

**SOCIAL AND ENVIRONMENT IMPACT
ASSESSMENT (SEIA) REPORT
&
HIGH CONSERVATION VALUE
REPORT**

**SIME DARBY PLANTATION
LIBERIA
(10,000 HA)**

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CHAPTER 1.0 EXECUTIVE SUMMARY

1.1 Background Information

In April 2009, Sime Darby Plantation (Liberia) entered into a concession agreement with the Government of Liberia for the lease of 200,000 HA for the purpose of cultivating oil palm plantations and an additional 20,000 HA for rubber plantations over a period of 63 years with an option of renewal for another 30 years. The concession agreement includes the takeover of the former Guthrie Rubber Plantation comprising of 120000 ha, located in Bomi and Cape Mount County.

The Guthrie rubber plantation since the late 1950's has been the number one source of employment for rural people in Grand Cape Mount and Bomi County. Due to the civil war, the operations of the plantations were disrupted, forcing Kumpulan Guthrie Berhad (KGB) to abandon its operations in Liberia by October 20, 2001. Since that time the plantation has been run by a GOL appointed interim management team, which eventually turned over the facility to Sime Darby Plantation (Liberia) in January 2010.

Based on the fact that the plantation has outlived its economic life span, Sime Darby Plantation (Liberia), is considering the cutting down of the plantation in order to make way for its replanting. However, the replanting exercise will only be taking place once the new oil palm area of 10,000 is completed that will provide an alternative employment for the existing plantation workers .lead to huge job loss and entrench hardship for the thousands who earn their livelihood from the plantation.

Against this background, Sime Darby Plantation (Liberia) has proposed to cultivate 10,000 ha of land adjacent to the plantation with oil palm. This initial exercise will provide more than 600 jobs for people in the area over the next two to three years while the former Guthrie rubber plantation is being gradually rejuvenated.

Consistent with the concession agreement, the Company will develop infrastructure for housing and other development. It shall institute a Corporate Social Responsibility (CSR) program that will implement educational, health, employment and other social obligations to communities in Bomi and Grand Cape Mount Counties.

1.2 Project Proponent and Description

1.2.1 Proponent

The project is owned by Sime Darby Plantation (Liberia), a Malaysian owned agro-industrial Company with downstream business comprising of 21 entities in 15 countries worldwide ranging from America, Europe, Asia and Africa. Sime Darby (Plantation) Liberia is a corporation duly organized under the laws of the Republic of Liberia, represented by its duly authorized representative Mr. Boima Sonnii the Liaison person for this project. Sime Darby (Plantation) Liberia current administrative office is located on the Mobil Compound, Virginia, Montserrado County. For now, the Company is a new one with the potential of developing and establishing herself in Liberia. The operational office for the oil palm project will be located in Bomi County.

1.2.2 Proposed Project Area and Location

The proposed project covers 10,000 ha of land found in a block of land that is located within the following GPS coordinates in Bomi and Grand Cape Mount Counties and extending across the Mahe and Lofa rivers: 263000/760000, 298000/760000, 263000/736000, 298000/748000. The project is projected to run over a period of more than 60 years.

The land area earmarked for the plantation currently consists mainly of agriculture degraded lowland forest. There are some fringes of semi-primary forest located along the banks of the Lofa and Mahe rivers.

1.2.3 Need

In terms of need, the proposed project fits within the framework of GOL Poverty Reduction Strategy (PRS). In that it will create jobs, provide basic social services, add value to Liberia's oil palm sector and generate sufficient revenues from taxes to support GOL post war development agenda. The Project Proponent is confident oil palm development is environmentally safe for the following reasons:

- A perennial tree crop like oil palm provides permanent crop cover to reduce soil erosion especially where terracing and cover crops are used.
- It is not affected by serious pests or diseases, thus minimizing the use of pesticides.
- Existing and future technology utilizes many plant parts and products to reduce waste generation.
- The crop cycle of 25 years makes it an effective crop in 'greening' of the environment.

