

**TEMPLATE**

# KEY PROJECT INFORMATION & PROJECT DESIGN DOCUMENT (PDD)

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VERSION **v. 1.2**

RELATED SUPPORT

– **TEMPLATE GUIDE Key Project Information & Project Design Document v.1.2**

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This document contains the following sections

Key Project Information

Section A – Description of project

Section B – Application of approved Gold Standard Methodology (ies) and/or demonstration of SDG Contributions

Section C – Duration and crediting period

Section D – Summary of Safeguarding Principles and Gender Sensitive Assessment

Section E – Outcome of Stakeholder Consultations

Appendix 1 – Safeguarding Principles Assessment

Q – Contact information of Project participants (mandatory)

Q – LUF Additional Information (project specific)

Appendix 4 – Summary of Approved Design Changes

## KEY PROJECT INFORMATION

GS ID of Project	GS11154
Title of Project	JOil Jatropha plantation in Ghana
Time of First Submission Date	13/04/2021
Date of Design Certification	21/02/2022
Version number of the PDD	05.3
Completion date of version	15/01/2022
Project Developer	JOil (S) Pte. Ltd.
Project Representative	<p>JOil (S) Pte. Ltd.  Contact: Vasanth Subramanian  Address: 1 Research Link, National University of Singapore, 117604 Singapore  Email: <a href="mailto:vasanth@joil.com.sg">vasanth@joil.com.sg</a>  Phone: +(65) 6872 9890, +(65) 9127 0084</p> <p>JOil India Private Ltd.  Contact: Kins Varghese  Address: 1D, Lexus Regency, Behind airtel office, Lakshmi Mills, Coimbatore-641037, Tamilnadu, India  Email: <a href="mailto:kins@joil.co.in">kins@joil.co.in</a>  Phone: +(91) 422 4393559, +(91) 875 4008577</p>
Project Participants and any communities involved	<p>Smart Oil Ltd.  JOil Africa Pte. Ltd.  JOil India Private. Ltd.  South Pole Carbon Asset Management Ltd.</p>
Host Country (ies)	Ghana

Activity Requirements applied	<input type="checkbox"/> Community Services Activities <input type="checkbox"/> Renewable Energy Activities <input checked="" type="checkbox"/> Land Use and Forestry Activities/Risks & Capacities <input type="checkbox"/> N/A
Scale of the project activity	<input type="checkbox"/> Micro scale <input checked="" type="checkbox"/> Small Scale <input type="checkbox"/> Large Scale
Other Requirements applied	N/A
Methodology (ies) applied and version number	Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology, version 1 – Published July 2017
Product Requirements applied	<input checked="" type="checkbox"/> GHG Emissions Reduction & Sequestration <input type="checkbox"/> Renewable Energy Label <input type="checkbox"/> N/A
Project Cycle:	<input type="checkbox"/> Regular <input checked="" type="checkbox"/> Retroactive

## Land-use & Forest Key Project Information<sup>1</sup>

Scope:	<input checked="" type="checkbox"/> Forestry <input type="checkbox"/> Agriculture
Silvicultural system:	<input checked="" type="checkbox"/> Conservation (no use of timber) <input type="checkbox"/> Selective Harvesting <input type="checkbox"/> Rotation Forestry

<sup>1</sup> Please refer to 0 for detailed information on LUF projects

Project Area (ha):	3,944.22																		
Eligible Area (ha):	2,862.97																		
10% Set Aside Conservation area (ha):	1,081.25																		
Evidence that Project Area Boundary is clearly distinguishable in the field:	The project boundaries are determined using GPS to generate polygons for each of the areas included in the project. The plantation phases have been well marked with the boards, stating the phase, planting year and block number.																		
Planting Area	Year 2018: 1,136.87 Year 2022: 2,807.35																		
How many Modelling Units (MUs) are included in the eligible area:	<div>The MUs are defined by the location of the plantation catchment area. There are two MUs under year 2018 included in the project area.</div> <table><thead><tr><th>MU</th><th>Location</th><th>Eligible Area (ha)</th></tr></thead><tbody><tr><td>Year 2018</td><td>Kwaease-Yeji</td><td>102.66</td></tr><tr><td></td><td>Kadua</td><td>470.06</td></tr><tr><td></td><td>Gyentidua</td><td>442.81</td></tr><tr><td>Year 2022</td><td>Gyentidua</td><td>1,847.44</td></tr><tr><td colspan="2">Total eligible area</td><td>2,862.97</td></tr></tbody></table> <div>The MUs of planting year 2022 within an eligible area of 1,847.44 ha will be updated when the plantation activities have been performed.</div>	MU	Location	Eligible Area (ha)	Year 2018	Kwaease-Yeji	102.66		Kadua	470.06		Gyentidua	442.81	Year 2022	Gyentidua	1,847.44	Total eligible area		2,862.97
MU	Location	Eligible Area (ha)																	
Year 2018	Kwaease-Yeji	102.66																	
	Kadua	470.06																	
	Gyentidua	442.81																	
Year 2022	Gyentidua	1,847.44																	
Total eligible area		2,862.97																	
Summary of New Areas added (copy and insert as needed):																			
Size (ha):	N/A																		
Date Added	N/A																		

Table 1 – Estimated Sustainable Development Contributions

Sustainable Development Goals Targeted	SDG Impact (defined in Error! Reference source not found.)	Estimated Annual Average	Units or Products
<b>8 Decent Work and Economic Growth</b>	Average hourly earnings of female and male employees, by occupation, age and persons with disabilities	8.80	GH¢/day
	Percentage of workers linked to SOIL in relation to the total number of permanent and temporary employees	20/80	%
<b>13 Climate Action (mandatory)</b>	The amount of CO <sub>2</sub> removed by Jatropha trees plantations	55,072	VERs
<b>15 Life on Land</b>	Number of staff and workers attending awareness-raising training on management of biodiversity	3	People/session
	Number of training courses to staff and workers on the management and conservation of biodiversity	1	Training session

## SECTION A.

### DESCRIPTION OF PROJECT

#### A.1. Purpose and general description of project

>> The JOil Jatropha Plantation Project in Ghana has been engaged by Smart Oil Limited (SOIL) – an agri-business company in Yeji, Brong Ahafo Region. SOIL is wholly owned by JOil (S) Pte Limited. JOil (s) Pte Ltd is a pioneer in the Jatropha industry, aiming to supply Jatropha seeds and products as environmentally sustainable products. This will be accomplished through the establishment of environmentally certificated plantations belonging to both JOil called nucleus area, and out-growers plantations based in Africa, with high yielding proprietary seed varieties. Processing technologies will be developed to meet selected applications and market development, thereby creating significant value for JOil’s shareholders, while making a positive contribution to the environment and to communities in Ghana, Africa. Furthermore, the project aims to expand its plantation activities to mitigate climate change and improve the land use of open shrublands and bare land. Additionally, the project aims to create jobs in rural areas

through the sustainable production of biofuels and enhance the livelihood of communities. The project is working with local communities and out-growers to promote sustainability practices. The selection of planting areas is based on land availability, eligibility, consent and commitment of the Kadua Stool and Yeji Stool, Lands Commission, Brong Ahafo Region of Ghana. The leased land of 6,540.04 ha has been classified as an agriculture zone by the Planning Department of District Assembly. Hence, the plantations development has been carried out on the land which does not conflict with the land use in baseline scenario. Furthermore, only 4,500 ha can be cultivated *Jatropha* plantation as per agreement with the traditional authorities and with over 2,000 ha earmarked as a buffer zone for subsistence agriculture compensation.

*Jatropha* is known to survive on rainfall at least 600mm of rain annually<sup>2</sup>. It can survive in very poor soil which considered marginal for normal agriculture. It is also seen to grow rocky soil. However, *Jatropha* can survive three years of drought by dropping its leaves. Therefore, the baseline scenario of shrubland and bare land are suitable for *Jatropha* cultivation.

The project focuses on *Jatropha* plantation in nucleus areas; Kwaease-Yeji site, Kadua site, and Gyentidua site, with last for 30 years, from 2018 to 2048, in compliance with the requirements of the Gold Standard. The plantation's objective is to establish about 1,015.53 ha and 1,847.44 ha of eligible area in 2018 and 2022, respectively, excluding out-growers' plantations, which generates approximately 55,072 tCO<sub>2</sub> annually. The project aims to not cut *Jatropha* trees and/or selling timbers or making charcoal as *Jatropha* trees are not suitable as firewood due to excess smoke. The project activities include the tree plantations with *Jatropha curcas* on the degraded land of shrubland and bare land – as these land uses are the baseline scenario of this project, and biodiversity management to conserve the biodiversity of the area as described in Table 2. – with some of the species found within the project area dominated by *Daniella oliveri*, *Dalbergia afzeliana* and *Anogeissus leiocarpa*. However, two plant species which is listed on the IUCN Red list of threatened species as "Endangered" *Ptericarpus erinaceus* and

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<sup>2</sup> FOSFA: Federation of Oils, Seeds and Fats Associations Ltd, Available at <https://www.fosfa.org/content/uploads/2014/11/Jatropha.pdf>

*Azelia Africana* as “Vulnerable”. See supporting Document/ Biodiversity, Environment and Social/ JOil\_AR\_Final Biodiversity Report.

Table 2. Description of the reforestation and conservation activities include in the project area

Type of system	Description	Scientific name	Area (ha)
Plantation	Reforestation with commercial plantation with no use of timber in eligible area	<i>Jatropha curcas</i>	2,862.97
Conservation	Conservation of the isolated trees within the project area	<i>Azelia africana</i> <i>Anogeissus leiocarpa</i> <i>Dalbergia azeliana</i> <i>Daniella oliveri</i> <i>Pterocarpus erinaceus</i> <i>(endangered species)</i>	N/A

#### A.1.1. Eligibility of the project under Gold Standard

>> This project is eligible under Gold Standard as it applies an approved methodology of The Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology (401.13 A/R V1), version 1 – published July 2017.

The JOil *Jatropha* plantation project is eligible where trees are planted on the land that does not meet the national forest definition at the start of planting, and the planted area should not have been forest for at least 10 years prior to the starting date of the plantation. The definition of forest used was by the Designed National Authority (DNA) of the project’s host country<sup>3</sup>. An A/R project is eligible where trees are planted on land that does not meet the definition of a forest at the start of planting, and the planted area should not have been forest for at least 10 years prior to the start of planting. The eligibility analysis was performed based on cartographic information from the Global Forest Change 2000–2019 (Hansen et al., 2013).

<sup>3</sup> According to the Designed National Authority (DNA) of Ghana, the forest definition is land area is 0.1 hectare with tree height at 5 meters and canopy cover of 15 per cent. Forest definition available at <https://cdm.unfccc.int/DNA/index.html>

Global Forest Change<sup>4</sup> is a global loss and gain coverage forest map for the 2000–2019 period, constructed by Department of Geographic Sciences of the University of Maryland (USA). It was performed based on Landsat TM, ETM +, and OLI images with a size of pixel of 30 m and a cartographic scale of 1: 100,000. The results of the map are a temporal series of Landsat images that characterize the forest cover and change that occurred according to the following definitions:

- **Forest cover:** trees with a minimum height of 5 m, expressed as a percentage of crown density per cell for the year 2000.

This data set displays tree cover over all global land (except for Antarctica and a number of Arctic islands) for the years 2000 and 2010 at 30 × 30-meter resolution. “Percent tree cover” is defined as the density of tree canopy coverage of the land surface and is color-coded by density bracket (see legend).

Data in this layer were generated using multispectral satellite imagery from the Landsat 7 thematic mapper plus (ETM+) sensor. The clear surface observations from over 600,000 images were analyzed using Google Earth Engine, a cloud platform for earth observation and data analysis, to determine per pixel tree cover using a supervised learning algorithm. The tree cover canopy density of the displayed data varies according to the selection - use the legend on the map to change the minimum tree cover canopy density threshold.

- **Annual loss of forest cover:** the loss of forest area per year, from 2001 to 2019.

These dataset measures areas of tree cover loss across all global land (except Antarctica and other Arctic islands) at approximately 30 × 30-meter resolution. The data were generated using multispectral satellite imagery from the Landsat 5 thematic mapper (TM), the Landsat 7 thematic mapper plus (ETM+), and the Landsat 8 Operational Land Imager (OLI) sensors. Over 1 million satellite images were processed and analyzed, including over 600,000 Landsat 7 images for the 2000-2012 interval, and more than 400,000 Landsat 5, 7, and 8 images for

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<sup>4</sup> Global Forest Change (<https://earthenginepartners.appspot.com/science-2013-global-forest>)



updates for the 2011-2020 interval. The clear land surface observations in the satellite images were assembled and a supervised learning algorithm was applied to identify per pixel tree cover loss using Google Earth Engine.

In this data set, “tree cover” is defined as all vegetation greater than 5 meters in height and may take the form of natural forests or plantations across a range of canopy densities. Tree cover loss is defined as “stand replacement disturbance,” or the complete removal of tree cover canopy at the Landsat pixel scale. Tree cover loss may be the result of human activities, including forestry practices such as timber harvesting or deforestation (the conversion of natural forest to other land uses), as well as natural causes such as disease or storm damage. Fire is another widespread cause of tree cover loss and can be either natural or human-induced.

The tiles of the information of global forest watch used is tiles used: **10N\_010W**

- **Data mask:** values representing continental areas and permanent waterbodies.

To perform the eligibility analysis, Global Forest Change information was downloaded and divided into 10x10 cells ranging from 180W–180E and 80N–60. The project area is located between cells 10N and 010W. Three raster layers were downloaded: the tree cover layer at the pixel level (0% to 100% of cover cover) for the year 2000, the annual forest loss layer for the 2001–2018 period, and the layer of permanent water bodies for the study area or data mask.

To obtain the Forest-Non-Forest layers of 2008 and 2018, the following steps were taken:

- Downloading the Global Forest Watch information, 10N 10W cell raster’s
- Reclassification of the tree cover layer of 2000 according to DNA Forest definition (15% canopy cover)
- Downloading the layers of losses from 2000 to 2018 and cutting the information within the project area
- Reclassification of annual forest loss layer 2001-2018 to obtain layers of forest loss accumulated in 2008 and 2018:
  - Losses from 2001 to 2007 to obtain the forest of 2008

- Losses from 2001 to 2017 to obtain the forest of 2018
- After the accumulated layers were obtained, we must do the subtraction of forest losses to the initial forest cover of 2000 obtaining the raster of 2008 and 2018 and converting to shapefiles. The forest areas smaller than 0.1 ha are converted to non-forest since they do not meet the forest definition.
- These two layers are combined to find the areas with no forest stable during the 10 years period (the eligible areas)

For the canopy cover of 15%, the initial raster's have a percentage of cover in each pixel, so a reclassification is performed where the pixels with values greater than 15% are classified as forest (value 1) and the rest as no forest (value 0). This process was done in the last step.

For the minimum area of forest, the final raster for 2008 and 2018 have a minimum mappable area with Global Forest Watch which is 0.09 ha, an area less than the country's forest definition of 0.1 ha. so, to accomplish with the forest definition the raster was converted to polygon and the areas lower to 0.1 ha were not considered forest.

Using the Forest-Non-Forest layers (2008 and 2018), a cartographic cross-over of both periods was made for the delimitation of the eligible areas; the information was reclassified so as to class as eligible those areas maintained as non-forest in the period 2008–2018, except for populated centers and permanent water bodies on a scale of 1: 100,000. At the same time, areas classed as non-eligible were those with a stable forest or with gains or losses in forest cover over the same period.

Finally, with the resulting raster information, a post-processing was carried out, which consisted of changing the projection system of the WGS84 geographic coordinate system to the flat WGS84-UTM 30N system, transforming the resulting layer (raster) to vector format, eliminating isolated polygons smaller than 1 ha, constructing the table of attributes with the following categories: eligible and non-eligible, and cutting the layer to the boundaries of the project area.

According to the eligibility analysis, 3,944.22 ha of the project area for more than 10 years prior to the project start date, and thus the area meets the eligibility criteria. The area of 2,862.97 ha is eligible, accounting for 72.59% of the project area. The area of 1,081.25 ha is a non-eligible area, accounting for 27.41% of the total project area.

Figure 1 shows the eligible area marked in orange, i.e., the land that has been non-forest for more than 10 years prior to the project start date, according to the analysis done using satellite imagery.

Additionally, the eligibility confusion matrix 2008 - 2018, evaluated in the year 2018, with an overall accuracy of 94.50% with respect to the control points correctly assigned to the classes and a classification error of omission of 4.32% and visual assignment commission of 8.20% in the non-forest class, and 3.62% and 9.68% in the forest class, with a success rate of over 90 as shown in Table 3. The full procedure is described the supporting document GS11154\_JOil\_Eligibility Accuracy Assessment\_Report.pdf.

Table 3. Classification – Accuracy values

Validation Points (Units)					
Classification	Non-Forest	Forest	Total	User Accuracy	Overall Accuracy
Non-Forest	133	6	139	95.68%	
Forest	5	56	61	91.80%	
Total	138	62	200		
Production Accuracy	96.38%	90.32%			
Overall Accuracy					94.50%

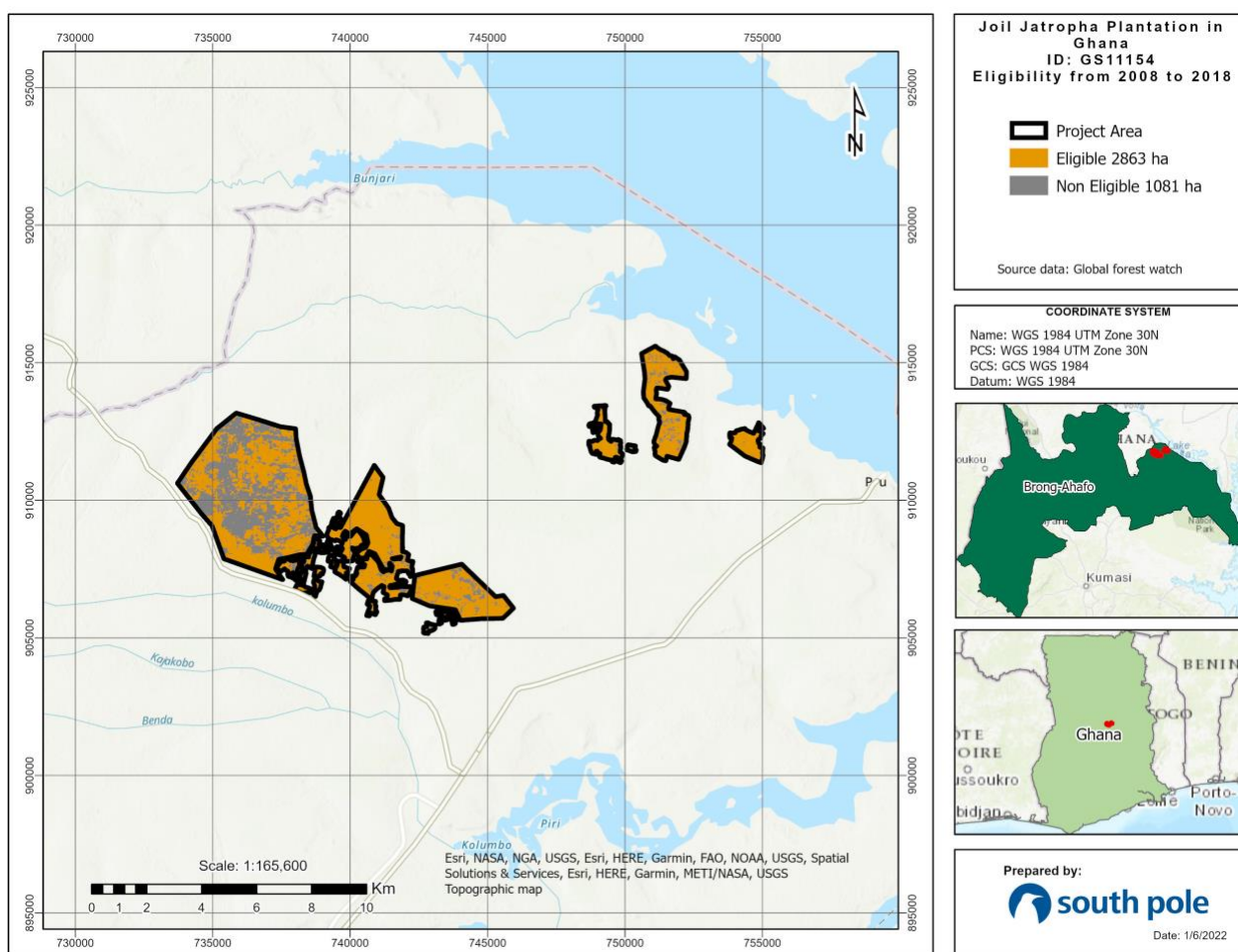


Figure 1. Eligible areas

The JOil Jatropha plantation project is in Yeji, Brong Ahafo Region of Ghana where has no emissions reduction cap enforced in the region and host country. The project activities are following national and international environmental, ecological, and social laws and regulations. The project has not been registered with any other voluntary or compliance schemes before and has no potential for double counting of impacts as the project area does not overlap with any Gold Standard or other voluntary or compliance program.

A.1.2. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

>> The Jatropha plantation project has been engaged by SOIL, which is an agri-business company and wholly owned by JOil (s) Pte Ltd. As the project owner, JOil (S) Pte Ltd will have the rights to carbon credits generated by the JOil Jatropha plantation project in Ghana. Nevertheless, the project owner aims to obtain additional economic

benefits in order to maintain and expand its plantation activities, enhance the carbon sequestration from land use of open shrubland and improve the local communities' livelihood through employment to generate alternative incomes from project activities, such as land preparation, plant nursery and plantation.

Smart Oil Ltd, with a mandate in the renewable energy sector, applied for the concurrence in respect of 6,540.04 ha of agriculture land located in Pru District of Brong Ahafo Region with the main focus on vegetable oil production. As per agreement with the local chiefs Smart Oil can plant 4,500.00 ha, and the remainder must be left for farmers and buffer zones. The stools have agreed to lease the land for a total duration of fifty years, commencing from 1 January 2012. See supporting documents folder Land Agreement.

## **A.2. Location of project**

>> The JOil Jatropha plantation project is located near Yeji, the district capital of the Pru District Assembly of the Brong Ahafo Region of Ghana. The project area can be accessed by the Atebubu-Salaga road through Prang, Labo and Sawaba, all in the East Pru District. Yeji is approximately 184 km by road from Kumasi, the capital of Ashanti Region, Ghana. The plantation project comprises three sites, namely Kwaease-Yeji, Kadua and Gyentidua, with a total area of 3,944.22 ha which includes planted areas, and areas to be planted (Figure 2).

### Kwaease-Yeji site

The Kwaease-Yeji site is about 4 km from the main Yeji Township, and 2.5 km from Kojo Baffour town, and is easily accessible by resident workers. The Kwaease-Yeji site belongs to the Yeji Stool and close to Yeji town. SOIL intends to replant the entire area with hybrids and improved varieties soon. An untarred road connects the site to the main asphalt road. This road has been tarred and is currently in a good state, thanks to periodic maintenance, upgrades and filling of potholes. The northern end of the site is located near the Volta Lake.

