



**ENVIRONMENTAL SOCIAL AND HEALTH IMPACT ASSESSMENT FOR THE
ESTABLISHMENT OF OIL PALM AND RUBBER ESTATES IN THE MALEN
REGION, SOUTHERN SIERRA LEONE**



Prepared on behalf of

SOCFIN AGRICULTURAL COMPANY, SIERRA LEONE LIMITED (SAC)

by

STAR Consult

JANUARY, 2011.



EXECUTIVE SUMMARY

This report is the outcome of the Environmental, Social and Health Impact Assessment (ESHIA) (or EIA for short) of the planned oil palm and rubber investment project in the Malen region of southern Sierra Leone, comprising Malen chiefdom in Pujehun district, Bum chiefdom in Both district, Lugbu and Bargbo chiefdoms in Bo district.

The project is to be implemented by Socfin Agricultural Company (SAC), Sierra Leone Limited. SAC proposes to invest in large-scale oil palm and rubber plantations in the Malen region, as part of a national community development plan.¹

A *classic agro-industrial model*² consisting of nucleus oil palm and rubber plantations has been developed for the region. The project will be managed by three departments that take care of the corporate, agricultural and processing operations of the project respectively. More than two thousand four hundred (2400) personnel will be recruited locally over a period of seven (7) years to assume various job positions during the operations. Land acquisition will be conducted according to the laws of Sierra Leone. About thirty thousand hectares (30,000 ha) of land concession will be acquired for a period of 71 years for which substantial lease payments and surface rents go to affected chiefdoms to be used for funding community development initiatives. Where projects operations necessitate relocation of settlements, suitable arrangements will be made in consultation with the relevant internal and external stakeholders. In the initial phase, a 12,000-ha nucleus oil palm plantation will be established along with a palm oil processing factory to be operated in accordance with good agricultural practices (GAP). Factory operations will target a capacity of 30-60 tones of fresh fruit bunches (FFB) per hour for the production of crude palm oil and palm kernel. All related operations (including harvesting, handling and storage) will thus be sized accordingly. Operations in the rubber plantation will be very similar to those for oil palm. In both cases various forms of solid and liquid wastes will be generated and in-built waste management strategies to handle such wastes to the advantage of the project operations have been proposed. For instance, all wastes from oil palm processing will either be utilized as fuel for thermal processes or as input for amending the fertility of soil in the plantations (thus reducing the demand for inorganic fertilizer).

As a community development project, the development of rural infrastructure is pivotal in the success of the day to day operations. Direct project investment in this respect will include power supply, roads, administrative and staff housing facilities, to name a few. Specific investments will be dedicated to the development of infrastructures for environmental management. Investment in staff welfare will include the construction of staff housing, recreational, water and sanitation facilities. Social investment in the wider communities will include public facilities such as schools, hospitals and possibly, other communal facilities. Surface rents that will be paid on a periodic basis will contribute to the local chiefdom funds of the affected chiefdoms. Such monies could be utilized in funding local development projects in the respective chiefdom development plans. Also, a special Small Holder Out-Grower (SHOG) scheme will be implemented for smallholder farmers to further reflect the

¹ Similar investments exist in the northern parts of the country

² Combining agricultural and industrial infrastructure with social infrastructure in the project area.



community development character of the project. The company anticipates the possibility of expanding such farms in the future. Although this scheme (the SHOG scheme) will not be very rewarding to the company (from a strict financial point of view) it is expected to provide substantial cash flow to plantation owners and impact significantly on their economic and livelihood standing.

As a statutory requirement, an agricultural investment of this nature and scale (and similar natural resource-based capital investments in such sectors as land and water use, forestry, mining, fishery, etc.) that have bearing on the environment must be preceded by the conduct of an EIA, which is a requirement for obtaining an environmental license/permit from the government of Sierra Leone. The Sierra Leone Environmental Protection Agency (SLEPA) is empowered by law, to approve the establishment of development projects having environmental impact implications, only after the receipt of an acceptable report of an Environmental, Social, and Health Impact Assessment (ESHIA) Report on behalf of the project proponents/developers.

