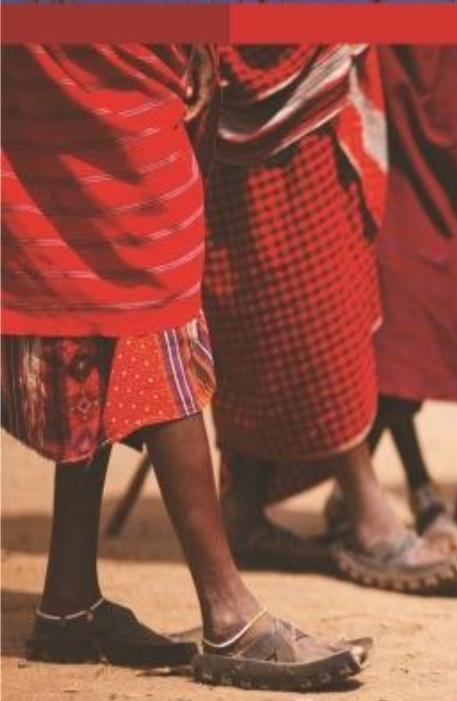


DIGBY WELLS
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Feronia Environmental and Social Assessment

Summary Report

Project Number:

CDC2950

Prepared for:

Feronia Inc

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1 Introduction

This report presents a summary of the environmental and social assessment (ESA) undertaken by Digby Wells to identify the risks and impacts associated with the rehabilitation of three oil palm plantations (Lokutu, Yaligimba, and Boteka), in the Democratic Republic of Congo (DRC). The plantations are owned and operated by Feronia Plantations et Huileries du Congo (PHC, Feronia or the Company) and were acquired in September 2009. The plantations, which date back over one hundred years, were previously owned by Unilever and were in a neglected state when Feronia acquired them.

The scope of the ESA report relates to the biophysical and socio-economic environments and potential impacts subsequent to Feronia taking ownership (as these are the current conditions and impacts associated with the proposed rehabilitation and modernisation of the plantations). In terms of context, Feronia has had to manage many legacy issues which the Company inherited as part of the long history of the plantations and the turbulent political events that have affected the DRC, particularly since independence in 1960. The plantations have been in continuous operation since they were established, albeit at sub-optimal levels over the last few decades.

The structure of the summary report is as follows:

- Section 1: Introduction and Background;
- Section 2: Project Description;
- Section 3: International Standards, Legislation and Policies;
- Section 4: Socio-economic Assessment;
- Section 5: Biophysical Studies; and
- Section 6: Conclusions and Recommendations.

The full reports for the socio-economic and biophysical studies are presented in Volumes 2 and 3.

1.1 Project Background

The Feronia Project comprises the rehabilitation and operation of plantations and associated infrastructure (e.g. roads, mills, staff housing, and offices). Boteka was established in 1911, Lokutu in the 1920s, and Yaligimba in the early 1930s. Thus, the original vegetation and forested areas were disturbed and heavily impacted on over 100 years ago when Lever Brothers established its business. Feronia will only be operating in areas that have already been disturbed by these previous operations (i.e. this is a “brownfield” project).

The concession areas cover a total area of approximately 107,000 hectares (ha), of which Lokutu, located within the Orientale province is 63,500 ha, Yaligimba, located within the Equateur province, is 30,199 ha, and Boteka, also located in the Equateur Province, is 13,542 ha.

The principal palm oil products are crude palm oil (CPO) and palm kernel oil (PKO). CPO and PKO are sent by barge from the plantations to Kinshasa where it is bought by local refineries; all the oil produced is currently for consumption within the DRC.

Since acquisition of PHC, Feronia has committed to a number of initiatives which apply to all three plantations (e.g. achieving Roundtable on Sustainable Palm Oil (RSPO) certification in 2017).

Feronia is focussing on the rehabilitation and replanting of the existing plantations and does not intend to extend into previously unplanted areas of the concessions (i.e., re-planting / plantation development and management will only occur on area that have previously been cleared and planted). The Company is tackling the rehabilitation project by initiating:

- Short-term objectives: re-establish business operations to a profitable and sustainable level and securing jobs for the existing workforce and employment opportunities within the wider communities, Commissioning environmental and social studies including this assessment (i.e., a High Conservation Value (HCV) assessment; qualitative air and noise assessments; review of waste water treatment options; and a social assessment); implementing an environmental and social action plan (ESAP); developing a stakeholder engagement plan (SEP); developing a community development plan (CDP); and re-planting specific areas of the plantations.
- Medium- to long-term objectives: refurbishing the mills; increasing plantation productivity, upgrading buildings; improving/building infrastructure; and implementing effective stakeholder engagement across the whole operation.

The Company has established a management team that has a shared vision and the experience to turn plans into actions. A significant factor associated with the new ownership is that Feronia has secured long-term jobs for in excess of 3,500 employees with the attendant multiplier effect on the local economy.

1.2 Palm Oil

Palm oil is extracted from the flesh of fruit from the tropical palm, *Elaeis guineensis*. The palms grow in a zone that extends between 10 degrees north and south of the Equator. It is an important and versatile vegetable oil used for cooking or as a raw material for food (e.g. Margarine, biscuits, stock cubes, ice-cream and confectionary), and non-food uses (e.g., in soap, cosmetics and biofuels).

Oil palm trees can grow up to a height of 20 m and have an average economic life of 25 years. Trees start to bear fresh fruit bunches (FFBs) after three years. Palm fruits can be harvested throughout the year; yields improve as trees mature and their peak productivity is between eight and fifteen years. On average each tree can produce 10 tonnes of FFB per ha; from these FFBs an average of 2.1 tonnes of CPO and 0.15 tonnes of PKO can be extracted. CPO is extracted from the fruit while PKO is extracted from the nut or kernel.

Palm oil requires 10 times less land than other oil-producing crops (greenpalm.org). Pulp left over from processing, palm kernel cake or expeller, can be used as animal feed or fertiliser, and as biomass.

1.3 Feronia

Feronia Inc. is a large-scale oil palm and farming business, was founded in 2008 and is the parent company of Feronia PHC. The vision of Feronia Inc. is to unlock the agricultural potential of Africa using modern technology and good practices that are suited to local conditions.

Key members of Feronia's management team include Chairman (Ravi Sood); Chief Executive Officer (Xavier de Carniere); Chief Operating Officer (Raymond Batanga); Chief Financial Officer (David Steel) and Human Resources Director (Sherree Schaefer); and Environmental, Social and Governance (ESG) Director: (Pierre Bois d'Enghien).

Since 2008 to the present, Feronia Inc. has raised money to undertake and initiate projects, for both the agricultural and oil palm businesses; key projects include:

- 16,633 ha of oil palms have been replanted;
- Two palm oil mills have been reconditioned and a new mill has been built following decommissioning of the old mill;
- Vehicles, plant equipment, tools and machinery have been bought;
- Over 3,500 direct jobs have been secured for the long term and there are indirect economic and social benefits for surrounding communities which are estimated to be approximately 98,000 people (living on and within 5km of the concessions);
- An ESAP has been implemented to address immediate environmental, social and governance priorities;
- A programme of repairing and rebuilding social infrastructure has commenced (e.g., roads, sanitation, boreholes, housing, schools, hospitals and clinics);
- Preparation for RSPO certification; and
- The Company has re-established production and sale of palm oil into the domestic market; in 2014 13,500 tonnes of crude palm oil (CPO) and 840 tonnes of palm kernel oil (PKO) was sold.

1.4 Scope of Work and the Environmental and Social Assessment

An E&S scoping exercise was undertaken and completed in 2014, as phase 1 of an ESA of the three plantations (Phase 1).

Subsequently, Digby Wells Environmental (Digby Wells) was appointed by Feronia to undertake Phase 2 comprising baseline studies and an impact assessment, as follows:

- A social assessment (Volume 2). The key objectives were to undertake a baseline study to international standards in order to:
 - conduct a community needs assessment;
 - identify social risks and impacts;
 - recommend measures to ameliorate negative impacts and enhance positive ones;
 - compile a plan according to which engagement with stakeholders can take place; and
 - compile a plan that can guide community development efforts.
- An HCV assessment of the planted areas and wider areas within the concessions (e.g., wildlife corridors) that will assist Feronia plan future replanting; to identify the local biodiversity (e.g., secondary forest, invasive species) and to meet the requirements of the RSPO (Volume 3);
- Qualitative air and noise assessments (Volume 4); and
- Waste water management options to determine impacts and management of emissions from the mills (Volume 4).

All specialist studies followed standard internationally accepted methodology (i.e., desktop reviews of available information supplemented by field studies). During the visit to site, the social team gathered information through conducting a household survey, and from meetings and interviews with communities and other interest groups, including chiefs, local community representatives, women, the youth, government representatives, plantation management and union representatives. Further details are set out in Appendix A.

1.4.1 The Scoping Phase

The scoping phase for the project, undertaken by Feddersen (2014), included preparation of the Terms of Reference (ToR) for the ESA studies which would enable Feronia to meet the requirements of the RSPO. Consideration was also given to the requirements of current and potential investors.

The outcomes and findings of the scoping phase (Phase 1) were consolidated into a report:

- To present Feronia operations to interested and affected parties (I&APs) and gather feedback to inform and focus studies in Phase 2;
- To identify issues and concerns raised by I&APs; and
- To define environmental and social issues requiring additional investigation during Phase 2.

2 Project Description

Feronia is operating the project as a brownfield operation with no deforestation or resettlement of communities.

2.1 Project Motivation

The demand for palm oil has been increasing since the 1960s resulting in annual production growth of approximately 8% per annum; much of the demand can be attributed to population growth, increased consumption (per capita), and industrial use. Currently India, Indonesia, and China are the largest consumers of palm oil but the demand in Africa is growing and is likely to continue (based on population increase and rising per capita income). Palm oil is the cheapest of vegetable oils hence the world demand.

Due to the specific growing requirements of oil palm, plantations can only be established in tropical countries that are between 10 degrees north and south of the Equator and have a minimum rainfall of 1,600 mm per annum. Rapid expansion of oil palm plantations in many areas (especially in Asia) has resulted in a range of environmental and social impacts, particularly the loss of tropical moist forest / biodiversity, and impacts on local communities and forest dependent people. In the case of Feronia, rehabilitation is based on the re-establishment of existing plantation areas, new planting of oil palm on former plantation areas that had become overgrown during the past 20 years as well as the rehabilitation of dilapidated infrastructure.

The net result of this is that:

- Production of palm oil from Feronia plantations will help to fulfil demand for cheap vegetable oil in the DRC;
- Significant employment and economic benefits on a local, regional, and national scale (job security, multiplier effect, and reduced need for imports);
- No previously unplanted areas will be cleared; and
- Updating infrastructure and implementing modern operational methods will increase production compared to historical methods.

2.2 Project Setting and Climate

The DRC straddles the Equator, between 6°N and 14°S, and longitudes 12° and 32°E and therefore portions of the country are ideally suited for the palm oil sector. The DRC is approximately 2,3 million km², of which 77,810 km² is water; it is the largest country in Sub-Saharan Africa (www.cia.gov). The capital is Kinshasa which has a population of 11 million; the official language of the DRC is French.

The DRC has a tropical climate which is hot and humid in the equatorial river basin (where the plantations are located), and is cool and dry in southern highlands. It has an average temperature of 24°C, an average precipitation 1,646 mm of rainfall per year and is characterised by subtropical moist forest (www.dr-congo.climatemps.com). The wet season

lasts from April to October and the dry season from December to February (climatezone.com).

Specifically, the DRC is highly conducive to the growing oil palms in terms of climate. There are 2,000 hours of sunshine per year and precipitation in the Feronia plantations is approximately 2,000 mm which falls over eight months of the year. All three plantations have sufficient rainfall to be productive.

2.3 Background and History

The company that was founded in 1911 as Huileries du Congo Belge (HCB) became one of the biggest private sector employers in Africa. Its core business was supplying edible oils and agricultural products. The company operated from Belgian rule to independence; it changed its name to Plantations Lever au Zaire (PLZ) in 1960 when the country became the République du Zaire, and then to Plantations et Huileries du Congo Sarl (PHC) in 1997 when the country became the DRC.

The government granted Unilever long-term leases on the land. Due to civil instability during the 1990s and 2000s, investment in the plantations and infrastructure was minimal so they deteriorated. Thus, when Feronia acquired the plantations in 2009, they were in poor condition, and production capacity was significantly reduced from peak production.

Since independence in 1960, the DRC has had a turbulent history which has resulted in direct impacts on the broad environment (both physical infrastructure and communities) at each of the plantations. The populations were subject to disease, starvation, isolation as a result of conflict and the breakdown of infrastructure (Lokutu and Yaligimba were both over-run by rebel factions for periods of the civil war) and a much depleted public sector. Communities have lived through cycles of peace and war followed by recent peace which has enabled Feronia to commence the rehabilitation of the plantations.

After the second of the Congo wars a transitional government was established in 2003 and a new constitution was drafted and implemented. Two more democratic elections have taken place and, currently, the country is relatively stable. Economic growth is being driven primarily by exploiting the great mineral wealth by mining. However, poverty is still widespread, public services are under-developed and many communities are unable to engage in trade due to a number of factors (e.g., lack of infrastructure, resources and liquidity). Despite this, the DRC's medium-term economic outlook is positive, promising to be one of the fastest growing in the continent (www.cia.gov).

