



RSPO NEW PLANTING PROCEDURES

Summary Report of ESIA, HCV Assessments and Management Plan

Sotrader, Ndende

June 2016



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1. OVERVIEW AND BACKGROUND

The *Société gabonaise de transformation agricole et développement rural* (SOTRADER) is a public-private partnership between the Government of Gabon (GoG) and Olam International, the technical partner. The purpose of Sotrader is to promote and implement GRAINE¹ (*Gabonaise des réalisations agricoles et des initiatives des nationaux engagés*), the Government's new rural development programme. SOTRADER has applied for a long-term land lease from the Ministry of Economy, Employment and Sustainable Development for an area of land covering 58,400 hectares in Ngounié Province, southern Gabon, in the view to develop an oil palm project.

As part of the Gabon Strategic Plan, the Government of Gabon has been working on a national land use planning that considers agronomic factors, land use, land cover, conservation priorities, ecosystem types, protected areas, etc. in order to guide future development and conservation activities. Ndende site was selected using this data as a suitable option in terms of rainfall, topography, soil, logistics, environmental sensitivity and operations.

The Ndendé concession would be the latest development in an area of the country which has been designated as the most suitable for oil palm cultivation by both the National Parks Authority (ANPN) and WWF (*see map below*) based on criteria ranging from accessibility, favorable rainfall and minimal impacts on biodiversity loss. This analysis confines the development of oil palm to the "fingers" of grassland ecosystems associated with the syncline Niari-Nyanga².

Ndende concession is predominantly savannah grassland (approximately 44,000 ha or 75%) with forests restricted to riparian galleries and isolated patches. It is located ca. 5 km north of the town of Ndendé. A carbon assessment has been conducted to map carbon stock of the area and vegetation is categorized into five levels (<10tC/ha; 10-35tC/ha; 35-75tC/ha; 75-150tC/ha; >150tC/ha).

The site does not overlap with any national parks and will not be ecological barriers that prevent significant movements of fauna over the distances. The site is located in the immediate vicinity of the Gamba-Mayumba-Conkouati Central African Regional Program for the Environment (CARPE) landscape, however considering that its focus is to protect particularly coastal habitats and biodiversity, and given that CARPE landscapes do allow for economic development, in consultation with CARPE implementing partners this assessment concluded that the Ndendé site would not pose a direct threat to its conservation objectives.

There are 10 villages surrounding the proposed site. The main livelihood strategy is based on small-scale subsistence farming, fishing, hunting and the collection of local non-timber forest products (NTFPs). Participatory mapping and consultation have been conducted with 10 impacted villages. All activities described as basic needs such as fishing, water collections etc. by local communities which overlap with

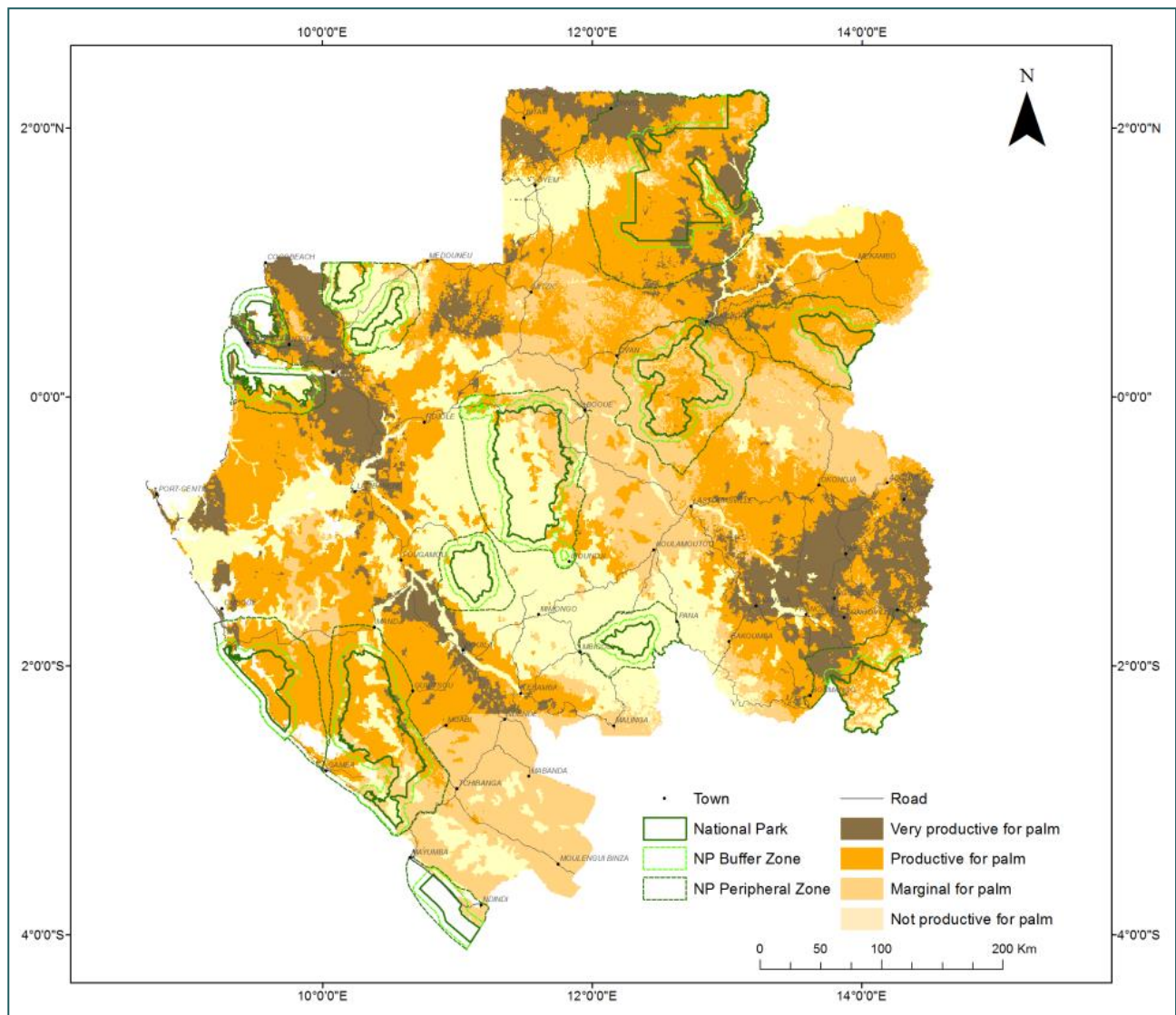
¹ graine-gabon.com

² <http://www.pangeaminerals.org/2013/07/28/3101/>

the Ndendé site are assessed as HCV 5. These areas will either be excised or compensated through the FPIC process. There are no other valid permits overlapping.

SOTRADER has been a member of the Roundtable for Sustainable Palm Oil (RSPO) since July 2015. Sotrader has commissioned an independent regulatory Environmental and Social Impact Assessment Company (Terea Gabon) and High Conservation Value assessors (HCV, Proforest UK) to conduct studies for the RSPO New Plantings Procedures (NPP), during which time no development had started on the main plantation project (except nurseries developed on grassland in 2015, see section 2.4, New Plantings).

Figure 1: Oil palm suitability for industrial operations in Gabon, taking into account considerations of climate, access and soil fertility, amongst others (Source: ANPN).



1.1 Assessment of Forest Areas

Approximately 44,000 ha of the area is savannah and defined as low carbon stock area (<35tC/ha).

Above-ground biomass for the Ndendé concession was mapped based on **LiDAR-derived biomass maps** (100m resolution) collected using a Leica ALS 60 sensor mounted on a Cessna 402 aeroplane.

- Canopy Height Model (CHM) developed based on LiDAR derived Digital Terrain Models and Digital Surface Models (spatial resolution of 2m),
- LiDAR outputs were calibrated based on georeferenced, forest inventory surveys conducted by the Gabon National Park Agency (ANPN), in a neighbouring, but biophysically similar forest-savannah area about 200 km to the northwest of the Ndendé concession. The inventories measured all trees with a DBH >10 cm,
- Field AGB values per tree were then correlated with the LiDAR point cloud using a point-density corrected, quadratic mean canopy profile height (QMCH) regression model. This was used to develop a 5m resolution AGB map that was generalised to a coarser 100m resolution AGB map by Sotrader.
- Carbon estimates, at 100m resolution, were then calculated from the AGB map based on the assumption that biomass has a carbon content of 50%.

The LiDAR derived biomass maps used here calculate all living above-ground biomass, but are calibrated based on field inventories of trees >10 cm DBH.

In the **forests**, the botanical team sampled 47 (100-250 m x 20 m) randomly selected plots within the forest strata across the planned development area. The sampling effort took into consideration the similarity of the forests found onsite, and the extensive amount of data already gathered in similar forests by the same survey teams. For each plot the team described the general habitat characteristics, and then recorded the species and the diameter at breast height (DBH) of every tree over 10 cm in diameter.

The botanical team used a phytosociological approach to study the **savannah** plant communities and species composition in a sampling of 190 (5 m x 5 m) 0.25 ha plots along 19 transects. The team recorded all the species identified in the plot, as well as the relative abundance of each species in the site. In parallel with the field survey, a desk-based study of previous, historic, savannah inventories in the region highlighted the likelihood of finding herbaceous species of conservation significance.

The survey data identified three main types of ecosystem/ forests within the concession:

- Savannahs, characterized by historical man-made fire,
- Seasonally flooded gallery forests, and
- Blocks of terra firma forests.

There are no areas of primary forest within the concession.

1.2 Areas Required to Maintain or Enhance One or more HCV

Areas supporting HCV 1, 3, 4, 5, 6 were identified during the HCV assessment. These are described in the report. See section 5 on summary of HCV identification.

1.3 Peat Soils

There is no peat soil within the project area, evidenced by the soil and agronomic studies. The soil survey was conducted at an intensity of one auger examination per 50 ha. A total of twenty (20) soil mapping units were identified in the study area. These belong to twelve (12) soil series and one miscellaneous land unit as mapped in Malaysia. The parent materials found in the Proposed Ndende Oil Palm Estate consist mainly of sedimentary rocks, pediments (sol remanie) and sub-recent alluvium. The study area consists of level (0–4%), undulating (4–12%), rolling (12–24%) and hilly (24–38%) land. The terrain in the Proposed Ndende Oil Palm Estate is mainly undulating, rolling to hilly. Thus soil erosion and runoff is a moderate to minor problem in parts of the Estate. As the topography in eastern parts of the Estate is level to undulating, localized temporary flooding does occur in the Proposed Estate during the rainy seasons.

Figure 2: Soil Map

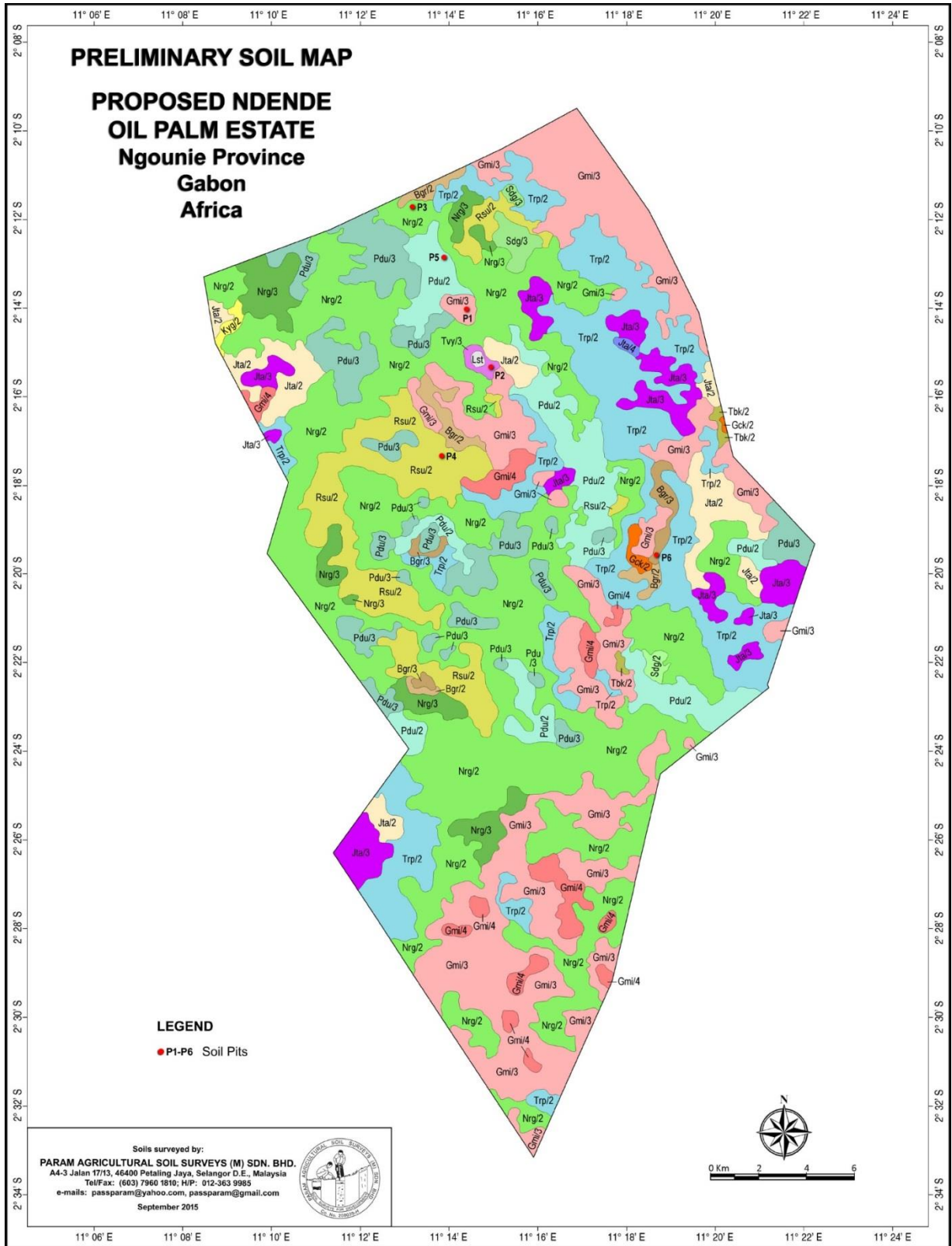


Table 1: Preliminary soil map legend

Parent Material	Map Symbol	Soil Series	Slope Class (%)	Description	Extent	
					Ha	%
Sedimentary rocks	Bgr/2	Bungor	Undulating (4-12)	Deep (>100 cm) yellowish brown to strong brown fine sandy clay. Moderate medium subangular blocky; friable to firm. Patchy clayskins (kandic). Well drained. Soils developed over sedimentary rocks.	563.2	1.0
	Bgr/3		Rolling (12-24)		336.1	0.6
	Sdg/2	Serdang	Undulating (4-12)	Deep (>100 cm) brownish yellow fine sandy clay loam. Weak fine and medium subangular blocky; friable. Thin patchy clayskins (kandic). Well drained. Soils developed over sedimentary rocks.	102.3	0.2
	Sdg/3		Rolling (12-24)		327.3	0.6
Pediments	Gmi/3	Gajah Mati	Rolling (12-24)	Shallow (<50 cm) gravelly clay. Yellowish brown to strong brown; weak medium subangular blocky; friable. Patchy clayskins. Stones consist of subangular petroplinthite gravels. Well drained. Soils developed over pediments (P) surface. Larger boulders may be present on the soil surface.	2,303.7	3.9
	Gmi/4		Hiily (24-38)		140.7	0.2
	Tvy/3	Tavy	Rolling (12-24)	Moderately deep (50-100 cm) yellowish fine sandy clay over gravelly clay below 50 cm depth. Moderate medium subangular blocky; friable. Patchy clayskins. Gravels consist of subangular petroplinthite gravels and stones. Well drained. Soils developed over pediment (P).	97.0	0.2
	Jta/2	Jitra	Undulating (4-12)	Shallow (<50 cm) gravelly clay. Strong brown to brownish yellow; weak medium subangular blocky; friable. Patchy clayskins. Stones consist of subrounded petroplinthite gravels. Well drained. Soils developed over pediments (P ₃) surface.	2,059.0	3.5
	Jta/3		Rolling (12-24)		10,758.2	18.4
	Jta/4		Hiily (24-38)		1,222.6	2.1