Thus, SAC contracted STAR Consults³ as an independent local consultant to conduct the ESHIA on its behalf. The ESHIA assignment was broken down into two parts. In the first part, pertinent policies, regulations and guidelines were reviewed; baseline conditions that describe the environment⁴ of the project area were assessed and these were then juxtaposed with project activities to help identify potential positive and negative impacts on the environment. In the second part some environmental and social action plans were drawn up as mitigating options for potential negative environmental impacts.

The study involved a number of field activities conducted across the Malen Region, in Pujehun District, Lugbu and Bagbo Chiefdoms in the Bo district, and Bum Chiefdom in Bonthe district, coupled with intensive desk review. Field activities were very participatory in approach; employing mainly Participatory Rural Appraisal (PRA) tools including focus group discussions, key informant, and semi-structured interviews, etc., in eliciting primary data from the intended target communities. Primary data was mainly geared towards the perception of the communities about the project, through community disclosure meetings, where the community fears and apprehensions were noted.

Data collected from interviews were complemented by a pool of information from inspections, observations and secondary sources ranging from national through international policies and best practices and guidelines on the implementation of such projects, keeping the ESHIA in view. From this pool of information, baseline parameters were identified against which the project's potential effects were measured. The proponent also considers this assignment as part of the early stages of consensus building and stakeholder engagement – this was also initiated during the field visits.

³ STAR Consults is a private multidisciplinary team of researchers committed towards providing technical direction and guidance to institutions/organizations that aspire to undertake meaningful investment programmes and/or existing services in Sierra Leone

⁴ Both the biophysical and socioeconomic environments



Specifically, the project has been evaluated using a rigorous impact assessment methodology comprising the following:

- A review of compliance with the Sierra Leone legislation framework;
- A description of the project and review of alternatives;
- Determination of the project physical and social baseline conditions at a regional and site specific level;
- Derivation of a standardized methodology based on evaluating valued receptors and impact index derived from assessing extent, duration and magnitude;
- Assessment of the likely impacts that may arise, both positive and negative. Where impacts are identified that could cause adverse effects, the ESHIA considers alternatives, mitigating measures and what the likely remaining or residual impact will be after such intervention;
- The environment and social impact assessment has been applied systematically to four areas of the project: the factory, the transport corridor, the port and the off-shore and coastal zone.

The following principal issues have been determined:

Air & Noise

Air quality impacts comprising both dust and exhaust emissions arising from land clearance, mining, stock-piles, vehicles and machinery have been identified as primary emission sources. The implementation of standard mitigation measures involving adequate containment of loads during haulage, dust suppression by water spraying, extractive covers at key point sources and machinery selection should result in no major impacts.

The proximity of the proposed transport route in relation to villages and residential areas remains a key issue. Whilst a principle of avoidance of resettlement wherever possible has been upheld, the combination of public safety and dust and noise nuisance issues means that in some instances, even though mitigation measures may be partially effective, it has been considered more appropriate and responsible to pursue a resettlement solution. The maintenance of a buffer zone should be sufficient for most residential areas, but in exceptional cases where a suitable buffer cannot be maintained and resettlement is not feasible, additional mitigation measures (e.g. noise barriers or noise isolation) at sensitive receptors will minimize the impacts. A buffer zone of 500m has generally been accepted for the project, if communities lie within this zone then a review of either resettlement or mitigation is required.

Noise sources vary, but transport noise, including heavy vehicles, are considered to be potentially significant. Assuming that occupational noise limits are maintained within facilities then it is predicted that appropriate environmental noise standards will be met at a distance of about 500m from the facilities.

Ecology & Biodiversity

Ecological impacts across the project have been evaluated and found to be significant primarily due to the high level of biodiversity and conservation value of certain plant species. This is the case at a variety of discreet habitat settings including forest and grass-lands located at the factory-site, along riverine forests, inland valley swamp locations and in mangrove forest in the coastal areas.