The proposed development will also yield ripple economic effects for Bomi and Grand Cape Mount County and the country at large

1.2.4 Project Activities

The project activities will be executed in the following outline:

Nursery Establishment

- Access road
- Base camp
- Site clearing - under brushing & clear felling
- Biomass management & disposal
- Earthworks, drainage & irrigation
- Planting and maintenance of seedlings

Two nursery sites have initially been identified, one in **Budding** Camp –Bomi County and the other between Gbah and Kon Town-Grand Cape Mount County

Site Preparation

- Access road
- Base camp
- Utilities provision
- Site clearing - under brushing & clear felling
- Biomass management & disposal
- Earthworks, drainage, infrastructure
- Cover crop establishment

Field Establishment

- Field lining & holing
- Final culling
- Transplanting

Maintenance & Harvesting

- Fertilizer application
- Use of control agro-chemicals
- General field upkeep
- Harvesting
- Transportation

Replanting

- Nursery establishment
- Removal of old palm trees
- Biomass management & disposal
- Field lining and holing
- Transplanting of mature seedlings
- Maintenance & field upkeep
- Harvesting & transportation

Abandonment

- Evacuation of plantation staff & workers
- Removal of equipment, machinery & structures
- Site restoration/ rehabilitation

1.3 Project Options

If the Project area was not to be developed into an oil palm plantation, the area will continue to be utilized for subsistence agriculture which has not proven to be a sustainable option under present conditions. Hence, the livelihood of the people will remain unchanged with no access to basic social services and poor quality of life.

1.4 The Existing Environment

Environmental baseline studies of the Project Area was undertaken by a team of Evaluators and Field Assistants from GREENCONS in order to gather information in respect to the status quo even before the project commences

1.4.2 Atmospheric Environment

The climate in the project area can be characterized as either wet or dry, depending on the prevailing precipitation. The rainy season extends from April through October, with $\pm 90\%$ of the rainfall occurring between mid-April and mid-October. The dry season extends from mid October to mid April. The humidity is low during the day and increasing slightly as the temperature cools at night. A relative humidity of 90% to 100% is common during the rainy season. During the dry season it decreases between 80% and 85%. In March and February the driest period of the year, relative air humidity decreases to as low as 65%. Total wind speed is greatest in the rainy season and lowest in the dry season. The climate of the area can be described as tropical, experiencing warm dry seasons and cold wet season.

1.4.3 Aquatic Environment

The Project Area is drained by the Lofa and Mahe rivers along with a number of seasonal streams including: Goimay, Zinny, Bobo, Lebain. The seasonal streams and rivers flow in a number of directions that eventually lead southward to the Atlantic Ocean.

Most of the water bodies of the Project Area are devoid of major chemical pollution problems. This may be attributed to the fact that the river courses are largely undisturbed by such activities as artisanal mining or any intensive fishing. Although used as a source of potable water by settlements located along their banks, concentrations of indicator microorganisms show that the surface-waters of the project area are contaminated by both total and faecal coli forms. These coli forms may have several origins:

1. poor or non-existent sewage systems for all the towns,
2. extensive bathing in the streams and
3. zoological

Hydrogeology

In the type of geological formation found in the area (flat plains with undulating hills that range between 0-100m) there is no primary porosity of groundwater. Groundwater

resources in the area will be of no problems when it comes to finding the requirements for drinking water.

1.4.4 Floral Environment

The Project has been associated with prolonged anthropogenic activities associated with shifting cultivation (farming). These activities have affected the kind of vegetation in the area. Forest vegetation comprising of semi-primary forests are mainly restricted to the offshore of the Lofa and Mahe Rivers. There are scattered secondary forest patches along the area. There are evidences that a succession of vegetation communities occurs in the disturbed areas, with vegetative cover initially being reinstated by pioneer shrubs, followed by the proliferation of large pioneer grass types, including *Paspalum scrobiculatum* and *Leersia Hexandra*. Ferns, including the creeping and scented fern, *Gleichenia polypodioides* and *Mohria caffrorum*, are also important pioneering species that follow soon after the ground has been substantially covered by pioneering grass types.