Parent Material	Map Symbol	Soil Series	Slope Class (%)	Description	Extent	
					Ha	%
	Trp/2	Terap	Rolling (12-24)	Moderately deep (50-100 cm) yellowish brown to strong brown. Fine sandy clay to 70 cm over stony clay. Moderate medium subangular blocky; friable. Patchy clayskins. Stones consist of subrounded petroplinthite (lateritic) gravels. Well drained. Soils over Pediments (P3).	8,178.3	14.0
	Pdu/2	Pedu	Undulating (4-12)	Shallow (<50 cm) gravelly loam. Strong brown to brownish yellow; weak medium subangular blocky structures; friable. Patchy clayskins. Stones consist of subrounded petroplinthite gravels. Well drained. Soils developed over pediments (P3) surface.	3,709.1	6.4
	Pdu/3		Rolling (12-24)			
	Nrg/2	Nerang	Undulating (4-12)	Moderately deep (50-100 cm) brownish yellow to strong brown fine sandy loam to over 50 cm overlying a dense thick (>25 cm) gravelly clay. Gravels consist of rounded and subrounded petroplinthic gravels. Weak medium to fine structure; friable; patchy clayskins. Within 100 cm soil is variegated. Moderately well drained soil on Pediment (P ₃) surfaces.	19,007.0	32.5
	Nrg/3		Rolling (12-24)			

1.4 Local Peoples' Lands

Identification of areas important to local communities was carried out by 360 degree participatory mapping in each village. This process identified both the areas currently used for hunting, fishing, logging and collection of non-timber forest products and sacred and culturally important sites, both within and outside the concession. A socio-economic survey of each village potentially impacted by the project completed the information on resource use and livelihoods. The maps were validated by the communities and will significantly guide the FPIC process and further HCV spatial planning. Potential impacts on villages varied, and are provided, along with other details in Table 1.

The NPP site is located under jurisdiction of Dola District. Based on the 2003, there were 8775 inhabitants (RGPH 2003), currently, it is estimated at 5598 inhabitants (Monographs Prefecture and Mayor of Ndendé, 2014), a decrease of population by 36.20%. This is a typical issue of rural exodus in Gabon, due to the absence of employment and opportunities. Tsangui is an exception where population has increased due to an industrial wood processing plant.

The table below provides population size in the project area.

Table 2: Size and activities of the studies villages and the potential impact of concession development (source: socio-economic studies and participative mapping).

Zone	Settlements	Pop. (RGPH 2003)	Pop. (Préf. 2014)	Pop. (Obs. 2015)
Dola North	Ferra	131	60	73
	Nanga	123	66	51
	Mounighou	87	49	58
	Nyanga-Youngou	71	41	65
	Moungola	29	25	12
Subtotal		441	241	259
Dola South	Minganga	60	24	81
	Ngoussou	30	14	20
	Tsangui (campement)	70	8	8
	Base-vie de SHV (Tsangui)	0	140	138
	Moungali	180	7	3
	Mourembou	93	58	35
	Moussambou	253	125	93
Subtotal		686	376	378
Commune	Ndendé	6853	4560	4560
Total		7980	5177	5197

2. SCOPE OF THE ESIA AND HCV ASSESSMENT

2.1 Organisational Information and Contact persons

Olam Palm engaged TERE, a Gabonese environmental consultancy, to conduct the ESIA in Ndende. The firm has established expertise in the fields of mining, quarrying, gas and oil, fisheries, forestry, and infrastructure and worked previously on OPG's Awala plantation ESIA. Terea worked with Proforest UK to validate the ESIA methodologies in order to ensure that results were suitable for ESIA and HCV assessment. The results from the ESIA were one of the primary data sources used for identifying HCVs. ESIA's are required by Gabonese regulations as well as the NPP.

The HCV assessment was carried out by Proforest UK according to the requirements of the HCV Resource Network Assessor Licensing Scheme (ALS). The HCV Assessment for Ndende has been approved by ALS Peer Review and Quality Control and posted on the ALS website. Proforest is an independent company working with natural resource management and specializing in practical approaches to sustainability. Their expertise covers all aspects of the natural resources sector, from forestry and agricultural commodities to conservation, supply chain management and responsible investment.

Table 3: Sotrader Ndende HCV and ESIA assessment personnel

Name	ALS Licence	Organisation	Role	Expertise
Dr Audrey Versteegen audrey@proforest.net	ALS15032AV	Proforest	Lead Assessor	Biodiversity Conservation GIS
David Hoyle david@proforest.net	ALS15008DH	Proforest	Assessor	Biodiversity Conservation Social
Aubin Mboumba		TEREA	Team member	Environmental and social impacts
Name		Organisation		Expertise
TEREA: Environmental and Social Impact Assessment				
Aubin MBOUMBA; Gustave NGUEMA;		TEREA		ESIA coordination
Geophysical and hydrological studies				
Jean-Charles MONTAUFIER		TEREA		Hydrology and hydrogeology
Dr Selliah Paramanathan		Param Agricultural Soil Surveys (Malaysia)		Soils
Vegetation and faunal studies				
Dr. Alfred NGOMANDA		Tropical Ecology Research Institute (IRET)		Fauna
Dr. Nestor ENGONE OBIANG		IRET and National Herbarium		Botany
Blaise MBOYE		IRAF at CENAREST		Fish and aquatic macro-invertebrates

Botanical Risk assessment		
Tariq Stévant	Herbier National de Belgique	Botany
Pete Lowry	Missouri Botanical Garden	
Socio-economic survey		
Dr Léon NGUIMBI	IRAF at CENAREST	Socio economic study
Guy-Roger MBATOUILA OBOLO	TEREA	Participatory mapping

2.2 List of Legal Documents, Regulatory Permits and Property Deeds Related to the Areas

- A long-term (49 year, renewable to 99 year) agriculture lease (Bail Emphyteotique signed between the Director General of Olam Gabon, the President of Republic of Gabon and Minister of Town Planning and Housing (*Ministre de l'Urbanisme et du Logement*)).
- Certificate of Conformity for Environmental and Social Assessment and Management Plan Ndende 58,400 ha dated 4 August 2016.
- Letter of environmental and social conformity #1280/MFEPRN//, Directorate-General of Environment and Protection of Nature, for the creation of two nurseries for the GRAINE programme, 22/06/15.

2.3 Location Maps and Description

The proposed agricultural concession area is located 5 km north of the town of Ndendé straddling the Mouila-Ndendé main road across the forest-savannah transition region of southern Gabon, in one of the two savannah fingers reaching northwards into Gabon from the Republic of Congo.

The site lies on the foothills of the Ikoundou plateau, in the plain extending on the eastern edge of the Ngounié syncline. The area is a savannah plain, across which run shallow valleys where forest corridors have developed. The plain lies over a limestone/shale bedrock typical of this area of Gabon, with residual karst formations to the West and an undulating relief more characteristic of eroded karst plateaux to the East. Numerous permanent or seasonal small lakes pepper the area, which have formed following the erosion of the parent material and the formation of shallow bowl-shaped depressions (“dolines”) plugged by clayey sediments.

From a hydrological point of view, the entire concession is located within the catchment of the Dola River, a tributary of the Ngounié. The Dola joins with the Ngounié approximately 20 km from the northernmost concession boundary, and within the concession itself, the main tributaries of the Dola are the Ouafou River, the Rembo, the Douba and the Doungui. Many smaller streams and seasonal rivers can be traced from the geology, most of them are not named and often are seasonal.

2.4 Area of New Plantings and Time-plan for New Plantings

Sotrader intends to establish new plantings across the concession, setting aside and managing HCV areas as discussed in this summary. Commencement of planting is planned for the commencement of the rainy season around September 2015. The planting plan is to still be finalized and will be subject to adjustment according to the outcome of FPIC procedures.

Activity	Area (ha)
Total concession	58,400
A.) HCV 1, 2 and 4 management area^a	21,014
B.) HCV 5,6 management area and HCV 3 connectivity planning	6264.5
C.) Plantable area excluding (D)	30,000
D) Infrastructures and roads^e	1,121.5

**Notes to area table: All forest/ area with higher carbon stock will be set aside as part of HCV. All areas are approximate based on current assessments, and may change following further surveys and FPIC negotiations.*

Two separate nursery areas of ca. 95 ha each were approved and developed in 2015 within the Savannah area inside the concession. Two nursery sites of 95 ha each were prepared on savannah lands in July 2015 (see figure 6 below) and have been developed before the revised NPP has been endorsed, for which an environmental impact assessment was carried out by an independent consultant (Terea Gabon 2015) and a Notice of Impact including an ESMP (Environmental/Social Management Plan) duly filed, regulatory approval by Govt of Gabon was received, an internal HCV assessment carried out by SOTRADER Environment and Social department, and signed prior consent of the two local villages including representatives of youth, women and elders was obtained through a documented process. These areas are also covered by the full ESIA and HCV assessments. It is notably that both nurseries are located on savannah.

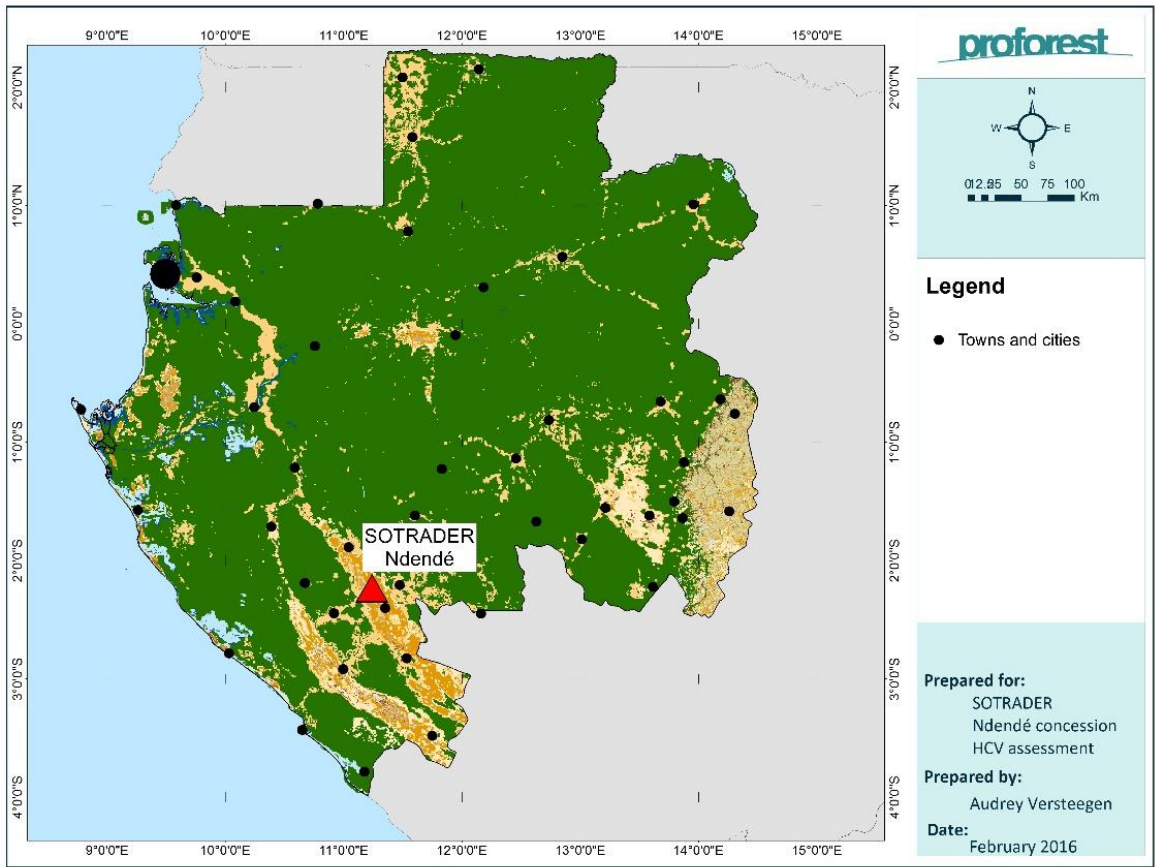


Figure 3: Location map for Ndende

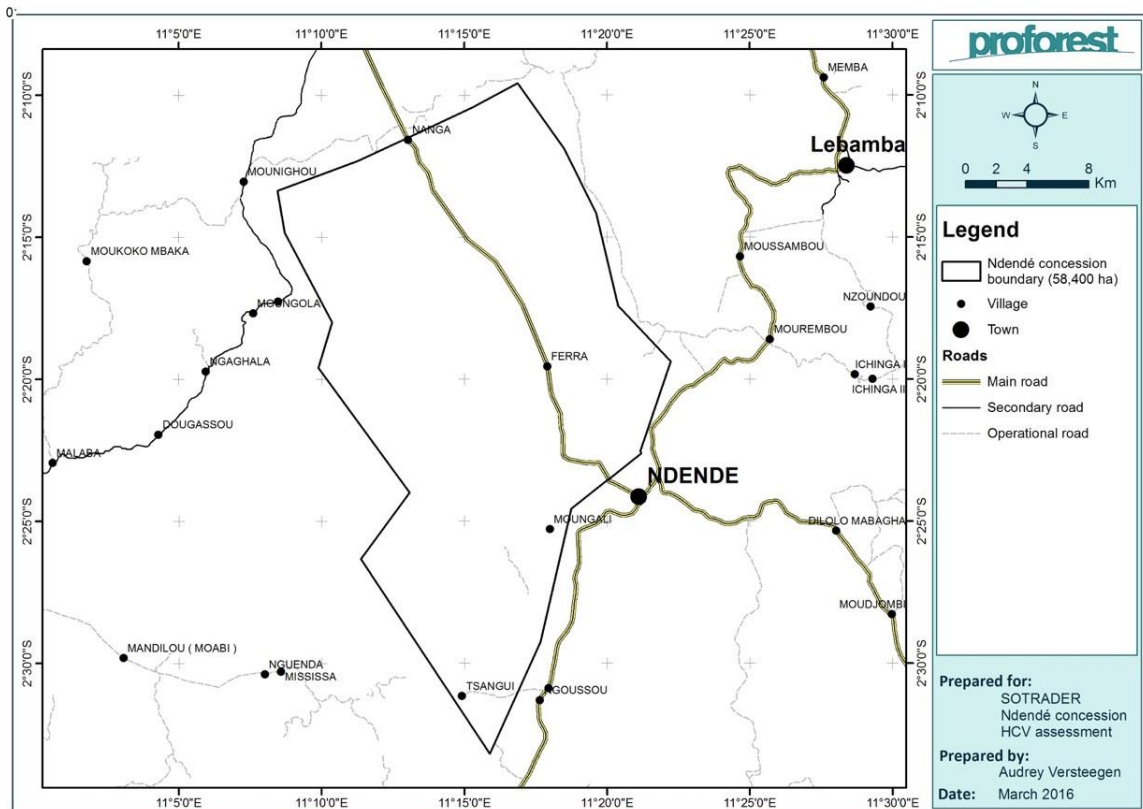


Figure 4: Map of the main villages and other infrastructure in and around the SOTRADER proposed Ndende concession.

