverts should be cleaned at inlets and outlets and waterways opened (including at the bridge pictured above) and soil needs to be compacted and material spread along shoulders; and
- At excavation pits, slopes need to be stabilized, pits de-watered, and safety measures need to be in place to prevent injuries to humans and animals.

These remedial actions should be completed by February 29, 2016 and 21st Century EO should report on their status in his next monthly report.

(2) Remedial action on the John's Town to Bulor road (SSF)

- Where material has been moved into and stockpiled in wetland (picture above), it should be removed, and the wetland should be restored.

The SSF EO should ensure that restoration has been sufficient and that no permanent damage has been done, and should report on the status in his next monthly report. This remedial action should be completed by the substantial completion inspection.

4.2Considerations for future USAID road program's ESMMPs

Future USAID road programs will be responsible for developing their own project-specific ESMMPs, which will likely be an update of the ES3R ESMMP. The updating process should take into account lessons learned during ES3R, as described below.

The following four considerations are aimed at making mitigation practical and flexible, while also controlling potential impacts and giving Construction Contractors' EOs broad authority to evaluate, monitor, and report on impacts and mitigation. The considerations are based on the issues mentioned in the Findings section above.

(1) To ensure ESMMP requirements for erosion control during the construction phase (short-term erosion control) are practical and implementable, future road programs should consider stipulating in the ESMMP that Construction Contractors' EOs work closely with project engineers to evaluate the baseline environment at water crossings and wetlands to determine the potential **construction phase impacts**, and the need for and availability of erosion control on a short-term basis. Use of erosion control should be based on potential site-specific impacts (these are mainly determined by the

existing environment, timeframe of construction, and type of construction). There may be situations where short-term erosion control is unnecessary, as well as situations where it is crucial for protecting important aquatic habitat, drinking water sources, or cultural uses.

(2) Best practice is to always avoid stockpiling, even temporarily, in wetlands, watercourses, and on live vegetation; however, in some cases, it may be impossible to avoid. Future road programs should consider requiring in the ESMMP that Construction Contractors' EOs work closely with project engineers to **identify already disturbed sites to stockpile material outside of sensitive ecosystems/areas**. If already disturbed areas are unavailable for stockpiling, EO should ensure mitigation is in place (erosion control, restoration plans).

(3) The ESMMP should require that Construction Contractors' EOs be involved in borrow pit restoration plan development, including consultations with communities, and EOs should also be involved in monitoring during closure/restoration.

(4) The ESMMP should state that Construction Contractors' EOs should work closely with project engineers to ensure de-watering of excavation pits takes place in a timely manner (to be determined in consultation with EO and engineer) and that appropriate and practical safety measures are in place for the duration of construction.

The following are additional considerations for any future USAID road program ESMMPs based on lessons learned from ES3R.

(5) To minimize the need of workers to cut or gather fuel wood, Construction Contractors should transport wood from trees cut during site clearing for use at worker camps.

(6) Construction Contractors' EOs should be responsible for developing reuse/recycling measures at worker camps.

(7) Prior to the start of construction in future road program roads, a "Training-of-Trainers" environmental compliance workshop for Construction Contractors' EOs (and MPW and other relevant staff) could help minimize construction phase impacts, such as clearing too large swathes of vegetation, indiscriminately cutting and stockpiling vegetation, and damaging waterways and wetlands. EOs would then be expected to train and provide regular guidance and oversight to equipment operators, field foreman, all laborers, and other on-site staff.

4.3 Procedural Recommendations for the Remainder of ES3R and/or for Future USAID Road Programs

(1) Construction Contractors' EOs should always be included in substantial completion walk-throughs along roads to identify any remaining environmental concerns. This is good practice, will help empower EOs, and is a good learning experience for EOs (so they see and have input into road rehabilitation activities from start to completion).

(2) Construction Contractors' EOs should be <u>required</u> to submit monthly reports - as stated in the current ESMMP - but a requirement which has not been fully implemented. Future USAID road programs should provide much closer oversight and mentoring of EOs than has occurred in the past. This can be done through

emails, review of ESMMRs with suggestions for improvements, and periodic site visits to oversee EO monitoring and reporting.

(3) USAID/Liberia should emphasize that Construction Contractors are required to hire and support EOs, who are fully authorized to monitor and report on environmental compliance. Future USAID road programs should stress the EOs' roles in monitoring and reporting and clearly differentiate the Owner's Representative's oversight role from that of the Contractor's EO.

(4) Construction Contractors' EOs should include photographs, dated and located, in their ESMMRs: a GIS-enabled camera would be a useful tool to provide to them.

(5) USAID Contracting Officer, through their engineers, should ensure Contracts, in particular, Special Provisions and Bill of Quantities sections, cater for mitigation measures (technically and financially).

(6) Future USAID programs should update the Ministry of Public Works (MPW) Feeder Road Design Manual with a stronger environmental considerations section. (If impossible to incorporate formally, an informal addendum could be prepared). The Environmental Considerations section could showcase environmental best practices and lessons learned from past programs, as well as from rural road rehabilitation projects elsewhere in Liberia and worldwide.

4.4 Recommendations to Mitigate Road Selection Impacts, Long-Term Impacts, and Cumulative Effects

(1) Future USAID road programs should identify roads where timber extraction, wild plant collection, hunting, or wildlife trafficking may be of particular concern, and where road improvements may indirectly increase these activities. This assessment should involve the following:

- Meet with Forest Development Authority, Environmental Protection Agency, USAID natural resources/biodiversity activities (PROSPER, etc.), and other relevant donor projects to determine ecological significance of area, extent of concern, and possible mitigation measures;
- Ground-truth this information through a rapid assessment to gather on-site data;
- As needed, gather other relevant information such as ownership of land, role of local government authorities, and role of communities in management and protection; and
- Design mitigation to be included in the ESMMP.
- The assessment may result in rejecting specific roads by the GOL and/or USAID, if significant environmental harm could result from improvements.

(2) The potential along rural roads for agricultural conversion of natural ecosystems is considerable. ES3R relied on USAID/Liberia's Food & Enterprise Development (FED) project to address this concern. FED discourages conversion, including slash and burn agriculture and draining or filling wetlands that have not yet been cultivated. However, FED ends in September 2016. Future USAID road programs will need to either demonstrate that road improvements will not indirectly increase agricultural conversion (i.e., if there are already adequate control measures in place) or identify other means of minimizing the potential indirect impacts from road improvements on agricultural conversion. Mitigation measures should be included in the ESMMP.

Of note, FED minimizes the potential of conversion by encouraging farmers to cultivate only areas that are fallow or currently under production. They train extension officers to discourage expansion of agricultural land and they provide improved seed, fertilizer, and other inputs to help retain fertility and increase productivity.

Future USAID road programs should make best efforts to document the consideration of the two environmental criteria in site selection.

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