1.4.5 Fauna Environment

The results of the survey in the area pointed out that fauna population and diversity was less than expected. This is attributed to consistent shifting cultivation and hunting practices. This statement is specifically true for large mammal species. There was evidence of the occurrence species protected under Liberian laws, such as Water Chevrotain, locally known as “Water Deer”, Black Duiker---Cephalophus Niger, Royal antelope, locally known as “Foolish Deer”

A high diversity of bird species were noted, including the migratory Cattle egret African Fish Eagle, Palm-Nut Vulture, Yellow-Throated Tinker bird, Yellow-Spotted Barbet, Vieillot's Barbet. The diversity and abundance of reptile species was also noted to be low. A relatively diverse invertebrate community was observed, especially in areas with fewer disturbances.

1.4.6 Soil Environment

The soil type is a mixture of lithosols and some laterite, which is reddish brown in color containing aluminum iron, oxides, acid and low in nitrogen concentration; swamp soil occurring in swampy areas, high concentration of humus with layers consisting of biodegradable materials; and alluvial soil with a high nutrient concentration. Intensive subsistence farming for commercial agricultural activities and food crops couple with other human activities within thickly populated area within the Project Area have greatly influenced the nature of the soils resulting in nutrient depletion, soil erosion, iron pan formation and land degradation.

1.4.7 Land Use

Land use in the proposed area can be classified as subsistence agriculture (farming)

1.4.8 Socio-Economic Environment

Agricultural production is the main economic lifeline in the communities within and without the Project Area and is practiced mainly on subsistence level. Agriculture accounts for more than 90% of the labor force within the Project Area. The remaining are those involved in hunting and petty trade. This reflects the agrarian nature of the local economy. Most of the road networks in the Project Area are feeder roads that are in extremely poor condition, especially during rainy season. Consequently, transportation of food crops to the market centers is very difficult and expensive. These conditions, couple with an inadequate number of suitable storage and preservation facilities, are a major impediment to increased agricultural production.

Communication services are available for larger and populated towns. These services are provided by private companies. Reliability of connections, however, can be extremely variable. Basic social services such as health care, education, sanitation etc are far from adequate and even if they do occur, they are restricted to the larger communities. The main sources of drinking water in the Project Area are not intrinsically different from other rural areas, i.e. borehole, streams and hand-dug wells. In number terms, educational infrastructure could be considered very inadequate with a number of towns having no educational facility at all. In general, however, school facilities are not up to acceptable standards. The physical state of most of the school buildings is deficient, particularly in the immediate project area. Facilities like furniture and equipment are totally inadequate. Even in the urban centers, the administrative headquarters, libraries, staff accommodation, transport, offices are generally in poor condition.

1.5 Environmental Assessment, Mitigation and Monitoring

Procedures have been used to identify potential impacts included standard identification tools as well as discussions with stakeholders, community leaders and residents as well as other experts. Potential impacts were assessed according to a set of assessment criteria and a significance value was assigned. One alternative (No Action) was considered. Potential impacts were identified and their level of significance was assessed. Mitigation measures were proposed for all the identified potential impacts. People, organizations/institutions and other stakeholders of the Project, including interested parties have been identified at local and national level.

Key Environmental Impacts, Recommended Mitigating Measures and Compliance Monitoring Requirement

Based on the assessment, the anticipated key environmental issues that would be affected by the proposed forest harvesting operation are:

- Increased soil damage/ erosion and risk of slope instability
- Increased sediments load and deterioration of water quality
- Disturbance to the hydrological cycle and drainage pattern
- Loss of biodiversity
- Destruction of wildlife habitat
- Destruction of habitat
- Impact on the socio economy
- Increase of biomass generation
- Potential pests and disease problems
- Risk of forest fire