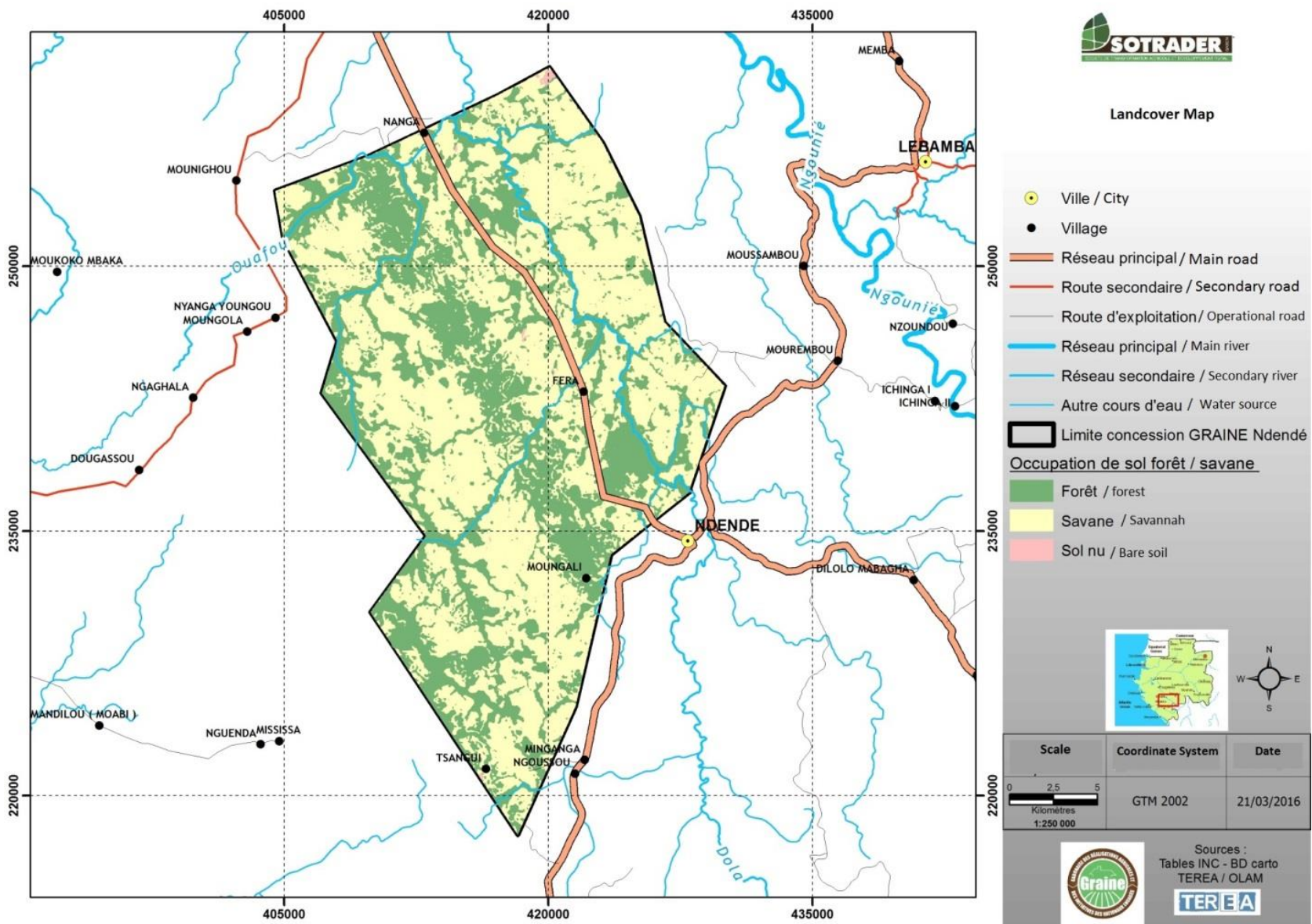


Figure 5: The Ndendé concession preliminary land cover map (using ALOS PALSAR data 2009) showing savannah (ca. 41,670 ha) and forests (ca. 16,730 ha).

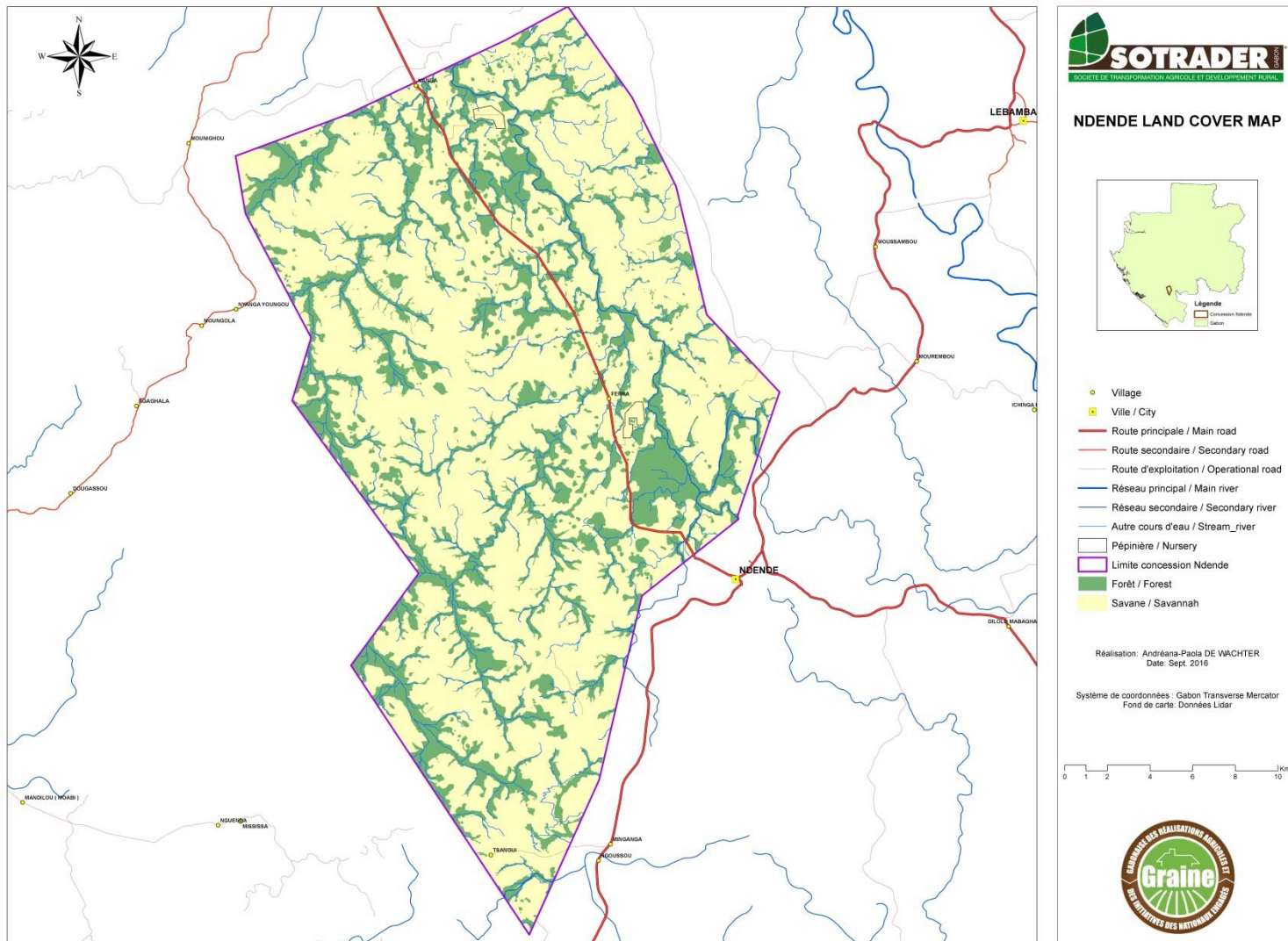


Figure 6: The Ndené nursery land cover map (using ALOS PALSAR data 2009) showing savannah (ca. 41,670 ha) and forests (ca. 16,730 ha).

3. ASSESSMENT PROCESS AND PROCEDURES

Olam jointly engaged Proforest and Terea to supervise and verify the field studies and analysis of results necessary to fulfill the ESIA and HCV assessments. The methods were reviewed and approved by Proforest, after expert consultation, prior to any fieldwork being carried out.

3.1 Assessment process

Proforest, Terea, selected field experts and Department of Environment officials visited the site at various times between July and November 2015 for preparatory and scoping missions. Proforest reviewed the terms of reference for field experts and coordinated with Terea to ensure that ESIA reports were appropriate for HCV interpretation.

Data collection took place between August 2015 and April 2016. Proforest and Terea separately accompanied the field teams during the fieldwork. Participatory mapping was the final part of fieldwork to be completed, with validation of the maps obtained in all the villages.

Table 4: Timeline of activities for the ESIA and HCV assessments

Activities		2015												2016				
		J	J	A	S	O	N	D	J	F	M	A	M	J	J			
Pre-assessment	Information exchange	■	■	■														
	Initial field scoping visit by Dept. of Environment (DGE), ESIA/HCV teams	■																
	Preparation and planning, including development of methods and sampling protocols				■													
Assessment (field studies, consultations, HCV identification, sharing of results)	Participatory mapping and socioeconomic survey					■	■											
	Biological field data collection – full assessment					■	■	■										
	Validation of the participatory maps								■	■								
	Public consultation in Mouila											■						
Preliminary conclusions, concerns, and recommendations	Expert workshop										■							
	NGO and expert stakeholder consultations										■							
Reporting & Peer review	Peer review												■	■	■	■		
	HCV reporting & submission												■	■	■	■		

3.2 ESIA and HCV Assessment baseline survey methodologies

After a literature review, in order to inform HCV identification and interpretation, the following field baseline surveys were carried out:

- Flora – forest inventory and savannah vegetation classification;
- Botany – remote risk analysis for HCV1 herbaceous species;
- Fauna³ – terrestrial mammals, fish and macro-invertebrates;
- Soils;
- Hydrology;
- Water and soil chemical analysis, and
- Socio-economics and participatory mapping.

The **flora inventory** was split into two parts: forest areas and savannahs. In the **forests**, the botanical team sampled 47 (100-250 m x 20 m) randomly selected plots within the forest strata across the planned development area. The sampling effort took into consideration the similarity of the forests found onsite, and the extensive amount of data already gathered in similar forests by the same survey teams. For each plot the team described the general habitat characteristics, and then recorded the species and the diameter at breast height (DBH) of every tree over 10 cm in diameter.

The botanical team used a phytosociological approach to study the **savannah** plant communities and species composition in a sampling of 190 (5 m x 5 m) 0.25 ha plots along 19 transects. The team recorded all the species identified in the plot, as well as the relative abundance of each species in the site. In parallel with the field survey, a desk-based study of previous, historic, savannah inventories in the region highlighted the likelihood of finding herbaceous species of conservation significance.

The **faunal (mammal) inventory** focused on the forest areas and used recce-transects as well as camera traps in order to characterise the fauna present. The team walked along 27 recce transects (37.5 km total) and installed 53 cameras every 100m along 1 to 2 km transects. The cameras were in place in November and December 2015, for a total effort of 1912 camera days.

The faunal diversity was further assessed by sampling the **fish and macro-invertebrate** populations in the Dola River and four of its main tributaries crossing the concession. Fourteen sampling stations were set up to assess fish and macro-invertebrates population and describe the ecological quality of the watercourses.

A comprehensive **soil survey** was conducted by a Malaysian soil expert. A system of free traversing was employed for the survey. A sampling intensity of one examination point for every fifty to hundred hectares was maintained. This was completed by a field campaign to sample the 6 main soil types found onsite in soil pits.

³ Note that a bird survey was carried out following the recommendation from stakeholders during this study after its completion. Detailed findings of the study could not be included in this summary report.

A socioeconomic study was carried out for 10 villages and the town of Ndendé, identified as potentially impacted by SOTRADER's planned development. A combination of group discussions at the village/town level and semi-structured questionnaires at the household level was used in a qualitative study of resource use.

Participatory mapping and carried out in the same 10 villages and town. Participatory mapping was done to identify and map sites and resources of cultural or economic significance to the local population. The mapping was conducted in two stages with designated members of each village. First, discussions were held and sketch maps produced. Then an exercise of GPS field mapping was organised – where the social mapping team and representatives of the local communities walked along paths and throughout customary use areas to identify and map sites of importance, such as hunting or fishing grounds, sacred sites, NTFP, etc. The digitally-produced maps were validated by the local communities before being shown to a wider group of villages and to local authorities for a final validation.

Local consultations (villages and local authorities): Meetings were held by SOTRADER social team in the villages on a regular basis (formal and informal) during 2015 to explain the project and to collate concerns and social issues arising in the local communities. The preliminary ESIA and HCV results were presented in the villages by Terea and a final Public Consultation was convened with all parties on March 22nd 2016. The minutes of these public consultation meetings can be found in Annex 7 of the full ESIA report. The revised ESIA and Management Plans were subject to a validation meeting involving the Provincial and Departmental administrations and village chiefs, with SOTRADER in attendance and led by the DGEPN in Ndende on July 17th/18th 2016.

Stakeholder consultations were also carried out at both the national level. The assessment team carried out two sets of consultations with important stakeholders at the national level at key milestones along the assessment process:

November 2015 consultations: This was an introductory session to inform the stakeholders of the project. Stakeholders were asked to raise any initial concerns regarding the project, site location or the planned process. Consultations were conducted with WWF, WCS, and Mouissi Environment by the Lead Assessor.

February 2016 Consultations: The second consultation session included an expert workshop on the ESIA studies, and stakeholders were presented with HCV preliminary findings and recommendations⁴.

Stakeholder concerns and feedback have been taken into account in the preparation of the final assessment report.

⁴ 60 slide presentation showing all the preliminary HCVs (1-6) identified and recommendations.

3.3 List of Legal, Regulatory and Other Guidance Referenced

3.3.1 International Conventions, Treaties and Guidelines

Climate Change:

- 519/PR/MEPNV by decree of 11 July 2008 on the establishment and organization of the National Authority for the Clean Mechanism (AN -MDP) Development;
- No 748/PM by order of 11 October 2010 establishing the Multidisciplinary Working Group for the CDM (GT -MDP);
- 002/PR/2010 by order of 25 February 2010 a Gabonese Agency of Studies and Observations Spatiales (AGEOS);
- Decree No. 0122/PR/MRPICIRNDH a Climate Council.