### Kadua site

The Kadua site belongs to the Kadua Stool and close to Kadua-1 village. Access to this site is by a 6 km road from the main national highway. The road is not easily accessible during the rainy season. The site is the second-largest land area. The eastern and northern ends of the site are bordered by grassland and the Volta Lake. The vegetation

type is Guinea Savannah woodland, and the area is characterised by relatively flat lands with a few elevated lands with gentle slopes.

### Gyentidua site

The Gyentidua (or Ajentriwa/Agentriwa) site is the biggest site of land, with pockets of trees growing alongside streams and on hillsides. The site belongs to Kadua Stool and surrounds with Ajentriwa, Kobre, Parabo, Sawaba, and Number One villages. It's possible to access the site travelling from Sawaba on a track road along the Southern border of the area. On average, the proximity to the main town centre (Sawaba) is 12 km.

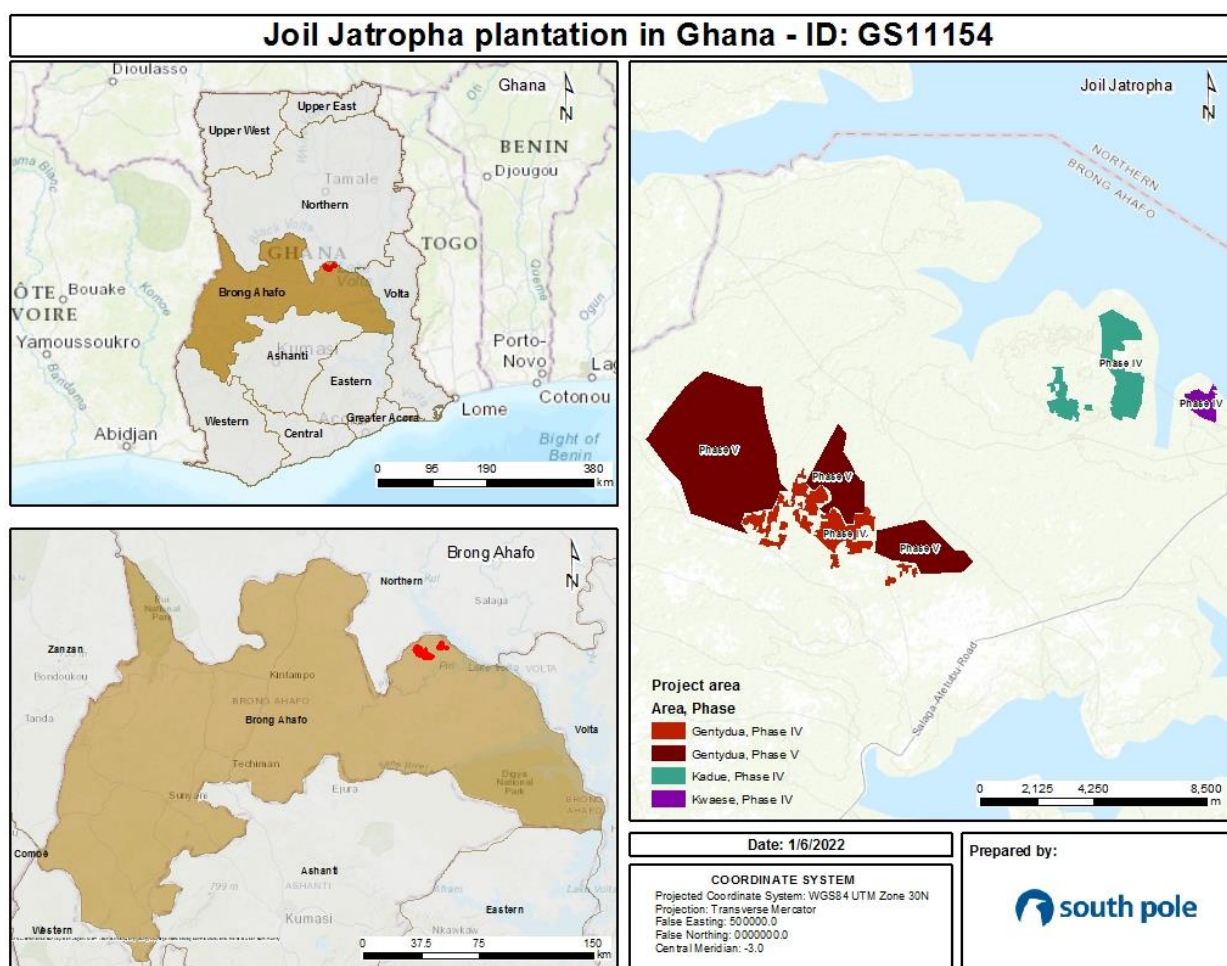


Figure 2. Project Implementation Areas

In addition, as the methodology indicates, the project is focused on the tree planting activity, using single-species plantation, applying the silvicultural system of conservation forests (no harvesting, no use of timber). Therefore, the project meets section 2.1.2 of Land Use & Forest Activity Requirements version 1.2.1. Furthermore,



the project area will not be developed on wetlands<sup>5</sup>. Based on the wetland definition, the wetlands in the region are not located in the project area (as shown in Figure 3).

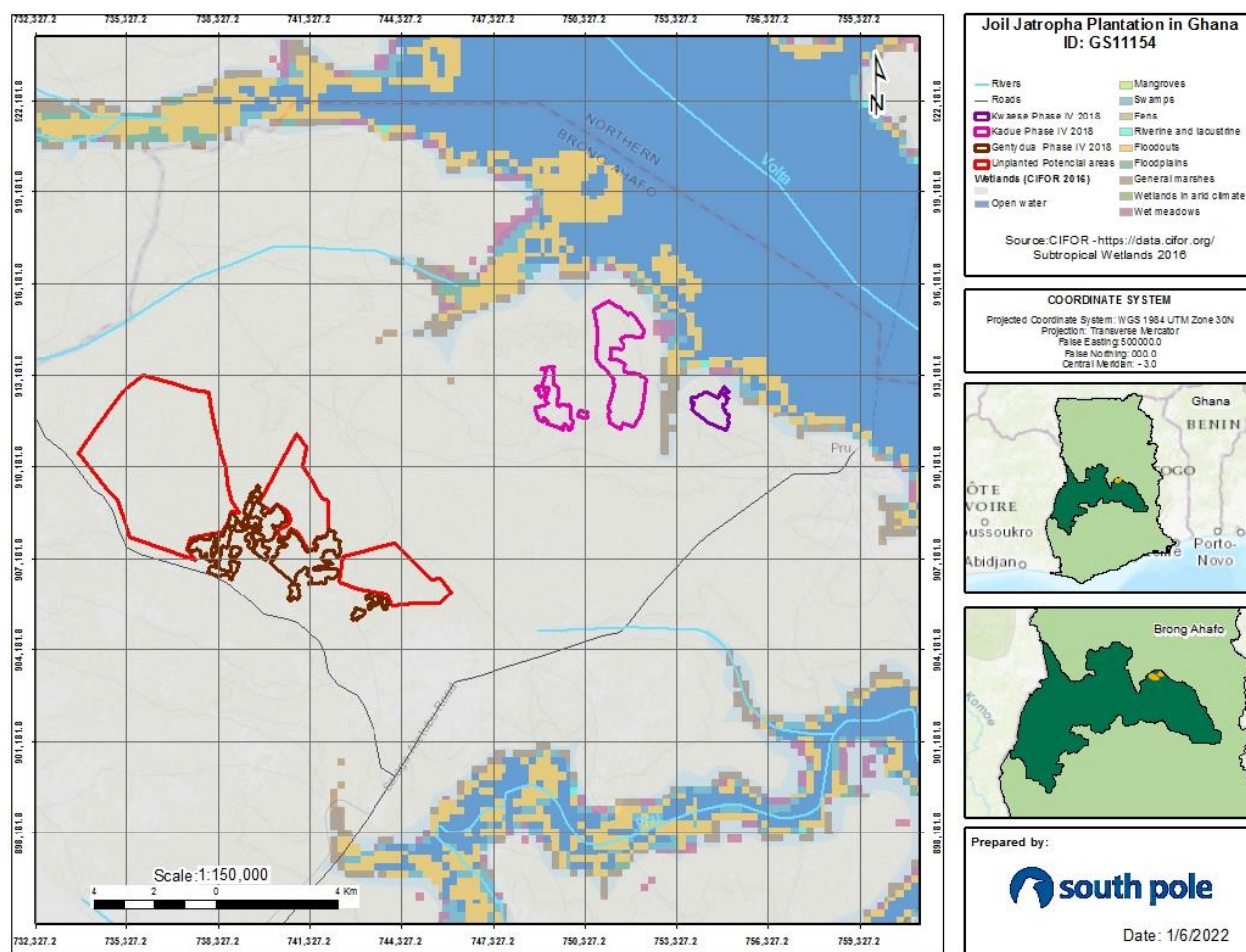


Figure 3. Location of wetlands

### **Physical/geographical location**

>> The JOil Jatropha plantation project is located in three areas near Yeji in the Brong Ahafo Region of Ghana. It is a rural area about 250 km from Kumasi and 400 km from Accra. The plantation project comprises three sites: Kwaease-Yeji, Kadua and

<sup>5</sup> Definition of wetland according to IPCC: "This category includes land that is covered or saturated by water for all or part of the year (e.g., peatland) and that does not fall into the forest land, cropland, grassland or settlements categories". Source: IPCC – Good Practice Guideline – Wetlands

Gyentidua, with a total area of 3,944.22 ha, which includes planted areas and areas to be planted. The project is located between 729°43'39.36" N and 922° 41' 40.56" W

Ghana's coastline is dotted with sandy palm-fringed beaches and lagoons. A narrow grassy plain stretch inland from the coast, widening in the east, while the south and west are covered by dense rainforest. To the north are forested hills, beyond which is dry savannah and open woodland. In the far north is a plateau averaging 500 m in height. In the east, the Akuapim Togo hills run inland from the coast along the Togo border. The area falls almost entirely within the Volta Basin, with the Red, Black and White Volta rivers all flowing into its northern borders from Burkina Faso. The project lies in the central transitional zone of Ghana. The Transitional Zone exists in the mid-part of the country. It portrays characteristics of both the High Forest and Savannah Zones.

## **Climate**

>> The project location has a varied geography and a changing tropical climate due to its proximity to the equator and low elevations. The entire project area lies below 1,000 m (3,300 ft). Daytime temperatures are high throughout the year, approaching or surpassing 30°C (86°F) on most days, and humidity is very high, especially along the coast. Temperatures tend to drop to around 20°C (68°F) at night. The most temperate part is the highlands area flanking the Volta Basin, which is often pleasantly cool after dusk.

The precipitation of the project area varies between 1,200-1,300 mm (47/51 in), having longer rainy season. There are two rainy seasons: the first is from March to July, and the second from September to October. The rainy season lasts from May to September in the north, from April to October in the centre, and from April to November in the south. The rainiest area is the south, where precipitation is above 1,500 millimetres (60 inches) per year, and even more so the small west coast area, where it reaches 2,000 mm (80 in) per year. The driest areas are the north, where the rainfall amounts to around 1,000 mm (40 in) per year, and the eastern coast, which includes Accra, where it drops below 800 mm (31.5 in).

In the project area, the winter is hot: daytime temperatures are usually about 35°C (95°F) in December and January, even though the air is dry, and nights are quite cool. Sometimes, however, nights can get a bit cold, with lows dropping to around 10°C



(50°F). A dry, dust-laden wind, called Harmattan, often blows from the desert. From February to April, the temperature increases further, easily exceeding 40°C (104°F), and are followed by monsoons. In March, early showers and thunderstorms may occur, usually in the afternoon or evening, which become more substantial, exceeding 100 mm (4 in) per month in the following month (i.e., April in the project area). As a result of thunderstorms and clouds brought by the ocean currents, the temperature gradually decreases, and from July to September when clouds and rains are more frequent, it drops to around 30/31°C (86/88°F), however, air humidity increases. The rains cease in October in the north and in November the centre; with the dry wind from the north, hot and sunny conditions return.

According to Ghana's Notational Forest Reference Level<sup>6</sup>, the forests in Ghana are very diverse in term of species composition and ecological landscape. Consequently, Ghana's forest is divided into three main ecological zones: the high forest zone, the transitional zone, and the savannah zone. These zones have been delineated based on climatic factors, rainfall and temperature. The main sub-ecological zones consist of nine forest strata as showed in Figure 4. The project area is located in the savannah zone which mainly exists in the northern part of Ghana, but extends further south into the east coast.

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<sup>6</sup> Ghana' National Forest Reference Level, 2017, National REDD+ Secretariat, Forestry Commission

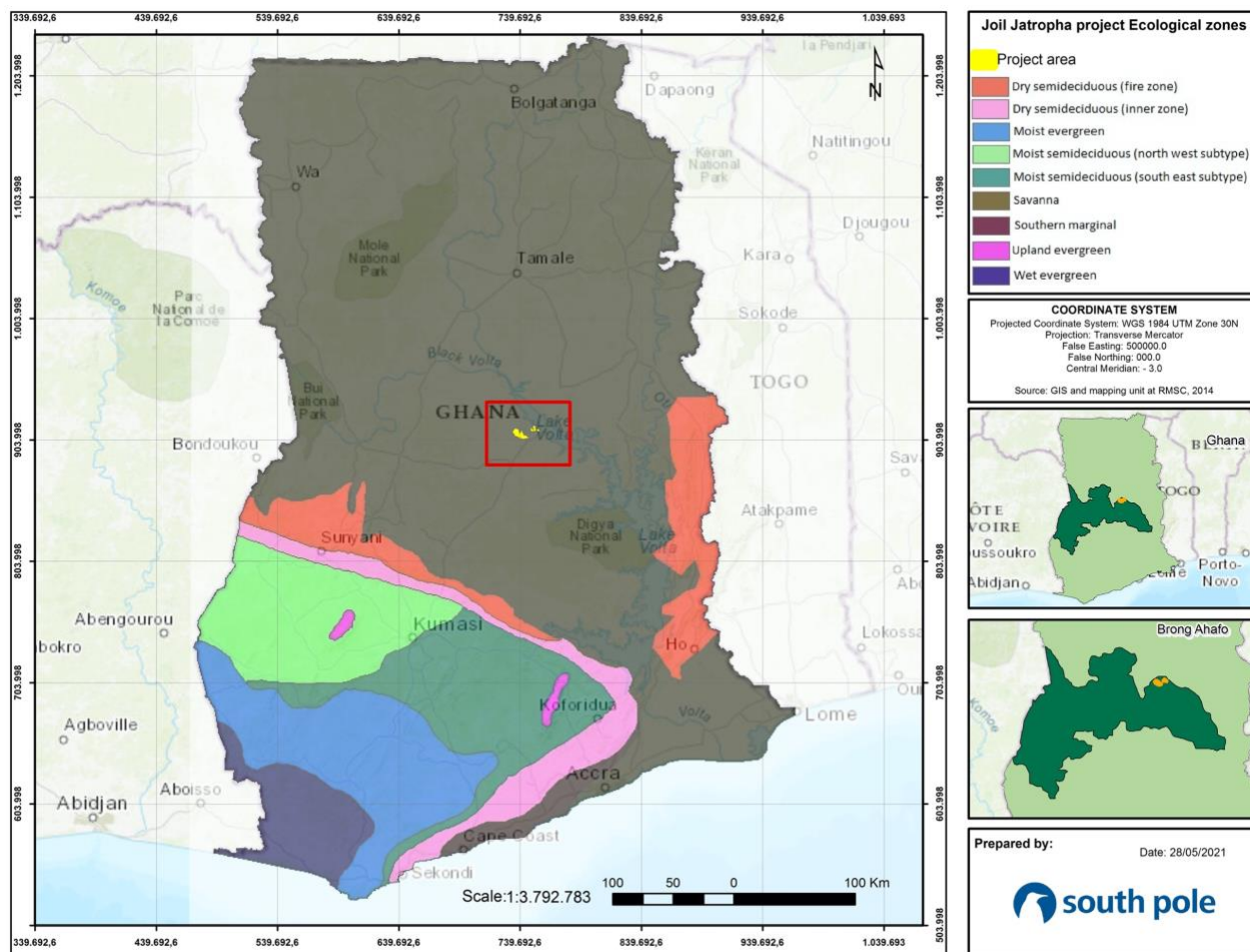


Figure 4. Ecological zones in Ghana<sup>7</sup>

### A.3. Technologies and/or measures

>> The project is working with local communities located within the Yeji, the district capital of the Pru District Assembly of the Brong Ahafo Region of Ghana, to promote the non-edible vegetable oil production activities, and to perform silvicultural operations in the planted area – including pruning and fruit harvesting. Additional objective for the project includes the enhancement of local livelihoods, and conservation of existing large trees. The planting areas are in three different sites, including the Kwasese site, the Kadua site and the Gyentidua site. All Jatropha trees planted should remain on the land for a minimum period of 30 years from the time of planting. During this period, it is

<sup>7</sup> Map prepared by GIS and mapping unit at RMSC, 2014. Available at [https://redd.unfccc.int/files/ghana\\_national\\_reference\\_level\\_01.01\\_2017\\_for\\_unfccc-yaw\\_kwakye.pdf](https://redd.unfccc.int/files/ghana_national_reference_level_01.01_2017_for_unfccc-yaw_kwakye.pdf)

possible for SOIL to undertake silviculture operations. Under this management system, the trees (*Jatropha curcas*) are planted at 4 m x 1.5 m (to establish 1,600 trees per hectare) as shown in Table 4. SOIL intends to establish plantation in three sites with an area of about 3,944.22 ha by 2022. The expected plantation area by year is shown in Table 5.

Table 4. Management operations for *Jatropha* plantation (*Jatropha curcas*)

Tree species	Native /exotic	Growth habit	Proportion of planting (%)	Planting density	Thinning	Rotation	Description of role
<i>Jatropha curcas</i>	Exotic	Fast growing	100	1,600 trees/ha	No thinning	No rotation	Fruit

The *Jatropha* plantation project includes only the planting in Phase 4 (year 2018) and Phase 5 (year 2022) in three different sites (as showed in Figure 2).

Table 5. Plantation targets for the project

Year	Project area (ha)	Eligible area (ha)
2018	1,136.87	1,015.53
2022	2,807.35	1,847.44

## Water buffers

The project will create water buffers between plantation and water bodies to protect the soil along the water bodies. Buffers also reduce the risk that the plantation will be lost if the course of the river changes. Additionally, the project area is more than 500 m away from Lake Volta.

## Protected areas

The total project area of the preliminary land commitment to the project under the agreement between the Land Commission and SOIL is 6,540.04 ha. The total area of this project is 3,944.22 ha. The eligible area is 2,862.97 ha classified plantable area. The non-plantable area is native vegetation and other non-plantable areas such as settlements, roads, water bodies, etc. The project will preserve native vegetation, in addition to buffer areas, which makes up 27.41% of the total project area (Figure 1).

## Plantation management

The Jatropha plantation management is explained in

Figure 5, with the following steps:

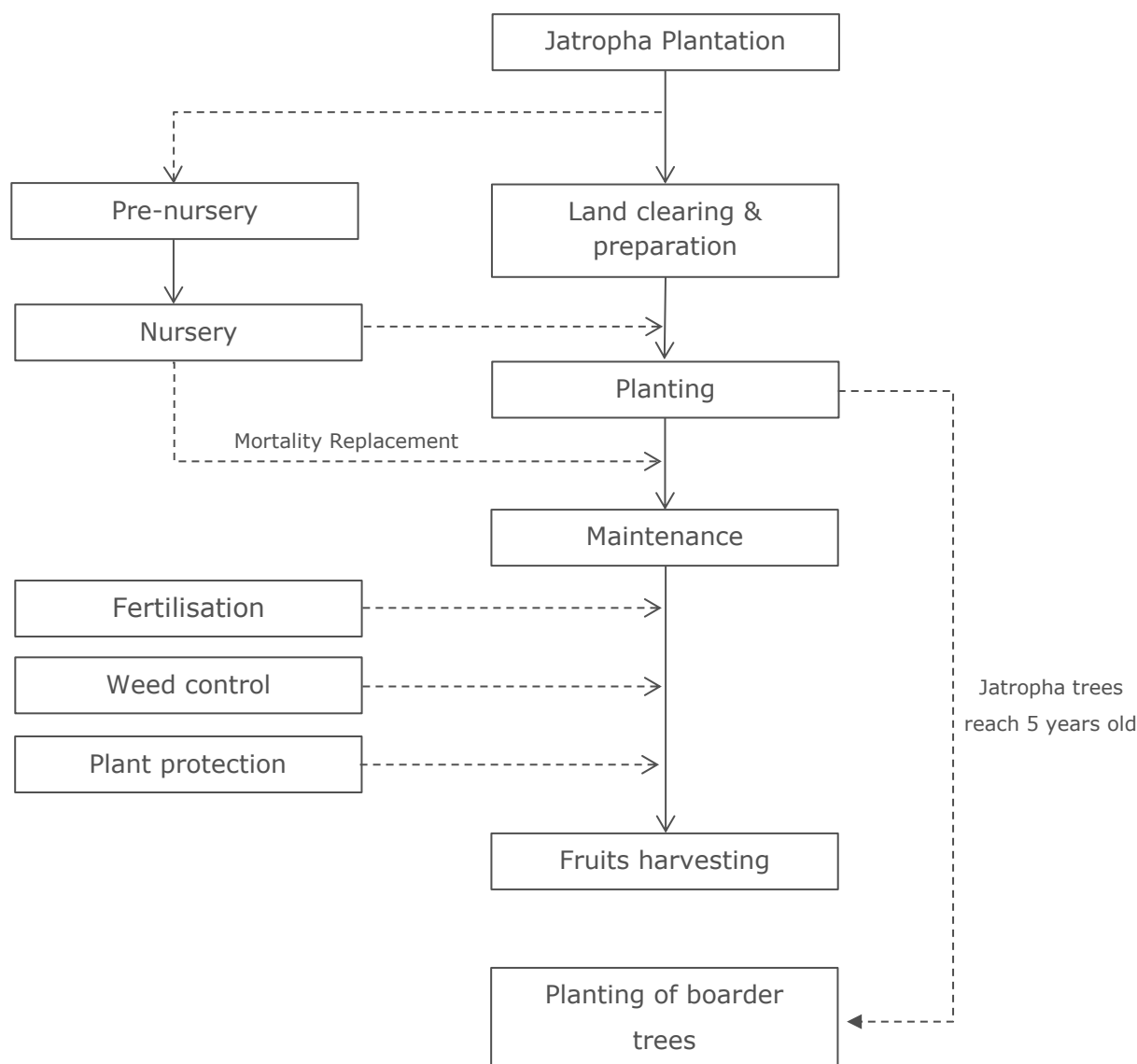


Figure 5. Material Flow Chart for Jatropha plantation<sup>8</sup>

## 1. Plant nursery

Seedlings will be produced at SOIL nurseries and community nurseries. These seeds are planted in the nursery, and saplings are transplanted to the field after 3-4 months. Jatropha plants are very tender during the initial 50-60 days of their growth. Hence, a nursery would be beneficial in maximising the survival and assuring the quality of the plantations. Plants developed from seeds have a better root structure and therefore higher chances of survivability. Saplings developed from nurseries are found to have better tolerance to drought compared to cuttings. Nurseries provide the necessary controls for water, light, nutrients, competition, diseases and pests. This will enable the production of healthy saplings.