2.3.1 Legacy Issues

The scoping study determined that the local populations have a positive attitude regarding the rehabilitation of the plantations, with a vision of a return to prosperity and high expectations of economic development. To better understand the expectations of local communities, Digby Wells undertook extensive consultation, specifically 23 individual interviews and 33 focus group discussions (FGDs) during the course of fieldwork in 2014

and 2015 (Appendix A). Each participant /group had the opportunity to voice current and historic opinions and grievances.

Specific legacy issues (and areas that Feronia is working to address) include:

- Poorly maintained housing for workers. Houses were built by the Company's predecessors between the 1930s and 1980s but there has been virtually no maintenance over the last twenty years. Feronia has embarked on a rehabilitation programme of workers' houses.
- Roads surrounding the concessions are degraded and the Congo River continues to be the major access to the plantations. Feronia is implementing a road maintenance programme within the concessions to improve access and safety.
- Healthcare facilities in the study area appear to be well-utilised with more than 80% of people (workers and non-workers) reporting that they had sought treatment at a public health facility in the last year; however, at the time of the survey each hospital needed refurbishment and replacement of medical equipment, some of which was over 50 years old. Since the survey, the Company has completed a hospital refurbishment programme and new hospital equipment has been provided by Project C.U.R.E., a US-based NGO.
- The government and religious organisations provide schooling and employ teachers. Facilities are poor and materials inadequate. The government has made school fees compulsory which has resulted in many families reporting they cannot send all their children to school. Feronia is developing a CDP as part of the ESAP and a part of this is a review of educational facilities within the concessions.
- A legacy of the isolated locations and restricted access to trade during the civil conflict has resulted in an over reliance on ecosystem services, such as timber, fuel (firewood), medicinal plants, and bushmeat. The hunting for bushmeat and logging by local communities has definitely had an impact on the diversity and density of certain flora, mammal and bird species. An education programme to improve agricultural practices and maximise nutritional value from existing farmland will help communities to use available land more effectively and may help to reduce pressure on ecosystem services.
- At the peak of Unilever's operation of PHC, 63 groundwater boreholes provided clean drinking water to the workers and local communities. In 2013 when Feronia conducted a survey, only eight boreholes were operational. A programme of work has subsequently been implemented by Feronia to reinstate the boreholes and provide additional boreholes in local communities.
- Poor communications between communities and the Company are allegedly due to the paternalistic Company culture established over previous decades. It is apparent from the scoping study (Feddersen, 2014) and Digby Wells' meetings that communities (workers and non-workers) are ready to engage with independent consultants and reported a desire to engage with the Company. A SEP has been

developed for Feronia which documents the procedures and actions to be taken by the Company as it engages with and establishes a proactive, two-way communications strategy with communities (Volume 2, Appendix C, Sections 10.3.4 and 10.3.6).

2.4 Current Activities on the Plantations

Upon taking ownership of the plantations, Feronia had to take immediate action to generate revenue so that the Company could survive and provide employment for over 3,500 employees as well as fund environmental and social initiatives. Thus, Feronia prioritised the following tasks:

- Rehabilitation of plantations by replacing old oil palm trees;
- Re-establishing nurseries to grow new trees;
- Restoring and reinstating palm oil mill infrastructure and processing facilities;
- Addressing working conditions and terms of employment (including improving occupational health and safety and salary deficiencies); and
- Initiating a programme to restore critical social infrastructure including worker housing, hospitals and schools.

In November 2013, CDC Group made an investment of USD18.1 million to help Feronia re-establish the business, secure employment and achieve its environmental and social objectives; USD3.6 million of this was assigned to implementing Feronia's ESAP. The ESAP comprises seven topics which include actions, deliverables, roles and responsibilities, timeframes, and costs:

- Personnel;
- Policy;
- Surveys and assessments;
- Management systems;
- Infrastructure;
- Monitoring; and
- Governance.

Importantly, milestones are included which indicate progress towards becoming RSPO certified and onwards on the path to continuous improvement in environmental and social performance.

An ESG Board Committee convenes quarterly to monitor ESAP progress and ESG matters. The Committee includes three company directors with support of environmental and social (E&S) advisors.

2.5 Overview of the Plantations

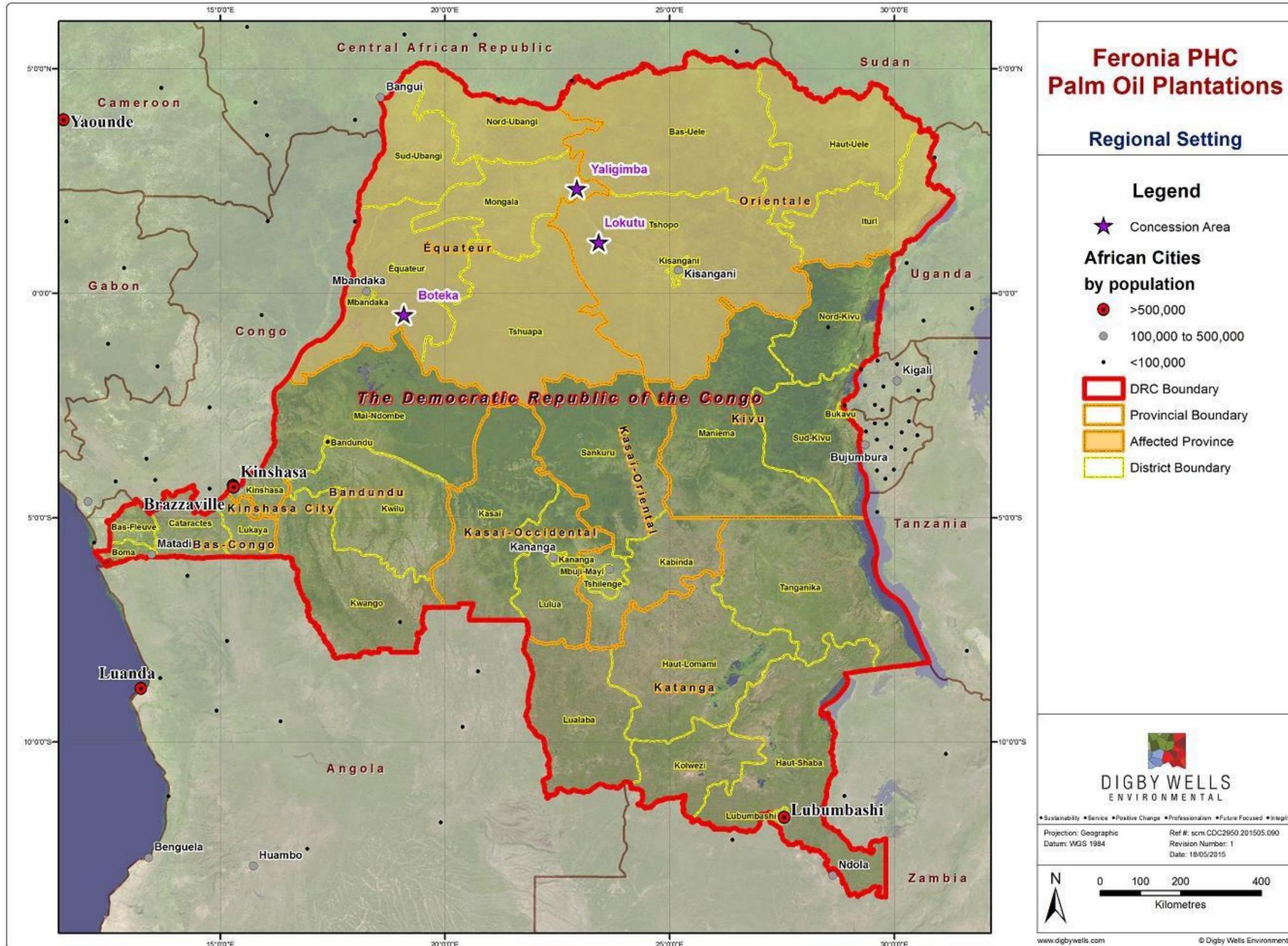
The concessions carry 25-year term rolling leases which are renewed through an administrative process that involves leasing lots; the land is owned by the DRC government.

The three plantations are adjacent to, or in the vicinity of, the Congo River or its major tributaries (i.e. the Momboyo River) (Plan 1).

The mills at the three plantations produce CPO; the mills at Lokutu and Yaligimba also produce PKO. The Yaligimba mill is new (commissioned in 2013) and is a 30 FFB tonne per hour mill. The mills at Lokutu and Boteka are being refurbished and currently have capacities of 15 and 10 tonnes of FFB / hour, respectively. The mills have capacity to produce 52,000 tonnes of CPO but expansion at the end of 2016 will be required; this may be an upgrade, expansion or adding a new mill at Lokutu. The expansion of Yaligimba is anticipated to be required by 2020. It is unlikely that Boteka will need additional capacity.

Increasing capacity of the mills, in future, will be related to the areas that are replanted. Yaligimba can be upgraded to 60 tonnes of FFB per hour in a cost-efficient manner as civil works are already in place.

Each plantation has nurseries where seedlings are grown in preparation for the re-planting programme.



Plan 1: Feronia's Operations in the DRC

The three plantations (total area of approximately 107,000 ha) range from 63,000 ha to 13,000 ha (all areas are currently approximate whilst Feronia undertakes a detailed survey of concessions due for completion in 2016). In November 2015, the three plantations had a total planted area of 24,471 ha of which 13,570 ha were immature palms and 10,901 ha mature producing palms; current plantable reserves amount to 6,338 ha and there remains 76,492 ha of infrastructure, villages, unplanted areas and land subject to further assessment.

Approximate locations and total plantation areas are presented in Table 1.

Table 1: Details of the Concessions

Name	Province	Location	Concession Area (ha)	Planted Area (ha)
Boteka	Equateur	0°23'40.90"S 19°5'39.95"E	13,542	3,668
Lokutu	Orientale	1°8'53.00"N 23°36'46.79"E	63,560	11,727
Yaligimba	Equateur	2°13'29.18"N 22°55'50.68"E	30,199	9,076

The concessions comprise plantations, unplanted reserves, plant nurseries, processing mills, storage facilities, transportation facilities, and associated infrastructure; Yaligimba has a seed research station.

The sites are remote with a shortage of public services for both the local populations and Feronia employees. However, Feronia provides medical facilities and assists with maintenance of educational facilities. Communal assets and structures were recorded during a survey carried out by the Digby Wells social team; these are assets not owned by individuals (Table 2).

Table 2: Community infrastructure recorded at Lokutu, Yaligimba and Boteka (Digby Wells, 2014-2015)

Infrastructure	Lokutu	Yaligimba	Boteka	Total
Church	110	134	46	290
Water source (pumps, standpipes and springs)	61	38	94	193
Primary school	30	30	18	78
Shop	29	9	8	46
Secondary school	19	12	6	37
Cemetery	11	3	20	34
Health centre	16	14	3	33
Dispensary	18	6	4	28
Football field	9	11	6	26
Market	10	9	3	22
Administrative/ office building ¹	11	1		12
Hospital	3	1	1	5
Bar	2	2		4
Crèche	1	3		4
Community hall	3			3
Communal meeting place	1	1		2
Nursery	2			2
Oil tanks		2		2
Old factory	2			2
Police station	1	1		2
Cinema		1		1
Communal social area	1			1
Fuel station	1			1
Fuel tank		1		1
Guesthouse	1			1
Hand pump			1	1

¹ Company and Government owned

Infrastructure	Lokutu	Yaligimba	Boteka	Total
Hotel	1			1
Medical training school	1			1
Mobile phone tower	1			1
Mosque	1			1
Old shop	1			1
Prison		1		1
Radio station (building and infrastructure)	1			1
Traditional palm oil mill	1			1
Workshop	1			1
Total	350	280	210	840

Services available in each settlement (worker and non-worker villages) are presented in detail in Volume 2, Appendix B).

The plantations are located near national roads but journeys by road are slow and present risk due to distances and poor maintenance (there has been virtually no investment in roads in / near the plantations since the mid-1990s). Feronia is able to access the plantations by boat due to their proximity to the Congo River, which overcomes some of the issues of road transportation. The products are transported on barges to Kinshasa where local refineries buy all the products and after refining, the oil is sold for domestic consumption.

2.5.1 The Feronia PHC Operation

The pertinent aspects that apply to future operations at all three plantations are:

- The ongoing oil palm replanting programme will result in 35,000 ha of plantation at peak operations.
- At full production, it is expected there will be a minimum of 500,000 tonnes of FFB and 110,000 tonnes of CPO per annum.
- Three palm oil mills (one at each plantation) will maintained to ensure sufficient capacity once the plantations are fully planted.
- Achievement of RSPO Certification.

3 Legislation, International Standards and Policies

In terms of legislation, standards and policies, Feronia's aim is not only to maintain compliance with legal requirements, as a minimum, but to achieve good international industry practice, specifically to demonstrate compliance with IFC Performance Standards

and World Bank Environmental, Health and Safety (EHS) guidelines for vegetable oil processing and plantation crops and to achieve RSPO certification in 2017.