A policy on climate change by Reducing Emissions from Deforestation and Forest Degradation (REDD +), conservation, sustainable forest management and increasing forest carbon stocks also exists and are relevant to international conventions on climate change such as:

- UN Framework Convention on Climate Change (and 0030/ 96 of 28/06/1996 authorizing the ratification of the Convention)
- The Kyoto Protocol ratified by Gabon 20 June 2005 (extended to 2020)

Conventions on the protection of natural resources:

- Rio de Janeiro Convention on Biological Diversity, ratified by Gabon in 1997
- Algiers Convention, adopted by Gabon in 1968

Conventions on the protection of the environment and human health

- Stockholm Convention on Persistent Organic Pollutants (POPs) adopted by Gabon in 2001
- Cartagena Protocol, for genetically modified organisms
- International Convention to Combat Desertification in Countries Experiencing Serious Drought and / or Desertification ratified by Gabon in 1998
- The EHS (Environment, Health, Security) policy of the World Bank

3.3.2 National Legislation

Overarching laws

- The Environmental Code: Act No. 16/93 of 26 August 1993 on the Environmental Code
- The Forest Code: Law No 16/2001 Law of 31 December 2001 on the Forest Code
- The Agricultural Code: Law No 22/2008 Law of 10 December 2008 on the Agricultural Code
- The Labour Code: Law No. 003/ 94 of 21 November 1994 on the Labour Code
- The Social Security Code: Act No 6/75 Act of 25 November 1975 on the Labour Code

With Specific legal context to the project

ESIAs

- Article 67 of the Environmental Code: Decree No. 00539/PR/MEFEPEPN of 15 July 2005 regulating Environmental Impact Studies

Protection of the environment, human health and the fight against pollution

- Order No. 00247/HAEDR/IG/IPP regulating imports of products with impact on the environment
- Decree No. 541 of 15 July 2005 regulating waste disposal
- Decree No. 542/PR/MEFEPEPN regulating the discharge of certain products in surface, ground and marine waters
- Act No 07/ 77 Act of 15 December 1977 on the establishment of a pesticide regulations

Emissions from liquid effluents

- Decree No. 00198/MRS/E/PN/CENAP in the Environmental Code of Gabon controlling liquid effluents
- Order No. 247/96 of 12 March 1996 on the measures required to import, distribute and use of plants or plant products.

Protection of natural resources and species with special status

- Decree 0164/PR/MEF of 19 January 2011 regulating the classification of permissible killing of animal species
- Decree of 19 January 2011 0164/PR/MEF regulating the classification of permissible animal hunted

Protection of the rights of local populations

- Decree No. 692/PR/MEFEPEPN of 24 August 2004 laying down the conditions for the exercise of customary use rights
- Decree No 1016/PR/MAEPDR of 24 August 2011 fixing the scale of compensation payable in case of willful destruction of crops, livestock, livestock buildings, fish ponds or fish resources relating to the project.
- Article 2 of Decree No. 0137/PR/MEFEPA concerning setting aside of certain plant species in multipurpose Gabonese forests.
- Decree No. 692/PR/MEFEPEPN 24 August 2004 for harvesting of these species in the context of the exercising customary use rights of village communities.

4. SUMMARY OF ASSESSMENT FINDINGS (FOR ESIA ASSESSMENTS)

Section below presents the summary of key findings of socio-economic impacts to impacted villages/ local communities.

The project will be planned in several phases:

- Phase 1: Establishment of two (2) nurseries
- Phase 2: Site preparation after approval of NPP
- Phase 3: Establishment of permanent and temporary infrastructure project (roads, bridges, housing, offices, etc.)
- Phase 4: Establishment of plantation (planting and maintenance of the plantation), harvesting and processing of the crop, etc.

Summary of positive and negative environmental and social impacts:

The land lease granted to the SOTRADER covers a landscape of savannah grasslands and and gallery forest. There are several major rivers pass through the site, including main rivers namely Dola, Ouafou, Rembo, Duba and Douengui. Several deep sinkholes clogged with clay deposits have fostered the establishment of permanent lake within that concession.

The fauna that inhabits this area is very low in species richness (15 species identified) and in abundance. ESIA survey noted on presence of several protected species (elephant and buffalo forest) in the north and south of the concession areas.

In terms of the human environment, there are ten (10) villages and / or group of villages and two (2) districts of the city of Ndendé distributed in the department of Dola.

- i. Ferra
- ii. Mounighou
- iii. Minganga + campement Tsangui
- iv. Mougali
- v. Mougola
- vi. Mourembou
- vii. Moussambou
- viii. Nanga
- ix. Ngoussou
- x. Nyanga-Youngou
- xi. Quartier Malaba 2
- xii. Quartier Mindanda

Several activities are practiced by the local communities in the project area including subsistence farming, fishing, hunting, forest gathering and / or collecting NTFP.

Below are list of positive and negative impacts of the project:

- Job creation (4,285 jobs, including 2,570 cooperating and 1715 direct jobs);
- Improve food security through cultivation of basic commodities (e.g. cassava, banana, pepper, tomato, palm etc.)
- Poverty reduction through financial empowerment of low-income populations;
- Provision of operating equipment and housing to members of each cooperative;
- Support construction of social infrastructure, public lighting in villages etc. (social needs to be finalized though free prior informed consent consultation with impacted communities);
- Attract population into rural area;
- Revitalize villages in the project area;
- Technical training provided to the villagers;
- Taxes paid to the Gabonese State;
- Significant carbon fixation (positive global impact) due to the planting in low carbon stock area and set aside high carbon stock area for sequestration;
- Improve soil fertility in savanna (stop annual savanna fires, enrichment of organic matter in soils).
- Establish cooperatives (technical and financial monitoring) by the members themselves;
- Provide land title to the cooperatives and individual titles attributed to cooperative;
- Provide training on palm plantation management for cooperative members;
- Support construction of housing for cooperative members (provision of building materials or construction of some housing);
- Additional monthly work bonus (ahead of cooperatives earning: 125 000 FCFA / month) prior to production phase of palm plantation.
- Marketing and purchase guarantee for products cultivated by the SOTRADER

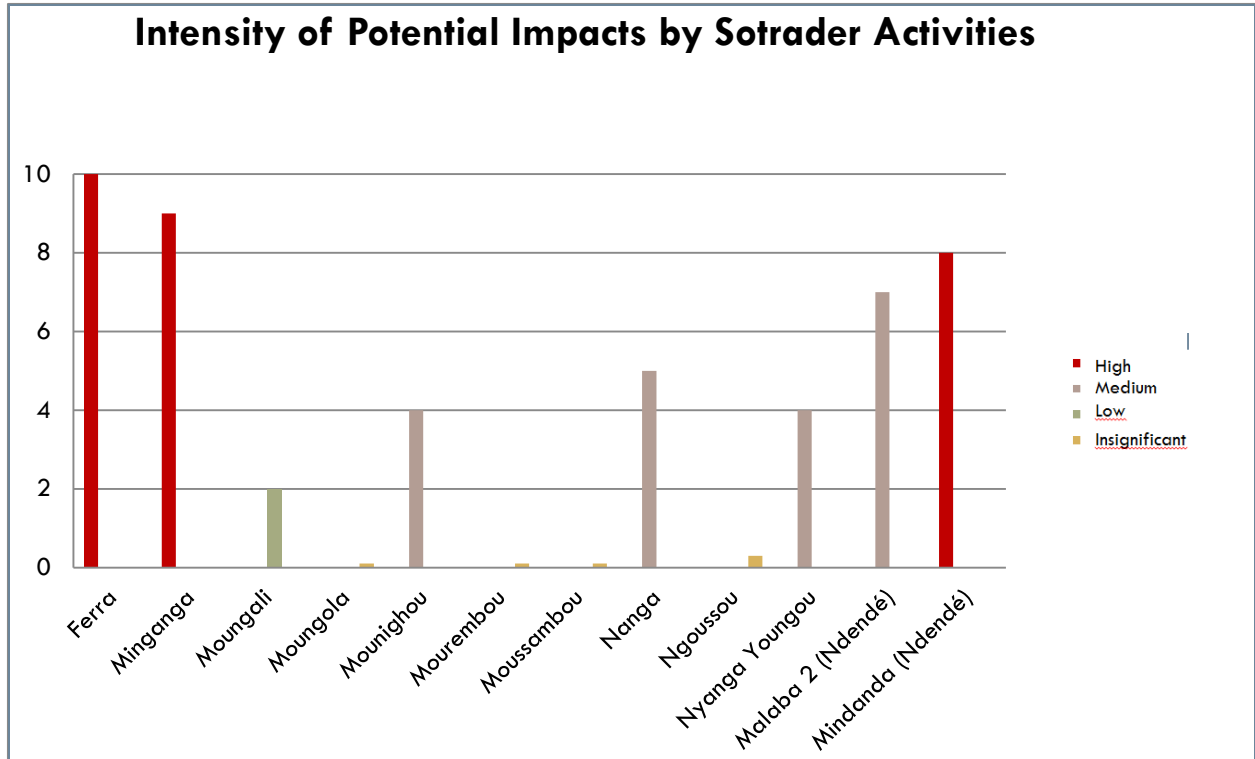
The main negative impacts related to the project are:

During site preparation:

- Potential impact on air quality (dust formation and greenhouse gas (GHG));
- Potential impact on soil stability (erosion and destabilization)
- Potential impact on water turbidity and aquatic environments;
- Impact on soil in case of oil leakage of construction machinery;
- Impact on the landscape;
- Impact on the water in case of hydrocarbon leakage of construction machinery;
- Impact on animal and plant biodiversity;
- Impact on the safety and health of workers and residents at the project site;
- Impact related to waste production and management;
- Potential impact on local communities (areas of destruction of village cultures, sacred sites, etc.).
- During the construction of infrastructure (roads, bridges, base camps, offices, etc.):
- Potential impact on air quality (dust formation and greenhouse gas (GHG));
- Potential impact on soil stability (erosion and destabilization)
- Potential impact on water turbidity and aquatic environments;
- Impact on soil in case of oil leakage of construction machinery;
- Impact on the landscape;
- Impact on the water in case of hydrocarbon leakage of construction machinery;
- Impact on animal and plant biodiversity;
- Impact on the safety and health of workers and residents at the project site;
- Impact related to waste production and management;
- Potential impact on local communities (areas of destruction of village cultures, sacred sites, etc.).

During installation and maintenance of two (2) nurseries:

- Potential impact on soil stability (erosion and destabilization)
- Impact on soil quality related to the use of pesticides;
- Impact on water quality in the use of pesticides;
- Quantitative impact on the use of water;
- Impact on animal and plant biodiversity due to the use of pesticides;
- Impact related to waste production and management;
- Impact on the safety and health of workers and residents nurseries.
- During maintenance of the planting and harvesting:
- Potential impact on the quality of the air (aerosols and greenhouse gas (GHG));
- Impact on soil during the use of pesticides;
- Impact on the landscape;
- Production of domestic and industrial waste;
- Impact on animal and plant biodiversity;
- Impact on the safety and health of workers and residents for planting.



Ultimately, there are 10 village settlements identified in this study, 3 of them have been identified within the license area and will be more strongly affected by the activities of SOTRADER. In addition to these, two other plantation areas have been identified adjacent to the boundary and possibly affected by certain activities within Sotrader.

The study also identified food security constraint due to :

- Scarcity of crops in particular due to the reported destruction of crops by elephants;
- Seasonal fishing (in rivers , lakes and backwaters)

Other potential constraints identified and linked to the Sotrader are:

- Potential decrease of hunting areas due to license area
- Potential decrease in fish stock;
- Potential conflict or common interest areas.

The following recommendations are summarized for major social impacts highlighted above:

- Prioritize the most affected villages in all actions of SOTRADER e.g. recruitment, cooperatives, social and community works;
- Propose solutions to identified food constraints: crops protection, agricultural and fishing projects (including support for food crop production for villagers not involved in palm);
- Propose alternatives to the problems identified: support for livestock projects, ecotourism and promotion of applied research;
- Involve citizens potentially affected in participatory consultation;
- Enhance communication around the GRAINE program.

Management plan is prepared separately and summary is available.

5. SUMMARY OF ASSESSMENT FINDINGS FOR HCV ASSESSMENTS

A full public summary of the HCV assessment is made available separately by Proforest on the website of the [HCV Resource Network](#) and will be published on the Olam’s website. The data below cover the essential findings. The project was assessed as Tier 1 under the HCVRN ALS Scheme. The HCV report was prepared following the new ALS (Assessor Licensing Scheme) and peer reviewed by approved HCVRN peer reviewer.

5.1 Data Sources and Quality

Proforest worked with the experts and with Terea to establish suitable methods for data collection and then reviewed all reports, supplementing this information from relevant literature, expert consultation and experience. Additionally, Proforest made use of the precautionary approach to HCV identification.

5.2 HCV Toolkits Employed

The reference documents used to interpret and identify HCVs during this assessment include the HCV National Interpretation for Gabon (2008) and recently published Common Guidance for HCV Identification (2013), Common Guidance for the Management and Monitoring of High Conservation Values. HCV Resource Network (2014).

5.3 Decisions on HCV status and Related Mapping

The decisions on HCV status are presented in Table . HCV 1, 4, 5 and 6 are present in Lot 3.

Table 5: HCV Identification conclusions

HCV	Definition	Assessment identification		
		Present	Potential	Absent
1	Concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species that are significant at global, regional or national levels	Present		
2	Large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance			Absent
3	Rare, threatened, or endangered ecosystems, habitats or refugia		Potential	
4	Basic ecosystem services in critical situations including protection of water catchments and control of erosion of vulnerable soils and slopes	Present		
5	Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples...	Present		
6	Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples...	Present		

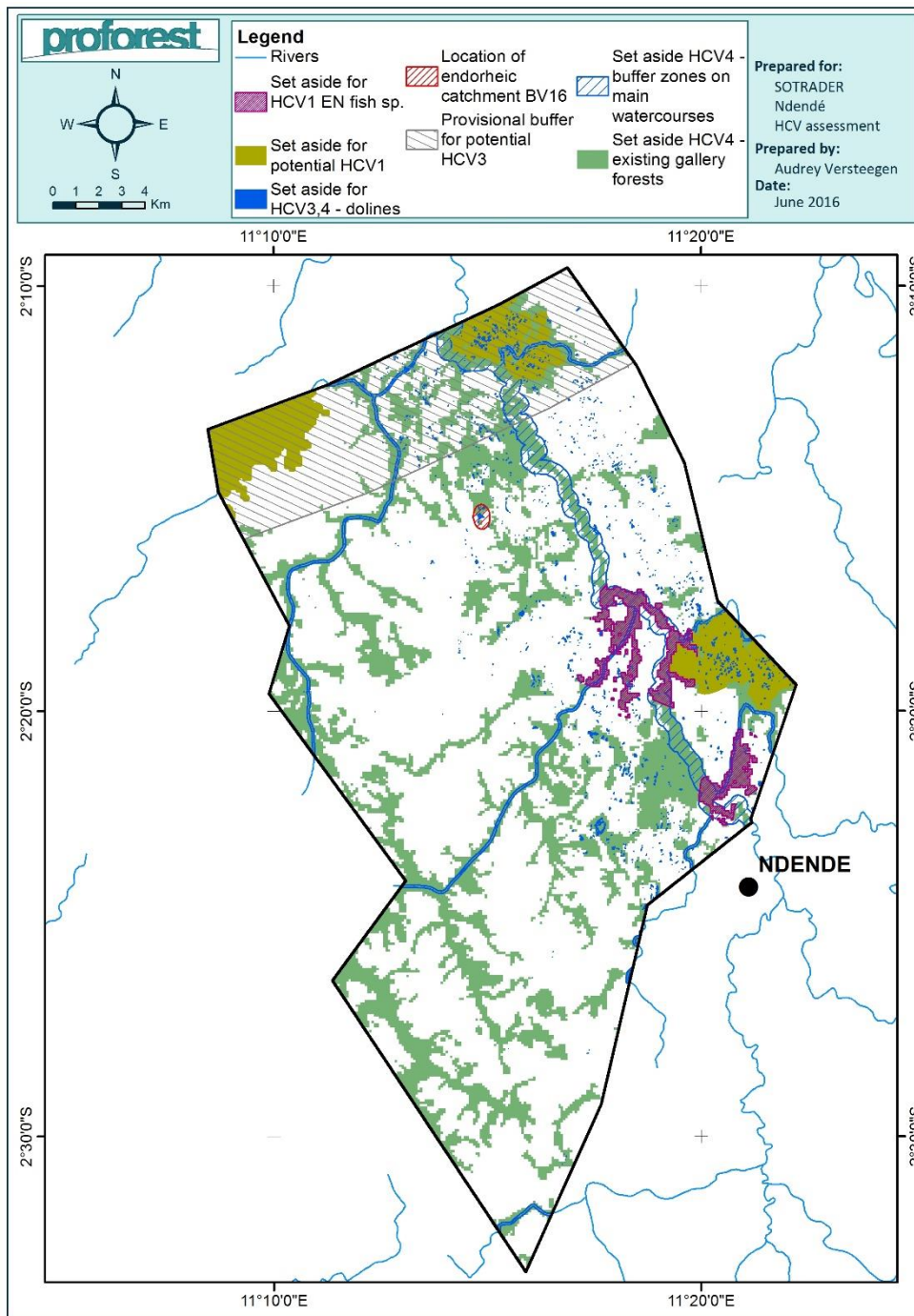


Figure 7: Location of all HCV identified in Sotrader's Proposed Ndende concession and their management areas. Note the 'buffer' for HCV3 is provisional and its outline will be finalised through FPIC and savannah landscape connectivity planning.