Figure 6. Plant nurseries

## 2. Land clearing and preparation

### 2.1 Land Selection

Jatropha is normally grown on marginal lands, or lands which are not under agriculture. In Ghana the plantation is being developed in grasslands, which was once cultivated by the communities, and is now being abandoned due to low fertility status. This land had grasses and some bushes.

<sup>8</sup> See supporting Document/ Biodiversity, Environment and Social/ Plantation Management/ Plantation Manual



## 2.2 Land preparation

The land needs to be levelled and free of all grasses and weeds before the planting of *Jatropha*, as shown in Figure 7. It is observed that a slope of 30° is suitable for a good plantation of *Jatropha*.



Figure 7. Land clearing and preparation

## 3. Planting

### 3.1 Planting time

The best time for planting *Jatropha* is before the onset of seasonal rains. However, in some areas, planting is also done after the rains to use the available moisture in the soil.

### 3.2 Planting depth

The optimum planting depth for *Jatropha* saplings (at 60-75 days old) is 45-50 cm. The pit size should be 45 x 45 x 45 cm. The pits are then filled with soil after planting.

### 3.3 Plant spacing

An optimum spacing of 4 x 1.5 m is found to be suitable for better growth and performance of *Jatropha*. One thousand plants per acre can be accommodated with this spacing.



Figure 8. *Jatropha* trees plantation

#### 4. Maintenance

##### 4.1 Fertiliser application

The application of organic manure (if available at the time of planting) to the pits is found to positively affect the growth and performance of *Jatropha*. Application of organic manure alone should be at the rate of 1:1 with soil, and if inorganic fertilisers are applied, then the rate of application is 2:1:1 for soil, organic and inorganic manure. The fertiliser should be thoroughly mixed in order to avoid any injury to the roots. Application of NPK at 20:10:10 g per pit was found to be beneficial, in addition to well decomposed organic manure, as presented in Table 6.

Table 6. NPK application schedule<sup>9</sup>

Age of the plant	Fertilisers (kg/ha/year)		
	N	P	K
0	20	10	10
1	35	35	30

<sup>9</sup> See supporting Document/ Biodiversity, Environment and Social/ Plantation Management/ Plantation Manual

2	60	40	35
3	70	50	35



Figure 9. Fertiliser application

#### 4.2 Weed control and plant protection

Weeding is found to be an important aspect of the *Jatropha* agronomy, as competition leads to poor growth in the first year of planting, and the likelihood of disease pest harbouring increases (Figure 10). The most common weeds observed are Cyprus and Elephant grass. Weeding at regular intervals is suggested. The frequency of weeding depends on the growth rate of the weeds. When weeds start to shade the *Jatropha*, or grow as tall as the *Jatropha* plants they should be removed, as well as when they limit access to the space in between rows. After one to three seasons – depending on the agro-climatic conditions – the canopies of *Jatropha* will be so dense that weed growth is severely suppressed, and labour for weeding consequently drops. Weeds can be removed and used as an organic manure/mulch for the plants.

Controlling of disease can be achieved by pruning and destroying the effected branches. However, the initial 2 years of trees will be assisted with efficient pruning.





Figure 10. Slashing for weeding control

## 5. Fruit harvesting

Harvesting *Jatropha* is a tedious affair, and requires a lot of labour. Manual harvesting is the only option as no effective mechanical harvesters have been developed (Figure 11). However, harvesters are used for similar crops like olives. The mature fruits are harvested when yellow in colour, and laid out in the sun for drying. The seed oil is used as fuel and conversion to biodiesel. Also used in soap production and as insecticide.



Figure 11. Harvested fruit from Jatropha trees

#### **A.4. Scale of the project**

>> According to the Land Use & Forests Activity Requirements, Version 1.2.1, and given the planted area exceed 500 ha and the emission reductions achieved is more than 10,000 tCO<sub>2</sub>e, the project is classified as a 'large-scale project'.

#### **A.5. Funding sources of project**

>> The project does not receive any public funding. It is expected that the necessary funding for the project will be provided from a range of sources. These may include equity (cash) infusion from existing shareholders and possible new partners who may participate in the project and debt financing from a range of sources.

## SECTION B. APPLICATION OF APPROVED GOLD STANDARD METHODOLOGY (IES) AND/OR DEMONSTRATION OF SDG CONTRIBUTIONS

### B.1. Reference of approved methodology (ies)

>> The methodology selected for the calculation of GHG Sequestration is the 'Gold Standard Afforestation/Reforestation (A/R) GHG Emission Reduction & Sequestration Methodology, version 1 – published July 2017'.

The tool selected for the establishment of baseline scenario is the 'Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities, Version 01'.

### B.2. Applicability of methodology (ies)

>>

#### 1. Planting of trees on land that does not meet the definition of a forest

*To comply with this applicability condition, an eligibility analysis was performed for both the planted areas up to 2018, and the project area to be planted.*

An A/R project under GS is eligible where the trees are planted on land that does not meet the definition of a forest at the start of planting, and the planted areas should not have been forest for at least 10 years before the start of plantation. The eligibility analysis was performed on the methodology of interpretation and analysis of Landsat satellite imagery for coverage classification, using supervised classification in baselines 2008-2018 (See section A.1.1 Eligibility of the project under Gold Standard for a detailed description of the methodology).

#### 2. Project areas shall not be on wetlands

*This category includes "land that is covered or saturated by water for all or part of the year (e.g. peatland) and that does not fall into the forest land, cropland, grassland or settlements categories".*

Ghana has six RAMSAR sites – none of which are in the Brong Ahafo Region where the project activities are located<sup>10</sup>. The project area consists of open shrubland and grassland. No wetlands are included in the project areas, as shown in Figure 3.

### 3. Project areas with organic soil shall not be drained or irrigated (except for irrigation for plantation)

This methodology defines organic soils as follows:

1. If the soil is never saturated with water for more than a few days and contains more than 20% organic carbon in terms of weight (35% organic matter).
2. If the soil is subject to water saturation episodes and has either:
  - 12% (by weight) organic carbon (20% organic matter) if it has no clay
  - 18% (by weight) organic carbon (30% organic matter) if it has more than 60% clay
  - A proportional lower limit of organic carbon content between 12 and 18% if the clay content of the mineral fraction is between 0 and 60%

According to the definition, and based on the soil type map of the project area, the soil types in the project area include Undifferentiated Fluvisols and Haplic Lixisols presented in Figure 12. According to Soil Atlas of Africa<sup>11</sup>, Fluvisols occur in all periodically flooded areas such as flood plains, river fans, valleys, tidal marshes and mangroves throughout Africa. Fluvisols show a layering of sediments with pedogenic horizons as a result of deposition by water. Their characteristics and fertility depend on the nature and sequence of the sediments and length of periods of soil formation after or between flood events. Lixisols are slightly acid soils that show a distinct increase in clay content with depth. The clay is predominantly kaolinite with limited capacity to hold nutrients. Occurring mainly in the dry savannah region with low biomass production, Lixisols do not hold much organic matter and lack a well developed soil structure. Similarly, to the FAO soils definitions<sup>12</sup>, the topsoil and subsoil organic carbon of Fluvisols group contain

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<sup>10</sup> <https://www.ramsar.org/wetland/ghana>

<sup>11</sup> Soil Atlas of Africa, 2013, European Union

([https://esdac.jrc.ec.europa.eu/Library/Maps/Africa Atlas/Documents/JRC\\_africa\\_soil\\_atlas\\_part1.pdf](https://esdac.jrc.ec.europa.eu/Library/Maps/Africa Atlas/Documents/JRC_africa_soil_atlas_part1.pdf))

<sup>12</sup> FAO Soils Portal. Available at: <http://www.fao.org/soils-portal/data-hub/soil-maps-and-databases/harmonized-world-soil-database-v12/en/>



0.8% and 0.4% by weight, respectively. The topsoil and subsoil of Lixisols group in Ghana country contain 0.74% and 0.34% (by weight) organic carbon. Thus, soils in the project area are not organic soils and this requirement is met. In addition, the project activities do not involve any drainage or irrigation, therefore the application condition is met.

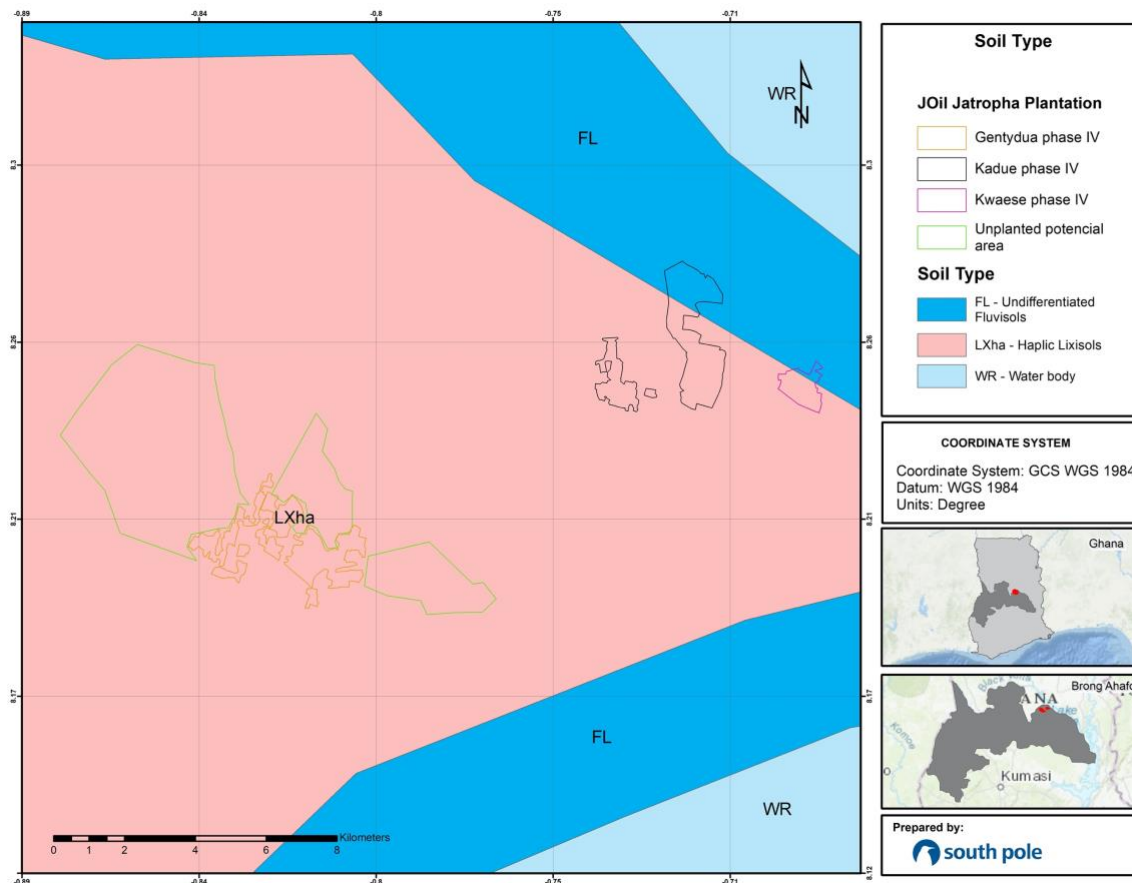


Figure 12. Soil types in project area

4. Soil disturbance (through ploughing, digging of pits, stump removals, infrastructure, etc.) on organic soil shall be in less than 10% of the area that is submitted to certification (not 10% of the entire project area)

Given the information outlined in the previous paragraph, the type of soil in the project area are identified and it is concluded that there is no organic soil. Therefore, this requirement does not apply for this project.

5. Special Condition for A/R Mangrove projects

The project is located in open shrubland and grassland. No wetlands are included in the project areas and A/R mangrove is not considered in this project. Therefore, this requirement does not apply for this project.

6. The most likely scenario without the project (baseline scenario) shall be defined for the project area. This scenario shall not show any significant<sup>13</sup> increase of the Baseline biomass ('tree' and 'non-tree')

According to the scope and applicability, 'the project that include planting of trees on land that does not meet the definition of forest at planting start are eligible to apply this methodology'<sup>14</sup>. The scenarios without the project (baseline scenarios) are showed in Table 10. These scenarios do not show any significant increase of the baseline biomass as they are classified as grassland and bare land. Therefore, this application condition is met.

7. Projects shall apply the Gold Standard Land-use Activity Requirements as applicable to A/R Projects

This project applies the Gold Standard Land-use Activity Requirements, Version 1.2.1 – Published April 2020, as applicable to A/R projects.

### **B.3. Project boundary**

>> The project is being established on leased land in Kadua site and Gyentidua site that belongs to the Kadua Stool and Kwaease-Yeji site belongs to the Yeji Stool. The project area is located in Yeji sub-district, Pru district, Brong Ahafo Region, Ghana as presented in Figure 13.

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<sup>13</sup> Significant is defined to be more than 5% of the 'long-term CO<sub>2</sub>-Fixation' – see 'CO<sub>2</sub>-Fixation'

<sup>14</sup> Scope and Applicability, Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology, Version 1 – Publish July 2017

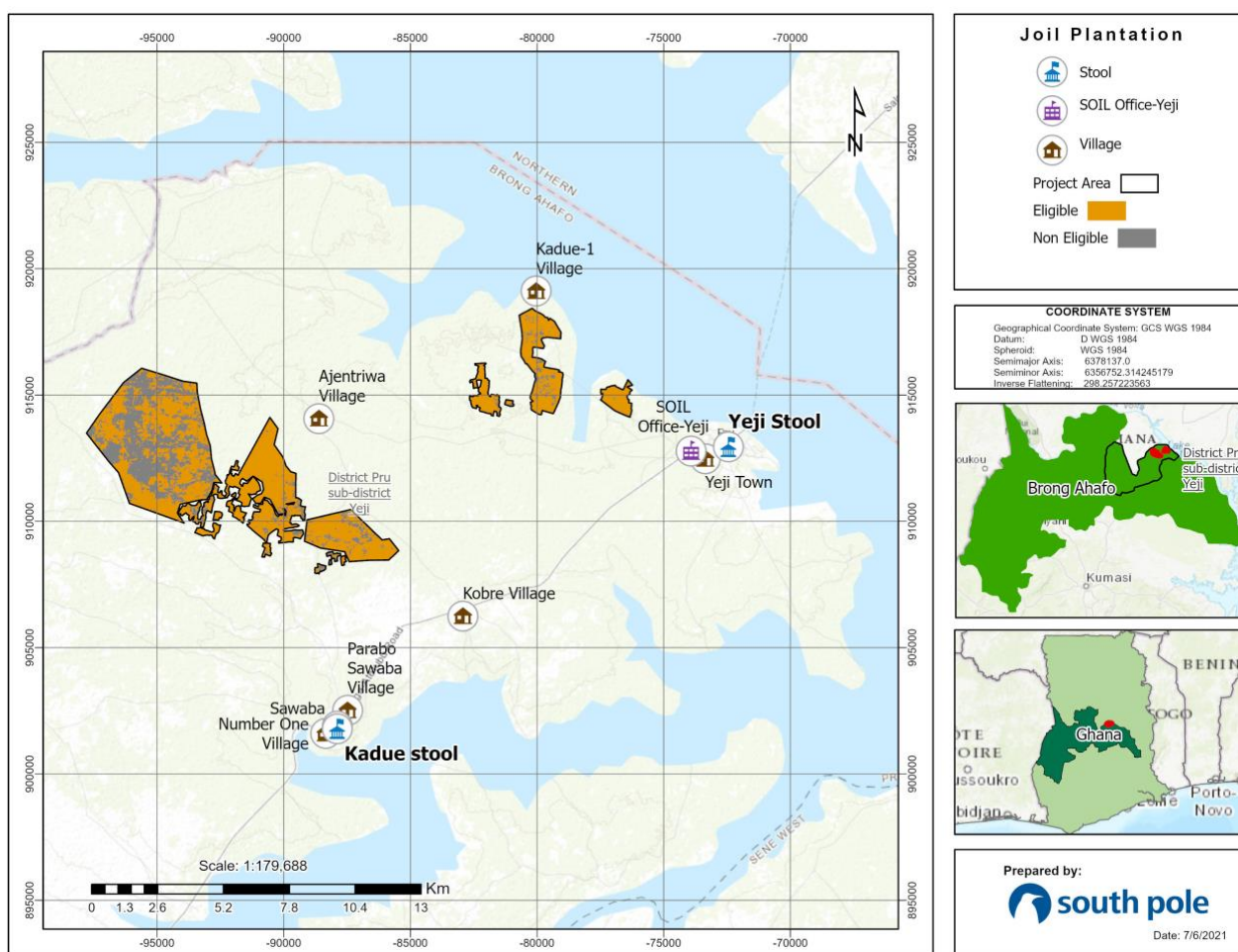


Figure 13. The project locations and boundaries

The process for leasing the land is explained in section A.1.2 of this document. Figure 2 shows the boundaries of the project, which is located in the nucleus area including three sites: Kwaease-Yeji, Kadua and Gyentidua. The compartment boundaries will be well marked with boards, showing the planting phase, year and block number. A GPS of the laid-out boundaries will be recorded and entered into a Geographic Information System (GIS) to ensure that the project area does not overlap with buffers for the watercourse, community areas, conservation reserve areas or others. Once the compartment is delineated, the project activities start as presented in Figure 14.

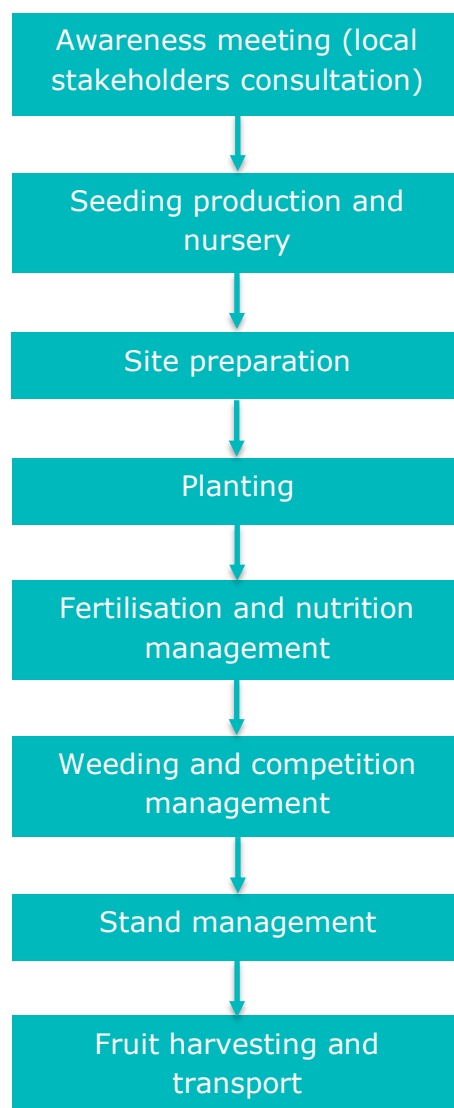


Figure 14. Flow diagram of the activities of the project

Table 7. GHG mitigation and sequestration

Source	GHGs	Included?	Justification/Explanation	
Baseline scenario	Source 1: Aboveground Biomass	CO <sub>2</sub>	Yes	All grass and shrubs existing in the planting area will be accounted for following the requirements for baseline carbon stocks estimation put forward by the methodology.
		CH <sub>4</sub>	No	Minor emission source
		N <sub>2</sub> O	No	Minor emission source



Source		GHGs	Included?	Justification/Explanation	
	Source 2: Belowground Biomass	CO <sub>2</sub>	Yes	Belowground biomass will be included in the baseline estimations in accordance with the applied methodology.	
		CH <sub>4</sub>	No	Minor emission source	
		N <sub>2</sub> O	No	Minor emission source	
	Source 3: Soil	CO <sub>2</sub>	No	The project does not include disturbance of organic soils. Emissions are not expected in this compartment.	
		CH <sub>4</sub>	No		
		N <sub>2</sub> O	No		
	Source 4: Harvested wood	CO <sub>2</sub>	No	Not relevant to the project activity. The baseline scenario is shrubland and bare land. Therefore, there is no timber or wood for harvesting in and surround project area.	
		CH <sub>4</sub>	No		
		N <sub>2</sub> O	No		
	Source 5: Litter and lying dead wood	CO <sub>2</sub>	No	Not relevant to the project activity. The baseline scenario is shrubland and bare land. Therefore, there is no litter and lying dead wood in the project area.	
		CH <sub>4</sub>	No		
		N <sub>2</sub> O	No		
	Source 6: Other sources	CO <sub>2</sub>	No	Using a conservative approach, the baseline scenario does not include the use of fertilisers. Emissions are not expected from this activity.	
		CH <sub>4</sub>	No		
		N <sub>2</sub> O	No		
	Project scenario	Source 1: Aboveground Biomass	CO <sub>2</sub>	Yes	During project cycle, trees will grow, sequester and stock carbon on their trunk, branches and leaves.
			CH <sub>4</sub>	No	Minor emission source
N <sub>2</sub> O			No	Minor emission source	
Source 2: Belowground Biomass		CO <sub>2</sub>	Yes	While trees are growing they will be capturing and storing carbon through their roots. Those roots will not be removed; as a result, the carbon will remain stored.	
		CH <sub>4</sub>	No	Minor emission source	
		N <sub>2</sub> O	No	Minor emission source	
Source 3: Soil		CO <sub>2</sub>	No	Soil is not included, but this source might be included in the future.	
		CH <sub>4</sub>	No		
		N <sub>2</sub> O	No		
Source 4: Harvested wood		CO <sub>2</sub>	No	Not relevant to the project activity. There is no harvested wood in the project	
	CH <sub>4</sub>	No			

Source	GHGs	Included?	Justification/Explanation
	N <sub>2</sub> O	No	scenario because the Jatropha tree is not a timber wood.
Source 5: Litter and lying dead wood	CO <sub>2</sub>	No	Not relevant to the project activity. There is no litter and lying dead wood in the project scenario because the Jatropha is not a timber wood.
	CH <sub>4</sub>	No	
	N <sub>2</sub> O	No	
Source 6: Other sources	CO <sub>2</sub>	No	Not relevant to the project activity
	CH <sub>4</sub>	No	Not relevant to the project activity
	N <sub>2</sub> O	Yes	There will be fertilisation using nitrogenated sources.

#### B.4. Establishment and description of baseline scenario

>> In the absence of the project, grassland and degraded subsistence agriculture are the baseline scenario. The baseline scenario was selected using the 'Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities, Version 01'. The following steps were developed to demonstrate additionality:

- STEP 0. Preliminary screening based on the starting date of the A/R project activity
- STEP 1. Identification of alternative land use scenarios to the proposed project activity
- STEP 2. Barrier analysis
- STEP 3. Investment analysis (if needed)
- STEP 4. Common practice analysis

#### STEP 0. Preliminary screening based on the starting date of the A/R project activity

- Provide evidence that the starting date of the A/R CDM project activity was after 31 December 1999
- >> The plantation of *Jatropha curcas* was on 07/06/2018 as shown in Figure 8.
- Provide evidence that the incentive from planned sale of VERs was seriously considered in the decision to proceed with the project activity.