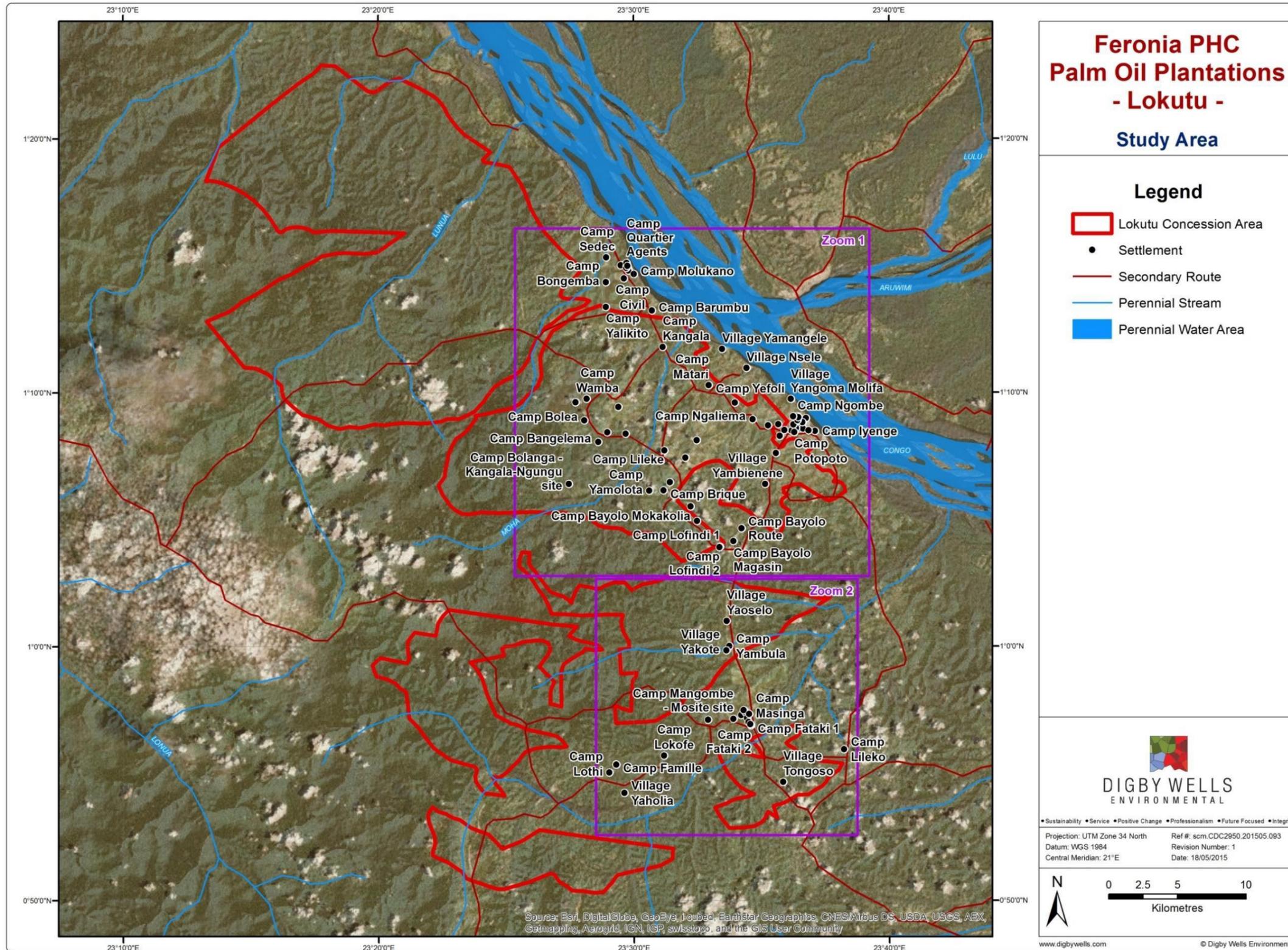
3.1 Feronia Policies

Feronia has developed a number of in-house policies (in French and English) that align with international good practice and to which the Company will operate:

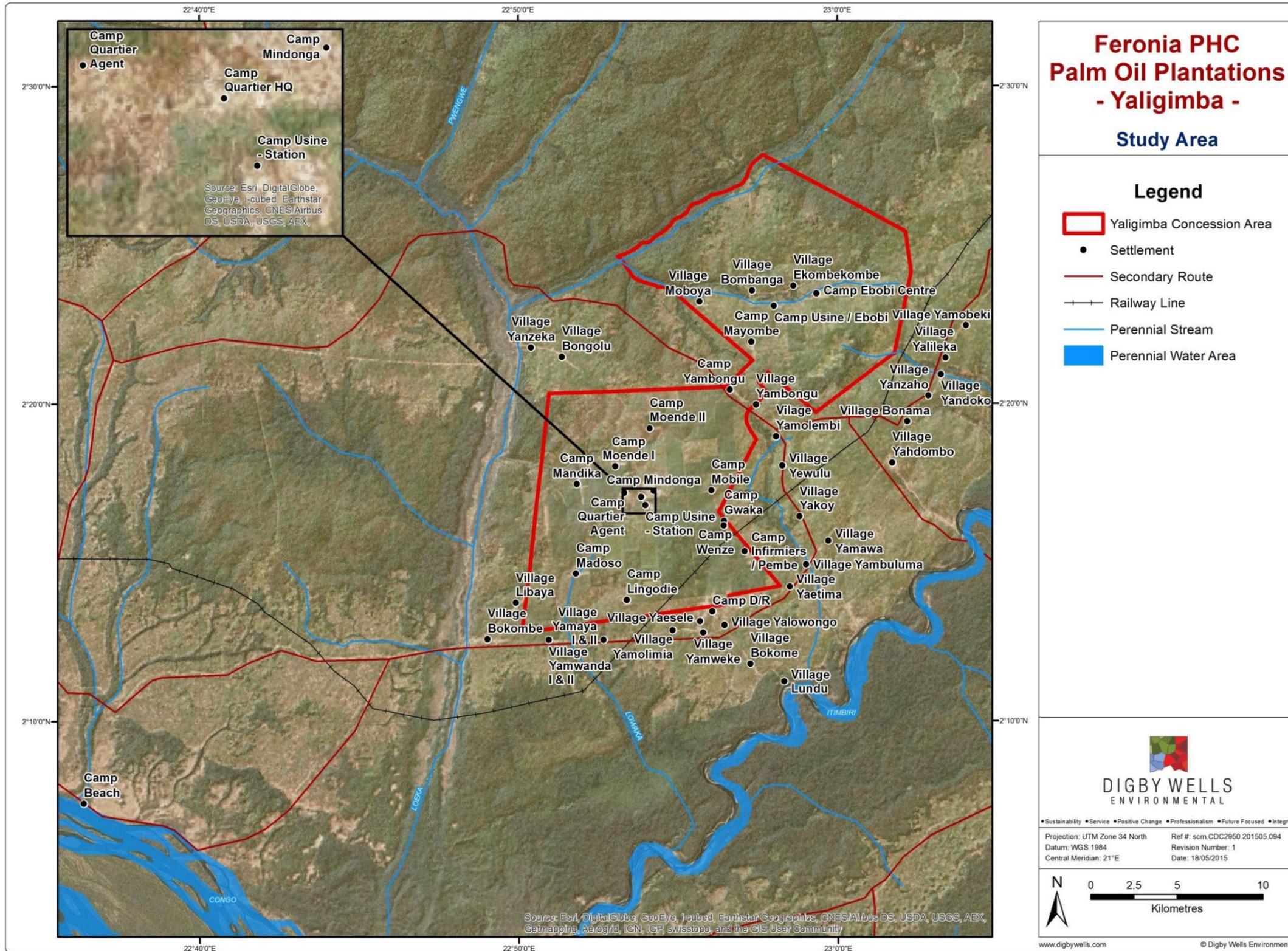
- Anti-bribery and Corruption Policy;
- Anti-Corruption Statement;
- Environmental and Social Policy;
- External Grievance Procedure;
- Occupational Health and Safety Policy;
- Statement of Human Resources Policy; and
- Whistleblowing Policy.

4 Socio-Economic Assessment

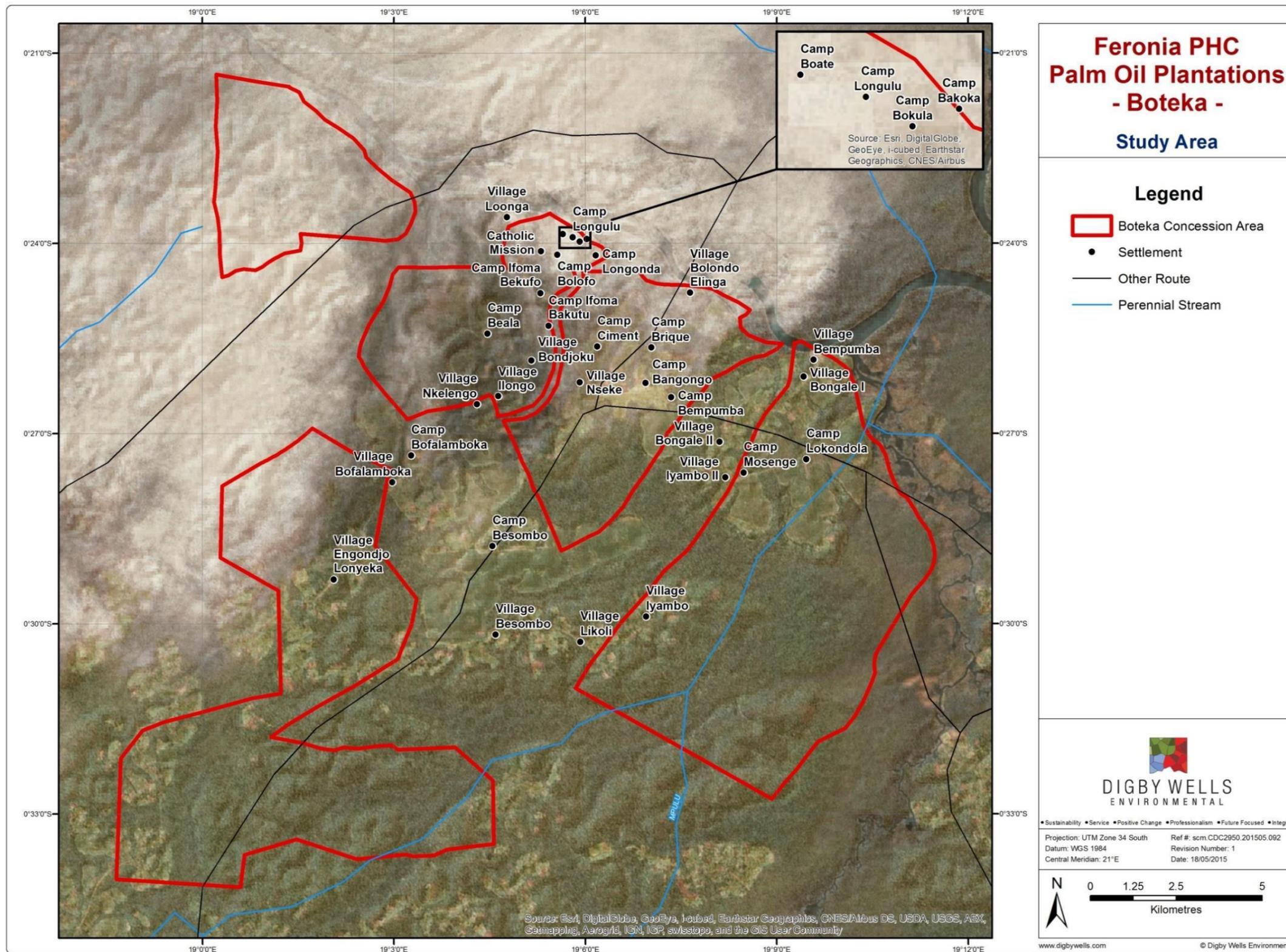
The socio-economic study area for each plantation includes all the villages (worker and non-worker villages) in the concessions (for which Feronia owns and holds the title deeds), and other villages up to five kilometres from the concession boundary (Plan 2 to Plan 4). Worker villages (established by previous plantation owners) are currently maintained by Feronia. The majority of permanent plantation workers live in these villages; households in worker villages have at least one person working for the Company. Non-worker villages are those located on Company land but Feronia is not responsible for maintaining them; most were established during the early 1900s, before the plantations were established.



Plan 2: Lokutu Study Area



Plan 3: Yaligimba Study Area



Plan 4: Boteka Study Area

4.1 Baseline Socio-Economic Environment

Baseline information was collected from within the 'study area', which consists of the three concessions and any villages located approximately five kilometres from the concession boundaries. Information was collected using the following methods:

- Desktop reviews of:
 - Internal Company documents;
 - Previous environmental and social reports (Feddersen Consulting Group (August 2014)); and
 - Aerial and satellite imagery.
- Consultation with stakeholders (a total of 33 focus group meetings and 23 one-on-one interviews) (Appendix A, and Figure 1).
- Household socio-economic surveys (using locally recruited and trained enumerators and supervisors).
- Community survey to identify and record assets and structures (Table 2).

The socio-economic survey differentiated between 'workers' and 'non-workers'. For the purposes of the survey, 'workers' are those individuals who are permanently employed by the Company. Most (if not all) workers reside in worker villages. 'Non-workers' refers to individuals in the study areas who are not permanently employed by the Company, but may include casual or temporary workers, as well as those not employed by the Company in any capacity and former permanent employees. Non-workers reside in non-worker villages, both inside and outside the concessions, but inside the 'study area'.