6. LAND USE CHANGE ANALYSIS

Land use change analysis (LUCA) based on LANDSAT imagery was conducted to determine changes of vegetation since November 2005 using data from Global Forest Watch. The analysis report shows no clearance of primary forest since 2005 and HCV assessment has been conducted prior to new planting developments. The SEIA and HCV assessment results are aligned with the Landuse Change Analysis performed on Landsat imageries (see HCV maps above). In addition, Sotrader has conducted LiDAR mapping prior to land operation as explained in chapter above.

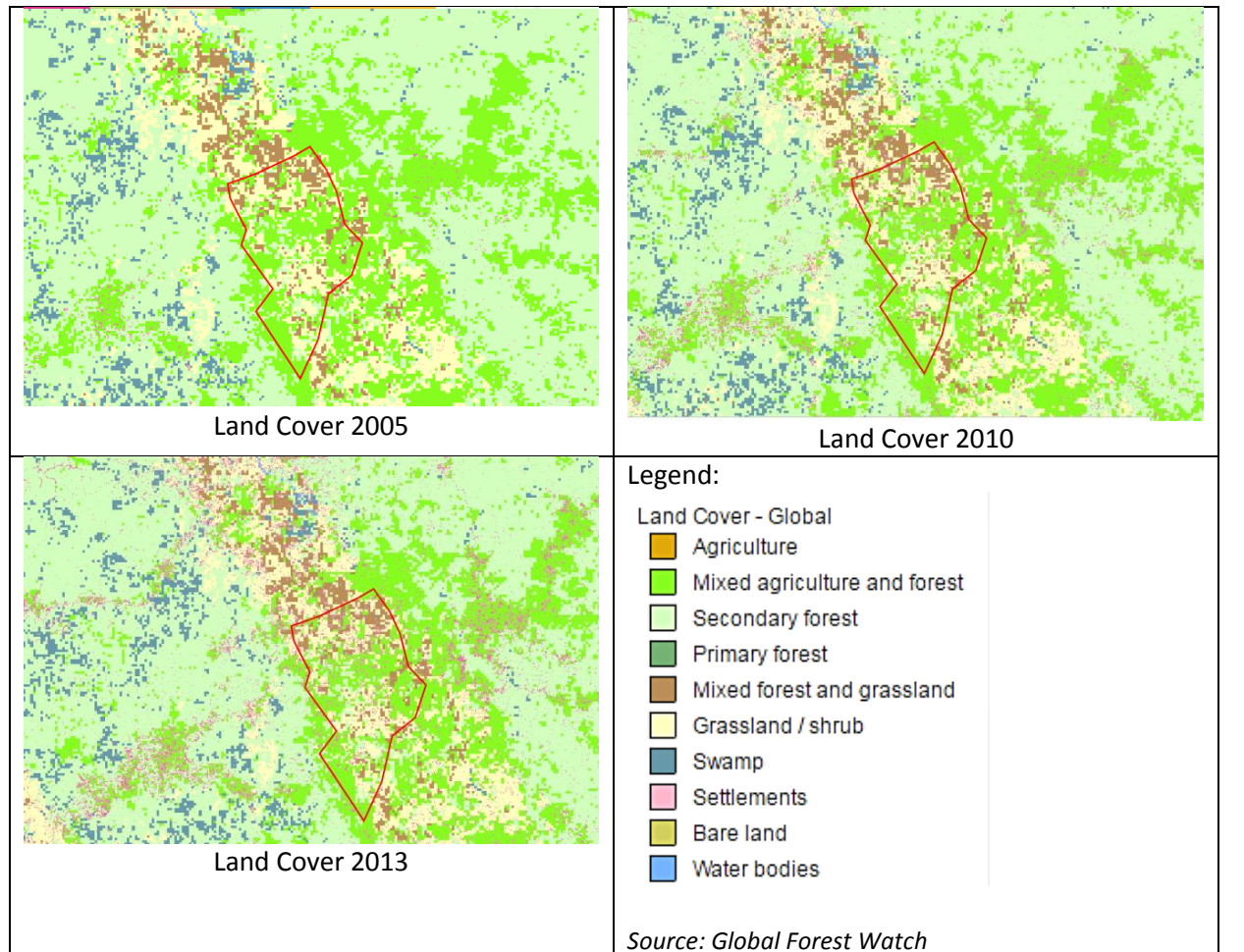



Figure 8: Land use change since 2005 based on LANDSAT image

Based on the analysis, there is no clearance of primary forest since 2005. The findings also shows approximately 58 ha of secondary forests were lost between year 2005 to 2014; and 78 ha were cleared between year 2010 to 2014. It is important to note that these areas lost are not due to commercial clearance for palm plantation.

Land Cover - Global

Annual Tree Cover Loss (in hectares) on Land 
Cover - Global

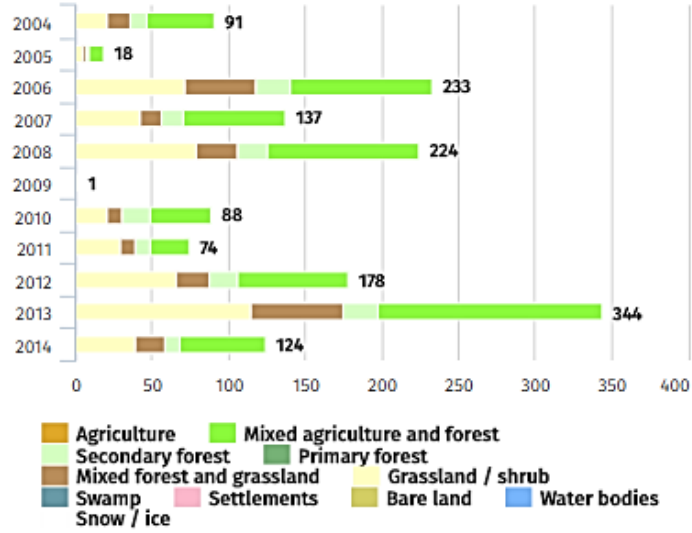


Figure 9: Analysis on vegetation lost based on data from Global Forest Watch

7. FREE, PRIOR AND INFORMED CONSENT

The process to obtain FPIC among villages surrounding the concession is an on-going process which has commenced. From the 6 steps recommended for completing the FPIC process, each of which have several key components, the social team of SOTRADER have completed the following actions against each step:

Step 1- ESIA: The ESIA has been submitted to the Director General of Environment (June 2016), subsequent to participatory mapping and multiple meetings and public consultations informing all stakeholders about the impacts of the project and addressing any concerns raised. The ESIA also includes a study for the impact of the project on subsistence activities (farming, hunting, gathering, collection and fishing) in and around the concession area and the recommended action to mitigate this.

Step 2-Elaboration of the FPIC process with stakeholders: The details of the FPIC process have been elaborated with local communities and relevant provincial and national government agencies. An information campaign on impacts of the project was completed in the first half of 2016. A register of information requested, issues, claims and complaints has been opened in the offices of Sotrader, and the the Prefectures of Dola and villages potentially affected by the project have been notified of the complaints procedure. Furthermore a list of all stakeholders is maintained and a record of communications, consultations and actions arising from these, is regularly updated.

Step 3-Identification of stakeholders, definition of participative modes of consultations, representation and negotiations: A steering committee composed of village representatives, chiefs and departmental authorities has been established to monitor and guide the FPIC process (June 2016). Procedures for communication, negotiation and complaints have been proposed, consulted on at the village level, and validated by the Steering Committee.

Step 4 -regulatory compensation of the persons affected by the project and estimation of compensation required: An agricultural inventory will be carried out to identify owners of crops and , farms at risk of conversion within the concession, allowing Sotrader to plan for avoiding these areas or compensation of owners in accordance to Gabonese law.

Step 5 – negotiations: Meetings are to be held during July 2016 to negotiate the free, prior and informed consent from the villagers based on the establishment of agreed compensations (regulatory and voluntary), land excisions or enclavements based on village needs, witnessed through a written Social Contract (which is a regulatory item appended to the Social and Environmental management Plan).

Step 6 – FPIC: Completion of the FPIC process is formalized through the signatures of all concerned parties on the Social Contract, and a traditional ritual ceremony. Execution of all completed steps (actions) is supported by documentary evidence signed by the relevant stakeholders and Sotrader.

8. SUMMARY OF SEIA AND HCV MANAGEMENT

Summary of planning and management of Ndende, including mitigation of emission impacts has been signed off by respective person in-charge and it is submitted as part of the NPP notification.

Organizational information and personnel involved in planning and implementation are presented below:

Contact Persons	Position	Entity
Supramaniam Ramasamy	President, Global Head of Plantation	Olam International Ltd
Gagan Gupta	Country Head	Olam Gabon
Faizal Mohd	Head of Sotrader	Sotrader
Christopher Stewart	Head, Environment and Sustainable Development	Olam Gabon
Quentin Meunier	ESIA Manager	Sotrader
Olivier Desmet	CRS Manager	Olam Gabon
Audrey Lee	Sustainability Manager	Outspan Malaysia Sdn. Bhd.

The plantations management is structured according to various roles and functions to ensure implementation of best agronomic, environmental, social practices and monitoring of ESMP, HCV management, social contract etc. Each of these divisions/ unit is managed by a manager, and assisted by assistant managers or executives.

Other stakeholders involved during consultation:

- Ministry of Housing, Urban Development, Environment and Sustainable Development, Director General of Environment and Protection of Nature
- Ministry of Water and Forests, Director General of Water and Forests
- Ministry of Agriculture, Livestock, Fisheries and Rural Development
- Ministry of Mines, Petroleum, and Hydrocarbons
- Ministry of Labor, Employment and Social Welfare
- The provincial administration
- Worldwide Fund for Nature (WWF)
- Wildlife Conservation Society(WCS)
- Institut Gabonais d'Appui au Developpement (IGAD)
- The communities of 11 villages, duly represented by their Monitoring Committees and Steering Group.

8.1 HCV THREAT ASSESSMENT

HCV	Brief description of value present	Main threats
1	<p>Species diversity</p> <ul style="list-style-type: none"> Two endemic species of fish, including one listed as Endangered by the IUCN Psychotria sp. new to science Potential kob population Potential bird species (based on upcoming bird survey report by Patrice Christy) 	<p>Current</p> <ul style="list-style-type: none"> Overfishing/overhunting by the nearby communities Destruction of habitat (gallery forest, wetlands) <p>Potential</p> <ul style="list-style-type: none"> Loss of water quality due to nutrient leaching / fertiliser runoff or other pollution, sedimentation caused by river crossings Loss of natural habitat Increased fishing and hunting pressure caused by influx of workforce
3	<p>Important habitats</p> <ul style="list-style-type: none"> Dolines / wetlands 	<p>Current</p> <ul style="list-style-type: none"> None <p>Potential</p> <ul style="list-style-type: none"> Clearance and drainage of wetland areas Lowering of the overall water table due to excessive field drainage Contamination of water sources in the area from chemical input in the plantation (rapid access to aquifer through higher water table and porous parent material)
4	<p>Basic ecosystem services</p> <ul style="list-style-type: none"> Hydrological functions to maintain water quality and quantity for community uses. 	<p>Current</p> <ul style="list-style-type: none"> Low level forest loss due to clearing for subsistence agriculture and small-scale logging/ timber extraction Roadworks, urban activities and waste disposal in the Ndendé area <p>Potential</p> <ul style="list-style-type: none"> Widespread loss of riparian forest due to land clearance for palm oil plantation (high level threat) Loss of water quality and quantity due to loss of forest cover and service provision (erosion and flood control) Loss of potable water supply downstream Flooding Water pollution due to fertiliser and pesticide use and waste disposal
5	<p>Basic Community Needs</p> <ul style="list-style-type: none"> Provision of food from farming, hunting, fishing and NTFP gathering in 	<p>Current</p> <ul style="list-style-type: none"> Bushmeat supply is already dwindling as hunted species numbers appear to be in low numbers from overhunting <p>Potential</p>

	<ul style="list-style-type: none"> the forest zone Water supply to communities 	<ul style="list-style-type: none"> Loss of fertile forest land for farming if riparian areas are replaced by oil palm. Loss of access to traditional hunting, fishing and NTFP grounds Reduction of fish stocks and loss of fish habitat due to impacts on water quality and quantity Loss of potable water due to pollution.
6	<p>Cultural values</p> <ul style="list-style-type: none"> Burial grounds Sacred sites in forests (grove, cave...) Lakes 	<p>Current none</p> <p>Potential</p> <ul style="list-style-type: none"> Loss of access Damage to sites or resource from land clearance Water contamination in sacred lakes and groves from chemical inputs and other pollution on the plantation