>> The revenues from CO<sub>2</sub> Certificates were considered in the feasibility study of the plantation plan.

## **STEP 1. Identification of alternative land use scenarios to the proposed project activity**

### ***Sub-step 1a. Identify credible alternative land use scenarios to the proposed activity***

#### Scenario 1: Degraded land due to subsistence agriculture (pre-project land use)

Ghana's agricultural sector accounts for one-fifth of Gross Domestic Product; as such, Ghana is considered an agriculture-dependent nation. The agricultural sector employs nearly half of the workforce and is the main source of livelihood for most of the country's poorest households, representing the majority of all economic activities and livelihoods among smallholder farmers (World Bank, 2017).

Weather conditions, including rainfall, are unpredictable in Ghana, leading to low yields for both staple and cash crops. Additionally, Ghana is a net importer of basic foods (raw and processed) including rice, poultry, sugar, and vegetable oils (World Bank, 2017).

Subsistence agriculture was the main activity in the project area before the start of the plantation and still occurs. In the rainy season, farmers grow crops such as yam, tapioca, maize, and pepper in scattered plots.

#### Scenario 2: Project activity on the land within the project boundary performed without being registered as a carbon project

Smart Oil Ltd, acting as lessee, signed a lease of land with Kadua and Yeji stools, lessors, which agreed to lease 6,540.04 ha for the development of an agricultural project of Jatropha plantations in 4,500 ha. The agreement has a duration of 50 years commencing from 1 January 2012.

**Outcome of Sub-step 1a:** the listed scenarios are alternative land use scenarios that could have occurred on the land within the project boundary of the A/R project activity, and are as follows:

- Degraded land due to subsistence agriculture

- Afforestation/Reforestation activities without being registered as a carbon project)

***Sub-step 1b. Consistency of credible land use scenarios with applicable mandatory laws and regulations***

Land in Ghana is held from various stool/skin lands, families or clans. The customary lands make up about 80% of all land in Ghana. The project area belongs to the Kadua and Yeji stools, both of which signed a lease agreement with Smart Oil Ltd. Scenario 2 is therefore consistent with the regulation.

Scenario 1, which consists of subsistence agriculture, would not represent any violation of laws and regulations, since the activity is performed by the inhabitants of the stools on land that is mainly grassland, with some bush.

**Outcome of Sub-step 1b:** Both scenarios are in compliance with mandatory legislation and regulations.

**STEP 2. Barrier analysis**

***Sub-step 2a. Identification of barriers that would prevent the implementation of at least one alternative land use scenarios***

Investment barriers

Investment is fundamental to economic growth, both in developing and developed nations. Ghana began its journey to sustainable growth and development through rapid industrialisation in the 1960s, using a variety of control measures and state intervention. In the 1970s and early 1980s, economic policies were not conducive to investment (Haynes, Aryeetey, Harrigan, & Nissanke, 2002).

Additionally, as shown in **Error! Not a valid bookmark self-reference.**, recent studies have found that high interest, exchange and inflation rates result in low private investment activities in Ghana (Robson & Obeng, 2008) (Ofosu- Mensah Ababio, Sarpong Kumankoma, & A. Osei, 2018) (Peter & Kwofie, 2019). These studies suggest that the Ghana Investment Promotion Council should pursue policies that will open more sectors of the economy for investment.

Table 8. Limitations encountered by entrepreneurs in achieving their business objectives over the last three years

Factor	Percentage of entrepreneurs reporting important or crucially important <sup>15</sup>
High rate of inflation	71.4
High interest rates	68.5
High tax and import duties	50.5
Difficult to meet loan criteria	50.3

One of the objectives of the project is to expand the planted area from year 2018 to year 2022 and additional to expand up to 20,000 ha in an out-grower scheme. Due to the low interest of private investors for the reasons mentioned above, revenue from carbon credits is expected to be the main source of resources for this expansion.

As shown, investment is a key barrier to project development in Ghana. This affects JOil's plantations, even though the project activities have already started, the continuation of the activities and expansion of the planted area will rely on the investment obtained. However, subsistence agriculture does not face this barrier since it does not require high investment at any stage.

#### Land tenure barriers

There are four main land tenure systems in Ghana, namely: individual, family, communal, and government or state lands.

Communal or chieftaincy institutions are custodians of around three quarters of land in the country, including most agricultural land. Chiefs can catalyse conflict through unclear ownership of land, illegal sale of land, unfair sharing of benefits, weak leadership, and abuse of authority (Campion & Acheampong, 2014).

The absence of regulators is common in land acquisition processes and can allow local chiefs to act in an unfair and exploitative way. Consequently, projects often suffer from a lack of transparency, accountability, and trust, as the traditional authorities in Ghana often refuse to disclose contract terms for fear that others will demand to share the benefits (Schoneveld & German, 2014). Subsistence agriculture does not face this

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<sup>15</sup> The research was conducted with a survey of 500 entrepreneurs located in six regions of Ghana where approximately 91% of all businesses in the country are found. Source: Robson & Obeng, 2008.

barrier since the land is owned communally, and the inhabitants are the ones who perform the activity.

**Outcome of Sub-step 2a:** the barriers listed are:

- Investment barriers
- Land tenure barriers

***Sub-step 2b. Show that the identified barriers will not prevent the implementation of at least one of the alternative land use scenarios (except the proposed project activity)***

The barriers identified in the previous sub-step may prevent the implementation of the Scenario 2 (Project activity on the land within the project boundary performed without being registered as a carbon project). Without the economic incentives obtained from the carbon project the proponent would face investment barriers that would prevent the development of the project and its proposed expansion.

**Outcome of Sub-step 2b:** The identified barriers will not prevent the implementation of Scenario 1 since subsistence agriculture does not face any of the barriers.

***Sub-step 2c. Determination of baseline***

The most plausible land use scenario in the absence of the project is the continuation of the agricultural practices, including the farming of yam, tapioca, maize and pepper. This was the main activity on the land before the beginning of the Jatropha plantation, and has historically been the locals' main economic activity, providing a source of food and revenue for households. In addition, as shown in the previous step, this scenario is not prevented by any barrier identified.

### **STEP 3. Investment analysis**

The investment analysis was not carried out; instead, a barrier analysis was conducted. Please skip this step.

### **STEP 4. Common practice**

Ghana's development plan afforded an important role to the biofuel industry. It was initially hoped that smallholder-based projects would promote energy security; the focus was subsequently moved to promoting rural development through foreign direct

investments and exports to international markets, which boomed during the mid-2000s (Ahmed, Campion, & Gasparatos, 2017). However, in terms of viability, Schoneveld & German (2014) and Nygaard & Bolwig (2018) show that the majority of biofuel projects collapsed within their first five years of operation due to the barriers identified above (investment and land tenure), as well as the discovery of crude oil, weak business plans and lack of institutional support. These factors explain why Ghana's biofuel programme did not meet with the success expected. For these reasons, the project activity is not considered as a common practice and is considered additional.

## B.5. Demonstration of additionality

Specify the methodology, activity requirement or product requirement that establishes deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).

### Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities, version 01

Describe how the proposed project meets the criteria for deemed additionality.	<p>The establishment of Jatropha plantation in the project area is not a common practice, as evidenced by current scenario of Jatropha plantation in project area and the environmental, financial, social, infrastructure and technology barriers that this activity presents.</p> <p>The objective of the project is to change the land use from non-productive degraded grasslands to forest plantation to produce fruit for the biofuel, and also generating economic growth in local communities due to employment, education and training opportunities.</p>
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### B.5.1. Prior consideration

>> Since the project is standalone project and does not request the inclusion of a new technology/measures, there is no need for prior consideration, according to section 4.1.49 of the Principle & Requirements version 1.2.

As per the 'Land Use & Forest Activity Requirements' Version 1.2.1, section 3.1.14, retroactive cycle projects shall submit the required documents to Gold Standard within five years of its start date (time of first submission). This project is a retroactive project

and submitted required documents to Gold Standard within five years of project start date.

According to 3.1.15, the retroactive cycle projects shall demonstrate the revenues from Gold Standard Certified SDG Impact Statements or Products. The project intended to develop the carbon project as mentioned in the Feasibility Study Report which considered the expected revenues. The project proponent determined to apply for Gold Standard certification for this project. Key events of project are shown in the following.

Time	Milestones
07/06/2018	Start date of the project (the date on the first plantation in phase 4)
24/08/2020	Completion of the Feasibility Study Report (Including prior consideration of the revenues)
14/12/2020	Stakeholder consultation meetings

#### B.5.2. Ongoing financial need

>> According to the 'Principles and Requirements' Version 1.2, section 4.1.52, Ongoing Financial Need shall be demonstrated at Design Certification Renewal.

### B.6. Sustainable Development Goals (SDG) outcomes

Relevant Target/Indicator for each of the four SDGs

Sustainable Development Goals Targeted	Most relevant SDG Target	SDG Impact
		Indicator (Proposed or SDG Indicator)
<b>8 Decent Work and Economic Growth</b>	8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	<ul style="list-style-type: none"> <li>Average daily earnings of female and male employees, by occupation, age and persons with disabilities</li> <li>Percentage of workers linked to SOIL in relation to the total number of permanent and temporary employees</li> </ul>
	8.6 By 2020, substantially reduce the proportion of youth not in employment, education or training	



Sustainable Development Goals Targeted	Most relevant SDG Target	SDG Impact
		Indicator (Proposed or SDG Indicator)
<b>13 Climate Action (mandatory)</b>	N/A	<ul style="list-style-type: none"> <li>The amount of CO<sub>2</sub> removed by Jatropha trees plantation</li> </ul>
<b>15 Life on Land</b>	<p>15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world</p> <p>15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species</p> <p>15.c Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities</p>	<ul style="list-style-type: none"> <li>Number of people attending awareness-raising workshops on the management of biodiversity</li> <li>Number of workshops to workers on the management and conservation of biodiversity</li> </ul>

#### B.6.1. Explanation of methodological choices/approaches for estimating the SDG Impact

>>All the SDGs will be monitored, however only the effects on SDG13 will be estimated using the methodology presented in the section B.1.

### SDG 8 Decent Work and Economic Growth

There is not a Gold Standard methodology for estimating the outcome of this SDG. However, the indicator to be evaluated will be:

1. Average daily earnings of female and male employees, by type of employment (temporary and permanent).

$$ADE = \frac{\text{Monthly salary} \left( \frac{\text{GH¢}}{\text{month}} \right)}{\text{Monthly working days} \left( \frac{\text{days}}{\text{month}} \right)}$$

Where:

ADE = Average Daily Earnings (GH¢/day)

The ADE must be calculated for each group mentioned in the indicator (female and male employees by type of employment; temporary and permanent). The net benefit is estimated as follows: the baseline scenario of SDG 8 is accounted as zero since without the implementation of the project activities there would not be job creation in the project area.

$$NB_{SDG8,i} = ADE_{PS,i} - ADE_{BS,i}$$

Where:

$NB_{SDG8,i}$  = Net Benefit for SDG 8 at year i

$ADE_{PS,i}$  = ADE in the project scenario at year i

$ADE_{BS,i}$  = ADE in the baseline scenario at year i

2. Percentage of workers linked to SOIL in relation to the total number of permanent and temporary employees.

$$PE(\%) = \frac{n}{N} \times 100$$

Where:

PE = Percentage of Permanent Employee (%)

n = Number of Permanent Employee (people)

N = Total employee (people)

$$TE(\%) = \frac{n}{N} \times 100$$

Where:

TE = Percentage of Temporary Employee (%)

n = Number of Temporary Employee (people)

N = Total employee (people)

## SDG 13 Climate Action

The proposed project activity is a mechanism for raising capacity for effective climate management in the country through the trainings related to climate mitigation, forest inventory and biodiversity conservation. The suggested way of measuring the contribution of the project to this SDG and specific target is estimating the amount of CO<sub>2</sub> removed by Jatropha trees plantations (the project activities) as the main activity of this project. Therefore, these activities of planting and conserving of biodiversity could contribute the SDG 13 climate action as the Jatropha trees act as carbon sinks which sequester Carbon Dioxide. The methodology used for its estimation is presented in the Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology, version 1. It is summarised below.

### 1. Calculation of CO<sub>2</sub> certificates

The number of CO<sub>2</sub> certificates is determined for every year (t) of the crediting period for each Modelling Unit using the following formula:

$$CO_2 \text{ certificates} = (CO_{2-\text{fixation}} - \text{Baseline} - \text{Leakage} - \text{Other Emissions}) * \text{Eligible planting area}$$

Baseline and leakage are deducted in the first year (t=1), the other emissions which are linked to the use of fertiliser are deducted over time.

The total CO<sub>2</sub> certificates for the project are estimated as follows:

$$CO_{2-\text{certificates Project area}} = \sum_{MU=1}^{MUs} \sum_{t=1}^{CP} CO_{2 \text{ certificates } MU,t}$$

Where:

CO<sub>2</sub>-certificates Project area, t = [tCO<sub>2</sub>] CO<sub>2</sub>-certificates of a project area in year t

CO<sub>2</sub> certificates MU, t = [tCO<sub>2</sub>] CO<sub>2</sub>-certificates of a MU in year t

MUs = 1, 2, 3, ... MUs of a project area

t = 1, 2, 3, ... Years of the crediting period

CP = [] Year the crediting period ends

The carbon pools taken into account are shown in Table 9. Soil carbon was not included in this version, but may be included in the future.

Table 9. Carbon pools accounted for the project

Carbon pools		Includes	CO <sub>2</sub> Fixation	Baseline	Leakage
Tree biomass	Aboveground	Stem, branches, bark	Yes	Yes	Yes
	Belowground	Tree roots	Yes	Yes	Yes
Non-tree biomass	Aboveground	Grass, herbs, etc.	No	Yes	No
	Belowground	Roots of grass, herbs, etc.	No	Yes	No
Soil		Organic material	No	No	No
Harvested wood (timber & energy wood)		Furniture, construction material, etc.	No	No	No
Litter and lying deadwood		Leaves, small fallen branches, lying dead wood	No	No	No

## 2. CO<sub>2</sub> fixation

Total tree biomass was estimated with the following formulas:

- CO<sub>2</sub> fixation

$$CO_{2\text{-fixation}} = (\text{Aboveground tree biomass} + \text{Belowground tree biomass}) * CF * C \text{ to } CO_2 \text{ factor}$$

Where:

CF = Carbon Fraction (value specified in section B.6.2)

C to CO<sub>2</sub> factor = value specified in section B.6.2

- Aboveground tree biomass

Aboveground tree biomass will be calculated as following:

The measurement data was organized per plot and the aboveground fresh weight biomass of each tree calculated using the project formula.

$$AG_{Fresh} = -14.542 + (3.5176 * DB)$$

where:

$AG_{fresh}$  = Aboveground fresh biomass (kg)

$DB$  = Diameter at base (cm)

The project has applied its formula of aboveground fresh weight biomass because the project formula provides more realistic results than other allometric equations.

Conversion of  $AG_{fresh}$  to  $AG_{dry}$  was carried out by applying the fresh weight to dry weight ration. According to the project data, the ratio depends on the age of *Jatropha* trees. For the first monitoring period, the trees had been planted two years ago. Thus, a ratio of 0.30 was applied.

$$AG_{dry} = AG_{fresh} * 0.30$$

where:

$AG_{dry}$  = Aboveground dry biomass (kg)

$AG_{fresh}$  = Aboveground fresh biomass (kg)

- Belowground tree biomass

$$\text{Belowground tree biomass} = \text{Aboveground tree biomass} * (\text{Root} - \text{to} - \text{Shoot ratio})$$

Where:

Root-to-Shoot ratio = value specified in section B.6.2

However, belowground dry biomass was calculated using the value of 0.41 presented by Diédhiou et al., 2017<sup>16</sup>.

$$BG_{dry} = AG_{dry} * 0.41$$

where:

$AG_{dry}$  = Aboveground dry biomass (kg)

$BG_{dry}$  = Belowground dry biomass (kg)

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<sup>16</sup> Diédhiou et al., 2017, Allometric equations and carbon stocks in tree biomass of *Jatropha curcas* L. in Senegal's Peanut Basin, *Global Ecology and Conservation*, 9 (61-69).

### 3. Baseline

The eligible area was stratified according to the vegetation type. For each of these strata national default values or IPCC default values were applied for tree and non-tree biomass of these vegetation types. The values applied are specified in section B.6.2. For the planted area and to be planted, a classification from Sentinel satellite images was used to define the baseline landcover. The strata and corresponding area are presented in Table 10.

Table 10. Land cover before project establishment (Baseline land cover)

Land cover type	Area (ha)	Percentage
Agriculture <sup>17</sup>	1,241.41	43.4%
Bare soil	19.31	0.7%
Grassland	966.72	33.8%
Shrub/Scrub	635.54	22.2%
Total	2,862.97	100%

Ghana falls within two of the savannah ecosystems in West Africa, consisting of the Guinea Savannah and Sudan Savannah. The characteristic feature of the savannah ecosystem is the dominance of relatively short trees with grass, shrub, and scrub under growth<sup>18</sup>. The sudan savannah and guinea savannah ecological zones are characterised by disturbed areas of trees, grasses, shrubs, and scattered trees<sup>19</sup>. According to Ghana's National Forest Reference Level<sup>20</sup>, the project areas fall within the savannah ecological zone as presented in Figure 4. Many shrublands with high proportions of perennial woody biomass may be considered to be a type of grassland and countries may elect

<sup>17</sup> Agriculture in this case corresponds to grassland that is frequently harvested, Thus, baseline carbon stocks for agriculture area is considered as the same of grassland cover.

<sup>18</sup> Convention on Biodiversity, Clearing House mechanism of Ghana (<http://gh.chm-cbd.net/biodiversity/faunal-diversity-ghana/ecosystem-diversity/savannah#:~:text=Ghana%20falls%20within%20two%20of,land%20area%20of%20the%20country.>)

<sup>19</sup> Geomatics International, The Assessment of Vegetation and Land Use Changes in Nigeria, 1998 (<http://documents1.worldbank.org/curated/en/611631468291342228/pdf/779940WP0P0021210Box377320B00PUBLI%20C0.pdf>)

<sup>20</sup> Ghana's National Forest Reference Level, 2017. Available at [https://redd.unfccc.int/files/ghana\\_national\\_reference\\_level\\_01.01\\_2017\\_for\\_unfccc-yaw\\_kwakye.pdf](https://redd.unfccc.int/files/ghana_national_reference_level_01.01_2017_for_unfccc-yaw_kwakye.pdf)



to account for some or all of these shrublands in the “Grassland” category. Hence, the baseline of this project is grassland in savannah ecological zone and bare land.

The equation used was:

$$Baseline_{stock} = Area_{stratum,i} * Carbon\ stock_{stratum,i}$$

#### 4. Leakage

Leakages are emissions that occur due to a mobility of farmers in the project zone. However, leakage of this project is not expected to occur due to no activities such firewood collecting, timber harvesting, and livestock in the project zone and project area, and it is therefore deemed to be at zero. The main activity that could cause leakage is agriculture, nevertheless, the land where the plantations established was chosen with the landowner (Kadua Stool and Yeji Stool) identifying areas that are underutilised. Thus, productive areas will not be part of the project to ensure the usual agricultural activities of the community. Moreover, local people will be also allowed to have crops in the plantation area during its first stages, which will contribute to avoiding leakage activities.

#### 5. Other emissions

No emissions are generated by site preparations as there is no removal of large trees, and no bushes are being burned as a site preparation activity. Other emissions are generated by the use of nitrogen (N) fertilisers. Thus, 0.005 tCO<sub>2</sub> was deducted per kg of the applied fertiliser. The use of fertilisers is presented in Table 6 under section A.3.

The net benefit associated to this SDG were estimated and presented in Table 11.

### **SDG 15 Life on Land**

There is not a Gold Standard methodology for estimating the outcome of this SDG. However, the following methodology will be applied to estimate the contribution of the project to this SDG.

#### 1. Awareness-raising on the management of biodiversity

- Total number of people attending awareness-raising training on the management of biodiversity

## 2. Training courses to staff and workers on the management and conservation of biodiversity

- Total number of training courses to staff and workers on the management and conservation of biodiversity
- Total number of staff and workers attending training courses on the management and conservation of biodiversity

The net benefit is estimated as follows: the baseline scenario of SDG 15 is accounted as zero, since without the implementation of the project activities there would not be training on biodiversity management in the project area.

$$NB_{SDG15,event,i} = Total\ event_{PS,i} - Total\ event_{BS,i}$$

$$NB_{SDG15,participant,i} = Total\ participant_{PS,i} - Total\ participant_{BS,i}$$

Where:

$NB_{SDG15,event,i}$  = Net Benefit for Event at year i

$NB_{SDG15,participant,i}$  = Net Benefit for Participant at year i

### B.6.2. Data and parameters fixed ex ante

#### SDG 8

There are no fixed parameters for the indicators chosen for this SDG.

#### SDG 13

Data/parameter	Baseline carbon stock
Unit	t/ha
Description	Total aboveground biomass and/or belowground of the land cover in the baseline scenario
Source of data	IPCC 2006, Chapter 6 Grassland, Table 6.4 Default biomass stocks present on grassland, after conversion from other land use.

