



**Tindilo Reduced Emissions from  
Deforestation and  
Degradation (REDD) Project, Sudan**

**Project Idea Note (PIN)**

March 2010

## 1. Basic Information

Project name: Tindilo Reduced Emissions from Deforestation and Degradation (REDD) Project, Sudan

### **PIN Date**

March 2010

### **Company data**

#### **Company:**

Name: Green Resources AS (GRAS)

Address: Strandveien 35, 1366 Lysaker, Norway

Website URL: [www.greenresources.no](http://www.greenresources.no)

No. of Employees: 1480 employees of which 365 are permanent staff and 1165 casuals

Registration number Professional or Trade Register + City: Org. no 975 879 968 NO

Date of registration: 26-08-1995

Company's core business: Reforestation, carbon offset, forest products and renewable energy

#### **Contact person:**

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### **Project Participant(s) / partner(s)**

#### **Company:**

Name: TreeFarms Sudan

Address: P.O. Box 3, Juba

Website URL: [www.greenresources.no](http://www.greenresources.no)

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### **Company's core business**

Green Resources is a plantation, carbon offset, forest products and renewable energy company. The Company was established in 1995 and is a private, profit oriented Norwegian company with 60 shareholders. It employs about 3,000 people in total and has invested more than NOK 300 million in plantations and industries in Eastern and Southern Africa with a strong local organisation. Green Resources has activities in Tanzania, Uganda, Sudan and Mozambique.

The Company is Africa's leading afforestation company and has established 14,200 ha of forest plantations and over 610,000 ha land under process for future planting and conservation. This is probably more new trees than any other private company has planted in Africa during the last 10 years. Green Resources is growing trees to generate carbon offsets, to manufacture wood products and for the generation of bio-energy.

Green Resources carbon offset projects include; afforestation/reforestation, reduced emissions from deforestation and degradation, bio fuel and renewable electricity projects. It is a leader in forestry derived greenhouse gas emission reductions, and received the first verified carbon credits in 2000. In 2009, one of GRAS` subsidiaries in Tanzania became the first project in the world to be validated against the Voluntary Carbon Standard (VCS). All Green Resources carbon offset revenues will be reinvested in new carbon offset activities or be used for community development.

Green Resources industrial operation, Sao Hill Industries, is East Africa's largest sawmill and one of the largest treated pole producers, it also has carpentry and joinery plants. It has several sales branches throughout Tanzania.

Green Resources strategy is based on sustainable development of the areas where it is operating. Our objective is to become the favoured African employer within the

industry and the East African region. The company believes that afforestation is the most efficient way of developing the social and economic conditions for people in rural areas. Green Resources aims to be the preferred partner for local communities in these areas.

Green Resources aims to follow the best international environmental standards. It conserves the natural forest and other valuable habitats. Green Resources only harvests plantation forest and plants ten new trees for every one tree that it harvests. In addition, it only plants on grassland or degraded forestland. It focuses on a wide variety of species, including; pine, eucalyptus, teak, measopsis and various indigenous trees.

## **2. Project characteristics**

### **Project type and scale**

The proposed REDD project will be implemented by Tree Farms Sudan Ltd in conjunction with local communities across 156,624 hectares of savannah woodland located in the Tindilo Payam Community area, Terekeke County, Central Equatoria State, South Sudan. The project entails protecting existing forest stocks from unplanned deforestation pressures and providing enabling conditions for the regeneration of degraded areas. The project will be implemented in conjunction with the establishment of 23,000 hectares of commercial forests through the reforestation of degraded grassland areas. It is estimated that the project will result in 14,965,839 tCO<sub>2</sub>e reductions over the initial 30 years of implementation.

### **Present situation at Project Site**

#### ***Geography***

The project area is located in the Tindilo Payam Community area, Terekeke County, Central Equatoria State, South Sudan. The total Tindilo Payam area is 250,000 hectares. The project boundaries have been delineated and approved by local communities and regional authorities. The inter-state line between the Central Equatoria State and the Lakes State represents the northern project boundary and the inter-state line between the Central Equatoria State and the Western Equatoria State represents the south western project boundary. There are two established

settlement areas within the payam totalling 33,046 hectares and an additional 37,095 hectares of largely unused community land. The larger of these settlements is situated at the centre of the project site and the smaller at the western edge bordering the neighbouring Magiki Payam. The payam has approximately 10,000 community members. Surrounding the central settlement area are the 5 forest blocks under management by Tree Farms Sudan Ltd, corresponding to the territorial areas of the 5 bomas that comprise the Tindilo Payam. In total these 5 forest blocks total 179,859 hectares (see figure 1).

