Project Idea Note (PIN)

Description of size and quality expected of a PIN

Basically a PIN will consist of approximately 5-10 pages providing indicative information on:

- **A.** Project participants
- **B.** Project description, type, size, location and schedule
- **C.** Avoided / reduced GHG emissions
- **D.** Financial aspects
- **E.** Expected environmental and socio-economic benefits
- **F.** Risks
- ***G.*** Other relevant information

Name of the Project	Sagera Sisal Waste Biogas Project

A. Project Participants

Project developer (proponent)	
Name of the project developer	Sagera Plantation Limited
Organizational category	Private company
Other function(s) of the project developer in the project	The project developer optimizes the daily operations in all of its sisal factories until the proposed CDM project is fully implemented
Summary of the relevant experience of the project developer	Since its establishment in 1995, Sagera Plantation Limited has been involved in production and trading of sisal fibers produced in its four factories located in its four sisal estates in Muheza and Handeni Districts in Tanga, Tanzania. In 2007, the company planned to use the stockpiled sisal waste to produce biogas to be used in generating electricity, inspired mainly by the successfully implementation of the Sisal Biogas pilot plant by Katani Ltd at Hale sisal Estate in Tanga, Tanzania.
Address	P.O. Box 117, Tanga, Tanzania
Contact person	Mr. B.S. Mamik
Telephone / fax	Tel: +255 27 2646847.
E-mail and web address, if any	bsmamik@gmail.com
Project sponsors	Not yet secured
(List and provide the following information for all project sponsors)	
Name of the project sponsor	
Organizational category	

Address (include web address, if any)	
Main activities	*Not more than 5 lines*
Summary of the financials	*Summarize the financials (total assets, revenues, profit, etc.) in less than 5 lines.*

B. Project Description, Type, Size, Location and Schedule

Technical Summary of the Project	
Objective of the Project	The objective of the project is to produce biogas from the sisal waste to be used in generating electricity. The generated electricity will be consumed onsite and excess will be exported to the grid. In this way, the project will avoid emissions of methane from the sisal waste disposal sites, and Carbon dioxide produced by fossil fuel power plants feeding the grid.
Project description and proposed activities (including a technical description of the project)	The project activity will be a bundled SSC project involving fours sisal estates namely; Kwaraguru, Kwamdulu, Tungi and Lugongo all located in Tanga. Basically, the project will involve production of biogas by microbial degradation of the sisal wastes, which are left after the remover of fibers from the fresh sisal leaves. In the absence of the proposed project the wastes at the disposal sites would decay anaerobically and emit methane to the atmosphere. It is estimated that 131,482tons of sisal waste will be processed per year to produce 7,100,043cum of biogas. The produced biogas will be used to generate 13,206,081kWh of electricity per year using a 1 MW generator to be installed in each of the four biogas plants. Of the produced electricity 50% will be consumed onsite replacing the imported power from the grid, and 50% will be sold to the grid and therefore reducing emissions of Carbon dioxide. A total of 31,329tCO_2-equiv per years will be claimed by the project developers.
Technology to be employed	The Sagera Plantation Ltd intends to replicate the technology used at Hale sisal Estate to the proposed CDM project. Basically, the biogas will be produced by anaerobic decomposition of the sisal waste using reactor technology called Continuous Stirred Tank Reactor. The whole biogas plant consists of several equipments including the digester, hydrolysis tank, after storage tank, gas tank, and gas purification equipments. Sisal wastes from the factory will be channelled down and collected in a collection tank before moved to the hydrolysis tank where the pH is neutralized (6-7) for an ideal performance of microbial organisms when the waste is moved into the digester. In the digester (where air is not allowed in) a number of biological processes occur before biogas is produced. The produced biogas is then passed through the Disulphuric tower whereby the corrosive Hydrogen sulphide is removed to prevent rust in generators. From the Disulphuric tower, the gas is collected in the Gas storage tank before