8.2 HCV MANAGEMENT AND MONITORING RECOMMENDATIONS

HCV	Threats	Management recommendations	Monitoring recommendations
1	<ul style="list-style-type: none"> Overfishing/overhunting and potential increased fishing/hunting pressure when influx of workforce on the planned plantation Loss of water quality due to nutrient leaching / fertiliser runoff; Destruction of habitat 	<ul style="list-style-type: none"> It is recommended that SOTRADER contributes to a better description of the fish populations on site and in the area. Further sampling at different seasons to ascertain the presence of valuable fish biodiversity and inform the FPIC process could for instance be valuable in decision-making processes. In the absence of more information, the presence of HCV should be assumed and SOTRADER should engage with local communities on the value present and develop a programme to mitigate the threat from overfishing. The existing forest vegetation should be integrally preserved as a buffer against potential runoff. Additional buffers around the Dola (300 m either side) and its main tributaries should be delineated and managed appropriately. SOTRADER should have a programme in place in cooperation with local communities in order to mitigate the potential impact of a sharp population increase on fish stocks and bushmeat. SOTRADER should work with ANPN to evaluate the viability of the kob Defassa population in the Ngounié savannas and develop a suitable conservation approach 	<ul style="list-style-type: none"> Regular water sampling following BACI approach (upstream, in site and downstream) to preserve water quality: water quality parameters should remain within an acceptable range (similar to baseline values for microbiology and physio-chemistry recorded prior to land development) to preserve the fish habitat. Further studies and on-going monitoring of fisheries in all the main rivers to ensure that HCV1 is maintained and enhanced. Ongoing monitoring should also inform on the presence of further endemic or IUCN listed species are present in the other watercourses: any finding should be fed back into the HCV management and monitoring plan. A regular monitoring system needs to be established to ensure that forest

			cover is maintained and hunting and fishing pressure is kept at a minimal
3	<ul style="list-style-type: none"> • Lowering of water table due to oil palm plantation too close to the dolines • Contamination of water sources in the area from chemical input in the plantation (rapid access to aquifer through higher water table and porous parent material) 	<ul style="list-style-type: none"> • SOTRADER should delineate all the wetlands on site before the start of planting operations and keep a buffer adequate to the size of the wetlands in order to protect water resources (see guidance for the size of buffer zones in the draft RSPO National Interpretation for Gabon). • Appropriate management practices should be in place for all operations near dolines, wetlands and lakes. Develop dedicate SOPs for the above • We recommend further botanical work in the wetlands in order to better understand these ecosystems. • Similarly, it is crucial that a bird survey is carried out in the savannah area, and in particular around the wetter areas in the depressions formed by the topography. • Any management recommendation found in the ongoing bird survey commissioned in April 2016 should be integrated to these. 	<ul style="list-style-type: none"> • Regular water sampling and monitoring of the water table levels. • Any monitoring recommendations made by the experts as part of the bird survey commissioned in April 2016 should be integrated to these.
4	<ul style="list-style-type: none"> • Low level forest loss due to clearing for subsistence agriculture and small-scale logging/ timber extraction • Large scale forest loss due to land clearance for palm oil plantation (high level threat) • Loss of water quality and quantity due to loss of forest cover and service provision • Loss of potable water supply downstream • Flooding • Water pollution due to fertiliser and pesticide use 	<ul style="list-style-type: none"> • Delimit, set-aside and protect existing riparian forests (these should be identified by following streams and tributaries to their source). Buffer zones should be at least 50 m on each side of the main tributaries of the Dola, and we recommend a precautionary 300m wide (on either side) of the Dola. Where the riparian vegetation has been cleared within these zones, SOTRADER should put in place active management measures to restore it. There are various small pockets of forest that are not directly riparian areas and can be cleared if less than 20 ha in size and if not connected to the river network. • Ensure sufficient alternative land available for farming or compensation if there are no alternatives, and limit farming and logging in the forest buffer zones, in agreement with local communities, as per the FPIC process; • Development and implementation of dedicated SOPs regarding chemical use • HCV sensitisation programme (internal & external) 	<ul style="list-style-type: none"> • Establish network of independent water monitoring stations; • Regular monitoring of forest set-aside zones shows no encroachment by communities and operations; • Annual monitoring of set-aside zone shows at least no decrease in canopy cover; • Set restoration goal (natural regrowth) for riparian zone with annual milestones; • Regular review of implementation of relevant Olam's SOPs;
5	<ul style="list-style-type: none"> • Loss of fertile forest land for farming • Loss of access to traditional hunting, fishing 	<ul style="list-style-type: none"> • Ensure sufficient alternative land available for farming or compensation if there are no alternatives; • Establish a community development programme to provide alternative food sources, with emphasis on availability of suitable protein; Ensure 	<ul style="list-style-type: none"> • Establish and implement a participatory monitoring system to regularly track provision of basic needs to the community. There should be a

<p>and NTFP grounds</p> <ul style="list-style-type: none"> • Loss of water quality and quantity due to forest loss • Water pollution due to fertiliser and pesticide use 	<p>controlled access for fishing;</p> <ul style="list-style-type: none"> • Strict hunting SOP for all SOTRADER staff and all local communities applicable inside the permit - including zero tolerance to any form of illegal hunting (hunting methods and protected species); sensitisation and suitable training of all local communities inside the permit. • Control all hunting in forest zones coupled with provision of protein sources in the zone • Ensuring a continuous social engagement process to find mutually agreeable solutions to HCV 5 threats and formalise in codes of conduct and community engagement policies; 	<p>clear mechanism for the findings of this participatory monitoring to be fed back into management measures in place (adaptive management).</p>
<p>6</p> <ul style="list-style-type: none"> • Loss of access • Damage to resource 	<ul style="list-style-type: none"> • Enable all communities to have access to their HCV 6 sites; • Sensitise all communities that have identified any HCV 6 sites that are not on the validated HCV 5 & 6 maps; • Develop robust SOP for the identification, demarcation and enclavement and protection of all HCV 6 sites with the communities; • Ensure community member present when clearing operations occurring in any HCV 6 sensitive zones; 	<ul style="list-style-type: none"> • Develop a simple HCV 6 monitoring system and ensure annual internal reporting against it;

8.3 SUMMARY OF MANAGEMENT AND MITIGATION PLANS (SEIA)

Topic	Source of impacts	Potential Impacts	Measures / Actions for the mitigation or strengthening	Timetable for implementation	Frequency	Indicators for Monitoring	Responsibilities		
							Execution	Control	
Site Preparation									
Physical environment	SURFACE WATER AND GROUNDWATER	Site preparation	Increase in flood flows (increase water turbidity and quantity of suspension particles)	Mulching soil during land clearing	At the end of the work	Once during the duration of the project	Control Report of the team planting /Agronomy of SOTRADER	The subcontractor, team HVC, team planting, HSE Engineer of SOTRADER	DGEPN + associated administrations
				Rapid implementation of cover crops (<i>Pueraria javanica</i>) in order to limit the duration of exposure to process of erosion of the surfaces of bare soil	At the end of the work	Once during the duration of the project	Control Report of the team planting /Agronomy of SOTRADER		
				Prioritize planting by towing without ground stripping	During the work	Continuously	Control Report of the team planting /Agronomy of SOTRADER		
				Maintain buffer zones along water courses and permanent water bodies (pools within the sinkholes, lakes, etc.)	During the work	Continuously	Mapping of buffer zones		
				Manage the water logged area, implement ditches and divert water to settling ponds to minimize suspension solid into rivers.	During the work	Continuously	Control Report of the management plan of the waters		
				Degradation of the quality of surface water and	Unpack the soil to avoid their settlement after passage of the heavy machineries (only the areas of heavy work)	At the end of the work	Once during the duration of the		

		groundwater - Flooding on site			project		ng, HSE Engineer of SOTRADER	
			Constitute the windrows perpendicular to the direction of the slope (following the curves of level)	During the work	Once during the duration of the project	Control Report of the team planting/Agronomy of SOTRADER		
			Protect the upper slopes above 20°	During the work	Continuously	Control Report of the team planting/Agronomy of SOTRADER		
			Monitor water quality of DOLA river (downstream)	In the course of the work	Once a Year / continuously	Follow-up report of the quality of the waters	Task HVC, HSE Engineer of SOTRADER	
			Maintain buffer zones along water courses and permanent water bodies (pools within the sinkholes, lakes, etc.)	During the work	Continuously	Mapping of buffer zones		
			Define specific areas for storage and fuel stations, with precautionary measures (retention walls and spill kits)	During the work	Continuously	Report of control of the Environment Team of SOTRADER		
			Provide spill kits in the event of an accidental spill of fuel or waste oils	During the work	Continuously	Purchase Invoice; number of kits available on the site		
SOIL	Oil leakage or spillage	Soil pollution	Provide spill kits in the event of an accidental spill of fuel or waste oils	During the work	Continuously	Number of kits available on the site	HSE Engineer of SOTRADER	DGEPN + associated administrations
			Maintain trucks, vehicles and construction equipment in good condition to prevent oil leakage. Manage waste oil in appropriate manner.	During the work	All Months	Maintenance Service book, Report of the Workshop Mechanical.		

	Installation of containment trays around diesel tank.	During the work	Continuously	Report of control of the Environment Team of SOTRADER		
	Provide appropriate PPE to workers and PPE must be replenished.	During the work	Continuously	Purchase orders from the EPI, monthly reports HSE		
	Provision of PPE and wearing of PPE on site must be mentioned in workers' contract.	During the work	Continuously	Number of person with the EPI		
	Access to the construction site will be prohibited to any person without PPE.	During the work	Continuously	Prohibition signs of access to the site		
	Land preparation according to plan	During the work	Once at the beginning of the work	Control Report of the team planting/Agronomy of SOTRADER	The subcontractor, team HVC, team planting, HSE Engineer of SOTRADER	DGEPN + associated administrations
Erosion and unstabilize soil	The field preparation should be carried out primarily during the dry season	During the work	Continuously			
	Rapid implementation of cover crops (<i>Pueraria javanica</i>) in order to limit the duration of exposure to process of erosion of the surfaces of bare soil	During the work	Dry season			

			Progressive field development	At the end of the work	Once during the duration of the project			
			Protection of slopes above 20°	During the work	Continuously			
			Stacking of plant/ organic matter	During the work	Continuously			
			Mulching soil during land clearing	At the end of the work	Once during the duration of the project			
			Protect watershed	At the end of the work	Once during the duration of the project			
			Training and control of sub-contractors	During the work	Continuously	Training Report/List of presence		
AIR	Site preparation	Emissions of dust	Control speed limit at 40 km/h inside of the field.	During the work	Continuously	Report of control of the Environment Team of SOTRADER	The sub-contractor, responsible for Sustainable Development (CRS Managers), plantations manager, team of land development of SOTRADER	DGEPN + associated administrations
			Establish speed limit signs at the main entries and sites and their access routes	During the work	Continuously			
			Spray water (if necessary) along the tracks to the areas of work in order to minimize the quantities of dust in the air	During the work	Dry season			
			Maintain forested areas and the habitat areas	During the work	Continuously			

			Provide vehicle with air-conditioning systems and windows to avoid breathing of dust	During the work	Continuously			
			Distribute masks (PPE) who are exposed to dust to limit inhalation of dust	During the work	Continuously			
	Movement of vehicles, trucks and heavy machineries	Emissions of greenhouse gases	Maintenance of the vehicles, trucks and construction equipment in good operating condition to minimize GHG emissions	During the work	All Months	Maintenance Service Booklet	HSE Engineer of SOTRADER	DGEPN + associated administrations
			Maintain forested zone for emission reduction and land preparation according to landuse plan	During the work	Continuously	Control Report of the team planting/Agronomy of SOTRADER		
			Staff training and awareness on fuel consumption	During the work	Continuously	Report of control of the Environment Team of SOTRADER		
			Prohibition to leave the trucks and vehicles to idle unnecessarily	During the work	Continuously			
LANDSCAPE	Site preparation	Degradation and modification of the landscape	No modification of important water sources	During the work	Continuously	Reports of control teams of land development/ Environment/ mapping of SOTRADER	The sub-contractor, responsible for Sustainable Development (CRS Managers), plantations manager, team	DGEPN + associated administrations
			Keep the flood areas under forest cover	During the work	Continuously			
			Optimize the use of the Savannah for the planting	During the work	During the work			
			Establish infrastructure on savannah	During the work	Continuously			

Biological environment	TERRESTRIAL FLORA	Site preparation	Loss of vegetation	Maximum use of savannah areas	During the work	During the work	Reports of control teams of land development/ Environment/ mapping of SOTRADER	The sub-contractor, responsible for Sustainable Development (CRS Managers), plantations manager, team of land development of SOTRADER	DGEPN + associated administrations
				Land preparation according to landuse plan and maintain area with high conservation values	During the work	Continuously			
				Preserve all gallery forest	During the work	Continuously			
				Establishment of a procedure to avoid damage on conservation area	Before the work	Once at the beginning of the work			
				Establish boundaries of areas before arrival of heavy machineries for land preparation	Before the work	Once at the beginning of the work			
	TERRESTRIAL FAUNA	Site preparation	Disturbance to wildlife and birds	Carry out land preparation in progressive stage to allow wildlife movement	During the work	Continuously	Reports of control teams of land development/ Environment/ mapping of SOTRADER	HVC Teams; responsible sustainable development (CRS managers) of SOTRADER	DGEPN + associated administrations
				Maintain forested area and forest corridors that enable wildlife movement	During the work	Continuously			
				Maintain savannah outside of concession boundary as a refuge for wildlife	During the work	Continuously			
				Inform workers and cooperative members on the Gabonese regulation	During the work	Once at the beginning			

related to hunting (seasons for hunting, no hunting on protected species, methods of hunting allowed, etc.)

ng of the work

SOTRADER will also have to ensure that a company policy **prohibiting hunting in the** concession for its workers and sub-contractors to be put in place and respected

Before the work

Once at the beginning of the work

AQUATIC FAUNA	Site preparation	Disturbance of aquatic fauna, pollution and contamination of the aquatic fauna	Protect the upper slopes above 20° to minimize soil erosion	During the work	Continuously	Reports of control teams of land development/ Environment/ mapping of SOTRADER	The sub-contractor, responsible for Sustainable Development (CRS Managers), plantations manager, team of land development of SOTRADER	DGEPN + associated administrations
			Conserve riverine system to protect aquatic fauna	During the work	Continuously			
			A buffer zone on both sides of watercourse will be retained according to the following diagram:	During the work	Continuously			

Type	Width (m)	Buffer zone minimum (m)
Temporary Stream	<5	10
Small river (tributary of the DOLA)	5-20	50
Great river (Dola)	>20	300

Permanent lakes*	>1000 m ²	50
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Flood plain, swamps, wetlands, and seasonal lakes and along the river Ngounié will be demarcated and protected according to the established procedures

Establish settling ponds	During the work	Continuously	Reports of control teams of land development/ Environment/ mapping of SOTRADER	The sub-contractor, responsible for Sustainable Development (CRS Managers), plantations manager, team of land development of SOTRADER	DGEPN + associated administrations
Crossing and clearing of river buffer is strictly prohibited unless for maintenance of essential crossings	During the work	Continuously	Report of control of the Environment Team of SOTRADER		
Maintenance and washing of machineries should be placed far from rivers. Sanctions will be imposed for offenders	During the work	As soon as there is pollution proved	Packing Slip of evacuation of waste		
Contaminated soil in the event of the accidental discharge (oils, hydrocarbons, etc.) shall be evacuated according to the QHSE procedure	During the work	Continuously	Report of control of the Environment Team of SOTRADER		
In order to avoid any spillage on the ground, site that handling hydrocarbon will be layered and waterproofed	During the work	Continuously	Report of control of the Environment Team of SOTRADER		

Human	LOCAL COMMUNITIES	Site preparation	Decrease or loss of hunting areas, gathering,	Establishment of a steering committee (in	Before the work	Once at the beginning of the work	Social Contracts signed with the populations	Responsible Sustainable Development (CRS managers) of SOTRADER;	DGEPN + associated
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agriculture, fishing, exploitation of wood and of heritage sites

collaboration between the proponent, the local populations, and the bodies of the provincial administration and Départementale) for the implementation of the FPIC

Team HVC of SOTRADER; Team; social mapping team; representatives of the villages
administrations

Demarcate community area and resources through participatory mapping and FPIC
necessary to the satisfaction of the economic, social and cultural needs

Before the work

Continuously

Text or document for the establishment of monitoring committees

Conservation, displacement or conversion after consultation with the populations of the areas of subsistence farming, sacred sites and of cultural or historical importance area identified on site