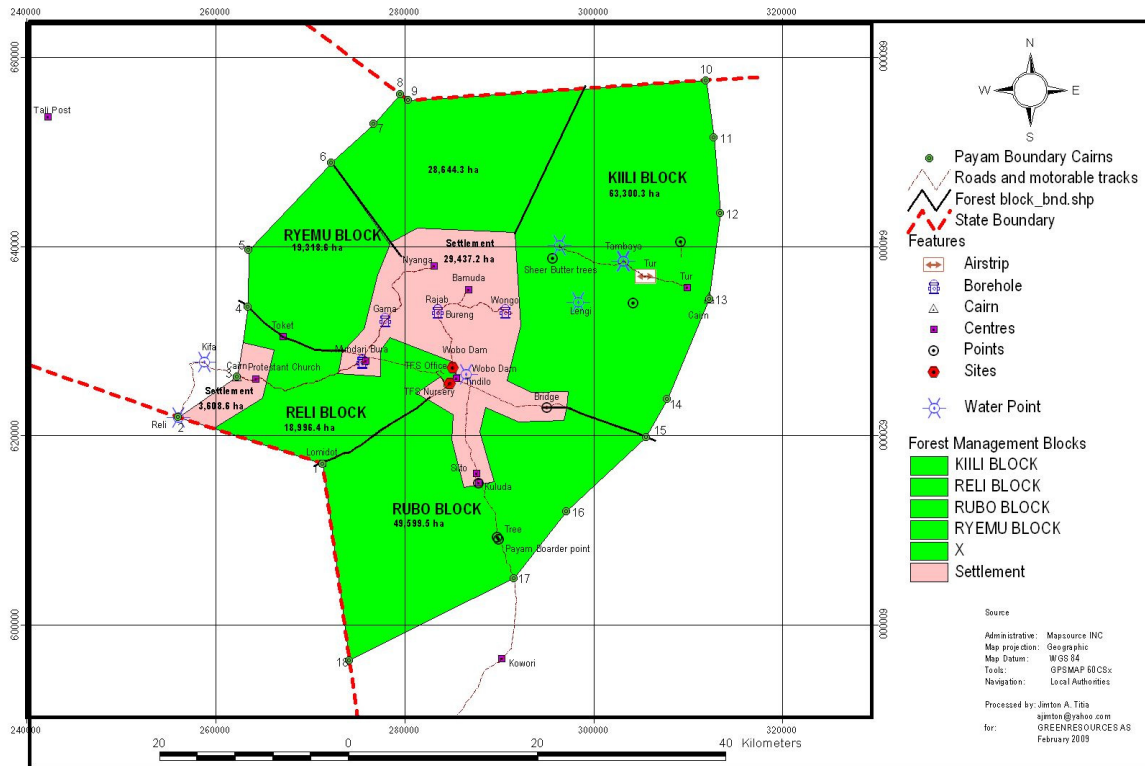
The area is predominantly flat and altitude ranges from 550m in the southern part to approximately 400m in the northern area. The area is generally savannah woodland with large open gaps of grassland and degraded areas. Rainfall in the area is approximately 900mm per year and occurs in the period between April and September. However the weather patterns are changing and rains often come earlier than expected and at times the dry season lasts longer than expected.

#### ***Government and legislation***

As of 2005 the management responsibility for forests in Southern Sudan fell under the Government of Southern Sudan's (GOSS) Ministry of Agriculture and Forestry. The Ministry is new and presently there are virtually no laws, detailed policies, or operational plans governing the forest resources of the region. As a result the forestry resources of the region including those within the project site are unprotected and extremely vulnerable to unsustainable extraction.

#### ***Deforestation***

Forest degradation is largely driven by over grazing of livestock, uncontrolled seasonal bush fires and charcoal production undertaken as an informal livelihood activity to meet a growing urban demand. Deforestation is driven by shifting cultivation, although as a consequence of the conflict this activity has been limited in recent years with families dependent upon the produce from home gardens, however with the prospect of peace returning to the area it is probable that such activities will resume.