Figure 1: Example of a FGD with men and women

4.1.1 Survey Results

The total number of households for all three study areas is estimated to be 12,845; the population is estimated to be 98,007 (Table 3).

Table 3: Estimates of Number of Households and Populations

Study Area	Number of Households	Estimated Population
Lokutu	6,908	53,192
Yaligimba	4,198	33,164
Boteka	1,739	11,651
Total	12,845	98,007

The household surveys indicate there are more males (53%) than females, and 47% of the population is under the age of 16. To put this in context, nationally, 48% of the population is under 14 years, which is typical of populations that are increasing due to rapid, natural growth. Households in worker and non-worker villages are typically headed by men (95%).

Nationally, 20% of households are headed by women; the reason for the difference found in the study areas compared to the national average is unknown.

Approximately two-thirds of children (6 – 13 years) were attending school when the surveys were conducted (61% girls and 68% boys), although in Boteka, the smallest concession area, less than half of this age group were attending school. Overall, average school attendance rate for boys in the study area is lower than the average for rural DRC (60% girls and 85% boys).

Two-thirds of households rely on two or more types of livelihood; employment with Feronia (both permanent and temporary employment) was reported as being the most common formal economic activity (85% of households in Boteka; 67% in Yaligimba; and 34% in Lokutu). Other common livelihoods are subsistence farming and selling of crops, but these livelihoods are less common in worker villages than non-worker villages. Primary, secondary and tertiary sources of household livelihoods are presented in Figure 2 to Figure 4.

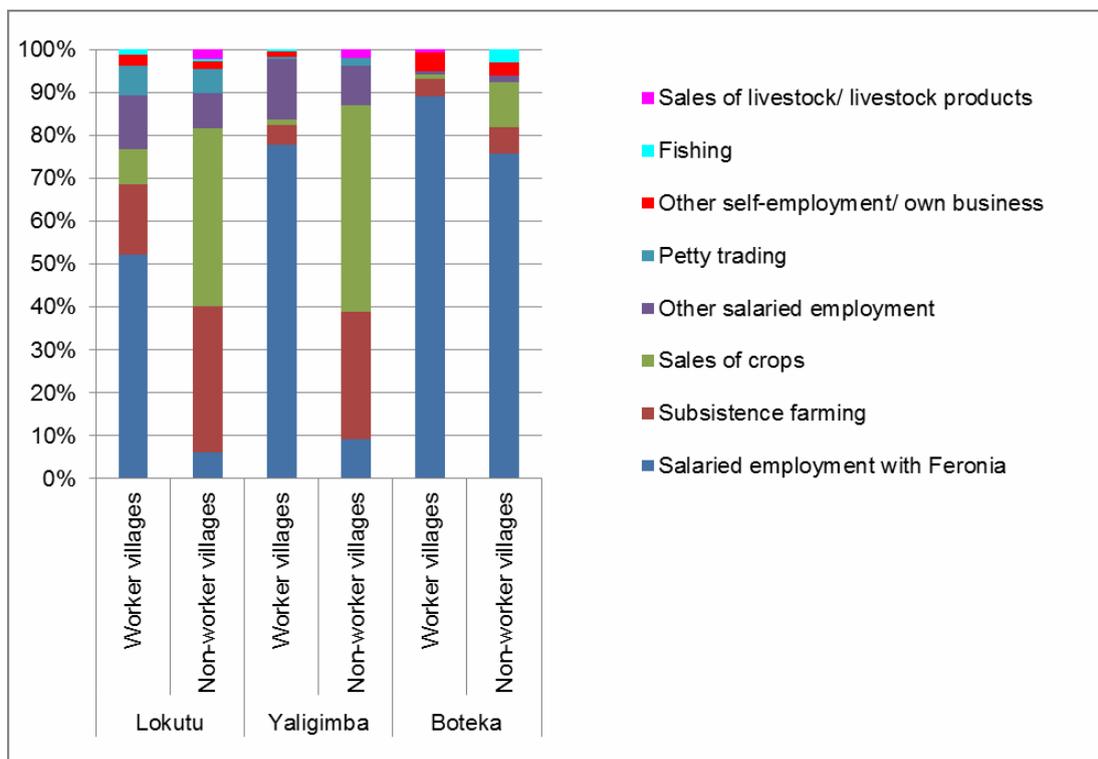


Figure 2: Primary Sources of Household Livelihoods



Figure 3: Secondary Sources of Household Livelihoods

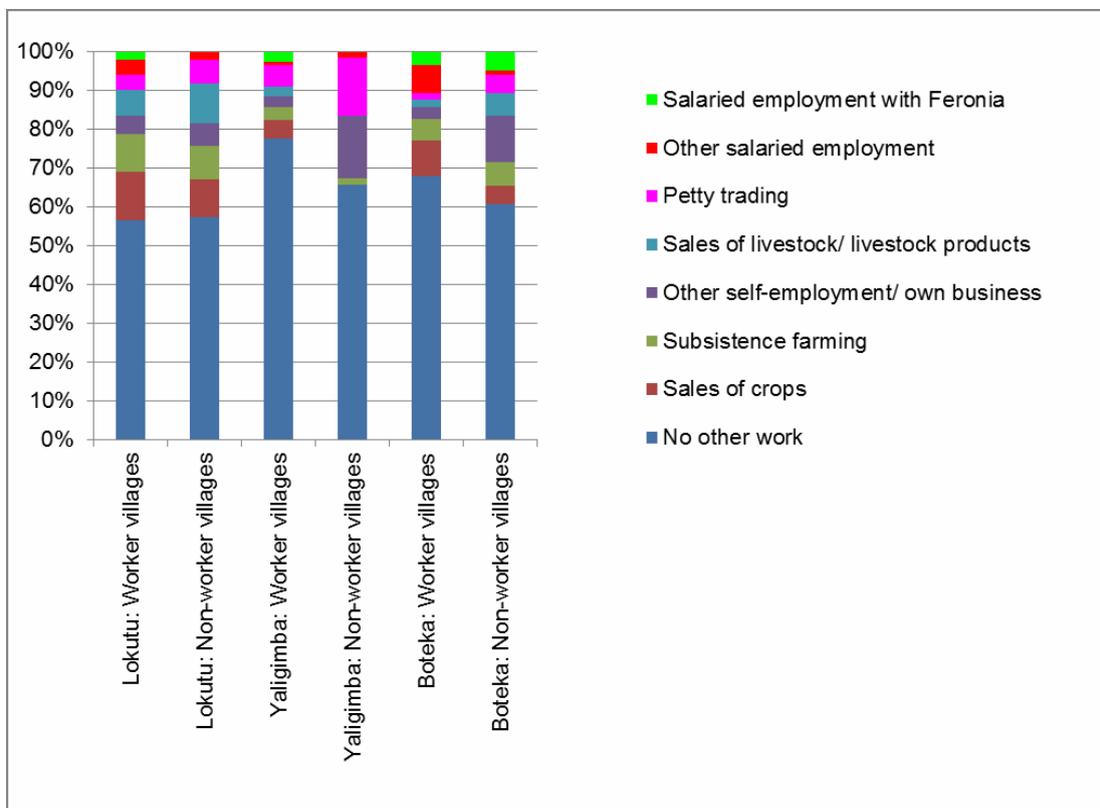


Figure 4: Tertiary Sources of Household Livelihoods



The degree of dependence on agriculture in non-worker villages is similar to the national average where 84% of households are engaged in farming. Amongst these households in the DRC, 91% are in the informal agricultural sector. Land acquisition in the DRC is through personal relations (e.g., birth-right or marriage, allocation by land chiefs). Only 9% of land is bought, and only 4% of households lease land.

About half of households have chickens, 14% have goats, and five households have cattle; other livestock includes pigs, sheep, ducks, guinea pigs, and rabbits. Livestock are reared for selling, domestic consumption, and ritual / ceremonial use. Bush meat and fishing provide important additional sources of protein. Petty trading is practised by about 5% of households, as another way of making a living. Homesteads are used for business purposes in 12% of households in Lokutu; activities include selling agricultural products, alcohol, and firewood.

Overall, communities are heavily reliant on natural resources; nearly all households are dependent on natural resources for sustenance. Forest resources that provide important ecosystem services include logging, fuel (firewood), medicinal plants, and bushmeat. The reliance on natural resources, and the increasing population, indicates there is pressure on the environment (Volume 2, Section 5.1.4). Construction materials, used for houses, include timber, clay, straw, cement, straw (thatch) and corrugated iron. The diversity of natural resources being used is higher among non-worker villages than worker villages (and is indicative of the benefits that employment with Feronia have).

The rivers are an important means of transport and provide good grounds for fishing. Water used for domestic purposes comes from rivers and wells; it is treated by less than 10% of the households. Reliance on surface water in the study areas (50% of surveyed households) is higher than elsewhere in the DRC (20 % of households). Toilets are mostly pit latrines and about half of households share toilets with another household.

Site-specific baselines are summarised in Sections 4.1.1.1 to 4.1.1.3.

4.1.1.1 Boteka

The social team gathered information at Boteka through nine meetings and six interviews; 9% of the total population in Boteka was surveyed.

The population of Boteka is estimated to be 11,651 people living in 1,739 households. Population growth is high with 49% being under the age of 16. There is currently little immigration; most people have lived in the same place for 15 years (mostly people move within the Boteka study area rather than other regions/ countries). The average household has 6.7 members and 97% are headed by men.

School attendance is low; 46% of children aged from 6 to 13 attend school. Literacy rates are about 55%; 16% of adults (over 20 years) attended secondary school but only 7% completed the courses.

Households survive through subsistence farming and cash income; two-thirds rely on two or more types of livelihoods. 85% of Boteka households get their primary income through



employment with Feronia (both permanent and temporary employment), 5% comes from subsistence farming and 4% from cash crops. Fields are farmed for an average of 5.7 years before they are left to regain fertility; regrowth is burned ready for planting. Two-thirds of individuals reported they have no regular income. Rivers and streams provide 55% of households with water and 32% use traditional wells. Food shortages were reported by 92% of households.

Open fires are used for cooking by 99% of households; lighting comes from fires, candles and battery lamps. About 10% of households own a mobile phone; working radios are uncommon. Traditional healers have been used by 32% of households; other facilities (healthcare centres and hospitals) are available.

4.1.1.2 Yaligimba

Information was gathered in Yaligimba through ten meetings and seven interviews.

The population of Yaligimba is 33,164 people in 4,198 households (average household size of 7.9) of which 92% are headed by men. Population under the age of 16 years is 50%. The average period of residence in any community is 18 years; there is little influx as population movement is mainly between nearby settlements.

Approximately 67% of individuals between the ages of 6 and 13 attend school. About 41% of adults (those aged 20 and older) have attended secondary school but 9% completed this stage of education.

Two-thirds of households rely on two or more livelihood activities. Employment with Feronia is the primary source of income for 67% of households; 9% comes from subsistence farming and 9% through cash crops.

The average age of active agricultural fields is three and a half years. Approximately 11% of households have left fields uncultivated to regain fertility.

Water is primarily supplied by rivers and streams (78% of households) and wells (21% of households). House building materials are the same as those for Boteka. About 20% of households have a mobile phone. Approximately 37% of households use traditional healers. Food security was a concern reported by 33% of households.

4.1.1.3 Lokutu

Information was gathered in Lokutu through 14 meetings and ten interviews.

The estimated population is 53,192 people in 6,908 households; the average household has 7.7 people and 96% are headed by men. Households have been in the same place for an average of 23 years. Population under the age of 16 years is 45%.

School attendance by children between the ages of 6 and 13 is 73%; 47% of adults (20 years and older) have attended secondary school but only 8% completed this level.

Feronia provides the primary income for 34% of households; 23% of household income comes from subsistence farming and 22% through selling crops. Two-thirds of surveyed

households (including both workers and non-workers) have no regular (monthly) source of income.

The average age of agricultural fields is three years; 42% of households have left fields uncultivated so they regain fertility.

Rivers and streams are the source of water for 40% of households and traditional wells are used by 57% of households. Food shortages during the last year were reported by 89% of households. Mobile phones are owned by 20% of households; 25% have used traditional healers.

4.2 Social Risks

Risks that could jeopardise the rehabilitation and operation of the plantations were identified using the results of the desktop reviews, interviews and consultation, and specialist opinion. Social risks for the Feronia project are related to workers and non-workers (Table 4).