Details of the assessment, mitigating measures and monitoring of the key impacts are Summarized in **Table 1**

Impacts	Mitigation Measures	Monitoring Program								
Soil Erosion										
<p>Soil damage & nutrient loss Soil instability Deterioration of water quality Disturbance to aquatic life Increase in sediment loads</p>	<p>Recommended preservation of riparian reserve for plantation</p> <table border="1" data-bbox="522 588 1036 840"> <thead> <tr> <th data-bbox="522 588 812 629">Stream Width</th> <th data-bbox="812 588 1036 629">Min. Width</th> </tr> </thead> <tbody> <tr> <td data-bbox="522 656 812 697"><3m</td> <td data-bbox="812 656 1036 697">5m</td> </tr> <tr> <td data-bbox="522 723 812 764">>3m – 20m</td> <td data-bbox="812 723 1036 764">30m</td> </tr> <tr> <td data-bbox="522 791 812 831">>20m</td> <td data-bbox="812 791 1036 831">100m</td> </tr> </tbody> </table>	Stream Width	Min. Width	<3m	5m	>3m – 20m	30m	>20m	100m	<p>Exclusion to be mapped on a 1:10,000 map scale. Marking on the ground or on the tree at 1.5-m height on the demarcation of riparian reserves.</p> <p>Photo (with date), GPS locations and map to be included in the Compliance monitoring Report.</p> <p>Monitoring of water quality upstream and downstream of the Project site. The parameters include <i>TSS, turbidity, oil and grease</i>. Other information such as GPS location, stream width, surrounding land use must be provided too.</p>
Stream Width	Min. Width									
<3m	5m									
>3m – 20m	30m									
>20m	100m									
	<p>Dominant drainage paths on cleared areas shall be rehabilitated with fast growing creeper plants to prevent formation of soil erosion channels.</p>	<p>Photo (with date) and GPS location of the drainage system.</p>								
	<p>Tractors must be of reasonable size and equipped with brush rake in place of earth moving blade, in order to minimize soil disturbance and compaction. The brush rake should be moved above the ground surface without touching the ground to prevent soil disturbance and forming of rill erosion.</p>	<p>Photo (with date) of machinery used for land clearing and preparation.</p>								
	<p>Table drains, culverts and other drainage structures to channel run-off water to road-side filter strips prior to entry into streams should be installed concurrently with road construction.</p>	<p>Marking of proposed roads on the map and ground checking for the width of roads, drainage system and gradient. Photo (with date) and GPS location of the filter</p>								

		strips especially in the high-risk area.
	Table drains should be seeded with grass to prevent erosion of drainage banks and to prevent formation of erosion channels.	Site inspection – during rehabilitation works. Any failures should be noted.
	Road grade should not exceed 15% (8degrees).	Photo (with date), GPS location and mark on map for such structures.
	Roads should not cross main streams unless appropriate crossing structures (e.g. culverts or bridges) are built.	Map showing the road with approximate area for each of them and photo (with date) for structures built across the river.
	Avoid pushing excess spoil into gullies and the edges of road embankments during road maintenance. Spoil should be compacted ‘ <i>in-situ</i> ’, or transported to disposal sites away from the road, thus minimizing erosion of roads and sedimentation of waterways.	Site inspection – during rehabilitation works. Any failures should be noted.
	Provide filter strips along the roadsides to help to reduce siltation of river systems and to prevent an increase in the intensity and frequency of peak flows into the river system downstream of the land clearing activities. Where filter strip is not possible, silt trap is encouraged at all drainage outlets, prior to discharge into streams to reduce suspended sediment loading. Silt traps should be maintained regularly. Disposal from silt trap should not be done adjacent to rivers, streams, creeks or any drainage.	Photo (with date) and GPS location of the filter strips and silt traps, especially in the high-risk area.
	All culverts should have cut-off wall to prevent erosion under the pipe. The head and outlet walls of culverts should be stabilized with log or stone pitched walls. Culvert gradients should ideally be 1-	Photo with date and GPS locations of all drainage system including any failures.