Tree Farms Sudan Ltd is a subsidiary company of Green Resources AS a plantation company with forest plantations and wood-processing operations in Tanzania, Uganda, Mozambique and Sudan. It is a Norwegian company that has invested more than NOK 300 million in East Africa since 1995 and established Africa's largest reforestation company. Its business is carbon offsets, forest plantations, renewable energy and wood products (building materials based on renewable resources). Green Resources AS has been Africa's largest afforestation company during the last 10 years and is the leading sawn timber and transmission pole producer in East Africa.

Tree Farms Sudan signed a land lease agreement with the Tindilo Payam community in October 2007, under an agreement to establish sustainable forestry operations within the 179,859 hectare community area. To date the company has established 300 hectares of trial plantations of eucalyptus and teak and constructed supporting plantation facilities including a nursery with 1,000,000 seedlings per year capacity. These operations employ 12 full time staff and on average realise 140 temporary employment opportunities each month for the local community.

A community support program has been developed after close consultation with the local community members to be implemented in three consecutive stages over the

next 25 years. The program aims to support the community in its infrastructural development, including school facilities, roads, water systems and dispensary units, as well as providing agricultural and forestry related support programmes to small farmers.

### **3. Project objectives**

- To prevent continued emissions from the deforestation and degradation of existing forest stocks through implementation of a community based forest management plan. To generate efficient GHG reductions that can be measured, monitored and verified and demonstrate the financial viability of private sector investments in REDD+ project activities in a region currently on the periphery of REDD debate.
- To sequester carbon through enrichment planting of degraded forest areas with indigenous fruit and high value tree species. This will enhance the nutritional safety net that the forest provides to local communities during poor harvests. The enrichment planting will provide improved feedstock for alternative community livelihood programmes such as Shea butter and gum Arabic production.
- To promote environmental protection, through safeguarding the hydrological and biodiversity services that the forest areas provide.
- To facilitate the long term socio-economic development of the local communities through:
  - Creation of direct and indirect employment opportunities
  - Supporting local farmers in improving agricultural production through provision of training, improved farm inputs and climate change adaptation technologies.
  - Supporting infrastructure development within the region, including road construction and provision of clean water sources.
  - Supporting local communities in establishing NTFP enterprises through provision of training, transport to local markets and processing equipment.
  - Supporting the establishment of community woodlots through provision of free seedlings and technical advice to provide alternative source of fuel and timber.

- Supporting sustainable charcoal production enterprise through provision of efficient charcoal producing technologies and waste timber supply from commercial plantation.

## **Proposed activities and community development**

The project activities involve the implementation of a community based forest management plan as a means of protecting existing forest stocks and rehabilitating degraded forest areas. It is recognised that the success of the project ultimately depends upon addressing the underlying drivers of deforestation and forest degradation and that this can only be achieved through assisting the social and economic development of the local communities.

TFS is in the process of creating a fully trained team and has established an indigenous seed supply and nursery that will have the capacity to supply the planned enrichment planting activities in degraded forest areas. Planting will occur in April as close as possible to the start of the main rains, ensuring adequate soil moisture for optimal growth. Spacing and techniques will be optimised during the establishment of trial plots and the analysis of results.

Conditions for regeneration will be optimised through the implementation of a fire and grazing management plan. Early morning controlled burning regimes will be undertaken at the beginning of the dry season, reducing the intensity of the fire, increasing sapling survival rates whilst still promoting re-growth of fodder to meet the needs of pastoralist activities. In addition enrichment planting will be undertaken in a phased manner in each forest management block, and grazing restrictions implemented in these areas during the first year of establishment.

Support will be provided to local communities in adopting sedentary agricultural production methods through the sustainable intensification of existing agricultural systems. Through the provision of training, improved seed varieties, nitrogen fixing shrubs and drip fed irrigation systems, pressure from shifting agricultural practices can be reduced. In addition through climate proofing the agricultural system in such a way food security will be enhanced.

The project will establish approximately 250 hectares of community woodlots through the provision of free seedlings and training in silvicultural techniques in order to generate a sustainable supply of wood and timber and thus remove the pressure on woodland areas. This woodlot area was based on the assumption that

per capita demand for subsistence wood use is approximately 1m<sup>3</sup>. To complement this activity the project will train interested members of the local communities in the construction of fuel efficient clay stoves, and for households with sufficient head of cattle the construction of biogas digesters. Such technologies not only reduce the demand for wood but also reduce incidence of diseases related to smoke inhalation.