During the work

Continuously

Control Report of the team HVC, Environment Of SOTRADER

Inform and create awareness of local communities on social and economic issues

Before the work

Continuously

Records of outreach meetings

related to Project
N dendé

Identification areas for communal use for economic activities	Before the work	Once before the work	Mapping of Community Sites
Application of a social policy that agreed by the populations	During the work	Continuously	Social Policy Implementation
Demarcate customary lands of Mindanda, Malaba 2 located in the permit area in consultation with the communities	Before the work	Once before the work	Minutes of output of customary lands of two neighborhoods
Choice and implementation mechanism of compensation shall be by the village/communities (social contract from the FPIC)	At the end of work	Once at the end of the work	Minutes of compensation of populations
Establishment of a monitoring committee in each village/Cooperative for the negotiations of the FPIC	Before the work	Once before the work	Text or document for the establishment of monitoring committees

Conflicts between SOTRADER and local communities	Taking consideration of local communities concerns and respect the agreements concluded through FPIC throughout the project duration	Before the work	Continuously	Control Report of the social team	Responsible Sustainable Development (CRS managers) of SOTRADER; Social Team; representatives of the villages	DGEPN + associated administrations
Temporary employment for the local communities (positive impact)	Establishment of a hiring policy that promotes recruitment priority villages (communities with high impacts)	During the work	Continuously	Number of local employees	Hrd SOTRADER	DGEPN + associated administrations
	SOTRADER should make available in each village the list of jobs to be filled or its needs in subcontracting through its social service team and ensure training of supervisor to enhance skills level	During the work	Once at the beginning of the work	List of jobs displayed in the village		
	Train national workforce for following activities (road construction and maintenance, harvesting and transportation of FFB)	During the work	Continuously	Number of person retained; Fact Sheets of presence in training sessions		

			SOTRADER should prioritize food produced locally (cassava, banana, etc.) that could bring additional income to the communities	During the work	Continuously	Contracts for the purchase of local products with the populations			
Human environment	ARCHEOLOGICAL SITE. HERITAGE	Site preparation	Destruction of archaeological site and loss of the collective memory	Stop work in the event of a fortuitous discovery	During the work	Has each fortuitous discovery	Minutes of judgment of the work	Responsible Sustainable Development (CRS managers) of SOTRADER; Team HVC of SOTRADER; Team; social mapping team; representatives of the villages	DGEPN + associated administrations
				Do the immediate reporting to the competent administrative authority, of any discovery	During the work	Has each fortuitous discovery	Letter of Declaration to the authorities		
				Make the appropriate inventory and take into account of identified and potentially of new archaeological or historical site, in collaboration with the authorities and the populations for their monitoring	During the work	Has each fortuitous discovery	Mapping of potential sites		
				Mapped all caves, sacred sites and ancient villages before land preparation	Before the work	Once before the work	Mapping of potential sites		

WORKERS	Site preparation	Personal injury accidents	The workers will have to be qualified for technical operation	During the work	Continuously	Certificate of fitness to drive gear	Sub-contractors, HSE and HRD of SOTRADER	DGEPN + associated administrations
			Provide appropriate PPE to workers and PPE must be replenished.	During the work	Continuously	Purchase vouchers of PPE		
			Provision of PPE and wearing of PPE on site must be mentioned in workers' contract.	During the work	Continuously	Number of person with the EPI		
			Access to the site will be prohibited to any person without PPE.	During the work	Continuously	Prohibition signs of access to the site		
Construction of Infrastructure								
SURFACE WATER AND GROUNDWATER	Construction of infrastructure (roads, bridges, etc.)	Degradation of surface water and groundwater	Develop drainage for flood prone area (see also the policy for the protection and management of wetlands).	During the work	Continuously	Report of control of the Environment Team of SOTRADER	The subcontractor, team HVC, team planting, HSE Engineer of SOTRADER	DGEPN + associated administrations
			Construction of bridge to be planned during dry season. However, the design should allow free water flow during rainy	Before and during the work	Once at the beginning of the project	Control Report of the team planting /Agronomy of SOTRADER		
Physical environment								

season

Consider hydrology during design of infrastructure	Before and during the work	Once at the beginning of the project	Report of control of the Environment Team of SOTRADER
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Establish ditches along the road to avoid sedimentation	During the work	Continuously	Report of control of the Environment Team of SOTRADER
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Drainage and ditches shall not directly flow into the rivers	During the work	Continuously	Report of control of the Environment Team of SOTRADER
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Establishment of earth bund could reduce erosion	During the work	Continuously	Control Report of the team planting /Agronomy of SOTRADER
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Road maintenance program	Throughout the project	Continuously	Report of control of the Environment Team of SOTRADER
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Vehicle maintenance program and prohibit washing of vehicles in vicinity to rivers	During the work	All Months	Maintenance Service Booklet	HSE Engineer of SOTRADER	DGEPN + associated administrations
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SOIL	Accidental oil spillage	Soil pollution	Vehicle maintenance program	During the work	All Months	Maintenance Service Booklet	HSE Engineer of SOTRADER	DGEPN + associated administrations
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Provide spill kits in the event of an accidental spill of fuel or waste oils	During the work	Continuously	Purchase Invoice; number of kits available on the site
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		Install containment tank around diesel tank	During the work	Continuously	Report of control of the Environment Team of SOTRADER		
		Isolate accidental spillage area	During the work	Continuously	Report of control of the Environment Team		
Construction of infrastructure (roads, bridges, etc.)	Erosion and destabilization of soils	Road planning to follow topography and contour	Before and during the work	Once at the beginning of the project	Control Report of the team planting/Agronomy of SOTRADER	The subcontractor, team HVC, team planting, HSE Engineer of SOTRADER	DGEPN + associated administrations
		The roads to be constructed in perpendicular to the main slope to limit erosion	During the work	Continuously			
		A road network to be provided to the sub-contractor. Their work will need to be regularly monitored to ensure compliance with the plan of work.	During the work	Once at the beginning of the project			
		The profile of the roads will normally cover between 2% and 5%, and ditches will be established ease flow of storm water	During the work	Continuously			
		Protection of slopes above 20°	During the work	Continuously			

Physical environment	In areas of high erosion risk, settling ponds/infiltration will be put in place along the tracks, especially toward the low points before discharge to the river	During the work	Continuously		
	Clearing of settling ponds will be carried out regularly	Throughout the project	Continuously	Control Report of the team planting/Agronomy of SOTRADER	The subcontractor, team HVC, team planting, HSE Engineer of SOTRADER
	Road maintenance will be the priority because it will reduce 95% the erosion that to be generated (Burroughs & King, 1989). Ideally, a layer of laterite will be covered during the dry season	During the work	Continuously		
	Regular monitoring of truck (in dry season)	Throughout the project	Continuously		
	Permanent building such as office and housing to be equipped with one or more of the settling ponds/infiltration	Throughout the project	Continuously		DGEPN + associated administrations

Human environment	LOCAL COMMUNITIES	Construction of infrastructure (Pollution, sedimentation and clogging of water courses, ponds, lakes used by the villages	Consider hydrology during design of infrastructure	During the work	Continuously	Report of control of the Environment Team of SOTRADER	Responsible Sustainable Development (CRS managers) of SOTRADER; Team HVC of SOTRADER; Team; social mapping team; representatives of the villages	DGEPN + associated administrations
				Establish ditches and bund along the road to avoid sedimentation	During the work	Continuously			
				Avoid direct diversion of ditches into the rivers	During the work	Continuously			
				Avoid accidental spillage of hydrocarbons, waste oils or other pollutants into streams, ponds, lakes	During the work	Continuously			
		Improvement of the access conditions of villages and facilitated their access to basic infrastructure (positive impact)	Rehabilitate basic infrastructure in the villages affected (schools, dispensaries, lighting, village hydraulic) depending on the need and in agreement with the communities through FPIC	During the work	Continuously	Reports of control of Social teams of / environment/ mapping of SOTRADER			
	Facilitate access to school and health care facilities		During the work	Continuously					
	Regularly maintenance of the secondary		Throughout the project	Continuously					

	roads (national roads being the responsibility of the State).					
	Allow access to the populations for their village activities through approved process	Throughout the project	Continuously			
	Develop partnerships with the administrations concerned (assignment of personnel, the distribution of medicines, opening of ATMS CNAMGS)	Throughout the project	Continuously			
Traffic accident on the national road (Mouila-Ndendé-Tchibanga) and periphery road (Ndendé-Lébamba)	Clear sign on the access into the plantation	During the work	Continuously	Report of control of the Environment Team of SOTRADER		
	Establish stop sign near road intersection	During the work	Continuously			
	Apply security control	During the work	Continuously			
Reduce unemployment (positive impact)	Establish a hiring policy that promotes recruitment of local population	During the work	Continuously	Number of local employees	Hrd SOTRADER	DGEPN + associated administrations

		SOTRADER should make available in each village the list of jobs to be filled or its needs in subcontracting through its social service team and ensure training of supervisor to enhance skills level	During the work	Once at the beginning of the project	List of jobs posted in the village		
		Train national workforce for following activities (road construction and maintenance, harvesting and transportation of FFB)	During the work	Continuously	Number of person retained; Fact Sheets of presence in training sessions		
		SOTRADER should prioritize food produced locally (cassava, banana, etc.) that could bring additional income to the communities	During the work	Continuously	Contracts for the purchase of local products with the populations		
Construction of infrastructure (roads, bridges, base-life, etc.)	Tangible risks	Ensure that the staff is qualified to operate equipment (bulldozer, grader, tractor, crane, etc.) or any other equipment	During the work	Continuously	Certificate of fitness to drive gear	Sub-contractors, HSE and HRD of SOTRADER	DGEPN + associated administrations

Human environment	The Workers	Construction of infrastructure (roads, bridges, base-life, etc.)	Tangible risks	Control speed limit at 40 km/h inside of the field.	During the work	Continuously	Register of accident	Sub-contractors, HSE and HRD of SOTRADER	DGEPN + associated administrations
				Establish speed limit signs at strategic locations	During the work	Continuously	Register of accident		
				Perform speed controls	During the work	Continuously	Register of accident		
				Vehicle maintenance	During the work	Dry season	Register of accident		
				Avoid transport movement at night	During the work	Continuously	Report of control of the Environment Team of SOTRADER		
				Driving under influence of alcohol and drugs are strictly prohibited	During the work	Continuously			
				Provide severe penalties for offenders	During the work	Continuously			
Maintenance of Nurseries									
Physical environment	SURFACE WATER AND GROUNDWATER	Maintenance of nurseries	Pollution of surface water and groundwater	Implement IPM to minimize chemical usage	During the operation of nurseries	Continuously	Control Report agronomists	Regional Manager; Responsible nurseries; HSE team, engineers, agronomists of SOTRADER	DGEPN + Administrations concerned
				Ensure that SOTRADER will follow a policy to minimize or even substitute completely the use of pesticides (insecticides, fungicides and	During the operation of nurseries	Continuously	Control Report agronomists		

herbicides), inter alia, train employees on IPM

Maintain buffer on both sides of water courses, but also around othr watershed in order to minimize chemicals runoff into surface water and groundwater around the nurseries (See procedure for the Management of Wetlands)	During the operation of nurseries	Continuously	Report of control of the Environment Team of SOTRADER
Manage waterway on bare soil (ditches and settling ponds)	During the operation of nurseries	Continuously	Number of ditches put in place
Train manuring workers on fertilizer application	During the operation of nurseries	Continuously	Fact sheets of formations and number of outreach meetings
Monitor water quality near to nurseries	During the operation of nurseries	Once a Year	Records of analysis of the waters
In case of significant degradation of waters, consider reduce nursery size and/ or provide other sustainable solution	During the operation of nurseries	Continuously	Report of control of the Environment Team of SOTRADER

	Establish retention tank to avoid oil leakage	During the operation of nurseries	Continuously	Report of control of the Environment Team of SOTRADER		
Quantitative impact of nurseries on surface waters	Respect a reserved flow equal to 1/10th of the average five-years capacity	During the operation of nurseries	Continuously	Report flow measurements	Regional Manager; Responsible nurseries; HSE team, engineers, agronomists of SOTRADER	DGEPN + Administrations concerned
	Perform flow monitoring of the initial state to measure flow of the river Dola downstream at the two pumping stations (measuring point Q7 of the initial state)	During the operation of nurseries	Once a month	Report flow measurements		
	Install a volumetric meter on the two pumping stations at the nurseries in order to quantify the volume of water collected on a monthly basis	During the operation of nurseries	Continuously	Report of volume measures collected		
	In order to optimize the watering of the nursery and limit water wastage, it is desirable (if affordable for the proponent) to opt for a drip watering system	During the operation of nurseries	Continuously	Control Report agronomists		

	Consider another water resource to ensure irrigation needs of the nursery (example: drilling) if to maintain minimum flow at end of dry season	During the operation of nurseries	Continuously	Control Report agronomists
Maintenance of nurseries	Provide for the storage of pesticides and fertilizers within an enclosed buildings with a concrete sealed floor in order to avoid any contamination of chemical product to soils	During the operation of nurseries	Continuously	Report of control of the Environment Team of SOTRADER
	Pesticides must be stored according to the recommendations of the FAO (Article 10, International Code of conduction the Distribution and Use of Pesticides, 2002) and the recommendations of the Toxicological sheets of the INRS for each pesticide	During the operation of nurseries	Continuously	Report of control of the Environment Team of SOTRADER
	Train sprayers Regularly check on the doses and concentrations recommended by the manufacturer	During the operation of nurseries	Continuously	Fact sheets of training in methods of spreading of products
	Avoid chemical spraying before rain	During the operation of nurseries	Continuously	Control Report agronomists

			Make an monitoring on soil quality	During the operation of nurseries	Once a Year	Records of analysis of soils			
			Implement IPM to minimize chemical usage	During the operation of nurseries	Continuously	Control Report agronomists			
			Ensure that SOTRADER will follow a policy to minimize or even substitute completely the use of pesticides (insecticides, fungicides and herbicides), inter alia, train employees on IPM	During the operation of nurseries	Continuously	Control Report agronomists			
	Maintenance of nurseries	Erosion and destabilization of soils	Put in Place a drip system to minimize the soil leaching during the dry season (period of irrigation), if this measure is affordable.	During the operation of nurseries	Continuously	Control Report agronomists	Regional Manager; responsible for nurseries, HSE Manager	DGEPN + Administrations concerned	
			Put in place of the ditches to collect run off from nurseries	During the operation of nurseries	Continuously	Number of ditches put in place			
Human environment	Local communities	Maintenance of nurseries	Pollution of rivers and direct or indirect contamination of food sources (fish, animals, plants) by the phytosanitary products, fertilizers , and domestic waste	Provide for the storage of pesticides and fertilizers within an enclosed buildings with a concrete sealed floor in order to avoid any contamination of chemical product to soils	During the operation of nurseries	Continuously	Fact sheets of training in methods of spreading of products	Agronomic team; responsible sustainable development (CRS managers) of SOTRADER; HSE team; responsible for the nurseries of SOTRADER; HVC Teams	DGEPN + Administrations concerned
				Implement mitigation actions to reduce impact of nurseries on surface waters and	During the operation of nurseries	Continuously	Report of control of the Environment Team of SOTRADER		

groundwater and the biodiversity

Put in place of techniques for integrated production. It is a farming system that optimizes use of natural resources and reduce pollutants inputs (IOBC 2004)	During the operation of nurseries	Continuously	Technique of integrated production put in place
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Apply composting, biological control and mechanical weed control in nurseries	During the operation of nurseries	Continuously	Control Report agronomists
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Create ecosystem that avoid pollution e.g. planting of bamboos (to strengthen forests),	During the operation of nurseries	Continuously	Report of control of the Environment Team of SOTRADER
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Establish latrines in the nursery and create awareness among nurseries workers on contamination (including near the rivers).	During the operation of nurseries	Continuously	Report of control of the Environment Team of SOTRADER
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The reduction of unemployment (positive impact)	Establishment of a hiring policy that promotes recruitment	During the operation of nurseries	Continuously	Number of local employees	Hrd SOTRADER	DGEPN + Administrations concerne
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priority villages
(communities with
high impacts)