	<p>3%. Contractors should ensure that proper drainage is installed in order to reduce soil erosion and runoff.</p>	
	<p>Removal of biomass should be carried out during suitable time period, proper methods and procedures and selection of machineries to reduce unnecessary surface erosion.</p>	<p>Photo (with date) and GPS location of the stacking of biomass and the location of burning at the field.</p>
	<p>Soil Protection - Terracing Slope between 12o and 20o should be terraced for better result in the field, improved access and water retention.</p>	<p>Marking of slope between 12o and 20o on the map and in the field. Photo (with date) of terracing in the field.</p>
	<p>Protection of Steep Area The steep areas should be conserved for flora conservation and ecological protection.</p>	<p>Development Plan in 1:10,000 scale maps. Photo with date and GPS locations showing the marking or painting on the trees.</p>
<p>Hydrological Impact</p>	<p>Water Yield Management:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Land clearing should only be carried out during the dry weather. <input type="checkbox"/> Commence planting soon (e.g. 1 month) after site clearing. <input type="checkbox"/> Refrain from clearing of areas where slopes are more than 25o and soils are shallow. <input type="checkbox"/> The areas should be limited by heavy machines during land clearing and preparation. <input type="checkbox"/> Suspending tractor traffic during wet periods to avoid excessive compaction. <input type="checkbox"/> Establish long term rainfall and flow gauging stations to monitor the impact on the river 	<p>Marking on map the boundary of each Project phases. GPS location and photo (with date) showing the land clearing activities carried out in phases. Records of rainfall</p>

	base flow.	
	<p>Reduction on the flood levels: Exercise proper management practices; develop Project area in phases, planting of cover crops immediately after clearing and maintaining adequate streamside buffer strips.</p>	<p>Map showing details of phased development. Photo (with date) showing cover crop establishment and maintenance of riparian reserves and buffer belts.</p>
	<p>Protection of water quality from sediment yield:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Develop plantation in phases and scheduled over drier period or months. <input type="checkbox"/> Lay roads carefully, preferably following the contour and must be far enough from stream. <input type="checkbox"/> Clearing should be done parallel to contour lines, starting from high to low ground. <input type="checkbox"/> Install cross drains for minimizing overland flow. <input type="checkbox"/> Timing of road construction or road upgrading to conform to periods of less rainfall and allowing sufficient time for earthworks to stabilize. <input type="checkbox"/> Using the appropriate machineries in the land clearing to minimize disturbance to the soil. <input type="checkbox"/> All clearing, grading and stabilization operations would be done before starting the next phase. 	<p>Photo (with date) of measures taken to protect water quality from sediment yield. Provide map to show</p>

	<ul style="list-style-type: none"> □ Where possible, the stages of development should be from the high to low grounds, so as to take advantage of the present vegetation to act as silt and runoff barriers. □ Reduce the duration (max. 3 months) of land exposure to natural elements. □ No person shall carry out any tree felling, building or structures erecting and other works within the riparian area. 	
Wildlife and aquatic ecology		
Human impact on wildlife populations Fragmentation of habitat and wildlife ranges Loss of biodiversity	Steep slopes must be protected Conserve riparian management	GPS location, photo (with date) showing the marking on the trees at 1.5-m height at the base limits and map (1:10,000) showing the surveyed area.
	No hunting or trapping of wildlife within and surrounding the Project area.	Regular check for any sign of hunting activities at all the base camps.
	Directional clearing or felling of trees towards forested area.	Development Plan with direction of clearing shown. Regular ground surveillance especially in the planting areas.
Biomass management		
	Stacking of vegetative waste along the contour	GPS location and photo (with date) showing the stacking of biomass in the cleared area.
	Explore alternative method of biomass disposal such as <i>in-situ</i> mulching or chipping.	The Project Proponent to look into these possibilities with consultation with the relevant authority.
Fertilizer Application and Pests and Diseases Management		
Incorrect application of	Avoid application of fertilizers,	The Project Proponent to closely