The project will support community members in establishing alternative livelihood activities to replace incomes derived from informal charcoal production. The project will provide training, interest free loans for the purchase of technologies for NTFP product processing and transportation as a means of accessing local markets for the resultant products. An initial focus will be on the establishment of Shea butter and Acacia gum production enterprises.

### **Applied technologies**

The project will utilise the latest available technology during all aspects of project development. Tree Farms Sudan Ltd has established a nursery in the project site, and specific silvicultural technologies and methods are currently being tested through field trials in order to decipher the most efficient means of achieving restoration of degraded forest areas with indigenous species.

Global positioning, mapping and information systems have been used during an initial mapping assessment to verify the exact area of the project site and distinguish the area of forest from those of community settlement. These techniques will continue to be used for project verification and monitoring. An initial field assessment carried out in February 2009 reported that the majority of the project area is made up of savannah woodland with some open grass and degraded areas. There is still a need to combine satellite imagery with field observations in order to accurately stratify and map different ecosystem types (forest, shrub land, grassland). In addition systematic sampling of the carbon stocks of each ecosystem type need to be undertaken in order to accurately establish baselines and project scenarios.

In addition to the requirements stipulated by the VCS and selected methodology, the following reports and plans shall be designed to allow for continued assessment of the project against social, economic, and environmental objectives.

1. Community based forest management plans
2. Environmental impact assessment reports
3. Socio-economic impact assessment reports

The project shall rely on the company's own staff implementing the project in conjunction with members of the local communities who will be provided the necessary training. Where possible, the project will seek to collaborate with the regional and local forestry departments, and in doing so shall assist in building the technical capacity for wider REDD program implementation. Where required, GRAS shall also seek advice from local and international experts on forestry, agriculture and climate change.

## 4. Greenhouse Gas Emission Reductions

The estimated annual and total emission reductions achieved in the first 30 years of the project are 498,861 tCO<sub>2</sub>e and 14,965,839 tCO<sub>2</sub>e respectively.

Year	Estimation of emissions reduced through avoided degradation (tCO <sub>2</sub> )	Estimation of emissions sequestered through regeneration (tCO <sub>2</sub> )	Estimation of total emission reductions (tCO <sub>2</sub> )
1	167097	364047	531144
2	164541	364047	528587
3	162023	364047	526070
4	159544	364047	523591
5	157103	364047	521150
6	154700	364047	518746
7	152333	364047	516379
8	150002	364047	514049
9	147707	364047	511754
10	145447	364047	509494
11	143222	364047	507268
12	141030	364047	505077
13	138873	364047	502919
14	136748	364047	500795
15	134656	364047	498702
16	132595	364047	496642
17	130567	364047	494613
18	128569	364047	492616
19	126602	364047	490649
20	124665	364047	488712
21	122758	364047	486804
22	120879	364047	484926
23	119030	364047	483077
24	117209	364047	481255
25	115416	364047	479462

26	113650	364047	477696
27	111911	364047	475957
28	110199	364047	474245
29	108513	364047	472559
30	106852	364047	470899
<b>Estimated total for initial 30 year crediting period</b>	<b>4044440</b>	<b>10921399</b>	<b>14965839</b>

### Key Assumptions underpinning emission reduction calculations

- Degradation rate:** In the absence of time series satellite imagery to establish site specific deforestation/ degradation rate, an annual rate of 1.53% was assumed. This was the rate reported by the FAO from analysis of the Yei region of Central Equatoria State from 1973-2006. It is worth noting that this rate is less than the regional average for Southern Sudan for the same period which was >2%.
- Land stratification:** In the absence of clear stratification of savannah areas in differing conditions it was assumed that 50% of the total savannah area remained in good condition whilst the remaining 50% had been degraded as a result of anthropogenic activity.
- Carbon stock estimates:** In the absence of site specific carbon stock estimates of the different strata's, the following assumptions were made based upon FAO estimates:

Forest type	tC ha <sup>-1</sup>
Tree savannah	48
Degraded tree savannah	10

- Regeneration rate:** It was assumed that the total regeneration of degraded savannah areas would be enabled over a 30 year period at the end of which the carbon stock would have reverted to 48tC ha<sup>-1</sup>. It was assumed that this regeneration obeyed a linear growth function.