Table 4: Key Social Risks

Origin	Risk	Description and impact
Workers	Worker strikes	<p>While Digby Wells considers it unlikely in the short term, the risk of worker strikes cannot be discounted for reasons including:</p> <ul style="list-style-type: none"> ▪ dissatisfaction regarding their housing conditions; ▪ low and sometimes delayed wages, and ▪ the perceived lack of engagement with the Company). <p>The impact of a strike will be reduced productivity at the plantations, with associated financial and reputational impacts for PHC.</p>
Workers	Ageing workforce	<p>The Company has indicated that many of its key managers are approaching retirement. Similarly, some of the experienced lower skilled workers are also older. In the medium to long term, these workers would have to be replaced. Succession planning has been implemented, reducing the risk of a drop in productivity during the transitional period; this has implications for its financial standing and subsequent ability to attend to community development needs.</p>



Origin	Risk	Description and impact
Non-worker communities	Community reliance on the Company	<p>The study areas, and the Company’s concessions, are vast and home to tens of thousands of people who live under socio-economic circumstances typical of rural DRC. The Government is not very active in these areas, and do not contribute significantly to community development. With the exception of worker villages and some of the non-worker communities’ attitudes towards workers, the divide between worker and non-worker communities is vague, with a large degree of interaction between the two groups. However, non-worker communities do not receive any of the benefits the workers do (such as palm oil, soap or free healthcare), and will likely not be first in line to benefit from impending community development initiatives.² Non-worker communities rely on the company for basic social infrastructure (healthcare facilities and schools) and have expressed frustration towards the Company at the rate of rehabilitation, which will only increase if they see that the Company starts to engage workers, and that workers are receiving additional benefits through community development.</p> <p>It is possible that this frustration will manifest in the form of active opposition against the Company, including actions taken to disrupt its operations (by, for example, barricading roads or threatening workers). This holds significant implications for the productivity of plantations, and subsequently the Company’s financial position as well as reputational risk.</p> <p>The likelihood of this risk will decrease once Feronia PHC commences with the implementation of the SEP and CDP.</p>

² It is acknowledged that the Company is investigating the feasibility of including some of the non-worker communities in its current water-related development project, during which boreholes will be established in settlements.

Origin	Risk	Description and impact
Non-worker communities	Resentment towards workers	<p>In light of the fact that (a) natural resources and agricultural land is becoming scarcer, (b) that this trend is likely to continue for the foreseeable future (due to the high natural population growth and possible influx), (c) non-worker communities' frustration with the Company (mostly due to its limited input outside its concessions), and (d) impending community development and engagement of workers, it is likely that the existing (albeit limited) tendency of non-worker communities to prevent workers from using natural resources and agricultural land will increase in prevalence and severity. The party that suffers most from this attitude is the workers, as their ability to meet their basic needs is being compromised. The worst case scenario is the eruption of conflict between the two groups (workers and non-workers).</p> <p>This may have an indirect impact on the Company's productivity, as the lack of the workers' ability to meet their basic needs and their morale, impacts on their productivity at work.</p>
Study areas' populations	Large, uneducated workforce	<p>The study areas are experiencing high natural population growth, and a large proportion of the existing population is aged 16 years or younger. Low levels of and poor quality education are prominent in the study areas. Motivation among the youth to get an education is also lacking, for a number of reasons, including limited employment opportunities and other prospects, and lack of money to pay tuition.</p> <p>The implication of this is that in the absence of an intervention, the Company's potential labour pool over the medium term will be vast and poorly educated, which does not make for an ideal workforce. In addition, the current trend of livelihood activities will likely persist, but with proportionally fewer natural resources and available agricultural land, which will likely result in poorer socio-economic conditions than what is presently the case.</p> <p>It is of utmost importance that the Company contributes to the personal development of people within the study areas as much as it can (through the CDP), in an attempt to decrease their reliance on natural resources and assistance from the Company to meet their basic needs.</p>

4.3 Social Impact Assessment

A summary of potential impacts associated with the rehabilitation project is presented in Table 5 (six positive impacts and four negative impacts): a qualitative description of the impacts is presented in Sections 4.3.1 and 4.3.2, respectively.

Table 5: Summary of potential social impacts

Category of impact	Impact	Significance before mitigation/enhancement	Significance after mitigation/enhancement
Positive	Job security	Moderate positive	Moderate positive
	Economic benefits	Moderate positive	Moderate positive
	Fiscal impact	Moderate positive	Moderate positive
	Improved access to services and infrastructure	Moderate positive	Moderate positive
	Community development	Minor positive	Moderate positive
	Contribution towards food security	Moderate positive	Moderate positive
Negative	Influx related impacts	Moderate negative	Minor negative
	Health and safety related impacts	Minor negative	Minor negative
	Impact on opportunistic agriculture	Minor negative	Minor negative
	Economic dependence on Feronia PHC	Moderate negative	Minor negative

4.3.1 Positive Impacts

Positive socio-economic impacts associated with the rehabilitation and operation of the Feronia project are as follows:

4.3.1.1 Employment

Feronia employs 3,689 people, on a permanent basis, in the three plantations (1,575 at Lokutu; 1,277 at Yaligimba; 837 Boteka. 31 December 2014), as well as approximately 4,000 seasonal workers.

Each plantation employs large numbers of temporary / seasonal employees although the numbers fluctuate (in May 2015, 1,979 were employed at Lokutu; 2,005 at Yaligimba; and 108 at Boteka).

As the Company is the sole, large-scale provider of formal employment in the region, this constitutes a significant positive impact. Rehabilitating the plantations will secure employment for current employees, and provide future work for the following generations.

Other benefits that employees of Feronia receive are housing, free healthcare, and cheap palm oil and soap. Thus, the Company is providing sustainable employment and access to basic services. Based on the results of the social surveys, it is apparent that for every one Feronia employee, at least six other people derive benefits from the employee's income.

4.3.1.2 Economic Benefits

The ongoing operations provide economic benefits to people living in the study areas (and the 24 Congolese staff based in Kinshasa). Non-workers may also benefit from the overall Company expenditure and activities which are created (e.g., markets for goods and services which, in turn, stimulates the growth of manufacturing and in the service sectors). Supplying food for local people and construction materials for the Company are examples of potential business opportunities. Salaries paid by Feronia add significantly to the spending power of employees and local population (as money circulates); as money is spent in the local communities, it assists growth in the formal and informal sectors.

Economic benefits extend to national level (e.g., transport services needed to move oil from the plantations to large-scale buyers). Revenues that are generated by local and national enterprises as a result of the Project represent sustained beneficial downstream impacts on the economy.

4.3.1.3 Fiscal Impacts

Benefits to the national Government and DRC through taxes, royalties, and other revenues derived from the Project. Monies paid by the Company to the Government increases the amount of money that is available for national projects (e.g., constructing and maintaining infrastructure, improving services and development projects).

In 2014 the Company paid the DRC Government USD 2,846,188 in taxes and fees (e.g., property taxes, licence fees, VAT and taxes on profit). Thus, the continued operation of the Feronia project affords a sustainable income for the Government.

4.3.1.4 Improved access to services and infrastructure (for communities in the study areas)

The Company owns and operates hospitals at each plantation; maintains roads in the concessions and some link roads outside the concessions; boreholes are being established in the concessions (providing potable water to anyone who can access them); and workers are provided with housing which benefits all their dependents.

This impact constitutes a significant positive impact as the study areas are isolated, rural, and there are minimal development initiatives taking place by the Government.

4.3.1.5 Community Development and Livelihoods

The Company is planning to implement a Community Development Plan (CDP) with the aim of improving the livelihoods of communities; workers would be the primary beneficiaries followed by workers' families, non-worker villages in the concessions, and settlements outside of the concessions.

Potential community development initiatives in the CDP address needs for basic services and infrastructure which would stimulate the local economy through enterprise development and income-generating projects (e.g., production of stabilised soil bricks) (Volume 2, Appendix D). The exact nature of initiatives (number, type and timeframes) are yet to be determined but any such developments will have a positive benefit to the well-being of communities.

4.3.1.6 Food Security

It is estimated that 6.7 million people (11% of the rural population) in the DRC are in an acute crisis regarding food security and livelihoods; this number has increased from 6.4 million in 2013, and 5.4 million in June 2012. Equateur and Orientale Provinces are classified as having high acute malnutrition rates. Results of the social assessment show that 89% of worker households at Lokutu, 34% at Yaligimba and 50% at Boteka reported experiencing food shortage during 2014.

Many basic foods have to be imported as food production does not meet needs. It is apparent that food production is declining and only 3.5% of total land area is under crop production (UNDP, 2012). Cassava and palm oil are the most commonly consumed foods; 85% households consume cassava and 96% consume palm oil on average five days per week. Palm oil is a critically important foodstuff used for cooking and as sauce; it improves nutritional value of food.

Currently, Feronia sells 100% of its palm oil products within the DRC. Because demand is high this is a sustainable market. Thus, on a national level, Feronia is helping to maintain food security; as plantations are rehabilitated and facilities modernised, there is an opportunity to improve this positive impact on food security. The Company's benefits for workers include supplying eight litres of palm oil per person per month, which is a significant positive benefit in a country (and region) where there is low food security.

4.3.2 Negative Impacts

Negative impacts associated with the rehabilitation and operation of the Feronia project include:

4.3.2.1 Influx Related Impacts

The data presented in the socio-economic survey (Volume 2) supports the observation that there is no substantial in-migration, as the area has not experienced any significant influx of people over the past several years. The average household has been living in the same settlement or village for nearly twenty years. However, based on experience, as the plantations are rehabilitated and the positive impacts make the study areas attractive to live in, it is likely that job-seekers and entrepreneurs will migrate to them. Potential negative impacts associated with influx are:

- Increased pressure on local services and resources.
- Increased social pathologies and change in value systems (e.g., changes in moral rules and rituals; loss of cultural integrity; cultural marginalisation; and commercial exploitation of cultural heritage commodities).

Competition between newcomers and established communities may lead to conflict (e.g., for natural resources and employment opportunities).

4.3.2.2 Health and Safety Risks

There are risks to pedestrians, users of motorcycles, cyclists and livestock from vehicles operating on Company business within the concessions. As the volume of traffic increases so will the risk of accidents. Increased population and the influx of people from other areas can increase the risk of disease.

4.3.2.3 Impact on Opportunistic Agriculture

Worker and non-worker households employ multiple livelihood strategies so subsistence farming and selling crops are very important. Local communities respect the boundaries of the active plantations but areas that could be developed in future (within the concession and classified as “plantable”) are used opportunistically for growing crops. Should these be developed as plantations, the opportunity for farming these areas will be lost.

The Company could opt to end the practice of any forest within the concessions being cleared to grow food (by local people). However, this could lead to social issues such as food insecurity and poor community relations.

4.3.2.4 Economic Dependence on Feronia

There is evidence that the study areas are changing from subsistence to cash-based economies (e.g., 78% of households in Lokutu, 70% in Yaligimba and 69% in Boteka have some form of cash income). The transition has benefits but it also presents risk as communities become increasingly dependent on Feronia; should the Company stop operations the loss of jobs would have significant negative impacts.



4.4 Impacts and Mitigation/Enhancement

Measures have been proposed to avoid or mitigate negative impacts and enhance positive ones (Table 6). The impact assessment was first carried out using a quantitative rating system to determine the significance of the impacts without mitigation / enhancement measures being applied. The same rating system was used to determine significance once the mitigation / enhancement had been applied.

The recommended measures for mitigation / enhancement are presented as bullet points in Table 6 below; full descriptions of the measures are presented in Volume 2 (Section 7.2).

Table 6: Summary of potential impacts and proposed management

Impact	Pre-mitigation Significance	Recommended mitigation/ enhancement	Post--mitigation Significance
Safeguarding employment	Moderate – positive	<ul style="list-style-type: none"> - Succession planning - Identify suitable candidates outside the concession - Continue with strategy to increase wages - Continue with development of worker villages 	Moderate - positive
Multiplier effects in the local economy	Moderate – positive	As for maximising employment benefits. Also: <ul style="list-style-type: none"> - Community development - Register of service providers - Training and capacity building 	Moderate - positive
Fiscal impact	Moderate – positive	N/A	Moderate - positive
Improved access to services and infrastructure	Moderate – positive	<ul style="list-style-type: none"> - Constant sufficient supply of medicine - Extend road maintenance to local study area - Optimise location of boreholes to benefit as many settlements as possible - Consider demographic characteristics of worker households 	Moderate - positive
Community development	Minor - positive	<ul style="list-style-type: none"> - Selection, design and implementation of initiatives to be undertaken with beneficiaries - Prioritise initiatives to stimulate the local economy 	Moderate - positive
Contribution towards food security	Moderate – positive	<ul style="list-style-type: none"> - Continue to supply national market - Increase monthly oil ration to workers - Sell oil in the local study area 	Moderate - positive
Influx related impacts (as positive impacts materialize, the area will become attractive to migrants. This holds positive impacts for the local economy, but also negative impacts such as increased pressure on local services and resources, increased social pathologies, and possible conflicts)	Moderate – negative	<ul style="list-style-type: none"> - Implement recommended enhancement measures - Engage local authorities to alert them of potential influx - Implement awareness campaigns - Make condoms available free of charge 	Minor - negative



Impact	Pre-mitigation Significance	Recommended mitigation/ enhancement	Post-mitigation Significance
newcomers and the incumbent population compete for jobs, resources, etc.)			
Health and safety related impacts (the nature of the operational activities at the plantations is such that it poses some health and safety risks for those in its vicinity; these are, however, well understood and mitigation is already in place).	Minor - negative	<ul style="list-style-type: none"> - Adequate PPE - Road maintenance and signage - Safe travelling speeds Drivers' competency to be determined - Emergency response plan 	Minor - negative
Impact on opportunistic agriculture	Minor - negative	As for enhancing continued employment. Also: <ul style="list-style-type: none"> - Adequate warning to households about replanting - Facilitate visit to areas to demonstrate its status as an old plantation 	Minor - negative
Economic dependence on Feronia PHC	Moderate – negative	- As for Community development and multiplier effects in the local economy	Minor - negative

5 Biophysical Studies

5.1 Biodiversity Assessment

The biodiversity assessment included specialist studies (i.e., amphibians and reptiles, mammals and birds, vegetation and aquatic ecology). The results of the studies were used to conduct a High Conservation Value (HCV) assessment of Feronia's three oil palm concessions.