Fertilizers Judicious use of pesticides	pesticides and weedicides during the wet season and windy conditions. Fertilizers should also be applied in split doses.	monitor this by keeping proper records of each application.
	The frequency, dosage and timing of chemical application should be monitored closely. Practice biological control and other environmental friendly methods to control weeds and mammalian pests whenever possible.	The Project Proponent to take into consideration in the development plan, with documentation of consultation with the relevant authority.
Forest Fires		
	Set up a team of trained forest fire fighting team and provide them with all the necessary equipment.	The Project Proponent to take action.
	Limit the size of clearing and planting to reduce the biomass built up.	The Project Proponent to take appropriate action during the development phase.
	Establishment of permanent water supply point with vehicle	The Project Proponent to identify the location and provide the locations with GPS reading and maps to the fire fighting team.
Socio-Economics		
Displacement of people and communities Loss of land and crops Change in lifestyle and living conditions	Establishment of Resettlement Framework policy and a Resettlement Team that includes representatives from Sime Darby, Affected Communities, Ministry of Agriculture, Ministry of Internal Affairs, Ministry of Finance, Civil Society and EIA Consultant. Define , affected people centered, resettlement criteria and compensation consistent with Liberian laws	Keep records of all meetings, consultations and negotiation regarding resettlement Keep record of all payments made to resettled persons Monitor the conditions of resettled persons in their new communities Keep records of all complaints and actions taken to address them
Provision of Employment Opportunities for locals Risks to human health at the camps within the project area	Work priority should be given to the suitable local villagers.	Keep a record of workers and their particulars.
	If foreigners were employed, proper procedures must be followed.	Relevant authorities to monitor.
	All workers to go through medical check prior to employment and emphasis on communicable or	Provide the audit team with the worker's medical records.

	infectious diseases especially Malaria, TB or others every 6 months	
	Provision of basic facilities and utilities (portable or clean water, mosquito netting and sanitary facilities)	Photo (with date) and GPS location of the camp,
Pollution by improper waste disposal in the project area	Refuse to be disposed off in pits approx. 30m from waterways and above water table. Cover refuse with soil once a week.	Photo (with date), GPS location of the dumping ground and general layout of the camp, name of contractor and plantation areas.
	Storage tank, if any, should be constructed on stable ground with bunding and at least 50 m away from waterways.	GPS location and photo (with date) showing the location of the storage facilities.
Water resource degradation and siltation	Ensure good site development practices e.g. conservation of riparian reserves, soil erosion minimization, etc. Cooperate with communities and local authorities on solving water supply issue on the directly affected communities.	Photos (with date) to show good practices on ground.
	Regular monitoring of water quality.	Compliance report to EPAL once in every 3 months.
Dust and noise pollution	Proper maintenance of vehicles.	Records of maintenance carried out for vehicles
	Gravelling of roads around the plantation office, village and living quarters. Introduce tree-covered buffer zone around plantation area. Install appropriate signboards and establish speed humps reduce speed.	Photo (with date) and map showing roads, speed humps and tree-covered buffer zone around plantation area, installation of signboards, speed humps
Road Safety	Proper traffic signboard at appropriate spots especially near T-junctions or settlement area.	Photo (with date) and GPS location of the signboard.
	Damage section of road should be repaired immediately.	Photo (with date) and GPS location of any damaged road.
Project Abandonment		
Disturbance land area	Re-establish all open area with fast	Project Proponent to take action

	growing indigenous species or fruit trees	Photo (with date) and GPS locations showing the reestablishment works on site.
Visual impact on abandoned camps	Remove all building structure to discourage any illegal squatter activities. Remove all solid and liquid waste. Rehabilitate all main roads.	Photo (with dates), GPS location of roads and map for the plantations.
	Remove all machinery and equipment to recover cost.	Project Proponent to take action.
Security of the Project area	Retain the security gates into the plantation areas.	Project Proponent to take action.