Principal direct impacts will arise from the clearance of land within the footprint of the project and its associated infrastructure. Vegetation that is not cleared or buried may be indirectly impacted by alteration, spread of invasive species and pressure from the influx of people that will increase the pressure on resources.

At factories, the potential release of acidity and metals from disturbed acid sulphate soils (if present) could cause localized impacts to vegetation.

At the same time, and along the transport corridor for the transportation of Fresh Fruit Bunches (FFBs) to the factories, disturbance of fauna, particularly large mammals such as chimpanzees may further reduce natural colonization by indigenous plant species where fauna play a role in seed dispersal. The impacts of habitat loss and fragmentation will affect terrestrial and aquatic ecosystems. Avoidance of areas of ecological value is the primary tool that is applied to minimize impacts.

However, the impact of land clearance and burial in the primary mining and rock dump areas can neither be avoided, nor mitigated because of the immovable location of the ore bodies and practicalities governing design of the factory and waste rock areas. The project proponent (SAC) should therefore undertake a commitment to seed collection, replanting, habitat renewal and protection at alternative selected conservation site(s). This offset or equivalence approach will not alter the primary ecological loss and cannot realistically overcome the direct impact resulting from clearance of forest and vegetation. Nonetheless, in combination with avoidance of sensitive areas outside of the factory footprint wherever possible, an off-set conservation programme can contribute to lowering the overall residual impact to a moderate level.

Hydrology and Hydrogeology

The project will result in an increase in suspended sediments in rivers, alteration of river channels and changes in catchment behavior. Without mitigation this could lead to flooding as well as a variety of water quality impacts. Changes of chemistry could occur with the water considered to have low chemical buffering capacity. At the factory and transport corridor the potable and construction water demand may lead to over-abstraction of local surface and groundwater sources leading to impacts on downstream flows affecting both communities and dependent eco-systems.

Groundwater is also considered both a sensitive and vulnerable resource. Construction and operational groundwater abstraction could lead to lowering of water levels in local wells and saline intrusion, while brown field regeneration and the industrial port operations could lead to contamination of a system that is important for sustaining potable water supplies as well as providing base flow discharging into the inter-tidal zone.

Residual, post mitigation impacts from the project will include some permanent loss of flow from springs and streams as well as alteration of stream and river channels and local water levels.

Soils & Land Use

Soil impacts will arise during construction and operational phases as a consequence of land clearance or sterilization / burial, increased erosion or inundation due to the modification of drainage patterns, compaction from vibration and loading under temporary stockpiles/structures. Chemical contamination could occur from release of hydrocarbons and other chemicals including diesel and lubricant oils and explosives residues. Some soil



resource can be rehabilitated if progressive reclamation techniques are applied. These impacts may constrain or modify existing land-uses in the factory area. The residual (post-mitigation) impacts of land clearance and sterilization / burial on soil resources and land-use are likely to remain significant and extremely long-term or permanent in the factory area. Other residual impacts should be minor if appropriate preventative and mitigation measures are put in place.

Socio-Economic

Socio-economic effects are strongly dependent on project phase. During construction some villages may require resettlement. Villages on the periphery of the project area will suffer loss of land resulting in potential temporary disruption of land used for shelter, access to agriculture and natural resources.

However a compensation principle is being applied throughout the project to ensure affected people are not disadvantaged or made worse off by the project. Some employment opportunities will be created with associated economic benefits to the wider community.

During operations, however, there is again a mix of both economic benefit and social disturbance.

Benefits (lasting over 70 years) will mainly be in the form of wages, payment for FFBs to out growers, disbursement for the procurement of supplies, social investments, such as schools, hospitals, road rehabilitation, and payment of revenue to the government, to name a few.

Potential negative impacts will mainly be due to disturbance to land owners and influx of workers and job seekers bringing pressure on social infrastructure and natural resources and possible increases in social ills.

Mitigation measures are dependent on establishing transparent and effective social management processes including harm minimization, compensation and long-term community development mechanisms. The following mitigation measures are expected to reduce the intensity of the residual impacts from major to moderate/minor.