	The aboveground and belowground biomass of bare land <sup>21</sup> is assumed.						
Value(s) applied	<table> <tr> <th>Land use type</th><th>Aboveground and belowground dry biomass (t.d.m./ha)</th></tr> <tr> <td>Grassland</td><td>8.7</td></tr> <tr> <td>Bare land</td><td>0</td></tr> </table>	Land use type	Aboveground and belowground dry biomass (t.d.m./ha)	Grassland	8.7	Bare land	0
Land use type	Aboveground and belowground dry biomass (t.d.m./ha)						
Grassland	8.7						
Bare land	0						
Choice of data or Measurement methods and procedures	<p>The value of grassland is presented for the region and the data used is based on the extensive literature review.</p> <p>Bare land does not contain vegetation subject to discount in the baseline scenario.</p>						
Purpose of data	Estimating baseline scenario emissions						
Additional comment							

Data/parameter	Aboveground and belowground dry biomass mean annual increment (MAI)														
Unit	t.d.m/ha/year														
Description	Mean Annual Increment of <i>Jatropha curcas</i> tree														
Source of data	JOil own measurement: Biomass sampling results. See supporting documents folder ER calculations.														
Value(s) applied	<table> <tr> <th>Age (years)</th><th>MAI AG and BG dry biomass (t.d.m/ha/year)</th></tr> <tr> <td>1</td><td>2.00</td></tr> <tr> <td>2</td><td>14.36</td></tr> <tr> <td>3</td><td>6.54</td></tr> <tr> <td>4</td><td>8.03</td></tr> <tr> <td>5</td><td>8.44</td></tr> <tr> <td>6-30</td><td>12.61</td></tr> </table>	Age (years)	MAI AG and BG dry biomass (t.d.m/ha/year)	1	2.00	2	14.36	3	6.54	4	8.03	5	8.44	6-30	12.61
Age (years)	MAI AG and BG dry biomass (t.d.m/ha/year)														
1	2.00														
2	14.36														
3	6.54														
4	8.03														
5	8.44														
6-30	12.61														

<sup>21</sup> According to the SEEA-UN, the bare lands are those areas with natural and non-built-up land surface covered with litter or no vegetation, burned areas, bare rocks, bare soils, land covered by sand including dunes and beaches. Retrieved from Dowuona et al 2011, Gessesse 2016, Belay et al 2018

Choice of data or Measurement methods and procedures	The yearly MAI value for age 1-5 obtained through the field measurements carried out by JOil in Ghana.  Average value obtained through measurements carried out by JOil in India for age 6 to 30.
Purpose of data	Estimation of GHG emission Reductions and Removals
Additional comment	

Data/parameter	Fresh weight to dry weight ratio												
Unit	Dimensionless												
Description	Ratio of the fresh weight of the aboveground to the dry weight of the aboveground of the <i>Jatropha curcas</i> . Used for aboveground Jatropha biomass estimation.												
Source of data	The data used was based on the field data measurement in Ghana.												
Value(s) applied	<table> <tr> <th>Age (years)</th><th>Fresh to Dry weight ratio</th></tr> <tr> <td>1</td><td>0.30</td></tr> <tr> <td>2</td><td>0.30</td></tr> <tr> <td>3</td><td>0.32</td></tr> <tr> <td>4</td><td>0.33</td></tr> <tr> <td>5</td><td>0.35</td></tr> </table>	Age (years)	Fresh to Dry weight ratio	1	0.30	2	0.30	3	0.32	4	0.33	5	0.35
Age (years)	Fresh to Dry weight ratio												
1	0.30												
2	0.30												
3	0.32												
4	0.33												
5	0.35												
Choice of data or Measurement methods and procedures	The value is presented for the site and the data used is based on the extensive experiment.												
Purpose of data	Estimation of GHG emission Reductions and Removals												
Additional comment													

Data/parameter	Root-to-Shoot Ratio (R)
Unit	Dimensionless
Description	Ratio of the weight of the roots to the weight of the top of the tree. Used for belowground Jatropha biomass estimation

Source of data	I. Diédhiou et al., 2017, Allometric equations and carbon stocks in tree biomass of <i>Jatropha curcas</i> L. in Senegal's Peanut Basin, Global Ecology and Conservation, (9) 61-69
Value(s) applied	0.41
Choice of data or Measurement methods and procedures	Belowground biomass is usually estimated, as sampling is destructive and expensive
Purpose of data	Estimation of GHG emission Reductions and Removals
Additional comment	

Data/parameter	Carbon fraction tC/tdm
Unit	Percentage
Description	Percentage of the biomass of the tree that is carbon
Source of data	Gold Standard Afforestation/Reforestation (A/R) GHG Emission Reduction & Sequestration Methodology, Version 1 – Published July 2017
Value(s) applied	0.5
Choice of data or Measurement methods and procedures	Estimation of GHG Emission Reductions and Removals and Baseline emissions
Purpose of data	Carbon fraction for tree biomass
Additional comment	

Data/parameter	Carbon fraction tC/tdm
Unit	Percentage
Description	Percentage of the biomass of the non-tree that is carbon
Source of data	Gold Standard Afforestation/Reforestation (A/R) GHG Emission Reduction & Sequestration Methodology, Version 1 – Published July 2017
Value(s) applied	0.4

Choice of data or Measurement methods and procedures	Estimation of GHG Emission Reductions and Removals and Baseline emissions
Purpose of data	Carbon fraction for non-tree biomass
Additional comment	

Data/parameter	C to CO <sub>2</sub> e
Unit	tCO <sub>2</sub> /tC
Description	Factor applied to convert tree carbon sequestered to tree CO <sub>2</sub> e sequestered
Source of data	Gold Standard Afforestation/Reforestation (A/R) GHG Emission Reduction & Sequestration Methodology, Version 1 – Published July 2017
Value(s) applied	44/12
Choice of data or Measurement methods and procedures	IPCC default value
Purpose of data	Estimation of GHG Emission Reductions and Removals and Baseline emissions
Additional comment	

Data/parameter	Eligible Project Area (PA)						
Unit	ha						
Description	Eligible Project Area as per Gold Standard definition						
Source of data	GIS						
Value(s) applied	<table> <tr> <th>Year</th><th>Eligible Area (ha)</th></tr> <tr> <td>2018</td><td>1,015.53</td></tr> <tr> <td>2022</td><td>1,847.44</td></tr> </table>	Year	Eligible Area (ha)	2018	1,015.53	2022	1,847.44
Year	Eligible Area (ha)						
2018	1,015.53						
2022	1,847.44						
Choice of data or Measurement methods and procedures	See section A.1.1						



Purpose of data	Estimation of GHG Emission Reductions and Removals and Baseline emissions
Additional comment	

Data/parameter	Emission due to the use of nitrogen fertilisers
Unit	tCO <sub>2</sub> /kg of N
Description	Emissions due to the use of nitrogen fertilisers are deducted according to the GS4GG rules.
Source of data	Gold Standard Afforestation/Reforestation (A/R) GHG Emission Reduction & Sequestration Methodology, Version 1 – Published July 2017
Value(s) applied	0.005
Choice of data or Measurement methods and procedures	Default value
Purpose of data	Estimation of GHG Emission Reductions and Removals and Baseline emissions
Additional comment	

## SDG 15

There are no fixed parameters for the indicators chosen for this SDG.

### B.6.3. Ex ante estimation of SDG Impact

>>

## SDG 8

For the ex ante estimation, average daily earning is 8.80 GH¢<sup>22</sup> with equal earning for men and women in the same position. The actual average daily salary will be determined by the record database from Human Resources Division of company.

The percentage of permanent and temporary employees will be reported for each monitoring period based on the record database from Human Resources Division of company. For ex ante estimation, 0% of permanent and 0% of temporary workers are employed, since without the implementation of the project activities there would not be job creation in the project area.

#### 1. Average daily earning

$$ADE_{PS,i} = 8.80 \text{ GH¢/day}$$

$$ADE_{BS,i} = 0.00 \text{ GH¢/day}$$

Ex ante estimation of SDG 8 is  $8.80 - 0.00 = 8.80 \text{ GH¢/day}$

#### 2. Percentage of workers

$$PE_{BS} = 0\%$$

$$PE_{PS} = 20\%$$

Ex ante estimation of percentage of permanent employee is  $20\% - 0\% = 20\%$

$$TE_{BS} = 0\%$$

$$TE_{PS} = 80\%$$

Ex ante estimation of percentage of temporary employee is  $80\% - 0\% = 80\%$

### SDG 13

This SDG was considered for monetisation and consequent ex ante estimation. As such, CO<sub>2</sub> emission reductions were estimated for the Jatropha plantations for the conservation system that will be used in the project.

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<sup>22</sup> The new minimum wage rate for the year 2017. Available at <https://wageindicator.org/salary/minimum-wage/minimum-wages-news/ghanas-minimum-wage-increases-by-10-december-23-2017#:~:text=The%20Minister%20of%20Employment%20and,now%20been%20pegged%20at%20GH8.>

Carbon estimations were developed following the Gold Standard Afforestation/Reforestation (A/R) GHG Emission Reduction & Sequestration Methodology, Version 1. The process is described briefly in section B.6.1. The detailed estimations are presented in the supporting documents folder ER calculations.

The ex ante of SDG 13 is calculated with Calculation of CO<sub>2</sub> certificates equation below.

$$CO_2 \text{ certificates} = (CO_{2-\text{fixation}} - \text{Baseline} - \text{Leakage} - \text{Other Emissions}) * \text{Elegible planting area}$$

Year	Eligible Area (ha)	CO <sub>2</sub> -Fixation (tCO <sub>2</sub> e/year)	Baseline (tCO <sub>2</sub> e/year)	Other emission (tCO <sub>2</sub> e/year)	CO <sub>2</sub> certificates (tCO <sub>2</sub> e/year)
1	1,015.54	3,706.7	12,871	101.6	-9,266
2		26,756.2	0	177.7	26,578
3		12,184.3	0	304.7	11,880
4	1,847.43	14,947.9	23,415	355.4	14,592
5		22,462.9	0	184.7	-1,137
6		72,160.3	0	323.3	71,837
7		45,651.6	0	554.2	45,097
8		50,679.2	0	646.6	50,033
9		52,083.6	0	0	52,084
10		66,212.3	0	0	66,212
11		66,212.3	0	0	66,212
12		66,212.3	0	0	66,212
13		66,212.3	0	0	66,212
14		66,212.3	0	0	66,212
15		66,212.3	0	0	66,212
16		66,212.3	0	0	66,212
17		66,212.3	0	0	66,212
18		66,212.3	0	0	66,212
19		66,212.3	0	0	66,212
20		66,212.3	0	0	66,212
21		66,212.3	0	0	66,212
22		66,212.3	0	0	66,212
23		66,212.3	0	0	66,212
24		66,212.3	0	0	66,212
25		66,212.3	0	0	66,212
26		66,212.3	0	0	66,212
27		66,212.3	0	0	66,212

Year	Eligible Area (ha)	CO <sub>2</sub> -Fixation (tCO <sub>2</sub> e/year)	Baseline (tCO <sub>2</sub> e/year)	Other emission (tCO <sub>2</sub> e/year)	CO <sub>2</sub> certificates (tCO <sub>2</sub> e/year)
28		66,212.3	0	0	66,212
29		66,212.3	0	0	66,212
30		66,212.3	0	0	66,212

## SDG 15

Since without the implementation of project activities, the baseline scenario would be accounted as zero as no trainings. For ex ante estimation, the data is from the Environmental and Social Management System (ESMS) Manual of the project. The training of biodiversity management plan is carried out once in a year and for plantation manager, E&S specialist, and field supervisors.

### 1. Total number of training courses

Total event<sub>PS</sub> = 3 events

Total event<sub>BS</sub> = 0 event

Ex ante estimation of training course is  $3 - 0 = 3$  events

### 2. Total number of participants

Total participants<sub>PS</sub> = 16 people

Total participants<sub>BS</sub> = 0 people

Ex ante estimation of training course is  $16 - 0 = 16$  people

## B.6.4. Summary of ex ante estimates of each SDG Impact

## SDG 8

The SDG outcomes corresponding to SDG 8 will be reported during the next stages, when the project activities are fully implemented (the ex-ante estimations are included under section B.6.1 and B.6.3). In this case, the baseline scenario of SDG 8 is accounted as zero. The project scenario of ex ante estimation is a minimum wage for the year 2017 which is 8.80 GH¢, since without the implementation of the project activities there would not be job creation in the project area.

## SDG 13

The outcomes corresponding to SDG 13 are presented in Table 11. The total of 1,652,157 tCO<sub>2</sub> was estimated as the total carbon reduction generated by the project over 30 years of project crediting period.

Table 11. Estimated baseline and project carbon reductions, and net benefits for the project period

Year	Baseline estimate	Project estimate	Net benefit
Year 1	12,871	3,706	-9,267
Year 2	0	26,756	26,578
Year 3	0	12,184	11,879
Year 4	0	14,947	14,592
Year 5	23,415	22,462	-1,138
Year 6	0	72,160	71,837
Year 7	0	45,651	45,097
Year 8	0	50,679	50,032
Year 9	0	52,083	52,083
Year 10	0	66,212	66,212
Year 11	0	66,212	66,212
Year 12	0	66,212	66,212
Year 13	0	66,212	66,212
Year 14	0	66,212	66,212
Year 15	0	66,212	66,212
Year 16	0	66,212	66,212
Year 17	0	66,212	66,212
Year 18	0	66,212	66,212
Year 19	0	66,212	66,212
Year 20	0	66,212	66,212
Year 21	0	66,212	66,212
Year 22	0	66,212	66,212
Year 23	0	66,212	66,212
Year 24	0	66,212	66,212
Year 25	0	66,212	66,212
Year 26	0	66,212	66,212
Year 27	0	66,212	66,212
Year 28	0	66,212	66,212
Year 29	0	66,212	66,212
Year 30	0	66,212	66,212

Year	Baseline estimate	Project estimate	Net benefit
<b>Total</b>	<b>36,286</b>	<b>1,691,080</b>	<b>1,652,146</b>
<b>Total number of crediting years</b>	30 years		
<b>Annual average over the crediting period</b>	1,210.00	56,369.00	55,072.00

## SDG 15

The SDG outcomes corresponding to the SDG 15 will be reported during the next stages when the project activities are fully implemented (the ex ante estimations are included under section B.6.1 and B.6.3). The baseline scenario is zero. The project scenario is from the Environmental and Social Management System (ESMS) Manual of the project. The training of biodiversity management plan is carried out 3 times in a year and for 6 staffs including plantation managers, E&S specialists, and field supervisors.

### B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

## SDG 8

Data / Parameter	Average monthly salary
Unit	GH¢ /month
Description	Amount of money earned by each employee every month
Source of data	Human Resources division of company
Value(s) applied	To be determined annually, after the design certification
Measurement methods and procedures	Measurement methods are not necessary. The procedure consists of constructing a database of all the salaries of the employees.
Monitoring frequency	Annually
QA/QC procedures	The information entered in the human resources databases will be checked for accuracy. Random samples of the contracts/services agreements of the employees will be taken and compared to the information on the database.



Purpose of data	To estimate the average daily earnings of the employees
Additional comment	This indicator must also be evaluated in community business groups.

Data / Parameter	Monthly working days
Unit	Days/month
Description	Total worked days of all the employees differentiated by type of employment (temporary and permanent)
Source of data	Human Resources division of company
Value(s) applied	To be determined annually, after the design certification
Measurement methods and procedures	Monthly working days for each employee are recorded in the salary database of the Human Resources Division of the company. The procedure consists of constructing a database of all the salaries of the employees.
Monitoring frequency	Annually
QA/QC procedures	The information entered in the human resources databases will be checked for accuracy. Random samples of the contracts/services agreements of the employees will be taken and compared to the information on the database.
Purpose of data	To estimate the average daily earnings of the employees
Additional comment	This indicator must also be evaluated in community business groups.

Data / Parameter	Number of permanent workers
Unit	people
Description	Total number of permanent employees work in the project
Source of data	Human Resources division of company
Value(s) applied	To be determined annually, after the design certification
Measurement methods and procedures	Measurement methods are not necessary. The procedure consists of constructing a database of all employees' record.
Monitoring frequency	Annually

QA/QC procedures	The information entered in the human resources databases will be checked for accuracy. Random samples of the contracts/services agreements of the employees will be taken and compared to the information on the database.
Purpose of data	To estimate the percentage of workers linked to the total number of permanent and temporary employees
Additional comment	This indicator must also be evaluated in community business groups.

Data / Parameter	Number of temporary workers
Unit	people
Description	Total number of temporary employees work in the project
Source of data	Human Resources division of company
Value(s) applied	To be determined annually, after the design certification
Measurement methods and procedures	Measurement methods are not necessary. The procedure consists of constructing a database of all employees' record.
Monitoring frequency	Annually
QA/QC procedures	The information entered in the human resources databases will be checked for accuracy. Random samples of the contracts/services agreements of the employees will be taken and compared to the information on the database.
Purpose of data	To estimate the percentage of workers linked to the total number of permanent and temporary employees
Additional comment	This indicator must also be evaluated in community business groups.

## SDG 13

Data / Parameter	Diameter at base (DB)
Unit	cm
Description	The DB of a tree is the diameter of its trunk measured at base of the tree, over the bark
Source of data	Forest inventory

Value(s) applied	To be estimated at each performance certification
Measurement methods and procedures	The DB will be measured using a measuring tape in each forest inventory plot
Monitoring frequency	Every Performance Certification
QA/QC procedures	Follow the Standard Operating Procedure (SOP) for data collect: Jatropha inventory of permanent sample plots. See the supporting document for details.
Purpose of data	To use the information for carbon estimations
Additional comment	

## SDG 15

Data / Parameter	Number of participants in each workshop/training session on management of biodiversity
Unit	Number of persons
Description	Total number of people participating in each awareness-raising training session on management of biodiversity
Source of data	SOIL's participant lists
Value(s) applied	To be determined annually, after the design certification
Measurement methods and procedures	Follow the company plan
Monitoring frequency	Annually
QA/QC procedures	For all performed workshops, it will be verified that all the attendants fill out the attendance lists and that all the fields of this list are completed for each person. The original attendance lists will be kept in case any inconsistency is detected when estimating this indicator.
Purpose of data	To calculate the total number of participants
Additional comment	All training sessions must have a section in which the comprehension of the topics explained is evaluated.

Data / Parameter	Number of training courses to staffs and workers
Unit	Number of training sessions

Description	Total number of training courses to staffs and workers on management and conservation of biodiversity
Source of data	SOIL's workshop/training record sheets
Value(s) applied	To be determined annually, after the design certification
Measurement methods and procedures	Follow the company plan
Monitoring frequency	Annually
QA/QC procedures	The information entered in the databases of company record report will be checked. Random samples of the contracts/services agreements of the employees will be taken and compared to the information on the database.
Purpose of data	To calculate the total number of events/workshops/training sessions
Additional comment	All training sessions must have a section in which the comprehension of the topics explained is evaluated.

#### B.7.2. Sampling plan

### SDG 8

Indicator	Sampling plan
Average hourly earnings of female and male employees, by occupation, age and persons with disabilities	No sampling plan required because there will be a record of all the salary payment to temporary and permanent employees
Percentage of workers linked to SOIL in relation to the total number of permanent and temporary employees	No sampling plan required because there will be a record of all temporary and permanent employees

### SDG 13

>> The Jatropha plantation was applied a conservation planting model. Therefore, the data sampling will be designed according to strata defined for the project according to the planting phase (year) and location (Table 12).

Table 12. Modelling Units

MU	Planting year	Location	Area (ha)
1	2018	Kwaease-Yeji	92.00
2	2018	Kadua	418.00

MU	Planting year	Location	Area (ha)
3	2018	Gyentidua	508.00
4	2022	Gyentidua	1,950.00

### Plot type and size

Permanent plots will be used for sampling carbon stock in all the areas. The sample plots will be used to take measurement such as diameter at base (DB) and tree height. For all *Jatropha* trees, the DB measurement will be taken at base. The permanent plots of 576 m<sup>2</sup> (24 m by 24 m) will be used for collecting data before each performance certification and recorded and kept in plot file. The plot will be geo-referenced. Therefore, the size of the sample plots shall be defined based on the plot area and the number of trees being measured.

### Number of trees remaining per sample plot

$$n_e = s_r * r_r * n_s$$

where:

- $n_e$  = Number of trees remaining at the end (trees/ha): 1,216 trees/ha
- $s_r$  = Survival rate (%): 76%
- $r_r$  = Removal rate (%): 1%
- $n_s$  = Number of trees at the project start (trees/ha): 1,600 trees/ha

### Size of the sample plots

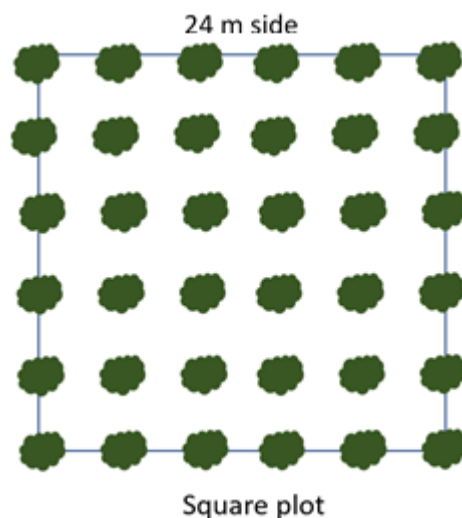
$$A_{min} = 10000 * n_{min} / n_e$$

where:

- $A_{min}$  = Minimum plot size (m<sup>2</sup>): 123.36 m<sup>2</sup>
- $n_{min}$  = Minimum number of trees required per plot (at least 10 trees): 15 trees
- $n_e$  = Number of trees remaining at the end (trees/ha): 1,216 trees/ha

The metric conversion from hectare to square meter is 10,000.

The area of each of the project's sample plots is 576 m<sup>2</sup> (square plot of 24 m x 24 m), meeting the required size under the CarbonFix Standard.



### Number of sample plots

The number of sampling plots for the forest inventory will be determined the precision level of analysis. The number of sampling plots (n) will be estimated using the following equation<sup>23</sup>.

$$n = \frac{\left( \sum_{h=1}^L N_h * s_h \right)^2}{\frac{N^2 * E^2}{t^2} + \left( \sum_{h=1}^L N_h * s_h^2 \right)}$$

Where:

- E = allowable error or the desired half-width of the confidence interval. Calculated by multiplying the mean carbon stock by the desired precision (that is, mean carbon stock x 0.1, for 10 percent precision, or 0.2 for 20 percent precision as per Gold Standard rules)
- t = the sample statistic from the t-distribution for the 95% confidence level.
- Nh = Number of sampling units for stratum h (=area of stratum in hectares or area of the plot in hectares)

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<sup>23</sup> Pearson, T., Walker, S., & Brown, S. (2005). Sourcebook for land use, land-use change and forestry projects. Winrock International and the BioCarbon Fund of the World Bank, 57.



n = Number of sampling units in the population

Sh = Standard deviation of stratum h.

The maximum allowable error according to the Gold Standard is 20%. If a greater error is obtained, a discount will be made in the total carbon credits generated by the project according to the established in the Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology.

### Standard operation procedure

The plots will be the randomly selected without bias. The plot locations will be identified with the help of the Global Positioning System (GPS) device in the field. For each plot the geographic position (GPS coordinates), administrative location and stratum code will be recorded and archived. The plots will be established before any monitoring takes place. In the case of exceptional circumstances in temporal plots (such as forest fires or uneven growth), additional plots may be laid out. In addition, a Standard Operation Procedure (SOP) will be used to make sure the measurements are consistent throughout different teams.

### Field measurement

In the permanent sample plots, trees were measured starting from North and moving in a clockwise direction, and a permanent tag was put on each tree.

### Field equipment

The following equipment is needed to carry out the forest inventory:

- Compass (this may not be necessary if using GPS)
- Geographic Positioning System (GPS)
- Maps of plots to be measured
- Fiberglass meter tape (100 m and 30 m)
- Tree measuring tape
- PVC tube or pole with 2.5 m painted in 10 cm long bands for height determination
- Metal poles
- Clinometer for tree height and land slope
- Chalk or spray to mark trees after measuring

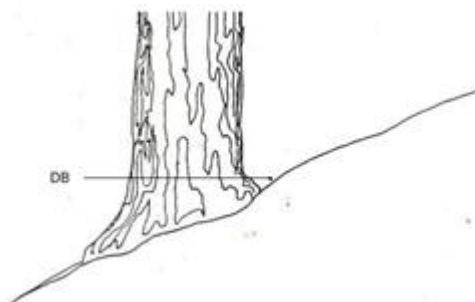
- Camera
- Data collection forms
- Permanent markers and/or pens

### Diameter measurement

The DB of all trees will be measured, and these data will be recorded in a field sheet. Trees located on the border of the plot will be considered as being inside the plot if at least half of the stem is within the limits of the plot. Data collected includes records of plant number, diameter, and height.

Some precautionary measures must be taken into account:

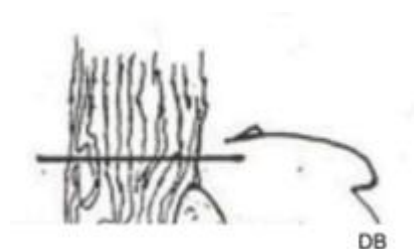
1. Metric tape for the diameter at the base and at 0 cm above the ground



2. On forked trees, measure as one tree if a fork occurs above the ground (left). Measure as two trees if a fork occurs at the ground (right)



3. For a large burl or canker, measure above the deformity and adjust the diameter down slightly



### Field data collection template

The following table is the field data collection template for use during the forest inventory process.