	being used to power generator for electricity and heat generation. Heat will then be recycled to raise the temperature in the digester. During this process the nutrients-rich sisal effluents is produced, which is stored in the After storage tank. This will eventually be used as organic fertilizer in local farming fields.
Type of Project	
Greenhouse gases targeted	Methane and Carbon dioxide
Type of activities	Green house gas abatement
Field of activities	
a. Energy supply	Electricity supply.
b. Energy demand	N/A
c. Transport	N/A
d. industrial processes	N/A
e. waste management	Management of sisal waste.
Location of the Project	
Governorate	United Republic of Tanzania.
City	Tanga
Brief description of the location of the plant	The company involved in the proposed project activity, Sagera Plantation Limited is based in Tanga region located in north- eastern Tanzania. The sisal factories to be involved in the project are all located in Muheza and Handeni Districts in Tanga and are Kwaraguru, Tungi, Lugongo and Kwamdulu. Both districts are situated about 60 km from Tanga town.
Expected schedule	
Earliest project start date	January 2010
Estimate of time required before becoming operational after approval of the PIN	Time required for financial commitments: 3 months Time required for legal matters: 3 months Time required for negotiations: 3 months Time required for construction: 6 months
Expected first year of CER delivery	January 2011
Project lifetime	20 years
Current status or phase of the project	Pre-feasibility study.
Current status of the acceptance of the Host Country	Letter of Approval is under discussion.
The position of the Host Country with regard to the Kyoto Protocol	Tanzania has signed and ratified the Kyoto Protocol.
Project Size	
Is the project a small-scale project?	Yes

C. Avoided/ Reduced GHG Emissions

Selected Crediting Period
7 – year two times renewable crediting period

Estimated Avoidance/Reduction of emissions in accordance with the Kyoto Protocol	
□ Carbon Dioxide(CO_2)	24,130 tCO_2 equivalent per year
□ Methane (CH_4)	7199 tCO_2 equivalent per year
□ Nitrous Oxide (N_2O)	N/A
□ Hydrofluorocarbons (HFCs)	N/A
□ Perfluorocarbons (PFCs)	N/A
□ Sulphur Hexafluoride (SF_6)	N/A

Reference Scenario or Baseline

Description of the reference level:

Baseline Methodology to be used

Under CDM Small Scale Methodologies, the baseline methodology **Type III F, version 06 (Avoidance of methane emissions through controlled biological treatment of biomass)** is used. This methodology is used following the recommendation by the Small Scale Working Group in its 17th meeting that took place on 30/06 – 02/07/2008. The Working Group was responding to the request from the project developers to the Meth-Panel on the applicability of the old version of the baseline methodology III D to the proposed CDM project activity. The Working Group ruled out that the III D is inapplicable to the proposed project; instead, a revised version of the III F would be a suitable baseline methodology. Basically, the baseline methodology III F is applicable to project activities that avoid the emission of methane to the atmosphere from biomass or other organic matter that would have otherwise been left to decay anaerobically in a solid waste disposal site. In order to calculate the emissions from the solid waste disposal site, the methodological tool 'Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site' (version 03) is applied.

What modifications the project would induce?

The project will reduce the amount of CH_4 emitted to the atmosphere from the sisal waste disposal sites by treating sisal waste anaerobically to produce biogas used as fuel in generating electricity. The electricity generated will be used onsite and the excess will be exported to the grid thereby replacing electricity generation from fossil fuels, which contribute to emissions of CO_2 to the atmosphere. The project will also reduce the accumulation of large amount of untreated waste produced daily from the sisal factories, and therefore help in sustainable management of sisal waste. Generally, the proposed CDM project activity will promote environment sustainability and dissemination of renewable energy technologies in the country.

What would be the situation in the absence of the project activity?

As there are no other activities with similar objectives to the proposed CDM project in Tanzania, in the absence of the project, the sisal waste would be left to decay at the disposal sites anaerobically emitting methane to the atmosphere. This process would continue due to the fact that the proposed project requires a huge investment which is difficult to raise if the project is not implemented as a CDM project activity. As far as electricity generation is concerned, the absence of the project activity would mean a continuation of using fossil fuels in generating electricity for the grid and increase in emissions of CO_2 to the atmosphere *'business-as-usual scenario'*.