The purpose of the assessment was to identify and record HCV areas and areas of biodiversity value to comply with the RSPO principles and criteria. The HCV assessment was carried out for each of the concessions including planted and surrounding areas.

There are six HCVs (Table 7): the definitions have evolved since their first inception by the Forest Stewardship Council.

Table 7: Definitions of the six High Conservation Values <https://www.hcvnetwork.org>

HCV	Definition
HCV 1: Species diversity	Concentrations of biological diversity including endemic species, and rare, threatened or endangered species (RTE), that are significant at global, regional or national levels.
HCV 2: Landscape-level	Large landscape-level ecosystems and ecosystem mosaics that are



ecosystems and mosaics	significant at global, regional or national levels, and contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.
HCV 3: ecosystems and habitats	Rare, threatened or endangered ecosystems (RTE), habitats or refugia.
HCV 4: Ecosystem services	Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.
HCV 5: Community needs	Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (e.g., for livelihoods, health, nutrition, water), identified through engagement with these communities or indigenous peoples.
HCV 6: Cultural values	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, identified through engagement with these local communities or indigenous peoples.

The results of the biodiversity assessment indicate that there is community-based pressure on the HCVs and natural resources, in the three study areas, due to the burgeoning populations and high reliance on natural resources for building materials, bushmeat etc (Sections 5.3.1 – 5.3.3).

5.1.1 Boteka

The Boteka Plantation is in the Central Congolian Lowland Forest; Tropical and Subtropical Moist Broadleaf Forests, and the *Cuvette Centrale* freshwater Ecoregion (Thieme *et al.*, 2005). The vegetation survey conducted by Digby Wells identified a mosaic of cultivated land and secondary vegetation that is typical of areas near human settlements; and little disturbed forest.

The field studies for fauna (animals) showed that the variety of mammal types was low and could be the result of hunting. Although the type of forest provides a suitable habitat to several species, only two monkey species were identified during the studies (i.e., the Red-tailed Monkey and Wolf's Monkey).

A number of bird Species of Special Concern (SSC) are expected to occur within the Boteka Concession, however there are large gaps linked to Data Deficiency. Five of the 133 bird species recorded by Digby Wells have not been recorded from this area before. These species are the Little Egret (*Egretta garzetta*), Long-legged Pipit (*Anthus pallidiventris*), Collared Sunbird (*Hedydipna collaris*), Wayne's Weaver (*Ploceus waynsi*) and the Forest White-eye (*Zosterops stenocricotus*); this information will require revision of scientific records and maps. The African Grey Parrot (*Psittacus erithacus*) was identified as fairly common



within the area of influence. This bird is listed as Vulnerable on the IUCN red data list (Ver 3.1).

Amphibians and reptiles are well represented by numbers and types, therefore community use of rivers (e.g., creating dams and washing) does not appear to have had a significant impact on these species. The aquatic ecosystems on the Boteka concession were found to be minimally influenced by human activities and categorised as largely natural. A total of 43 fish species were recorded in the study. Of the fish species observed, six are endemic rainforest species. One fish species, *Neolebias cf. gracilis*, has not been recorded in the region before, thus this will require revision of scientific records. No rare, vulnerable, threatened or endangered fish species were recorded during the survey in 2015.

Based on the findings of the Digby Wells studies, the HCV assessment shows that:

- HCV1 (species diversity): the plantations, secondary forests and disturbed areas are not HCV1; the relatively undisturbed forests are HCV1 but these areas will not be affected by Feronia's rehabilitation project.
- HCV2 (landscape-level ecosystems and mosaics): there are no HCV2 category areas on the concessions or nearby areas that could be affected by the Feronia project.
- HCV3 (ecosystems and habitats): no HCV3 category areas are in the concessions. The teams could not get to all areas (lack of roads) so were unable to eliminate rocky outcrops, ancient forests, or forests that are unique or unusual. However, the Feronia project will not be clearing previously unplanted areas so even if such areas occur, they will not be affected by the project.
- HCV4 (ecosystem services): Digby Wells found HCV4 on the concession due to the presence of natural forests which regulates rainfall and erosion, and extensive surface water and swamps that regulates water quality and quantity.
- HCV5 (community needs): Digby Wells found HCV5 on the concession due to the reliance of people on natural water sources, and forest products for building, firewood, food and medicine.
- HCV6 (cultural values): graves are present and these are classified as HCV6. Other sites may be present but as Feronia will not be clearing previously unplanted areas, it is unlikely there will be any affect.

Reliance on natural resources is extremely high, with the most commonly harvested resource being firewood, followed by forest food products (not meat). Reliance on natural resources and the high numbers of people in the region indicates pressure on the HCVs and natural resources are community-based. Table 8 indicates the prevalence of reliance different types of natural resources; Figure 5 shows the frequency with which these natural resources are harvested.

Table 8: Prevalence of Reliance on Natural Resources, Boteka

Type of natural resource	Prevalence of reliance (%)
Firewood	99
Forest food products (excluding meat)	90
Fish	88
Bush Meat	77
Medicinal Plants	71
Construction materials	67

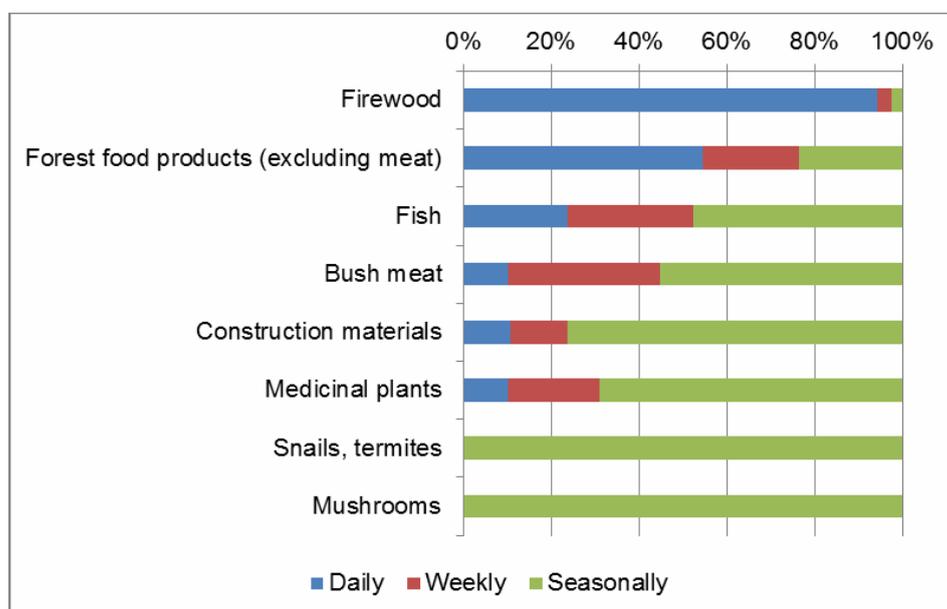


Figure 5: Frequency with which Natural Resources are Harvested, Boteka

5.1.2 Yaligimba

Yaligimba is in the Tropical and Subtropical Moist Broadleaf Forests; Northeastern Congo Basin Moist Forests Ecoregion; and the *Cuvette Centrale* freshwater Ecoregion (Thieme *et al.*, 2005).

The Digby Wells’ team conducted a vegetation survey that identified a mosaic of cultivated land and secondary forest which is typical of areas near settlements. Four types of forest occur (i.e., dryland, riparian, swamp and disturbed). The disturbed nature of the study area is probably due to commercial logging that has taken place historically (pre-1930s) and resulted in small remnants of very disturbed natural forest. Subsistence logging has also caused disturbance. There is a lack of old and large trees which is evidence of the history of



logging. The majority of animal and plant species are found in secondary forest. Weeds and other species that would fill gaps in the forest (when trees fall down), are found in the plantation.

The variety of mammal species was found to be low when Digby Wells carried out field surveys. The reasons for this could be attributed to hunting (for bushmeat), and logging (by local people and companies in the past) causing loss of habitat.

Two bird species were recorded for the first time in the Yaligimba area, including the African Rail (*Rallus caerulescens*) and the Little Egret (*Egretta garzetta*). The current known distribution of these species does not extend into the Congo Basin and this will result in a revision of their range distribution. Two species that are classified in the rare, threatened or endangered group, were recorded (African Grey Parrot *Psittacus erithacus* and *Afromisia* (plant)).

A moderate variety of amphibian and reptile species were found during the survey. Secondary forest (especially with streams habitat), Swamp Forest and Riverine Forest Habitats have moderate HCV for reptiles and amphibians although due to the seasonal timing of this survey no rare, endangered or threatened species were positively identified.

Results of the aquatic ecology survey indicated water quality is typical of a tropical system. The fish in the study site are common species, and there were no rare, threatened or endangered species identified.

Based on the findings of the Digby Wells studies, the HCV assessment shows that:

- HCV1 (species diversity): there is no HCV1 as there is no undisturbed vegetation, a very low number of rare, threatened or endangered species, surrounding areas have been greatly disturbed by people (past and present).
- HCV2 (landscape-level ecosystems and mosaics): there are no HCV2 category areas on the concessions or nearby areas that could be affected by the Feronia project.
- HCV3 (ecosystems and habitats): no HCV3 category areas are in the concession or areas that could be affected by the Feronia project.
- HCV4 (ecosystem services): HCV4 does not occur on the concession.
- HCV5 (community needs): Digby Wells found HCV5 on the concession due to the reliance of people on natural water sources and forest products for building, firewood, food and medicine.
- HCV6 (cultural values): graves are present and these are classified as HCV6. Other sites may be present but as Feronia will not be clearing previously unplanted areas, it is unlikely there will be any affect.

Reliance on natural resources is extremely high, with the most commonly harvested resource being firewood, followed by forest food products (not meat). Reliance on natural resources and the high numbers of people in the region indicates pressure on the HCVs and

natural resources are community-based. Table 9 indicates the prevalence of reliance different types of natural resources. Figure 6 shows the frequency with which these natural resources are harvested.

Table 9: Prevalence of Reliance on Natural Resources, Yaligimba

Type of natural resource	Prevalence of reliance (%)
Firewood	99
Forest food products (excluding meat)	63
Fish	31
Bush Meat	32
Medicinal Plants	60
Construction materials	42
Mushrooms	5
Snails, termites	3

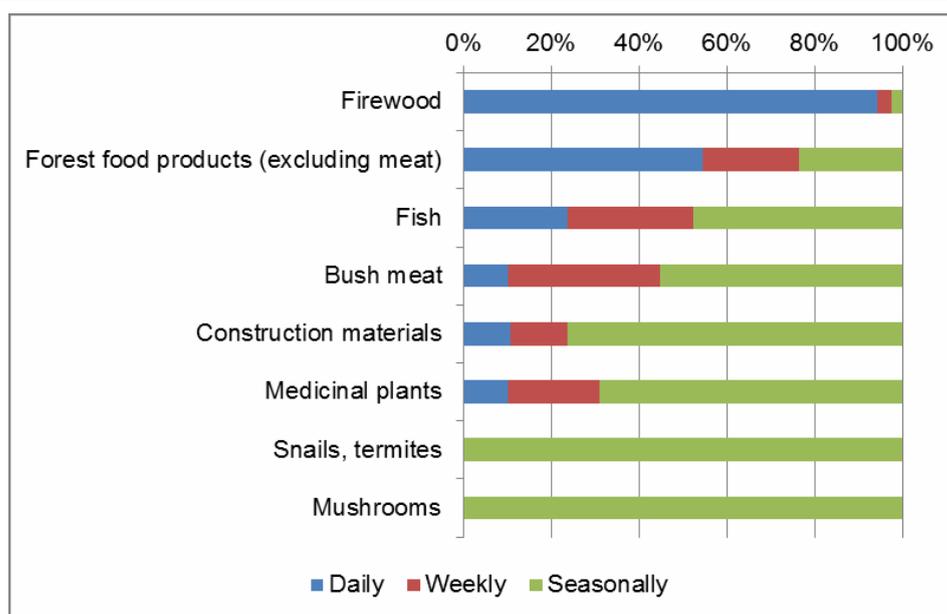


Figure 6: Frequency with which Natural Resources are Harvested, Yaligimba

5.1.3 Lokutu

Lokutu is in the Tropical and Subtropical Moist Broadleaf Forests; the border of three ecoregions (i.e., the Central Congolian Lowland Forests, the Western Congolian Swamp Forests and the Eastern Congolian Swamp Forests; and the *Cuvette Centrale* freshwater Ecoregion (Thieme *et al.*, 2005).

The Digby Wells' team conducted a vegetation survey that identified a mosaic of cultivated land and secondary forest which is typical of areas near settlements. Three types of forest



occur (i.e., dryland, riparian, and swamp). The plantations are disturbed and do not contain any indigenous forest.

The variety of mammal species was found to be low and the reasons for this could be attributed to hunting (for bushmeat), and logging by local people and companies in the past (pre-1920s) causing loss of habitat. Few mammal species were recorded by the team, although 162 bird species were recorded; six of these have not been recorded in the area before and will result in revision of scientific records to increase the range in which these birds are known to occur. The African Grey Parrot was seen in flocks of eight or more; this is a vulnerable species.