Table 13. Field data collection template

Plot ID			
Location			
Coordinate (X/Y)			
Stratum (Planting year)			
Date of collection			
Measurer's name			
Comment			
Tree no.	Diameter at base (cm)	Height (cm)	Tree condition

## SDG 15

Indicator	Sampling plan
Number of staff and workers attending awareness-raising training on management of biodiversity	No sampling plan required because there will be a record of all the participants in the training events
Number of training courses to staff and workers on the management and conservation of biodiversity	No sampling plan required because there will be a record of all the training/workshop on the management and conservation of biodiversity

### B.7.3. Other elements of monitoring plan

>> None

## SECTION C. DURATION AND CREDITING PERIOD

### C.1. Duration of project

C.1.1. Start date of project

>> 07/06/2018

C.1.2. Expected operational lifetime of project

>> 30 years

### C.2. Crediting period of project

C.2.1. Start date of crediting period<sup>24</sup>

>> 07/06/2018

C.2.2. Total length of crediting period

>> 30 years

## SECTION D. SUMMARY OF SAFEGUARDING PRINCIPLES AND GENDER SENSITIVE ASSESSMENT

### D.1. Safeguarding Principles that will be monitored

A completed Safeguarding Principles Assessment is in [Appendix 1](#); ongoing monitoring is summarised below.

Principles	Mitigation Measures added to the Monitoring Plan
4.1 Sites of Cultural and Historical Heritage	The SOIL/ESMS/MP/BMP01 is set a clear biodiversity management Strategies to ensure that biodiversity impacts are mitigated with strict Adherence to the mitigation hierarchy of biodiversity conservation.
4.2 Forced Eviction and Displacement	The project helps mitigation of socio-economic risks and provide opportunity for the restoration of farmers living standards through the livelihood restoration programs
8.1 Impact on Natural Water Patterns/Flows	The Pesticide Management Plan (SOIL/ESMS/MP/PS01) is developed to promote a pesticide specific Best Management practices (BMPs)

<sup>24</sup> According to Land Use & Forests Activity Requirements version 1.2, published April 2020, the crediting period starts either with the Project Start Date or three years prior to the date of Project Design Certification, whichever occurs later.

Principles	Mitigation Measures added to the Monitoring Plan
	for the handling and use of pesticides within the site to prevent contamination in the soil, damage to the flora and fauna and ground water
8.2 Erosion and/or Water Body Instability	The mitigation measures have been included in the Soil Erosion and Control Plan (SOIL/ESMS/MP/SEC01)
9.1 Vulnerability to Natural Disaster	The project has an Emergency Response Plan (SOIL/ESMS/MP/ERP01) that help to mitigate of these events
9.4 Release of pollutants	For fertilisers impacts and pesticide impacts, SOIL/ESMS/MP/FCN01 and SOIL/ESMS/MP/PS01 will be applied
9.5 Hazardous and Non-hazardous Waste	All waste must be classified into waste type, source, quantity before handling and removing from the Jatropha plantation, with the exception of vegetation or biomass waste following the Waste Management Plan (SOIL/ESMS/MP/WM01)
9.6 Pesticide & Fertilisers	The project has listed certain fertiliser activities and environment concerns with some help from technical team and fertilisers associate (SOIL/ESMS/MP/FCN01)
9.8 Food	Food security may improve with greater employment opportunities and a number of other economic variables associated with the project.
9.10 High Conservation Value Areas and Critical Habitats	The SOIL/ESMS/MP/BMP01 is set a clear biodiversity management Strategies to ensure that biodiversity impacts are mitigated with strict Adherence to the mitigation hierarchy of biodiversity conservation.
9.11 Endangered Species	See the Biodiversity Management Plan (SOIL/ESMS/MP/BMP01)

## D.2. Assessment that the project complies with GS4GG Gender Sensitive requirements

Question 1 – Explain how the project reflects the key issues and requirements of Gender Sensitive design and implementation as outlined in the Gender Policy?	Referring to SOIL's Human Resources Management Plan, SOIL prevents discrimination in hiring, access to training, promotion, and retirement on gender. The project has a gender approach that seeks to ensure women's rights and those of socially vulnerable groups. SOIL promotes women's participation in the different project activities like plantation establishment. The project will continuously work in women's inclusion in all project activities, thereby guaranteeing their rights. SOIL is also trying to increase the number of women in the field when including them in the plantation establishment activities as plant nursery, planting, fertilising, and fruit harvesting.
Question 2 – Explain how the project aligns with existing country policies, strategies and best practices	SOIL's Human Resources Management Plan is a key ingredient in the sustainability of SOIL to manage worker's relationship, treating

	workers fairly and managing women's opinion and participation. The Plan has been developed considering local labour requirements and the IFC Performance Standard 2.
Question 3 – Is an Expert required for the Gender Safeguarding Principles & Requirements?	There is no need for an expert for the Gender and Safeguarding Principles & Requirements because the project complies with the Gender Equality and Human Rights. Safeguarding Principles & Requirement version 1.2 was followed to address all questions presented in Principle 1 Human Rights and Principle 2 Gender Equality. The assessment of these Principles was completed before conducting the local stakeholder consultation. After discussing and receiving inputs from the communities during the consultation, a new safeguarding assessment was consolidated and presented in the Appendix 1 – Safeguarding Principles Assessment of this document. The justification and mitigation were suggested by the communities. The responses were recorded as 'Yes', 'Potentially' or 'No', depending on the assessment question.
Question - Is an Expert required to assist with Gender issues at the Stakeholder Consultation?	The Gold Standard Stakeholder Consultation & Engagement Procedure, Requirements & Guidelines was consulted and applied during the different stages of the local stakeholder consultation, preparation, invitation, meeting, feedback round. The detailed development and evidence of the local stakeholder consultation is presented in the LSC report.

## SECTION E. SUMMARY OF LOCAL STAKEHOLDER CONSULTATION

The below is a summary of the two-step GS4GG Consultation for monitoring purposes. Please refer to the separate Stakeholder Consultation Report for a complete report on the initial consultation and stakeholder feedback round.

### E.1. Summary of stakeholder mitigation measures

>> The local stakeholder consultation was held on 14-16 December 2020 at Pru East District Assembly Hall.

This agenda was followed:

15 minutes	Welcome and presentation of the facilitating team and Introduction to the agenda
20 minutes	Introduction of the participants
60 minutes	Presentation of <ul style="list-style-type: none"> <li>• Communication of the activity's objective</li> <li>• Presentation of the entities involve and rights of Use</li> <li>• Overview of the project structure</li> <li>• Contextualisation on the problem of climate change and carbon market</li> <li>• Certification standard and progress update concerning the certification</li> <li>• Presentation of carbon credits project activities</li> <li>• Explain the project in non-technical terms, providing project details including the location, project technology, implementation timelines, and project activities</li> <li>• Identification of project impacts and benefits</li> <li>• Presentation of the safeguards</li> </ul>
15 minutes	Break
60 minutes	Discussion and summary of the positive and negative impacts and mitigation plan to address risks
20 minutes	Discussion of the mechanism for input and grievance method
15 minutes	Q & A session

The non-technical summary was given in English as presented in the supporting documents folder LSC report/ Supporting Document/ Non-technical summary.

The invitation was communicated through multiple means: phone, email and letters. This table gives an overview of the invitation process:

Category code	Stakeholder type/organisation (if relevant)	Name of invitee	Male/ Female	Method of invitation	Date of invitation (>30 days before Meeting)
A	Parambo	Adu Collins	Male	Phone call	13/11/2020
A	Parambo	Shamsia Abubakari	Female	Phone call	13/11/2020
A	Parambo	Moro Changa	Male	Phone call	13/11/2020



Category code	Stakeholder type/organisation (if relevant)	Name of invitee	Male/ Female	Method of invitation	Date of invitation (>30 days before Meeting)
A	Parambo	Wahidu Issahaku	Male	Phone call	13/11/2020
A	Parambo	Adwoa Mansah	Female	Phone call	13/11/2020
A	Parambo	Kubaja Christiana	Female	Phone call	13/11/2020
A	Yeji	Akessie Kwame	Male	Phone call	13/11/2020
A	Yeji	Ernest Otabel	Male	Phone call	13/11/2020
A	Yeji	Prince Agyapong	Male	Phone call	13/11/2020
A	Yeji	Mensah Gaazenge	Male	Phone call	13/11/2020
A	Sawaba	James Aabako	Male	Phone call	13/11/2020
A	Sawaba	Akua Mansah	Female	Phone call	13/11/2020
A	Bankama	Badak Kumeime	Male	Phone call	13/11/2020
A	Bankama	Gyamfua Comfort	Female	Phone call	13/11/2020
A	Bankama	Makiwi Kennedy	Male	Phone call	13/11/2020
A	Bankama	Nnan Anthony	Male	Phone call	13/11/2020
A	Kobre	Afoa Christiana	Female	Phone call	13/11/2020
A	Kobre	Vida Lare	Female	Phone call	13/11/2020
A	Kobre	Donkor Joseph	Male	Phone call	13/11/2020
A	Kobre	Asare Francis	Male	Phone call	13/11/2020
A	Sawaba	Isaac Kofi	Male	Phone call	13/11/2020
B	Kadua divisional area	Nana Kwasi Amos	Male	Letter	13/11/2020
B	Kojo Boffour traditional area	Francis Mensah	Male	Letter	13/11/2020
B	Konkoma traditional council	Emmanuel Kojo Antwi	Male	Letter	13/11/2020
B	Kwaease traditional Councila	Kingsley Gyacham	Male	Letter	13/11/2020
B	Kadua divisional area	Alabagyewa Kofi Bruce	Male	Letter	13/11/2020
B	Yeji traditional council	Nyimini Francis	Male	Letter	13/11/2020
C	Pru East constituency	Hon. Dr. Kwaben Donkor	Male	Letter	12/11/2020
C	Pru district Assembly	Hon. Joshua Kwaku Abonkra	Male	Letter	12/11/2020
C	Parambo Zongo	Hon. Sulemana Yussif	Male	Letter	12/11/2020
C	Yeji Central	Hon. Abdul- Karim Issahaku	Male	Letter	12/11/2020
C	Parambo	Hon. Joseph Kofi Makpa	Male	Letter	12/11/2020
C	Yeji	Hon. Mayorwe Charlotte	Female	Letter	12/11/2020
C	Yeji	Hon. Donkor Victoria	Female	Letter	12/11/2020

Category code	Stakeholder type/organisation (if relevant)	Name of invitee	Male/ Female	Method of invitation	Date of invitation (>30 days before Meeting)
C	Yeji	Hon. Adankwa Coleman	Male	Letter	12/11/2020
C	Kadua	Hon. Gbenor M. Collins	Male	Letter	12/11/2020
C	Yeji	Hon. Daniel Anane Ogyigyator	Male	Letter	12/11/2020
C	VRA	Hon. Mahama Yakuba Augustine	Male	Letter	12/11/2020
C	Konkoma	Hon. Ngyemeneko Philip	Male	Letter	12/11/2020
C	Labun	Hon. Amedoma Samuel Agbey	Male	Letter	12/11/2020
C	Konkonse	Hon. Saho Nicodemus	Male	Letter	12/11/2020
C	Kojo boffour	Hon. Beya Yaw	Male	Letter	12/11/2020
C	Appointee	Hon. Hamidu Issah	Male	Letter	12/11/2020
C	Sawaba West	Hon. Haruna Sulemana	Male	Letter	12/11/2020
C	Sawaba East	Hon. Nanji Joshua	Male	Letter	12/11/2020
C	Parambo electoral area	Hon. Antwi Felicia	Female	Letter	12/11/2020
C	Konkoma	Hon. Patrick Yaw Boakye	Male	Letter	12/11/2020
C	Kobre	Hon. Issah Kofi Enock	Male	Letter	12/11/2020
C	Yeji traditional council	Hon. Awudi Thomson K. Godwin	Male	Letter	12/11/2020
C	Yeji town	Hon. Labio Donkor Mark	Male	Letter	12/11/2020
C	Jindibisa - Yeji	Hon. Aliu Mohammed	Male	Letter	12/11/2020
C	Cherepo - Ayimaye	Hon. David Agudey Sawu	Male	Letter	12/11/2020
D	Water resource commission	<a href="mailto:watrecom@wrc-gh.com">watrecom@wrc-gh.com</a>	N/A	Email	13/11/2020
D	Environmental Protection Agency (EPA)	<a href="mailto:jkudjawu@gmail.com">jkudjawu@gmail.com</a>	Female	Email	13/11/2020
D	Land Commission	<a href="mailto:info@lc.gov.gh">info@lc.gov.gh</a>	N/A	Email	13/11/2020
D	Forestry Commission	<a href="mailto:info.hq@fcghana.org">info.hq@fcghana.org</a>	N/A	Email	13/11/2020
E	Roman Catholic Church	Rosina Kobi	Female	Letter	15/11/2020
E	Roman Catholic Church	Leticia Anane	Female	Letter	15/11/2020

Category code	Stakeholder type/organisation (if relevant)	Name of invitee	Male/ Female	Method of invitation	Date of invitation (>30 days before Meeting)
E	Roman Catholic Church	Cecilia Bejiwa	Female	Letter	15/11/2020
E	Roman Catholic Church	Janet Obeng	Female	Letter	15/11/2020
E	Roman Catholic Church	Agnes Awitor	Female	Letter	15/11/2020
E	Roman Catholic Church	Joyce Nsefo	Female	Letter	15/11/2020
E	Roman Catholic Church	Elizabeth Donkor	Female	Letter	15/11/2020
E	Roman Catholic Church	Janet Sarfo	Female	Letter	15/11/2020
E	Roman Catholic Church	Gladys Nyankomago	Female	Letter	15/11/2020
E	Roman Catholic Church	Beatrice Nkrumah	Female	Letter	15/11/2020
E	Roman Catholic Church	Mary Sam	Female	Letter	15/11/2020
E	Roman Catholic Church	Edina Nyarko	Female	Letter	15/11/2020
E	Prebyterian Church of Ghana	Women Ministry	Female	Letter	15/11/2020
F	Gold Standard representative	help@goldstandard.org	N/A	Email	12/11/2020
G	Nature and Development Foundation	info@ndfwestafrica.org	N/A	Email	12/11/2020
G	IUCN - Ghana Project Office	sadia.bobtoya@iucn.org	N/A	Email	12/11/2020
G	International Development Enterprise	Valerie Labi-Okudzeto	Male	Email	12/11/2020
G	United Purpose	Lloyd Archer	Male	Email	12/11/2020
G	Global Offset Research	Siddharth Yadav	Male	Email	12/11/2020
G	Development Association for Renewable Energies	Yahaya	Male	Email	12/11/2020
G	Cedesol	David Whitfield	Male	Email	12/11/2020
G	Lean Management System Promotion Society	Raave Jain	Female	Email	12/11/2020
G	Concern Health Ghana	Isaac Ampomah	Male	Email	12/11/2020

The text of invitation is reproduced below. In each case English, French and Creole has been used, only the English version is reproduced here, please see the supporting document for other versions.



Smart Oil Limited  
Pru District Assembly  
Block Factory 3 P.O. Box 102  
Yeji BA Yeji, Brong Ahafo, Ghana

Our Ref:  
Your Ref:

Day Month Year

Hon. Awudi Thomson K. Godwin/Yeji Traditional Council

Dear Awudi Thomson K. Godwin,

**SUBJECT: CARBON CREDITS CERTIFICATION PROGRAM**

Smart Oil Ltd (SOIL) is embarking on an exciting new certification process to provide value addition to its business in Ghana. As the climate crisis across the world grows and global warming affects many countries disproportionately to their contribution to the causes, there is a need to find a way to both address the cause and mitigate the impact of climate change.

Trees are recognized to be one of the most effective solution to the climate challenge as they absorb CO<sub>2</sub> from the air, utilize the Carbon (C) and release Oxygen (O<sub>2</sub>) back into the atmosphere. Therefore, the retention, protection and planting of trees is a primary toll in the fight against climate change.

Companies that recognize that their emissions have a negative impact on the environment, yet they are some way from eliminating these emissions from their production, are seeking a way to mitigate their impacts. They are doing this in the form of procuring Carbon Credits on the Voluntary Carbon Market. Carbon credits can be sold by certified companies or groups whose business model focuses on activities

that reduce the impact of climate change, such as SOIL through its Jatropha plantation activities. The certification and marketing of carbon credits project coordinator called South Pole. The South Pole is helping SOIL to develop the carbon project and sell carbon credits on the Voluntary Carbon Market. The certification process will be similar to the process that SOIL currently undertakes with the International Sustainability and Carbon Certification (ISCC).

SOIL plans to certify its plantation to be eligible to produce certified carbon credits. As part of the certification process, SOIL must undertake a wide stakeholder engagement process which we will utilize to raise community awareness about climate change, conservation and environmental protection as well as informing them about this venture. We would like the opportunity to discuss this with you further over the next week on the telephone or in person (COVID-19 restrictions allowing).

Your Sincerely,

\_\_\_\_\_

Name

Position

Smart Oil Ltd

Most of the comments from the stakeholder meeting were justified and considered in Table 14. The points raised during the meeting were already contemplated by the project, and together with the SOIL steering committee, some improvements alternatives, and mitigation measures were being discussed as following:

1. A safer alternative for transportation of employees will be reviewed.
2. With the expansion of the company's activities to other territories, it is expected that other villages will be able to benefit from SOIL's voluntary programs.
3. Discussions will be held with Nananom assembly members to consider other benefits of SOIL's programs that are of interest to the communities, for example, channeling some of these funds towards rehabilitation or possibly purchasing additional waste disposal containers.

4. Alternatives will be sought for the proper disposal of chemical fertilizer containers used by the project's neighboring farmers.
5. Alternatives will be taken to ensure timely payment of salaries to all employees.
6. Ensure that all employees wear the necessary safety equipment so that they are not affected using chemical fertilizers.

Table 14. Assessment of comments from all consultations

Gender of stakeholder	Stakeholder comment	Was comment taken into account (Yes/No) ?	Explanation (Why? How?)
Male	Concerns were raised about the transport used by JOil employees (Kia trucks), as it isn't considered safe.	Yes	Kia trucks are used due to the road conditions, however, a safer alternative for employees will be reviewed internally.
Female	Environmental Protection Agency (EPA) representative asked how shells are disposed.	Yes	There are plans to start exporting the shells (casing or skin of the Jatropha fruit) which means the issue of disposal will soon be over.
	Environmental Protection Agency (EPA) representative asked how workers, especially casual workers, are cared for as and when they are laid off.	Yes	The company care for its permanent workers whether or not there are activities. For casual workers, they are only brought in as and when they are needed, especially during the peak period, and when they are hired the company does everything (safety tools etc.) for them, just like permanent workers, except for their SSNIT contribution.
Male	A parliamentary aspirant of Ghana Union Movement (GUM) for Pru East Constituency, asked why Smart Oil is only based in	Yes	JOil Africa Pte Ltd only acquired Smart Oil which was already based in Yeji. Currently, Smart Oil is embarking on an outgrower scheme at Abease; hence the project is not

Gender of stakeholder	Stakeholder comment	Was comment taken into account (Yes/No)?	Explanation (Why? How?)
	Yeji (Kwaease, Ajentriwa and Kadua) and whether there were any plans to go to other places. He added in his submission that there are lands in his hometown, the volta region of Ghana, which would be ideal.		only in Yeji, hopefully the project could be extended elsewhere in the future.
Female	Fisheries department, Yeji representative, asked what is the correct way of disposing of waste plastic chemical bottles.	Yes	Currently, Smart Oil send all plastic chemical bottles to Accra for recycling.
Male	A representative of the Konkoma traditional council asked whether there are plans to extend the outgrower scheme to other communities. In his submission he claimed that there are lands in his community, called Konkoma, that are ready to partake in the outgrower project.	Yes	The company already have three farmers in his community who are on the scheme but will alert management with regards to his concern if they are ready to increase the numbers in and around his community since Abease has always been the focus.
Female	A community representative added that neighboring communities have all benefited from the company's CSR project except Kobre. She pleaded that the people of Kobre	Yes	Indeed, Kobre have not benefited from the company's CSR projects but the decision to where and what to do lies with the committee which is made up of Assembly members and Nananom. The committee will be made aware of this issue and



Gender of stakeholder	Stakeholder comment	Was comment taken into account (Yes/No) ?	Explanation (Why? How?)
	need some of these facilities. She stated in her submission that they lack basic amenities like toilets, good drinking water and drainage systems.		hopefully they will agree to extend some of these facilities there.
Male	A representative from Yeji, who is also a morning show presenter from Okyema FM, asked whether permanent employees are given appointment letters and whether or the company pays their SSNIT	Yes	The company gives all permanent workers appointment letters and pays 13% of their basic salaries to the Social Security and National Insurance Trust (SSNIT).
Female	A meeting attendee suggested to Smart Oil that apart from the main objectives or visions, the company should try to increase the carbon project and credit as this would help Yeji and the world at large.	No	Plans are in place to expand the plantation which will have a direct correlation to the carbon credit concept.
Male	A meeting attendee wanted to know what Smart Oil is going to do to help farmers within their new concession or land which has to be cleared.	Yes	Smart Oil will engage will all of the farmers to reach an agreement with them with respect to their compensation packages in relation to relocation and resettlement.
Male	A meeting attendee appealed to Smart Oil to	No	Assembly members and Nananom determine what Smart Oil should

Gender of stakeholder	Stakeholder comment	Was comment taken into account (Yes/No) ?	Explanation (Why? How?)
	increase the benefit to communities with emphasis on the waste disposal containers.		finance for the year in terms of its CSR project and will notify the committee if it is worth channeling some of these funds into the rehabilitation of, or possibly buying additional waste disposal containers.
Male	A meeting attendee suggested to Smart Oil that they should teach nearby farmers how to properly dispose of pesticide containers.	Yes	Even though it does cost money to send these chemical containers to Accra and also to the recycling company, they will alert management and determine if an alternative way to dispose of these containers can be found.
Male	A meeting attendee wanted to know why Smart Oil didn't use infertile land, especially land by the riverbanks, and instead used fertile land,	Yes	The Jatropha plant does not do well in waterlogged areas, and just like any plant Jatropha needs a fertile land to grow well so as to give the expected yield.
Male	A meeting attendee suggested that Smart Oil should help displaced farmers develop their new land by assisting in land clearing and other preliminary expenses so as to ease the burden on farmers. He also suggested increasing compensation packages for these farmers. Even though he does not work with the company he	Yes	The suggestions are well noted and will be made known to management, with a decision during the follow-up meeting on either 19th or 20th January 2021.