- Preparation of a Resettlement Action Plan (RAP).
- Preparation of a livelihood restoration plan.
- Implementation of a grievance mechanism.
- Preparation of a Community Development Action Plan.

In some instances these community mitigation measures require co-opting the support of local government and Civil Society Movement Organizations in the country.

Human Health

The major impacts identified in the preliminary health impact assessment were primarily associated with community resettlement; impacts associated with worker in-migration (disease, food security, substance abuse, home violence); increased burden of disease such as cholera and malaria due to project activities and water storage facilities (drinking water tanks, waste and raw water storage ponds); and degradation of surface and groundwater (sedimentation/erosion, contamination, changes in drainage patterns). Moderate impacts were associated with increased road traffic, project noise and reduction of locally produced food.

Mitigation measures have been proposed for those impacts with major or moderate significance which, if implemented, are predicated to result in moderate, minor, or insignificant residual impacts. Since human health is dependant on many factors such as good



air, soil, water and food quality, and stable socio-economic status, the assessment of potential impact on human health associated with the Phase 1 project has been integrated with results of many of the other ESHIA disciplines (e.g., air, noise, hydrology, hydrogeology, flora, fauna, soil, water quality, and social-economic assessment).

Implementation of mitigation measures recommended by these disciplines would therefore reduce the potential for adverse human health impacts (HIA) and will be considered in the final HIA. Positive impacts identified include access to improved healthcare facilities (for general public), health benefits through local employment, improved access to the region and positive aspects of resettlement.

Offshore & Coastal Impact Assessment

The baseline preliminary survey indicates that the coastal and marine habitat around Malen is healthy and contains a high level of biodiversity. There are a number of potential impacts that could arise from reduction and clearance of habitat areas. However, the majority of the project infrastructure will be established within acceptable guidelines in accordance with the RSPO standards of sustainability. As a result there should be no significant to coastal habitat. The construction of oil mill factory in the project area (either in Sumbuya or Turma Bum) could increase ambient noise and light levels, and potentially result in disturbance of sensitive coastal fauna such as birds.

Therefore a number of mitigation measures are proposed to minimize impact or better still avoid sensitive habitat areas (eg high avifauna population, important nesting and feeding sites, and migratory and nesting seasons). A more detailed assessment of wastewater discharges is required to develop the necessary approach to wastewater treatment and management. As a minimum, mitigation measures that are included should include installation of temporary treatment plant to treat construction camp discharges, ensuring treated water discharge is located away from sensitive locations and in areas of strong tidal currents to increase dilution and removal; and compliance with World Bank discharge limits.

Moreover, during the operations of the factories, there is a risk of oil and chemical contamination from the factories which would lead to disturbance of existing land, and new incidents of fuel, lubricant and coating spills used in machinery operations, and from potential oil spills. This will require management through spillage treatment systems, waste management planning, spill response plans (contingency planning and emergency response measures should be in place). Industry best practice regarding re-fuelling activities, oil handling activities and machinery maintenance is required considering the site's sensitivity.

Commitments, Management and Performance

This ESHIA has been prepared for submission for approval on the understanding that elements of the infrastructure design and ESHIA study are not yet fully developed. In recognition of this, SAC has committed to undertake updating of the ESHIA study, which may require additional information gathering in the near future. This may be undertaken and reported on in updates to the Environmental Management Plans (EMP) outlined in this report.

A comprehensive environmental and social (E&S) management plan will continue, with the studies inputting to project design, construction and development. It is recommended that rigorous risk review is applied in the construction of infrastructures when it falls due. The Environmental and Social (E&S) management measures, which will be delivered through the



ongoing EMP that will extend into the operational phase can be a reliable vehicle for such valuable analysis.

A significant volume of assessment work has been achieved and the impact assessment has been completed to a sufficient level for regulatory decision making. It is recognized, however, that further work may be required during the project implementation, including further project definition in order to be able to identify more specific impacts and mitigation measures and develop effective management strategies. Where generic construction management plans could be generated based on the currently available information then these have been provided. But in other instances, the management plans may need to be formulated pending further project description and/or study work and all that is presented now could be an outline of the management plan purpose. This is of particular importance for the terrestrial and marine eco-systems that could be affected by the project. To date it has been recognized that areas under the direct footprint of the project contain either recognized high conservation value species or habitat that is of major significance.