A moderate variety of amphibian and reptile species were found during the survey. None of them are rare, threatened, or endangered.

No rare, threatened or endangered species of fish were identified and there was an absence of large species.

Based on the findings of the Digby Wells studies, the HCV assessment show that:

- HCV1 (species diversity): the plantations, secondary forest and disturbed areas are not HCV1. The natural forest in areas surrounding the concession is HCV1 but shows signs of disturbance from logging and hunting.
- HCV2 (landscape-level ecosystems and mosaics): the plantations are not HCV2 category areas. Some natural forests around the study site are part of a larger landscape and are HCV2 but this will not be affected by the Feronia project.
- HCV3 (ecosystems and habitats): no HCV3 category areas are in the concession or areas that could be affected by the Feronia project.
- HCV4 (ecosystem services): HCV4 is present based on the dependence of local communities on water resources which are protected by the forests.
- HCV5 (community needs): Digby Wells found HCV5 on the concession due to the reliance of people on natural water sources, and forest products for building, firewood, food and medicine.
- HCV6 (cultural values): graves are present and these are classified as HCV6. Other sites may be present but as Feronia will not be clearing previously unplanted areas, it is unlikely there will be any affect.

Reliance on natural resources which is extremely high and the large numbers of people in the region indicates pressure on the HCVs and natural resources are community-based. The most commonly harvested resource being firewood, followed by forest food products (not meat). Table 10 indicates the prevalence of reliance on different types of natural resources. Figure 7 shows the frequency with which these natural resources are harvested.

Table 10: Prevalence of Reliance on Natural Resources, Lokutu

Type of natural resource	Prevalence of reliance (%)
Firewood	92
Forest food products (excluding meat)	64
Fish	54
Bush Meat	49
Medicinal Plants	29
Construction materials	38

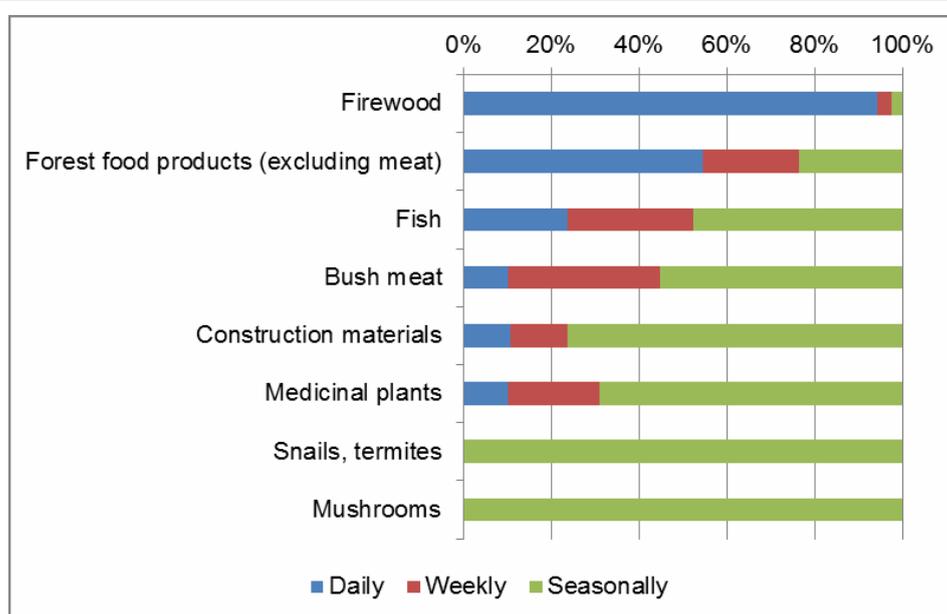


Figure 7: Frequency with which Natural Resources are Harvested, Lokutu

5.2 HCV Management and Monitoring

A threat assessment was carried out for each of the HCVs in the Boteka, Yaligimba and Lokutu areas of influence. Each threat was rated and management measures recommended for each Management Unit (MU). The threat assessment is based on the timing, scope and severity. The method is based on the scoring used by the IUCN and is described in the HCV reports. As Feronia has no scope beyond the concession, the MUs are only for those within the concession (Plan 5 to Plan 7). Recommendations for managing and monitoring MUs in the Boteka, Yaligimba and Lokutu concessions are presented in the detailed HCV reports.

In summary, the HCV surveys conclude that a number of education programs with a focus on reducing the reliance on bush meat and increasing the reliance on domestic animals would reduce the hunting pressure on wild animals throughout all the concessions. It is unlikely that hunting for bush meat would be entirely stopped, but it can be reduced.

Uncontrolled logging for local trade and subsistence does exist and the monitoring of the locations of logged trees and the numbers of trees felled is recommended. A re-planting scheme could assist in long term management of identified HCV areas.

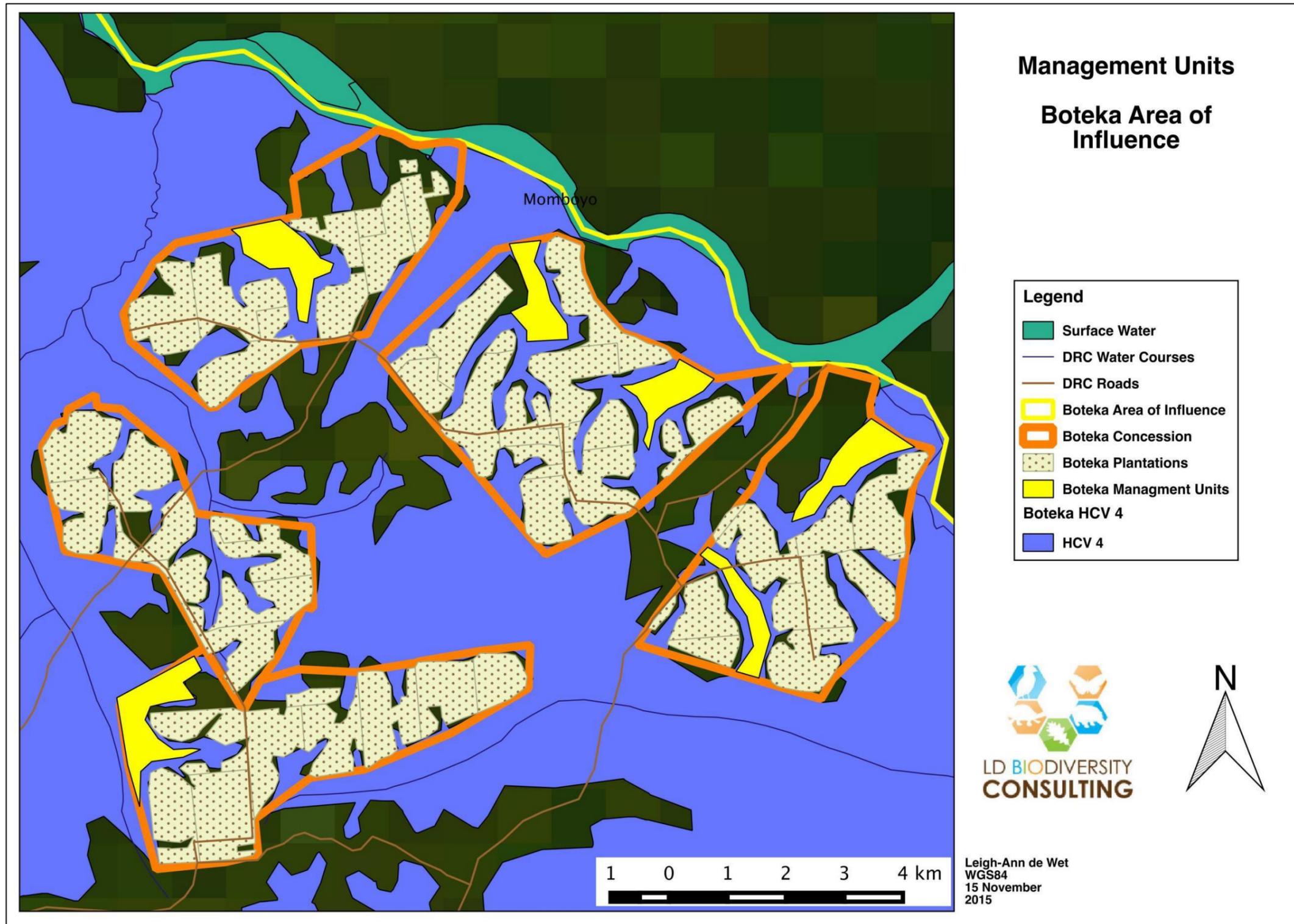
Fishing is one of the main natural resources used throughout all three concessions by the local communities. River systems have been moderately disturbed within many of the concession areas. Fishing within the MUs should be controlled, either by prohibiting entirely, or applying fishing quotas. No barrages or dams should be constructed in this area.

All culturally important sites throughout the three concessions, especially those located in or near natural forest should be mapped in conjunction with the community through participatory mapping.

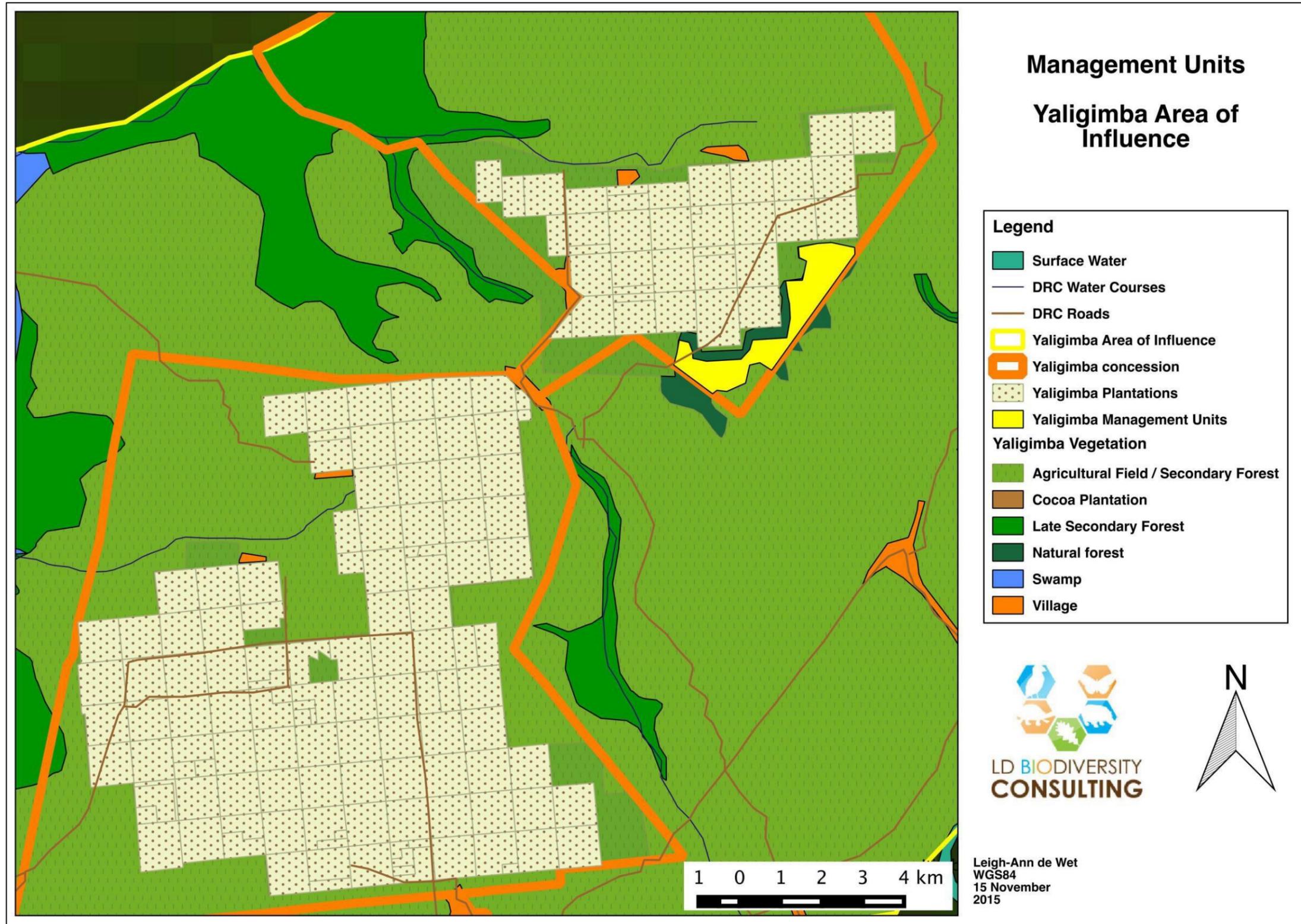
In terms of meeting RSPO requirements, Feronia is required to adhere to the following:

- Identify specific MUs within the concession areas;
- Develop and implement a management plan and associated maps for each of the MUs that can easily be applied by staff working on the ground;
- Develop and implement a monitoring plan for each of the MUs; and
- Do not expand into areas of little disturbed natural forest as per RSPO regulations.