Gender of stakeholder	Stakeholder comment	Was comment taken into account (Yes/No)?	Explanation (Why? How?)
	also suggested that employees' salaries should be increased and also advised that the company should ensure prompt payment of what is actually due all employees.		
Male	A meeting attendee wanted to know how individuals can join the outgrower scheme.	Yes	The outgrower scheme is virtually open to everyone, except those whose land is close to Smart Oil's plantation. The outgrower department will visit everyone, when the new season is about to start, and register all interested farmers in the community, especially those who have land at Abease and its environs.
Male	A meeting attendee wanted to know what criteria is followed to set up community projects.	Yes	There is a committee involving some of the assembly members and Nananom, who decide on things.
Female	A meeting attendee wanted to know exactly what Jatropha is used for and whether there was any intention to build a processing plant in Ghana for the benefit of all, especially the youth in the Yeji community.	Yes	The initial focus was biodiesel but they are now researching other options as Jatropha has many uses. On the issue of building a processing plant, there are plans in place to have a processing plant in Yeji, which would add value to the product. This suggest will forward this to the top-level hierarchy for her concern to be fully addressed in

Gender of stakeholder	Stakeholder comment	Was comment taken into account (Yes/No) ?	Explanation (Why? How?)
			the follow-up meeting on either 19th of 20th January 2021.
Female	A meeting attendee wanted to know if there were any plans to provide any safety or protective materials (nose masks) to the nearby farmers because of the extent of spraying and its associated effect because of the hazardous nature of some of these chemicals.	Yes	Smart Oil employees are provided with these materials but will notify management about whether there could be any additional support for these farmers in and around the plantation.
Female	A meeting attendee asked why there has been a sudden use or increase in the quantum of fertilizers on our farms.	Yes	Smart Oil believe that this will help increase yield since fertilizer helps improve the fertility of the soil. Farmers in general, have always ensured that they have had fallow periods on their land, but now farmers are constantly farming on one piece of land year in year out which means that the land has lost its fertility, that is why more fertilizer is being applied.
Female	A meeting attendee asked whether or not the land can be used for food production after the Jatropha project.	Yes	The land can be used for food production after the project.

## E.2. Final continuous input / grievance mechanism

Method	Include all details of chosen method (s) so that they may be understood and, where relevant, used by readers
Comment box (mandatory)	A comment box has been set up at the Smart Oil Ltd.'s human resources office Address: Plantation Office behind Pru District Assembly Block Factory 3 P.O. Box 102 Yeji BA, Yeji Brong Ahafo, Ghana
GS Contact (mandatory)	<a href="mailto:help@goldstandard.org">help@goldstandard.org</a>
Telephone (optional)	Smart Oil Ltd office Tel: (+233) 50 126 05 25
Internet/email (optional)	Website: <a href="http://www.joil.com.sg/Index">http://www.joil.com.sg/Index</a> Email: <a href="mailto:mark@joil.com.sg">mark@joil.com.sg</a>
Nominated independent mediator (optional)	Chief: The chief is the head of the community

## APPENDIX 1 – SAFEGUARDING PRINCIPLES ASSESSMENT

Complete the Assessment below and copy all Mitigation Measures for each Principle into [SECTION D](#) above. Please refer to the instructions in the [Guide to Completing](#) this Form below.

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
Principle 1. Human Rights			
<ol style="list-style-type: none"> <li>1. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights</li> <li>2. The Project shall not discriminate with regards to participation and inclusion</li> </ol>	No	<p>The project follows all the stated in the Universal Declaration of Human Rights.</p> <p>The project respects the right of employees and the employees have the right to raise their grievance with their managers and supervisors, according to Human Resources Management Plan (SOIL/ESMS/MP/HR01). Furthermore, the project applies both national and international requirements regarding the human rights.</p>	
Principle 2. Gender Equality			
<ol style="list-style-type: none"> <li>1. The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women</li> </ol>	No	<p>According to Human Resources Management Plan (SOIL/ESMS/MP/HR01), the project prevent discrimination in</p>	

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
<ul style="list-style-type: none"> <li>2. Projects shall apply the principles of non-discrimination, equal treatment, and equal pay for equal work</li> <li>3. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks</li> <li>4. (where required) Summary of opinions and recommendations of an Expert Stakeholder(s)</li> </ul>		hiring, remuneration, access to training, promotion termination, and retirement on the grounds of race, national or social origin, caste, birth, religion, disability, gender, sexual orientation, union membership, political opinions and age and promote equal opportunities.	
Principle 3. Community Health, Safety and Working Conditions			
<ul style="list-style-type: none"> <li>1. The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community</li> </ul>	No	The project addresses Health, Safety and Security risks likely to be suffered by nearby community members and workers due to the project's activities. According to the Community Health, Safety and Security Management Plan (SOIL/ESMS/MP/CH01), this plan is to anticipate and avoid adverse impacts on the health and safety of workers and neighbouring communities during the project life span from both routine and non-routine circumstances.	



Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
Principle 4.1 Sites of Cultural and Historical Heritage			
Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture?	Potentially	According to the Pru District Assembly, the project area has been zoned as an agriculture area. Hence, the project area is not located in the cultural and historical heritages and does not conflict with the land use.  According to the Final Report: Biodiversity analysis of <i>Jatropha curcas</i> plantation site at Yeji, however, the uncultivated area at Kadua site is cultural site which used as Ancestral burial ground.	The objective of Biodiversity Management Plan (SOIL/ESMS/MP/BMP01) is to ensure that biodiversity management becomes an integral part of day to day of project activities through identification of the status of habitats and species present and instituting key objectives for maintaining and enhancing biodiversity. The SOIL/ESMS/MP/BMP01 provides a clear set of actions that are consistent with IFC Performance Standard 1 and 6 on managing biodiversity within the project sites.
>> The Project shall not involve or be complicit in the alteration, damage or removal of any sites, objects or structures of significant cultural heritage			
>> Where a Project proposes to utilise Cultural Heritage, including the knowledge, innovations, or practices of local communities, affected communities shall be informed of their rights under Applicable Law, the scope and nature of the proposed commercial development; and the potential consequences of such development			
>> The Project shall provide for equitable sharing of benefits from commercialisation of such knowledge, innovation, or practice, consistent with their customs and traditions			
>> The opinions and recommendations of an Expert Stakeholder(s) shall be sought and demonstrated as being included in the project design			
Principle 4.2 Forced Eviction and Displacement			

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	Yes	Some farmers have been displaced from their economic and social life forms as some must travel further distance in search of fertile lands to continue their farming activities.  The chiefs and opinion leaders of Kwaese-Yeji, Kadua and Ajentriwa were consulted on Land acquisition, compensation and livelihood restoration issues (see SOIL/ESMS/MP/LALRP01).	The project is committed to meet international requirements of the IFC Performance Standard 5 to help mitigate the socio-economic risks and provide opportunity for the restoration of farmers living standards through the livelihood restoration programs which stated in Land Acquisition and Livelihood Restoration (SOIL /ESMS/MP/LALRP01). Furthermore, the project reserves about 2,000 ha of the total land leased for farmers within the project sites.
>> The Project shall not involve and shall not be complicit in the involuntary relocation of people			
>> Projects shall avoid physical (i.e., relocation or loss of shelter) and economic displacement (i.e., loss of assets or access to assets that leads to loss of income sources or means of livelihood), and mitigate displacement impacts on displaced persons and host communities when displacement cannot be avoided. In such cases, the Project shall integrate into the Project documentation a Resettlement Action Plan or Livelihood Action Plan as appropriate. Please refer to UNDP Standard 5: Displacement and Resettlement requirements for further details in this regard.			
>> The opinions and recommendations of an Expert Stakeholder(s) shall be sought and demonstrated as being included in the project design			
Principle 4.3 Land Tenure and Other Rights			

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
Does the Project require any change, or have any uncertainties related to land tenure arrangements and/or access rights, usage rights or land ownership?	No	The lands were acquired following proper consultation with the rightful landowners. The paramount chief of the Yeji Traditional Area and other sub-chiefs where the project lands are acquired were duly involved the land documentation process.	
>> For Projects involving land use tenure, are there any uncertainties with regards to land tenure, access rights, usage rights or land ownership? Examples include, but are not limited to water access rights, community-based property rights and customary rights.	No	The lands were acquired following proper consultation with the rightful landowners. The paramount chief of the Yeji Traditional Area and other sub-chiefs where the project lands are acquired were duly involved the land documentation process. Also, the project area has been zoned as an agriculture area. Hence, the project area does not conflict with the land use.	
>> The Project Developer shall identify all such sites/matters potentially affected by the Project. For all such sites/matters identified the Project shall respect and safeguard: (a) Legal rights, or (b) Customary rights, or	Yes	The project identified all plantation sites and potentially affected by project activities. Special cultural, ecological and economic sites have been previously identified and they are subject to preservation by	

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
(c) Special cultural, ecological, economic, religious or spiritual significance of people shall be demonstrably promoted/protected		the project. The project has reserved about 2,000 ha for the farming activities for the farmers.	
>> Changes in legal arrangements must be in line with relevant law and regulation and must be carried out in strict adherence with such laws. All legal disputes must be resolved prior to the Project being carried out in such areas. All such changes must be demonstrated as having been agreed with free, prior and informed consent	Yes	The project has designed a complete land strategy to guarantee community legal rights over the land. All laws of the host country that are applicable to land acquisition and involuntary resettlement are identified, reviewed, and abided.	
>> The Project Developer must hold uncontested land title for the entire Project Boundary to complete Project Design Certification	Yes	The project has not legal ownership of the land as is not possible by the laws to purchase land for developing a project. The project has been successful in obtaining lease agreement to cover the land that currently operate and continue to engage the right owners regarding payment of royalties and other social developments.	For guaranteeing the permanence of the project, the project has designed an entire land strategy that ensures the land leasing during the duration of the project.
>> The opinions and recommendations of an Expert Stakeholder(s) shall be sought and	Yes	The chiefs and opinion leaders of Kwaese-Yeji, Kadua and Ajentriwa were consulted on	

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
demonstrated as being included in the project design		Land acquisition, compensation and livelihood restoration issues.	
Principle 4.4 Indigenous people			
Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?	No	Communities in the project area are not considered as an indigenous people.	
>>The Project Developer shall identify all communities of Indigenous Peoples within the Project area of influence who may be affected directly or indirectly by the Project	No	No indigenous communities were identified in the project area.	
>> The Project Developer shall recognise and respect the indigenous people's collective rights to own, use, and develop and control the lands, resources and territories that they have traditionally owned, occupied or otherwise used or acquired, including lands and territories for which they do not yet possess title	No	The leased land that is used for the project is leased through a process of the Land Commission.	
>> The Project Developer shall respect, protect, conserve and shall not take the cultural, intellectual, religious and spiritual property of indigenous peoples without their free, prior and informed consent (FPIC)	No	The project does not take the property of any of the mentioned aspects.	Although the Project Developer does not take the property of any of the mentioned aspects. Free, Prior and informed consent is always used as the main strategy for any activity to be developed in the project.

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
>> The Project Developer shall ensure that the indigenous people are provided with the equitable sharing of benefits to be derived from utilisation and/or commercial development of natural resources on lands and territories or use of their traditional knowledge and practices by the Project	No	No indigenous communities were identified in the project area. However, the project generates multiple benefits to the local communities. The project has developed strategies that seek for equal distribution of the benefits.	As unequal distribution was one of the impacts identified in the local stakeholder consultation. New strategies will be implemented by the project to mitigate this impact. Among the strategies are: - develop workshops targeted to the community -Increase job opportunities for women.
>> The opinions and recommendations of an Expert Stakeholder(s) shall be sought and demonstrated as being included in the project design	No	No indigenous communities were identified in the project area. However, the chiefs and opinion leaders were consulted.	
Principle 5. Corruption			
The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects	No	According to the Security Policy and Security Management Plan (SOIL/ESMS/MP/SPS01), the project includes the induction training for all Security Personnel to shall not commit or participate in any act of corruption.	
Principle 6.1 Labour Rights			

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
<p>1. The Project Developer shall ensure that all employment is in compliance with national labour occupational health and safety laws and with the principles and standards embodied in the ILO fundamental conventions</p> <p>2. Workers shall be able to establish and join labour organisations</p> <p>3. Working agreements with all individual workers shall be documented and implemented and include:</p> <p>a) Working hours (must not exceed 48 hours per week on a regular basis), AND</p> <p>b) Duties and tasks, AND</p> <p>c) Remuneration (must include provision for payment of overtime), AND</p> <p>d) Modalities on health insurance, AND</p> <p>e) Modalities on termination of the contract with provision for voluntary resignation by employee, AND</p> <p>f) Provision for annual leave of not less than 10 days per year, not including sick and casual leave.</p> <p>4. No child labour is allowed (Exceptions for children working on their families' property requires an <a href="#">Expert Stakeholder</a> opinion)</p>	Yes	<p>The project follows the Human Resources Management Plan and Security Policy and Security Management Plan which is in compliance with the national labour laws and international standards in ILO.</p> <p>The project respects the rights of employees to join any recognised identify groups.</p> <p>No child labour is allowed in the project hiring or recruitment as the hiring is limited to person above 18 years old.</p> <p>The project provided annual training to staffs and ensure that all Security Personnel are aware of the requirements of their job. The first priority of project's Emergency Response Plan (SOIL/ESMS/MP/ERP01) is the "Safety of People First". This plan described the steps that must be followed to ensure that</p>	



Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
5. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures		the project is able to effectively respond to any incident.	
Principle 6.2 Negative Economic Consequences			
Does the project cause negative economic consequences during and after project implementation?	No	The project relies on the sale of biofuel products. Therefore, the project is financially sustainable.	
>> The Project Developer shall demonstrate the financial sustainability of the Projects implemented, also including those that will occur beyond the Project Certification period	No	The project relies on the sale of biofuel products. Therefore, the project is financially sustainable.	
>> The Projects shall consider economic impacts and demonstrate a consideration of potential risks to the local economy and how these have been taken into account in project design, implementation, operation and after the Project. Particular focus shall be given to vulnerable and marginalised social groups in targeted communities and that benefits are socially-inclusive and sustainable	No	The goods and services resulting from the project activities will increase the income of the families involved with the project as well as enhance the climate and biodiversity. Hence, there are no risks to the local economy for the project.	
Principle 7.1 Emissions			
Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	The previous land was an open grassland and bare land.	

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
>> Projects shall not increase greenhouse gas emissions over the Baseline Scenario unless this is specifically allowed within Activity Requirements or Gold Standard Approved Impact Methodologies		Therefore, the project will not increase the greenhouse gas emissions over the baseline scenario.  The plantation project will not increase emissions over the baseline scenario as the main activity of the project is establishment of Jatropha plantation in the underutilised land.	
Principle 7.2 Energy Supply			
Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	No power consumption from local grid and fuel resources like wood or biomass required to plant Jatropha trees or other project activities.	
>> The Project shall not affect the availability and reliability of energy supply to other users			
Principle 8.1 Impact on Natural Water Patterns/Flows			
Will the Project affect the natural or pre-existing pattern of watercourses, groundwater and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	Potentially	The project depends on ground water to irrigating the nursery, mixing agrochemicals, cleaning and for sanitary uses. However, some villagers said water is	The Pesticide Management Plan (SOIL/ESMS/MP/PS01) is developed to promote a pesticide specific Best Management practice (BMPs)for the handling and use of

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
		contaminated by chemicals during the rainy season.	pesticides within the site to prevent contamination in the soil, damage to the flora and fauna and ground water.
<p>&gt;&gt; The Project shall ensure that water resources are conserved. For surface waters this means:</p> <p>(a) Maintaining credible environmental flows, demonstrated by providing a verifiable calculation that shows conservation is maintained at a level as advised by the independent Expert Stakeholder, and</p> <p>(b) Ensuring that any discharged wastewater is of a high enough standard to allow beneficial reuse. For ground water this means limiting abstractions to levels less than, or equal to, rates of recharge. Managed aquifer recharge may be used to conserve groundwater resources. The project can use historical records, ongoing monitoring and reporting through data logging of physical measurements, online sources and/or government data to assess the project risks/impacts</p>	No	As the project area is not located in or near the water resources, tree planting areas are not found in wetland areas and are mostly not near surface streams.	
<p>&gt;&gt; At each Performance Certification the Project shall assess whether it is in an area of physical water stress or scarcity. The project can conduct an analysis of the water scarcity within the</p>	No	Not applicable. It will be done at each performance certification.	

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
Project's physical area of influence (e.g., basin, watershed) and shall monitor the impact frequently. The project can use Aqueduct, GWSP Digital water Atlas, Water Risk Filter, WBCSD Global Water Tool, Water Stress Index Maplecroft, Water Scarcity Index Pfister or other recognised tools for water stress and scarcity assessment with in the Project's physical area of influence			
>> The Project shall provide verifiable evidence of water stress experienced in the basin(s) in which the Project is active, and demonstrate that consumption of water by the Project (over Baseline) is negligible or will bring positive impacts or, at a minimum, not increase the overall annual basin stress	No	According to the Aqueduct Water Risk Atlas Tool, the project area is in the low level (<10%) of water stress.	
>> The risk(s) of the Project negatively impacting the catchment shall be assessed and addressed to ensure its ongoing, long-term viability and impact on surrounding social-economic and environmental assets. The project can use mapping tools, or other appropriate nationally recognised tools in this regard. Recommended methods include online tools, engineering or physical assessment, historical flow records, land use records, and verbal or written surveys with local agencies and	Potentially	The project activities are designed to avoid any negative impact to the catchment. However, potential risks that negatively impact the watershed will be identified and evaluated during the entire project execution period. If one is detected, mitigation or correction measures will be designed.	

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
residents. Examination of longitudinal and lateral conductivity to check connectivity of flows, including vertical connectivity (i.e., sufficient flows or dead zones)			
>> Where the Project is involved in abstraction from water resources required to support biodiversity and other ecosystem services, an eflow assessment consistent with good practice, including a modern method outlined in one of the key references listed below must be undertaken. Alternatively, where local, national or regional regulation exists or where alternative approaches may be more appropriate then these may be put forward to Gold Standard for approval	No	The Project does not involve the abstraction of water resources to support biodiversity and other ecosystem services. However, Uncontrolled abstraction of groundwater could have an impact on the aquifer with attendant effect on the availability of water in wells and boreholes for use by communities depending on the same aquifer.	Maintain measure proposed by the expert and already in implementation by the project was Register water abstraction activities with the WRC to ensure periodic inspections and facilitate early detection of adverse water abstraction impacts.
>> Where environmental flow assessments are impractical, the Project is required to demonstrate that the flow rate and variability is maintained from the abstracted water resource. A verifiable calculation shall be provided for each water source demonstrating total flow rates do not fall below levels that are contextually appropriate, as advised by an independent Expert Stakeholder	No	The Project does not involve the abstraction of water resources to support biodiversity and other ecosystem services. However, Uncontrolled abstraction of groundwater could have an impact on the aquifer with attendant effect on the availability of water in wells and boreholes for use by	Maintain measure proposed by the expert and already in implementation by the project was Register water abstraction activities with the WRC to ensure periodic inspections and facilitate early detection of adverse water abstraction impacts.

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
		communities depending on the same aquifer.	
>> The opinions and recommendations of Expert Stakeholder(s) shall be sought and demonstrated as being included in the project design and Monitoring Plan	Yes	The opinions of experts in watershed management and conservation were taken into account to define the appropriate areas for planting	
Principle 8.2 Erosion and/or Water Body Instability			
Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion?	Potentially	The project might contain some water from natural resources for a plant nursery that potentially could be affected by the project activities. However, the project is more than 500 metres away from water bodies. In order to protect and conserve, the project has followed the Soil Erosion and Control Plan (SOIL/ESMS/MP/SEC01).	See the Soil Erosion and Control Plan (SOIL/ESMS/MP/SEC01)
Is the Project's area of influence susceptible to excessive erosion and/or water body instability?	Potentially	The soil potentially erodes due to rainfall, winds, soil erodibility, slope of the terrain, and soil surface cover.	See the Soil Erosion and Control Plan (SOIL/ESMS/MP/SEC01)
>> The risk of the Project negatively impacting the catchment and any risks impacting the Project's success shall be assessed and	Potentially	With the implementation of project activities associated with reforestation, it is expected to	See the Soil Erosion and Control Plan (SOIL/ESMS/MP/SEC01)

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
addressed. The project shall ensure its ongoing, long-term viability and impact on surrounding social-economic and environmental assets. The project shall assess the sensitivity of the physical area of influence due to low percentage of impervious cover in a project (e.g., basin, catchment), susceptibility to erosion and water body instability, and lack of terrestrial habitat connectivity. The project can use mapping tools, or other appropriate nationally recognised tools, academic or published studies on the relevant area. The recommended methods include online tools, visual inspection, engineering or physical assessment, historical land use records, aerial photographs, and verbal or written surveys with local agencies and residents on the characterisation of geomorphology of water bodies		positively impact the watershed, increasing coverage, reducing the risk of erosion by winds and trampling of animals and improving soil structure which in turn, improves infiltration.	
>> The Project shall demonstrate that measures to ensure soil protection and minimised erosion are in place prior to the commencement of the Project	No	The mitigation measures established by the experts will be followed.	See the Soil Erosion and Control Plan (SOIL/ESMS/MP/SEC01)
>> The Project shall demonstrate that measures will be undertaken to ensure that surface and ground waters are protected from erosion and that these measures are in place prior to the commencement of the Project	No	The mitigation measures established by the experts will be followed.	See the Soil Erosion and Control Plan (SOIL/ESMS/MP/SEC01)

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
>> Measures shall be incorporated to reduce soil erosion on slopes (e.g., hedge and tree rows, natural terracing, infiltration strips, permanent ground cover). For these measures, the concept of the effective slope length shall be taken into account	No	The mitigation measures established by the experts will be followed.	See the Soil Erosion and Control Plan (SOIL/ESMS/MP/SEC01)
>> Impact shall be reassessed at a frequency appropriate to the context of the ecosystem affected. The monitoring approach and frequency shall be justified by reference to natural patterns and variations	No	The mitigation measures established by the experts will be followed.	See the Soil Erosion and Control Plan (SOIL/ESMS/MP/SEC01)
>> Where the Project takes place in a water scarce or water stressed area, the opinions and recommendations of an Expert Stakeholder shall be sought and demonstrated as being considered and incorporated into the project design	No	According to the Aqueduct Water Risk Atlas Tool, the project area is in the low level (<10%) of water stress, so the project activities are expected to contribute to improving soil infiltration by improving soil cover. Similarly, the water scarcity in the project area is classified as low according to Think Hazard tool.	
Principle 9.1 Landscape Modification and Soil			
Does the Project involve the use of land and soil for production of crops or other products?	Yes	The project area has been zoned as the agriculture area by the Land Commission and now is	The land has been leased to plant the Jatropha trees. However, the project reserves



Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
		leased. However, the project activity involves plantation.	approximately 2,000 ha as a farming and buffer area.
>> The Project shall identify the functions and services provided by the landscape and demonstrate no net degradation in existing landscape function and services	Yes	According to the GIS analysis, most of the land in the project area is grassland with a higher potential of degradation when compared to the project activities. It is expected that the planting activities will improve the degraded condition of the soil, the connectivity will be enhanced, habitat for fauna is created and the erosion will decrease.	
>> To ensure healthy soils the following aspects shall be identified, and appropriate measures shall be put in place to protect them: (a) Soil types, AND (b) Biota, AND (c) Erosion	Yes	Soil characterization was developed for the project area, as well as biota characterization and an evaluation of the risk of erosion in the project area.	The soil erosion control measures for preventing the soil have been mentioned in the Soil Erosion and Control Plan (SOIL/ESMS/MP/SEC01).
>> Measures shall be incorporated to minimise soil degradation (e.g., through crop rotation, composting, no use of heavy machinery, use of N-fixing plants, reduced tillage, no use of ecologically harmful substances)	Yes	Measures to minimize soil degradation will be incorporated.	Measures to minimize impacts to soils from Project activities are described in the SOIL/ESMS/MP/SEC01.