An integrated approach involving additional assessment, avoidance wherever possible of critical areas, mitigation, development of compensatory programmes and community development programmes is required. It is also important that management plans take into account consequential impacts that will be created, many of which will be unintended and difficult to control. This includes the impact associated with speculative influx of migrant workers and accelerated degradation of habitat in areas that was hitherto relatively inaccessible and sparsely populated. Management plans need to develop a clearer understanding of how compensation, alternative livelihood schemes, regulation and sustainable community development can be effectively implemented to reduce secondary impacts.

Recommendations are given for ongoing monitoring, auditing and performance evaluation of the environmental and social elements of the project so that continued improvement, adherence to agreed standards and effective liaison with SLEPA is maintained.

Monitoring will involve both internal and external inspections and auditing of performance and compliance to contract documents. Where a degree of capacity building is required to ensure that inspection visits and audits by the competent authority (SLEPA) can be achieved then it is understood and will be recorded that SAC will provide resources for this.

In addition inspection visits and audits by independent consultants, appointed by SAC, will produce monitoring reports that SLEPA can access and comment on. Currently this has been done by the ESHIA consultants and their baseline data collection.

The monitoring strategy proposed for the project can be termed "Adaptive Environmental Monitoring". It is adaptive in the sense that the responsible party must adapt its methods and activities to the ongoing design and implementation and prevailing environmental conditions in a continuous process.

Conclusion

In all its ramifications the project is deemed acceptable by the communities concerned. This was the conclusion drawn from the community engagement and consensus building processes initiated in the study. Following detailed explanation of the implications of project operations to these communities, from which evidence of clear understanding of the various dimensions



of the project was demonstrated, cross-sections of the four chiefdoms in the Malen Region gave unanimous informed consent to the launching of the project in the region. However, a number of expectations were presented by the communities. Most common among these were the community development aspirations and priorities. Many of these concerns were already part of SAC's project design. These and other expectations were integrated into The Environmental Management and Social Action Plans as a community development action plan proposed for the region. Others concerns, which could not be addressed that way, were presented to the proponent and are expected to form part of the continuous negotiation and consensus building, that will go on throughout the life of the project in the region.

Key potential negative impacts were identified⁵ and for which mitigation actions, which the project proponents are expected to pay attention to, were identified accordingly. Also, it was noted that the success of the project will depend largely on the establishment of an Environmental Health and Safety (EHS) department that will be continuously engaged in all issues pertaining to the environment and interfacing with the communities. This was the basis upon which environmental action plans for the implementation of this project were conceived and developed.

The Structure of this Report

The structure of this report is summarized below:

- Chapter 1 is the introduction to the ESHIA report, giving adequate background information about the ESHIA concept and a synopsis of the steps involved;
- Chapter 2 describes the methodological framework employed in this study;
- Chapter 3 entails a description of the various regulatory and policy reviews pertinent to successful implementation of such projects in country. This also includes the institutional bodies and national legislation that applies to this project.
- Chapter 4 presents the project's description and profiling;
- Chapter 5 describes the stakeholder engagement and consensus building processes
- Chapter 6 entails environmental baseline studies which describe the existing environmental and social conditions in the project area. The project elements are assessed against the following categories: air quality; noise; ecology & biodiversity; hydrology & hydrogeology; soil & land use; socio-economic and human health to name a few. The offshore & coastal environment has also been considered;
- Chapter 7 outlines the Community Baseline Health Profile;
- Chapter 8 presents the outcomes of the various impact assessments undertaken as part of the ESHIA programme;
- Chapter 9 outlines the Environmental Action Plans
- Chapter 10 contains the Resettlement Policy Frameworks and Plans.
- Chapter 11 Entails the Decommissioning plan of the project;
- Chapter 12 is the Environmental Monitoring Plan.

⁵ Including noise level, air and water pollution tendencies associated with factory operations in the near future.