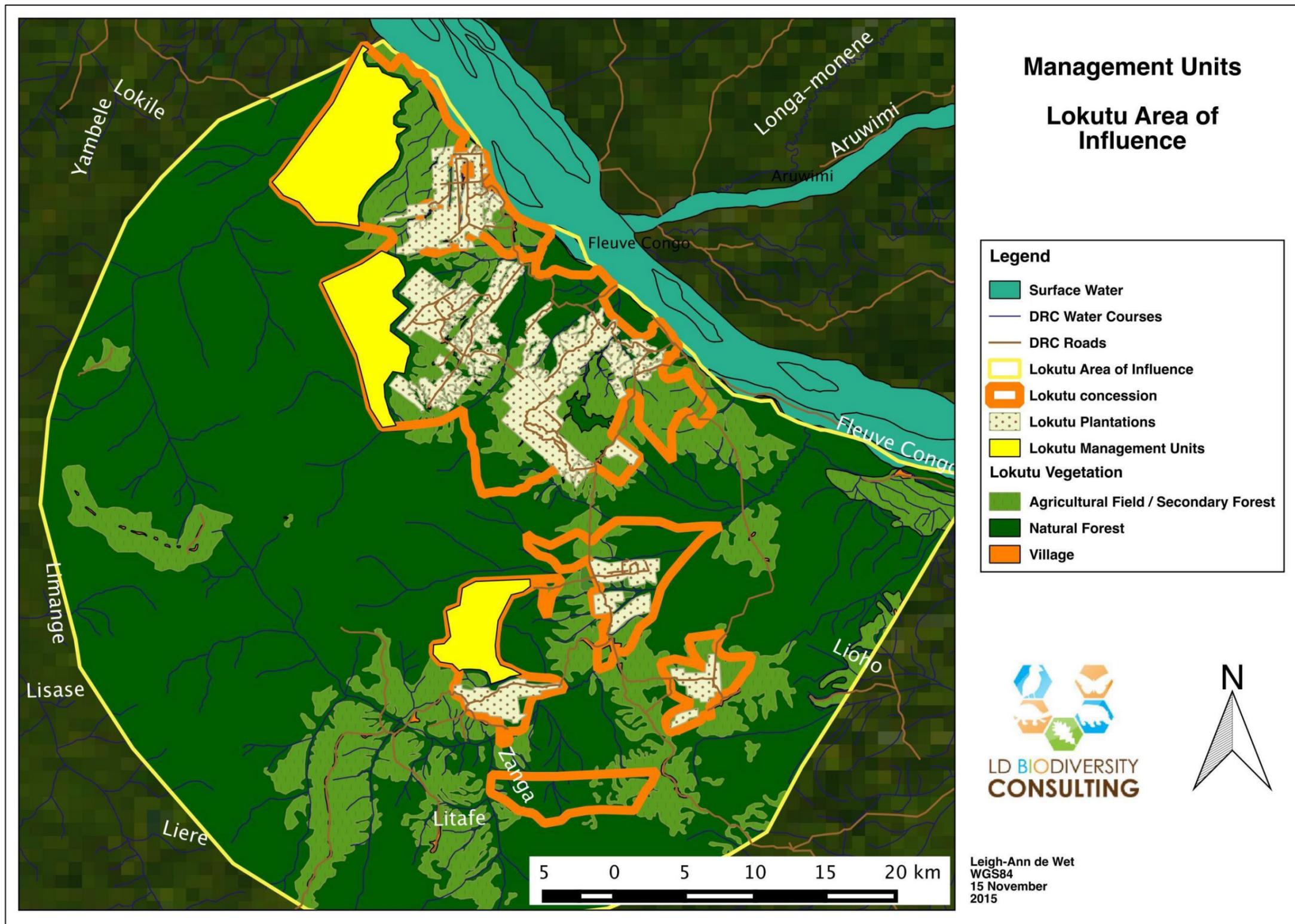
When the site is audited for RSPO accreditation, this HCV document will be required to be produced along with associated maps and plans.



Plan 5: Management Units for the Boteka Concession



Plan 6: Management Units for the Yaligimba Concession



Plan 7: Management Units for the Lokutu Concession

5.3 Air Quality

All three plantations are in remote areas and none have nearby industrial developments; thus, there are no large-scale operations that affect the overall air quality in or beyond the concessions.

Based on visual observations, the air is generally clear (in the concessions and surrounding areas) with only scattered point source emissions in the concessions and local communities (dust, and smoke); these are ephemeral and local in extent. The prevailing weather conditions influence the extent that these sources impact local air quality (e.g., dust is suppressed by rain during the wet season, and less dust is raised as soil moisture content increases).

Ambient air quality is generally clear with localised fugitive dust and scattered point sources of emissions (e.g., boiler stacks and wood burning smoke). The Feronia operations have no significant impacts on the existing air environment. As the plantations are rehabilitated and vehicles, equipment and mills are modernised, emissions from the mills and vehicles should be reduced.

Feronia will implement a monitoring programme that will enable it to gauge changes to air quality over time and as the seasons change. Air quality was not raised as an issue in any of the stakeholder meetings (FGDs and interviews).

5.4 Noise

The noise environment was described as being typical of African forested and rural areas. Noise associated with Feronia activities included low level noise from the mills and activities on the plantations. The overall noise environment has remained relatively unchanged since the commencement of operations. As the plantations are rehabilitated and old vehicles, equipment and facilities are replaced (e.g., with new vehicles and boats), noise levels will be reduced. Noise was not raised as a health or nuisance issue during stakeholders meetings. (FGDs and interviews).

5.5 Waste Water Treatment

The overall objective of the study was to give technical advice on how to reduce the biochemical oxygen demand (BOD) of the palm oil mill effluent (POME) to 50 mg/l (from 500 mg/l), which is the longer term objective set by Feronia to meet good international industry practice. BOD is the amount of dissolved oxygen required to meet the metabolic needs of aerobic organisms in water rich in organic matter. Digby Wells discussed waste water treatment management plans with Feronia staff, reviewed the “Proposal to Manage Palm Oil Mill Effluent (POME) over time to achieve good international industry practice (GIIP)” and carried out a brief literature review to determine technically and feasible options to treat POME.



Treatment options include conventional ponding systems, aerobic digestion, anaerobic digestion or treatment, physic-chemical treatment and irrigation. Based on information gathered, the proposed ponds are the best available option to treat the POME at the three plants. The capacity of the ponds may be too small to achieve the required retention times but this aspect needs to be evaluated at each plantation. The reaction characteristics of the effluent, at each mill, should be measured so that the pond sizes are optimal; they may need to be expanded to accommodate the high rainfall and future increased production. A geotechnical investigation would be required to assess the soil characteristics as it may transpire that ponds need to be lined to isolate the effluent from the underlying terrain (to avoid contamination).

6 Conclusions

The Environmental and Social Assessment (ESA) has identified and assessed the positive and negative risks and impacts associated with Feronia's ongoing rehabilitation of three oil palm plantations and associated infrastructure. In addition, the ESA has sought to contextualise the rehabilitation work within the highly challenging operating environment at Boteka, Lokutu and Yaligimba in DRC. In particular, the ongoing rehabilitation works are influenced by a legacy of over 100 years of operation and approximately 20 years of decline due to civil instability during the 1990s and 2000s, which set back economic and social development throughout the DRC.

When Feronia acquired Plantations et Huileries du Congo (PHC) in 2009, the first priority was to re-establish business operations to a profitable and sustainable level, and to secure jobs for the existing workforce. Given PHC's position as the only significant source of formal private sector employment in regions of operation, providing direct and indirect employment opportunities for the wider communities was also considered a priority. In addition to the commercial aspects of rehabilitation, Feronia has already increased salaries and made commitments to improve the living conditions of their workers and local communities (e.g., improving worker houses, hospital services, and water supply by restoring boreholes).

In terms of the socio-economic conditions, it is estimated that approximately 100,000 people live on or within 5 km of the three concessions ('the study area') and approximately 47% are under the age of 16. This rapidly growing and relatively uneducated population presents a significant challenge for the company and the local infrastructure, albeit the rate of growth and levels of education appear broadly consistent with elsewhere in rural DRC. Local communities within the study area are highly dependent on PHC for employment (both permanent and seasonal) and subsistence farming for their livelihoods. The socio-economic survey identified significant pressure on land for the cultivation of food crops as a source of tension between workers, who are restricted in where they can grow crops, and non-workers communities, who have more access to agricultural land outside of the concession. This pressure on land is likely to continue and emphasises the urgent need for the implementation of a community development plan. In addition, grievances raised during stakeholder meetings appear to be a result of, and exacerbated by, ineffective communications between PHC management, their workforce and non-worker communities. Going forward, establishing an effective and proactive stakeholder engagement plan is considered to be critical to the success of the rehabilitation project.

From a conservation perspective, Feronia has committed to protecting the overall environment by implementing a zero deforestation policy and concentrating solely on the replanting of old oil palm that has reached the end of its productive lifecycle. In this respect, the rehabilitation project is considered a "brownfield project". In addition, the Company has commenced a programme of work to achieve RSPO certification. As part of the Company's programme to achieving certification, the scope of this ESA included high conservation value (HCV) surveys of the three plantations, along with specialist faunal and floral studies. The studies identified community pressure on the natural resources at all three locations; a

legacy of the isolated locations and restricted trade during the civil conflict appears to have resulted in an over reliance in local communities on ecosystem services such as timber, firewood, medicinal plants and bushmeat. Management units have been proposed within the concession to protect the remaining areas of natural forest.

Overall, the challenges, risks and impacts identified in this ESA are complex, multifaceted and at times conflicting (e.g. use of ecosystem services vs conservation); however, they are characteristics of a post-conflict environment and the resultant underdevelopment and poverty. With increasing investment, a strategy to rehabilitate not just the commercial aspects of the business but the social infrastructure of the region, Feronia has made a commitment to address the needs of their workforce and play an important role in the broader development of its regions of operation.

Appendix A: List of interviews and focus group discussions

Table 1: Interviews conducted as part of the Social Assessment

Plantation	Interviewee	Date
Lokutu	City Chief – Bandu	14 January 2015
	Feronia PHC plantation management	14, 23 and 26 January 2015
	Indigenous people’s committee	21 January 2015
	Basoko Territory Authorities	22 January 2015
	Centre for social and medical services for St Joseph - NGO in Basoko city	22 January 2015
	Feronia PHC hospital doctor	22 January 2015
	Feronia PHC GIS specialist	26 January 2015
	Priest and nuns at the Saint Augustine parish	26 January 2015
	Chieftdom and sector chiefs	26 January 2015
	Union representatives	26 January 2015
Yaligimba	APEI agricultural NGO	3 February 2015
	Chieftdom and sector chiefs	5 February 2015
	Union representatives	5 February 2015
	UNIPM community oil palm plantation - NGO	5 February 2015
	Nuns at Saint Joseph’s parish	6 February 2015
	Feronia PHC hospital doctor and nurses	6 February 2015
	Feronia PHC plantation management	6 February 2015
Boteka	CODERBO and ADEL NGOs	17 March 2015
	Priest at Saint Xavier’s parish	17 March 2015
	Feronia PHC hospital doctor and nurses	18 March 2015
	Union representatives	18 March 2015
	Chieftdom and sector chiefs	20 March 2015
	Feronia PHC plantation management	18 March 2015


Table 2: FGD conducted as part of the social assessment

Plantation	Settlement	Category	Date
Lokutu	Worker village Makongo	Company Worker village	16 January 2015
	Village Yambienene	Village inside concession	17 January 2015
	Village Yaosele	Village inside concession	17 January 2015
	Village Liese	Village inside concession	18 January 2015
	Village Tongoso	Village inside concession	18 January 2015
	Worker village Bongemba	Company Worker village	19 January 2015
	Worker village Sedec	Company Worker village	19 January 2015
	Worker village Masinga	Company Worker village	20 January 2015
	Worker village Kimbaseke	Company Worker village	21 January 2015
	Worker village Potopoto	Company Worker village	21 January 2015
	Worker village Makau	Company Worker village	21 January 2015
	Village Yangoma Molifa	Village outside concession	23 January 2015
	Village Bandu	Village outside concession	23 January 2015
	Village Yaisubu	Village outside concession	24 January 2015
Yaligimba	Worker village Usine (Station)	Company Worker village	31 January 2015
	Worker village Moende I	Company Worker village	1 February 2015
	Worker village Mayombe	Company Worker village	2 February 2015
	Village Yambongu	Village outside concession	2 February 2015
	Worker village DR	Company Worker village	3 February 2015
	Worker village Pembe	Company Worker village	3 February 2015
	Village Yaesele	Village outside concession	3 February 2015
	Worker village Pembe	Company Worker village	4 February 2015
	Village Bongolu	Village outside concession	4 February 2015
	Worker village Beach and Village Yambenga	Company Worker village	7 February 2015
Boteka	Worker village Ciment	Company Worker village	16 March 2015
	Worker village Ifoma Benkufo	Company Worker village	16 March 2015
	Village Bolondo Elinga	Village inside concession	17 March 2015
	Village Loonga	Village outside concession	17 March 2015



Plantation	Settlement	Category	Date
	Worker village Besombo	Company Worker village	18 March 2015
	Village Likoli	Village outside concession	18 March 2015
	Village Bofalamboka	Village outside concession	19 March 2015
	Worker village Bofalamboka	Company Worker village	19 March 2015
	Village Mokonso	Village outside concession	19 March 2015