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
>> Projects that involve the production, harvesting, and/or management of living natural resources by small-scale landholders and/or local communities shall adopt the appropriate and culturally sensitive sustainable resource management practices	No	These activities are not performed as project activities. Nevertheless, they can be performed by the local communities as part of their daily subsistence activities.	
Principle 9.2 Vulnerability to Natural Disaster			
Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	Potentially	According to the Think Hazard tool, the project might be susceptible to river flood and extreme heat.	The project has an Emergency Response Plan (SOIL/ESMS/MP/ERP01) that help to mitigate of these events.
>> The Project shall avoid or minimise the exacerbation of impacts caused by natural or man-made hazards, such as landslides or floods that could result from land use changes due to Projects. The Project Developer shall include mitigation measures (if possible), the emergency preparedness plan and response strategies. The Project Developer shall disclose appropriate information about emergency preparedness and response Projects, resources, and responsibilities to affected communities	Yes	An evaluation of the natural or induced hazards was developed in the Emergency Response Plan.	The project has an Emergency Response Plan (SOIL/ESMS/MP/ERP01) that help to mitigate of these events.
Principle 9.3 Genetic Resources			
Could the Project be negatively impacted by or involve genetically modified organisms or GMOs (e.g., contamination, collection and/or	No	The project has not involved genetically modified organisms (GMOs). The project has been	

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
harvesting, commercial development, or take place in facilities or farms that include GMOs in their processes and production)?		certified by ISCC as having no GMO varieties in the Jatropha plantation.	
>> Projects involving the use of GMOs are not eligible for Gold Standard Project Design Certification	No	The project has not involved genetically modified organisms (GMOs).	
>> An assessment for the risk of GMO contamination from outside the Project area and reasonable and appropriate counter measures should be taken	No	The project has not involved genetically modified organisms (GMOs).	
Principle 9.4 Release of pollutants			
Could the Project potentially result in the release of pollutants to the environment?	Yes	The major risk is associated with the chemicals that could go to the watercourses.	For fertilisers impacts and pesticide impacts, SOIL/ESMS/MP/FCN01 and SOIL/ESMS/MP/PS01 will be applied.
>> The Project shall avoid the release of pollutants. This applies to the release of pollutants to air, water, and land due to routine, non-routine and accidental circumstances	Yes	Chemicals will be used as pesticide and fertilisers, as they are necessary for the plantation establishment and survival.	The project seeks efficient use of hazardous substances, minimising exposure and waste generated by the project activities. Measure minimise impacts are mentioned in the

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
			SOIL/ESMS/MP/FCN01 and SOIL/ESMS/MP/PS01.
>> The Project Developer shall ensure that pollution prevention and control technologies and practices consistent with national regulation or international good practice are applied during the Project life cycle	Yes	The project does not promote or advocate the use of High Hazardous Pesticides (HHP)'s due to its inhouse policy to avoid injury and damage to its workforce and environment.	Measure minimise impacts are mentioned in the SOIL/ESMS/MP/FCN01 and SOIL/ESMS/MP/PS01.
>> All potential pollution sources that may result from the Project that cause the degradation of the quality of soil, air, surface and groundwater within the Project's area of influence shall be identified. Appropriate mitigation measures and monitoring shall be implemented to ensure the protection of resources. The project can use historical records, ongoing monitoring and reporting through data logging of physical measurements, online sources, government data. The recommended methods include quantitative documentation of all sources and volumes of water abstractions, use of weirs and gauges, flow meters, pump energy consumption, transpiration rates, government data	Yes	The project adapts fertiliser placement techniques to reduce the losses of fertiliser into the soil through leaching and to the air through evaporation, thereby reducing environmental pollution.	Measure minimise impacts are mentioned in the SOIL/ESMS/MP/FCN01
Principle 9.5 Hazardous and Non-hazardous Waste			

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	Yes	Hazardous and non-hazardous wastes generated on plantation from land preparation to harvesting have varies degree of impact on the environmental and human health.	All waste must be classified into waste type, source, quantity before handling and removing from the Jatropha plantation, with the exception of vegetation or biomass waste following the Waste Management Plan (SOIL/ESMS/MP/WM01)
>> Projects shall avoid or, when avoidance is not feasible, minimise and control release of hazardous materials resulting from their production, transportation, handling, storage and use in the Project. Where avoidance is not possible, the health risks, including potential differentiated effects on men, women and children, of the potential use of hazardous materials shall be addressed appropriately	Yes	Fertilisers and potentially pesticides will be used in the plantation and nurseries, where they will be applied directly to land in the plantation and to seedling containers stored above the ground in the nurseries. Both applications have the potential to result in the accumulation of these chemicals in soils and, subsequently, groundwater.	Measure minimise impacts are mentioned in the SOIL/ESMS/MP/FCN01 and SOIL/ESMS/MP/PS01.
>> Projects shall consider the use of less hazardous substitutes for such chemicals and materials and will avoid the manufacture, trade, and use of chemicals and hazardous materials subject to international bans or phase-outs due to their high toxicity to living organisms, environmental persistence, potential for	Yes	The project does not promote or advocate the use of High Hazardous Pesticides (HHP)'s due to its inhouse policy to avoid injury and damage to its workforce and environment.	Measure minimise impacts are mentioned in the SOIL/ESMS/MP/FCN01 and SOIL/ESMS/MP/PS01.

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
bioaccumulation, or potential for depletion of the ozone layer			
>> All sources of waste and waste products shall be identified and classified. Waste products include amongst others: (a) Chemical wastes, AND (b) Containers, AND (c) Fuels and oils, AND (d) Human waste, AND (e) Rubbish (including metals, plastics, organic and paper products), AND (f) Abandoned buildings, machinery or equipment	Yes	All sources of waste and waste products have been identified and classified.	See the SOIL/ESMS/MP/FCN01 and SOIL/ESMS/MP/PS01.
>> Where waste generation may not be avoided, the Project shall reduce the generation of waste, and recover and reuse waste in a manner that is safe for human health and the environment	Yes	The project has a procedure that established how waste generated by Project activities must be handled and managed in a responsible manner. See the SOIL/ESMS/MP/FCN01 and SOIL/ESMS/MP/PS01.	
>> Where waste may not be recovered or reused, it shall be treated, destroyed, or disposed of in an environmentally sound manner that includes the appropriate control of emissions and residues resulting from the handling and processing of the waste material	Yes	The General Waste Management Procedure will be followed in this case.	See the SOIL/ESMS/MP/FCN01 and SOIL/ESMS/MP/PS01.

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
>> If the generated waste is considered hazardous, reasonable alternatives for its environmentally sound disposal will be adopted while adhering to the limitations applicable to its transboundary movement	Yes	The project does not promote or advocate the use of High Hazardous Pesticides (HHP)'s due to its inhouse policy to avoid injury and damage to its workforce and environment.	See the SOIL/ESMS/MP/FCN01 and SOIL/ESMS/MP/PS01.
>> The Project shall not make use of chemicals or materials subject to international bans or phase-outs. For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Conventions on Persistent Organic Pollutants or the Montreal Protocol	No	The project does not promote or advocate the use of High Hazardous Pesticides (HHP)'s due to its inhouse policy to avoid injury and damage to its workforce and environment.	
Principle 9.6 Pesticides & Fertilisers			
Will the Project involve the application of pesticides and/or fertilisers?	Yes	Pesticides and fertilisers are used in the project activities. See section A.3.	The project has listed certain fertiliser activities and environment concerns with some help from technical team and fertilisers associate. The Fertiliser (and Crop Nutrient) Management Plan (SOIL/ESMS/MP/FCN01) has been complied with all legal requirements related to nutrient management activities.

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
			For the Pesticide Management Plan (SOIL/ESMS/MP/PS01), the objective is to promote sustainable agriculture through minimising reliance on pesticides, and to develop and promote a pesticide specific Best Management Practices for the handling and use of pesticides within the site to prevent contamination in the soil, damage to flora and fauna and ground water from normal agricultural practices.
>> Projects involving pest management, the integrated pest management (IPM) and /or integrated vector management (IVM) approaches shall be adopted and aim to reduce reliance on chemical pesticides	No	The project does not promote or advocate the use of High Hazardous Pesticides (HHP)'s due to its inhouse policy to avoid injury and damage to its workforce and environment.	
>> The health and environmental risks associated with pest management should be minimised with support, as needed, to institutional capacity development, to help regulate and monitor the distribution and use of pesticides and enhance the application of integrated pest management	No	The project does not promote or advocate the use of High Hazardous Pesticides (HHP)'s due to its inhouse policy to avoid injury and damage to its workforce and environment. However, risks are managed	



Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
		through the Pesticide Management Plan (SOIL/ESMS/MP/PS01) and the Community Health, Safety and Security Management Plan (SOIL/ESMS/MP/CH01)	
>> When Projects include pest management or the use of pesticides, pesticides that are low in human toxicity, known to be effective against the target species and have minimal effects on non-target species and the environment shall be selected	No	The project does not promote or advocate the use of High Hazardous Pesticides (HHP)'s due to its inhouse policy to avoid injury and damage to its workforce and environment.	
>> There shall be a 'Chemical Pesticides Policy' that is documented, implemented and regularly updated. This policy shall include at a minimum: (a) Provisions for safe transport, storage, handling and application, AND (b) Provisions for emergency situations	No	There is not a Chemical Pesticides Policy at the moment. Nevertheless, there are procedures that fulfil the two main requirements mentioned here.	
>> The Project Developer shall not purchase, store, manufacture, trade or use products that fall in Classes IA (extremely hazardous) and IB (highly hazardous) of the World Health Organization Recommended Classification of Pesticides by Hazard	No	According to SOIL/ESMS/MP/PS01, the project Avoid the purchase and usage of pesticides under the HHP class as per WHO.	
>> Fertilisers shall be avoided, or their use shall be minimised and justified. If the aerial	Potentially	The project adopts nutrient management planning to	

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
application of fertiliser is used, then measures shall be put in place to prevent drift		minimize the environmental impact of the nutrients used on their farms, while at the same time optimizing yields and reducing fertilizer costs as stated in the Fertiliser and Crop Nutrient Management Plan (SOIL/ESMS/MP/FCN01).	
Principle 9.7 Harvesting of Forests			
Will the Project involve the harvesting of forests?	No	The project does not involve in the harvesting of forests. The project is managed by applying the conservation system.	
>> The Project shall: (a) Enhance the sustainable management of forests, including the application of independent, credible certification for commercial, industrial-scale timber harvesting, AND (b) Maintain or enhance biodiversity and ecosystem functionality in areas where improved forest management is undertaken	No	The project does not involve in the harvesting of forests. The project is managed by applying the conservation system.  The project enhances biodiversity through the training of biodiversity management.	
Principle 9.8 Food			
Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	Yes	Long-term changes to local gardening practices are not expected.	Food security may improve with greater employment opportunities and a number of

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
			other economic variables associated with the project.
>> The Project activity shall not negatively influence access to and availability of food for people affected	No	The project is established in the degraded grassland/shrubland which identified and provided by the Land Commission.	The project implemented the activities in the leased land and reserved about 2,000 ha of leased land for communities for farming.
Principle 9.9 Animal husbandry			
Will the Project involve animal husbandry?	No	The project does not involve animal husbandry, sufficient for avoiding damage by cattle.	
>> The welfare of animals shall be ensured by: (a) Provision of sufficient drinking water, AND (b) Access to daylight, AND (c) The prohibition of cattle trainers, AND (d) No hindrance in their sensory perception and performing their basic needs, AND (e) Management policies and staff training to prevent mistreatment (evidence of animal mistreatment shall be treated as an immediate Non-conformity)	No	No cattle raise in the project area.	
>> Excessive or inadequate use of veterinary medicines shall be avoided. Thus, all medications shall be: (a) Administered strictly according to label and package instructions, OR	No	No cattle raise in the project area.	

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
(b) According to a trained veterinarian			
>> Injured or sick animals shall be treated and isolated, if necessary, for recovery	No	No cattle raise in the project area.	
>> Synthetic growth promoters including hormones shall not be administered	No	No cattle raise in the project area.	
>> Animals shall be exposed to the least stress possible during transportation and slaughtering	No	No cattle raise in the project area.	
>> Appropriate space per animal and stocking rates per land unit should be set according to their developmental and physical needs	No	No cattle raise in the project area.	
Principle 9.10 High Conservation Value Areas and Critical Habitats			
Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	Yes	<p>The project is not located in any protected area of Ghana. It has a low conservation status in terms of presence and abundance of rare and threatened plant species.</p> <p>According to Final Report: Biodiversity analysis of Jatropha curcas plantation site at Yeji, however, an evaluation of the project area using the High Conservation Value Forest</p>	<p>The objective of Biodiversity Management Plan (SOIL/ESMS/MP/BMP01) is to ensure that biodiversity management becomes an integral part of day to day of project activities through identification of the status of habitats and species present and instituting key objectives for maintaining and enhancing biodiversity. The SOIL/ESMS/MP/BMP01 provides a clear set of actions that are</p>

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
		toolkit was done and the project contain HVC1, HVC5 and HVC6.	consistent with IFC Performance Standard 1 and 6 on managing biodiversity within the project sites.
>> No Project that potentially impacts identified habitats as identified above shall be implemented	No	The project will not impact natural ecosystems and HCV zones.	
>> Within the Project the area that is managed by the Project Developer and the area of impact downstream, the following shall be identified and protected/enhanced. In the case of downstream impacts, the Project shall ensure mitigation is in place within the Project Boundary such that the Project shall not adversely affect these areas: (a) Existing patches of native tree species, AND (b) Single solitary stems of native tree species, AND (c) All freshwater resources including rivers, lakes, swamps, ephemeral water bodies and wells (d) Habitats of rare, threatened and endangered species, AND (e) Areas relevant for habitat connectivity shall be identified and managed to protect or enhance biological diversity.	No	Through the conservation system, soil conditions are being improved, which can be seen reflected in improved watershed and prevent soil erosion. In addition, the project promote the protection and natural ecosystem the generation of riparian buffers in natural.	See the Biodiversity Management Plan (SOIL/ESMS/MP/BM01).

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
<p>&gt;&gt; If the Project is located in such habitats; the Project Developer shall:</p> <p>(a) Minimise unwarranted conversion or degradation of the habitat.</p> <p>(b) Identify opportunities to enhance the habitat as part of the Project. For Projects applying the Land Use &amp; Forest Activity Requirements Projects, a minimum 10% of the Project area shall be identified and managed to protect or enhance the biological diversity of native ecosystems. For this, the HCV approach should be followed (<a href="http://www.HCVnetwork.org">www.HCVnetwork.org</a>). This area has to be located within the project region and managed by the Project Developer. The area may also include the areas of the requirement (for example, buffer zones for water bodies in the case of Land Use &amp; Forests)</p>	No	The project is not located in such areas.	
<p>&gt;&gt; The opinions and recommendations of an Expert Stakeholder shall be sought and demonstrated as being included in the Project design. The project can use mapping tools such as LEFT, IUCN Red List, IBAT or other appropriate nationally recognised tools may be used or visual inspection. The recommended methods include online tools, visual inspection, engineering or physical assessment, use</p>	No	The opinions and recommendations of experts are consulted as showed in the Biodiversity Management Plan (SOIL/ESMS/MP/BMP01).	

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
historical data and verbal or written surveys with local residents			
Principle 9.11 Endangered Species			
Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)?	Yes	One plant species <i>Ptericarpus erinaceus</i> which is listed on the IUCN Red list of threatened species as "Endangered" was identified in the area.	See the Biodiversity Management Plan (SOIL/ESMS/MP/BMP01).
Does the Project potentially impact other areas where endangered species may be present through transboundary affects?	No	The project will conserve all big standing trees in the project area. Therefore, the project has no impact where the endangered species presented.	
>> Under no circumstances shall the Project lead to the reduction or negative impact of any recognised Endangered, Vulnerable or Critically Endangered species	No	Endangered species have been identified in the project area. These species will not be affected by the project activities.	
>> Habitats of endangered species shall be specifically identified and managed to protect or enhance them	No	The project promotes the protection of natural ecosystems through the training of biodiversity management.	
>> The opinions and recommendations of an Expert Stakeholder shall be sought and	Yes	The biodiversity management has been consulted.	See the SOIL/ESMS/BMP01 and the Final Report Biodiversity

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
demonstrated as being considered and incorporated into the project design			Analysis of <i>Jatropha curcas</i> Plantation Site at Yeji.



## APPENDIX 2 – CONTACT INFORMATION OF PROJECT PARTICIPANTS

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## APPENDIX 3 – LUF ADDITIONAL INFORMATION

<p>Risk of change to the Project Area during Project Certification Period:</p>	<p>The project is developed on leased land and purchasing the land to the stools. The project has a specific land tenure strategy that summarise the approach that followed to plant Jatropha during the following 30 years. In addition, there are natural risks such as drought and flood events can affect the project area.</p>
<p>Risk of change to the Project activities during Project Certification Period:</p>	<p>The Jatropha fruit produced by the Jatropha plantation will be mainly used to produce biofuel. The project reserves some area around 2,000 hectares for farmers to cultivate agriculture as one of displacement program. Therefore, farming can affect the Jatropha plantation.</p> <p>Jatropha grows under sub-tropical conditions and can withstand conditions of serve drought and low soil fertility. However, the natural risks like drought and flood events might occur and affest the project area. Therefore, the project sets out the responsibilities and outline instructions to be followed in ordered to prepare and respond to emergencies resulting from flooding (see Emergency Response Plan; SOIL/ESMS/MP/ERP01). For drought events, the project finds that saplings developed from nursery have better tolerance to drought compared to cutting. Potasium is a major nutrient for plant growth, increase root growth and improve drought resistance.</p>

<p>Land-use history and current status of Project Area:</p>	<p>The project area consists largely of the grassland/shrubland as the project is located in savannah ecological zone, and some bare land. The project is being developed in grasslands, which was once cultivated by communities and now being abandoned due to low fertility status. The land had grasses and some bushes.</p>
<p>Socio-Economic history:</p>	<p>Agriculture comprising farming and fishing is the main economic activity in the District. According to the 2010 PHC, a total of 65.9% of the population is involved in agriculture owing to the fertile farmlands and the Volta lake in the District. Yeji, the District capital is recognized as the largest inland supplier of fresh/ smoked/ salted fish, cattle, and other food crops in the District. The fish market serves as the main backbone of the Assembly's revenue. The strategic location (just on the edge of the Volta Lake) makes it ideal for trade in general commodities which are basic to human survival. There are more males (77.2%) engaged in agricultural forestry and fisheries in the District than females (54.4%).</p> <p>The next most important venture in the District is that of crafts and trade works which employs 14.1 % of the population. The District also has 11.7 % of its population engaged as service and sales worker. The least sector of employment in the District is clerical support jobs and managerial jobs. There are more females (21.2%) in craft and related trades work than males (7.0%), however there are</p>

	equal proportions of males and females working as managers (0.9%).
Forest management applied (past and future)	<p>The project area did not have forest management applied before the implement of the project because the forest cannot fall under the forest definition for the last 10 years. However, before that period, the forest areas that fall into the project areas have been converted to other uses such as grassland, shrubland, urban settlements and were also used for firewood, which increased the deforestation and degradation in the area.</p> <p>The area will be mainly planted with one species <i>Jatropha curcas</i>. The area will be planted applying the conservation system for 30 years without rotation activity.</p>
Forest characteristics (including main tree species planted)	The main tree species to be planted is <i>Jatropha curcas</i> with a average plantation density of 1,600 trees per ha for 30 years without rotation activity.
Main social impacts (risks and benefits)	<p>Risks:</p> <ul style="list-style-type: none"> <li>- Displacement of farmers from their economic and social life forms as some have to travel further distance in search of fertile lands to continue their farming activities</li> </ul> <p>Benefits:</p> <ul style="list-style-type: none"> <li>- Providing opportunity for the restoration of their living standards through payment displacement program</li> <li>- Development of community-based business companies, that will increase</li> </ul>

	<p>entrepreneurship and small-scale business activity</p> <ul style="list-style-type: none"> <li>- Higher income due to employment through the project and business activity arising because of business opportunities created by the project</li> <li>- Improvements to local road networks and service infrastructure</li> <li>- Increased school enrolment as education costs become less prohibitive</li> <li>- Increased skills as local workers are trained and employed by the project</li> </ul>
Main environmental impacts (risks and benefits)	<p>Risks:</p> <ul style="list-style-type: none"> <li>- Land preparation resulting in habitat loss for plants and animals</li> <li>- Chemical contamination and waste in the groundwater</li> <li>- Erosion leading to habitat degradation as a result of land clearing and other construction activities</li> </ul> <p>Benefits:</p> <ul style="list-style-type: none"> <li>- Soil erosion control by forest plantations</li> <li>- New habitat for animals through the Biodiversity Management Plan</li> <li>- Climate mitigation through carbon sequestration in Jatropha trees</li> <li>- Regulation of watercourses.</li> </ul>
Financial structure	<p>The project is seeking the financial support to develop such a project at this stage. After that, the funding will come from the sale of the additional carbon credits generated by the project.</p>
Infrastructure (roads/houses etc.):	<p>The main infrastructure found in the project area is buildings for schools and</p>

	health centres, and any other smaller constructions and boreholes.
Water bodies:	The project is not located in any RAMSAR sites of Ghana. No wetlands and rivers are included in the project areas.
Sites with special significance for indigenous people and local communities - resulting from the Stakeholder Consultation:	According to the result from the local stakeholder consultation, there is no indigenous people living in the project area.
Where indigenous people and local communities are situated:	Even through local communities or farmers live in the project area that have clear property rights of the areas included in the project area.
Where indigenous people and local communities have legal rights, customary rights or sites with special cultural, ecological, economic, religious or spiritual significance:	The project carried out on the land concession for agricultural purpose. There are farmers living in the project area. The project reserves 2,000 ha of land concession and allows farmers cultivate agriculture activities.

## APPENDIX 4 – SUMMARY OF APPROVED DESIGN CHANGES

Please refer to Annex A of [Principles and Requirements](#) for more information on procedures governing Design Changes

### Revision History

Version	Date	Remarks
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1.2	14 October 2020	<p>Hyperlinked section summary to enable quick access to key sections</p> <p>Improved clarity on Key Project Information</p> <p>Inclusion criteria table added</p> <p>Gender sensitive requirements added</p> <p>Prior consideration (1 yr rule) and Ongoing Financial Need added</p> <p>Safeguard Principles Assessment as annex and a new section to include applicable safeguards for clarity</p> <p>Improved Clarity on SDG contribution/SDG Impact term used throughout</p> <p>Clarity on Stakeholder Consultation information required</p> <p>Provision of an <a href="#">accompanying Guide</a> to help the user understand detailed rules and requirements</p>
1.1	24 August 2017	Updated to include section A.8 on 'gender sensitive' requirements
1.0	10 July 2017	Initial adoption