Expected Emission Reductions During the Crediting Period

Total Certified Emission Reductions (CERs) per year: 31,329 tCO2 equivalent/year. Total emission reduction for the Crediting period: 219,303 tCO_2 equivalent for 7 years.

D. Financial Aspects

Total Estimated costs	
Development Costs	500,000
Installation Costs	3,500,000
Other Costs	500,000
Total Cost of Project	4,500,000
(*) Please add any additional relevant information in this table if needed.	
Sources of Identified Financing	
Cash	
Long Term Loan	
Short Term Loan	
Expected Revenues from <u>CERs transfer</u>:	
Projected Price of the CERs	15 US \$/tCO_2 equivalent
Estimated total CDM Revenues	US$ 469,935 per year.
Details of the expected Revenues during the accountability period	US$ 3,289,545 for 7 years.
Amount and Modalities for the transfer of the CDM Contribution Advanced allocation… Yearly transfers……	 …….In $ US …….In $ US
Additional Financing	
Will the project receive co-financing under ODA (Overseas Development Aids) or from any other sources like GEF? Please mention the amount(s)	No

E. Expected Environmental and Socio-economic Benefits

Specific global & local environmental benefits	*(In total about ¼ page)*
Which guidelines will be applied?	Tanzania environmental and social guidelines for sustainable development as identified in the CDM national investor's Guide of 2004
Local benefits	- Creation of local employments, especially during the construction and operation of the biogas plants, - Supply of organic fertilizer produced by the biogas plants at affordable cost. This will positively impact agricultural production and ensure food security as well. - By reducing the accumulation of sisal waste at the disposal sites and avoid its mixing with local water resources, the project will protect the environment and reduce hazardous impact of sisal waste to local people.
Global benefits	- Globally, the project will contribute in preventing the anthropogenic GHG emissions by reducing emissions of CH_4 from the sisal waste disposal sites, and reducing CO_2 emissions from fossil fuels in the grid system.
Socio-economic aspects What social and economic effects can be attributed to the project and which would not have occurred in a comparable situation without that project? Explain the relationship between the project and the benefiting community/ies.	- Accessibility of new biogas production technology, which in the absence of the CDM project activity would not have been possible to access at a comparable scale. - In the longer term, local sisal growers will benefit as the sisal market will be guaranteed as a result of the project which will create additional economic incentives. This will improve per capital income and help in poverty alleviation in the country. - Creation of new jobs, both temporary and permanent jobs.
Which guidelines will be applied?	Tanzania environmental and social guidelines for sustainable development as identified in the CDM national investor's Guide of 2004
What are the possible direct effects (e.g., employment creation, capital required, foreign exchange effects)?	- Increase income distribution due to job creation. - Increase in overall income of the company through trading CERs, sale of electricity to the grid, and avoid import of electricity from the grid. This will lead to increase in employee's salaries and other fringe benefits.
What are the possible other effects? For example: - training/education associated with the introduction of new processes, technologies and products and/or - the effects of a project on other industries	- The project will necessitate operators and managers to acquire relevant skills, especially in biogas technology. These skills would not have been acquired in the absence of the CDM project activity. - Adoption of similar technologies and processes by other sisal estates in the country.
Environmental strategy/ priorities of the Host Country	Tanzania prioritizes environmental protection and its well being. The sustainable use of sisal waste to produce biogas will lead to a sustainable environmental and eventually help in achieving the sustainable development in Tanzania

F. Risks

Risks in the Project	Please describe the factors that may cause delays in, or prevent implementation of the project.

Estimate the Degree of Risk	
Technical risk	☐ Low technical risk since the technology to be employed has been tested at a small scale pilot case at Hale Estate. In addition, any technological modifications to be introduced will be proven accordingly before being implemented.
Timing risk	☐ High timing risk since project implementation depends very much on the finalization of the CDM legal processes and also the availability of fund. All of which have not happened yet.
Budget risk	☐High budget risk as the project implementation costs may be underestimated.

G. Other Relevant Information

Please mention any additional information or precisions to justify the project under CDM