SOTRADER should make available in each village the list of jobs to be filled or its needs in subcontracting through its social service team and ensure training of supervisor to enhance skills level

During the operation of nurseries

Continuously

List of jobs posted in the village

Train national workforce for following activities (road construction and maintenance, harvesting and transportation of FFB)

During the operation of nurseries

Continuously

Number of person retained; Fact Sheets of presence in training sessions

SOTRADER should prioritize food produced locally (cassava, banana, etc.) that could bring additional income to the communities

During the operation of nurseries

Continuously

Contracts for the purchase of local products with the populations

The Workers	Maintenance nurseries)	Impact of the application of pesticides on the health of workers	Train sprayers and ensure application according to dosage recommended by manufacturers	During the operation of nurseries	Continuously	Fact sheets of training in methods of spreading of products	HSE; Sotrader HRD	DGEPN + Administrations concerned
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			Distribute appropriate PPE adapted to each type of products (for example: protective gauge, boots, covered by the overalls, etc.)	During the operation of nurseries	Continuously	Number of Person with of PPE			
			Prohibit pregnant or breast feeding women on chemical spraying	During the operation of nurseries	Continuously	Pictograms of prohibition to pregnant women in the work of pesticide application			
			Regular medical check-up for sprayers	During the operation of nurseries	Continuously	Number of medical visit			
Maintenance of Plantations and Harvesting									
Physical environment	SURFACE WATER AND GROUNDWATER	Plantation Maintenance and harvesting	Pollution of surface water and groundwater	Apply composting and reduce chemical use	During the operation of plantations	Continuously	Control Report agronomists	Agronomic team; responsible sustainable development (CRS managers); Team; HSE Manager planting of SOTRADER	DGEPN + Administrations concerned
				Ensure that SOTRADER will follow a policy to minimize or even substitute completely the use of pesticides (insecticides, fungicides and herbicides), inter alia, train employees on IPM	During the operation of plantations	Continuously	Control Report agronomists		
				Monitor quality of ground and surface water	During the operation of plantations	Once a Year	Records of analysis of the waters		

			In case of significant degradation of water quality, consider reduce planting size and/ or provide other environmental solution	During the operation of plantations	Continuously	Report of control of the Environment Team of SOTRADER		
			Establish waste management plan and landfill shall be subjected to technical inspection	During the operation of plantations	Continuously	Report of control of the Environment Team of SOTRADER		
The Soil	Plantation Maintenance and harvesting;	Soil pollution	Provide for the storage of pesticides and fertilizers within an enclosed buildings with a concrete sealed floor in order to avoid any contamination of chemical product to soils	During the operation of plantations	Continuously	Report of control of the Environment Team of SOTRADER	Agronomic team; responsible sustainable development (CRS managers); Team; HSE Manager planting of SOTRADER	DGEPN + Administrations concerned
			Pesticides must be stored according to the recommendations of the FAO (Article 10, International Code of Conduct on the Distribution and Use of Pesticides, 2002) and the recommendations of the Toxicological sheets of the INRS for each pesticides	During the operation of plantations	Continuously	Report of control of the Environment Team of SOTRADER		
			Prepare absorbent product (sawdust or absorbent gel) to allow residues in the event of a leakage	During the operation of plantations	Continuously	Number of absorbent products made available		

				Train sprayers and ensure application according to dosage recommended by manufacturers	During the operation of plantations	Continuously	Fact sheets of training in methods of spreading of products		
				Avoid chemical spraying before rain	During the operation of plantations	Continuously	Control Report agronomists		
				Apply composting and reduce chemical use	During the operation of plantations	Continuously	Control Report agronomists		
			Accidental spills of oil or other products pollutant	Storage of hydrocarbon shall meet QEHS standard	During the operation of plantations	Continuously	Type of vats used		
				Train workers on transfer and transport of chemical. PPE shall be provided	During the operation of plantations	Continuously	Fact sheets of training in methods of destuffing		
				Equip unloading area with retention tank	During the operation of plantations	Continuously	Visual observation; HSE report		
Physical environment	SOIL	Accidental spills of oil or other polluting products, plastic pollution and household waste	Soil pollution	Carry out maintenance of retention tank. These areas should not locate within 100 m of any river	During the operation of plantations	Continuously	Report of control of the Environment Team of SOTRADER	Agronomic team; responsible sustainable development (CRS managers); Team; HSE Manager planting of SOTRADER	DGEPN + Administrations concerned
				Prohibit smoking in the vicinity of storage facilities and fuel station	During the operation of plantations	Continuously	Pictograms prohibiting smoking on the places of storage		
				Put in place a functional fire extinguisher in order to prevent any fire	During the operation	Continuously	Number of fire extinguishers on site		

				of plantations				
			Provide anti spill kit at strategic location (workshop, storage tank etc.) These kit could include absorbent, waterproof bags to isolate contaminated soil	During the operation of plantations	Continuously	Purchase Invoice; number of kits available on the site		
			Establish waste management plan and landfill shall be subjected to technical inspection	During the operation of plantations	Continuously	Report of control of the Environment Team of SOTRADER		
	Plantation Maintenance and harvesting	Nutrient input to the soil in Savannah (positive impact)	Train manuring workers	During the operation of plantations	Continuously	Fact sheets of training in methods of spreading of products	Agronomic team; responsible sustainable development (CRS managers);	DGEPN + Administrations concerned
			Adopt regulatory measures on the effective conditions for fertilizer application	During the operation of plantations	Continuously	Type of regulatory measures used	Team; HSE Manager planting of SOTRADER	
AIR	Plantation Maintenance and harvesting;	Pollution of the air by aerosols and GHG emissions and dust	Train manuring workers	During the operation of plantations	Continuously	Fact sheets of training in methods of spreading of products	Agronomic team; responsible sustainable development (CRS managers);	DGEPN + Administrations concerned
			Adopt regulatory measures on the effective conditions for fertilizer application	During the operation of plantations	Continuously	Type of regulatory measures used	Team; HSE Manager planting of SOTRADER	

Movement of vehicles, trucks and construction equipment

Innovate and research on nitrogenous fertilizers (responsible for release of N ₂ O and phytosanitary products, their adaptation and their ownership by the workers)	During the operation of plantations	Continuously	Control Report agronomists
Focus on a manual application for phytosanitary products, rather than by tractor	Operating phase of plantations	Continuously	Control Report agronomists
Equip the operators of adequate PPE	During the operation of plantations	Continuously	Number of persons using the PPE
Identify solution and replacement of harmful chemical	During the operation of plantations	Continuously	Control Report agronomists
Regular maintenance of trucks and vehicles in order to limit GHG emissions	During the operation of plantations	Once a month	Maintenance Service Booklet
Control speed limit at 40 km/h inside of the field.	During the operation of plantations	Continuously	Number of panels to speed limitation installed
Establish speed limit signs at the main entries and sites and their access routes	During the operation of	Continuously	Visual observation; HSE report

			Spray water (if necessary) along the tracks to the areas of work in order to minimize the quantities of dust in the air	During the operation of plantations	Dry season	Visual observation; HSE report			
			Maintain forested areas and the habitat areas	During the operation of plantations	Continuously	The presence of wooded areas			
Biological environment	Biodiversity	Plantation Maintenance and harvesting	Disturbance of Biodiversity (terrestrial, aquatic and avian)	Apply all recommended measures for biodiversity in nurseries	During the operation of plantations	Continuously	Report of control of the Environment Team of SOTRADER	Agronomic team; responsible sustainable development (CRS managers); Team; HSE	DGEPN + Administrations concerned
				To responsibly manage the inputs and observe buffer zones	During the operation of plantations	Continuously	Quantity of inputs used; marking of buffer zones	Manager planting; Sotrader	
				No hunting policy in the concession by workers and subcontractors. Members of cooperatives and villagers will have traditional rights to hunt in according to local regulation, outside of their working hour. Information on related law and workers safety shall be disseminated.	During the operation of plantations	Continuously	Policy put at the disposal of employees		
				Inform workers of the no hunting policy severe sanctions to be applied for offenders	During the operation of	Continuously	Number of outreach sessions		

				plantations					
			Regular monitoring of water quality to identify bioaccumulation of chemical along food chain (fish)	During the operation of plantations	Once a Year	Records of analysis of waters; results of the monitoring of pesticides in fish			
			Annual soil monitoring	During the operation of plantations	Once a Year	Records of analysis of soils			
			Encourage IPM for rodent control	During the operation of plantations	Continuously	Report of control of the Environment Team of SOTRADER			
			Vehicle maintenance to reduce noise and other pollution	During the operation of plantations	Once a month	Maintenance Service Booklet			
Human environment	Local communities	Plantation Maintenance and harvesting	Pollution of rivers, contamination of food sources (fish, animals, plants) and increase pressure on water	Train sprayers	During the operation of plantations	Continuously	Fact sheets of training in methods of spreading of products	Agronomic team; responsible sustainable development (CRS managers); Team; HSE Manager planting; Sotrader	DGEPN + Administrations concerned
				Regularly check on the doses and concentrations recommended by the manufacturer					
			Install a volumetric meter on the two pumping stations at the in order to quantify the volume of water collected on a monthly basis	During the operation of plantations	Once a month	Report of measures of debits			

		resources		ns						
				Diversify water sources because population increase will create higher water demand	During the operation of plantations	Continuously	Number of drilling made available to workers and of the riparian populations			
Human environment	Local communities	Plantation Maintenance and harvesting	Conflicts SOTRADE R workers/ members of cooperatives and local populations related to recruitment and the presence of non local workforce	Regulate the use of forest resources for its employees and members of cooperatives (prohibition to hunt, to practice agriculture, the Artisanal sawing in the terroir of the villagers) - management arrangements to determine through the FPIC	During the operation of plantations	Continuously	Policy of prohibition of hunting provision of employees	Agronomic team; responsible sustainable development (CRS managers); Team; HSE Manager planting; Sotrader	DGEPN + Administrations concerned	
				Establish access system to areas for hunting and fishing, for example, for Aboriginal people	During the operation of plantations	Continuously	Number of cards made available to Aboriginal people			
				Propose awareness campaigns on the IST (AIDS) and sexual risk behaviors	During the operation of plantations	Continuously	Rendering accounts of outreach meetings			
				Reduction of unemployment and the emergence of a new class of agricultural entrepreneurs	Establishment of a recruitment policy that promotes local recruitment from villages (communities with high impacts)	During the operation of plantations	Continuously	Number of local employees	Hrd; Social Team	DGEPN + Administrations concerned
					Training supervisor to enhance workers/ skills	Operating phase of plantations	Continuously	Fact sheets of training maneuvers		

eurs (positive impact)	Make attractive jobs (contracts to indeterminate, wages, respecting the legal requirements, social benefits such as the transport of the children of the employees attending the College and residents	During the operation of plantations	Continuously	The benefits available to employees
	Perpetuate and secure the jobs until retirement	Operating phase of plantations	Continuously	Type of contract signed
	Ensure the training and a career plan for workers	During the operation of plantations	Continuously	Fact sheets for the training of workers
	To mentor and train the members of cooperatives	During the operation of plantations	Continuously	Fact sheets for the training of the members of the cooperatives
	Provide operating materials and housing to each co-operative according to the Approvals-framework of the SOTRADER, benefits in the form of allowance and loan will be specified in detailed contracts as well as the period and the nature of refunds for investment for the benefit of cooperatives	During the operation of plantations	Continuously	Material made available to the co-operatives, contracts and commitments, documentation of the financing of co-operatives
	Ensure purchase of co-op products	Operating phase of	Continuously	Repurchase agreement signed with the

				plantations		co-operatives		
The Workers	Plantation Maintenance and harvesting	Personal injury accidents and the impact of the application of pesticides on the health of workers	Ensure workers are properly trained, for the handling of equipment and FFB harvesting	During the operation of plantations	Continuously	Certificate of fitness to drive certain gear	Agronomic team; responsible sustainable development (CRS managers); Team; HSE Manager planting; Sotrader	DGEPN + Administrations concerned
			Provide appropriate PPE to workers and PPE must be replenished.	During the operation of plantations	Continuously	Number of person wearing of PPE		
			Access to the site will be prohibited to any person without PPE.	During the operation of plantations	Continuously	Report of control of the Environment Team of SOTRADER		
			Train sprayers	During the operation of plantations	Continuously	Fact sheets of training in methods of spreading of products		
			Regularly check on the doses and concentrations recommended by the manufacturer					
			Distribute appropriate PPE adapted to each type of products (for example: protective gauge, boots, covered by the overalls, etc.)	During the operation of plantations	Continuously	Number of people with the EPI		
Prohibit pregnant or breast feeding women on chemical spraying	During the operation of plantations	Continuously	Pictograms of prohibition to pregnant women in the work of pesticide application					

Physical environment	Soils/surface water and ground water	Operation of the bases-life and of co-operatives	Pollution of soil and water	Regular medical check-up for sprayers	During the operation of plantations	Continuously	Number of medical visit	Agronomic team; responsible sustainable development (CRS managers); Team; HSE Manager planting; Sotrader	DGEPN + associated administrations
				Put a plan for waste management for domestic waste by workers and cooperatives members	At the beginning of the project	Once at the beginning of the project	Waste management plan put in place		
				Place garbage containers on the site	Throughout the project	Continuously	Visual observation; number of bins provision of workers		
				Build septic tank to avoid water contamination	During the operation of the bases-life and the villages of co-operatives	Continuously	Visual observation; number of septic tanks built		
				Ensure maintenance of these septic tank (which sedimented in the form of sludge)	During the operation of the bases-life and the villages of co-operatives	Continuously	Visual observation; number of septic tanks built		

			Prohibit the discharge directly into water course	During the operation of the bases-life and the villages of co-operatives	Continuously	Visual observation; number of septic tanks built	
			Establish waste management plan and landfill shall be subjected to technical inspection	During the operation of the bases-life and the villages of co-operatives	Continuously	Visual observation; number of septic tanks built	
Biological environment	Biodiversity	Operation	Impact on biodiversity	Prohibit the hunting of workers in the concession and define the sanctions including dismissal for offenders	Throughout the project	Continuously	Policy of prohibition of hunting provision of employees and members of cooperatives
				Members of cooperatives and villagers will have traditional rights to hunt in according to local regulation, outside of their working hour..	Throughout the project	Continuously	Report of control of the Environment Team of SOTRADER

	Inform workers and cooperative members on the Gabonese regulation related to hunting and fishing, Increase awareness on protected species by Gabonese law or at international level (CITES Species, IUCN Red List, etc.)	Throughout the project	Continuously	Record of Meeting of Awareness
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9. INTERNAL RESPONSIBILITY

This document is the summary of SEIA (Social and Environmental Impact Assessment) and HCV (High Conservation Value) assessments for the 58,400 hectare in proximity to Ndende Town proposed for development of oil palm plantations by Sotrader and has been accepted by the Management of Sotrader. We the undersigned accept responsibility for the assessments and summary.

Signed on behalf of SEIA assessors
Terea, Gabon



Signed on behalf of HCV Assessors
Proforest Ltd, UK

Audrey Versteegen, Lead Assessor

Signed on behalf of Sotrader

Head – Environment and Sustainability, Olam Gabon
Christopher Stewart

CRS Manager Plantations/ Directeur CRS
Olivier Desmet

Signed: June 2016