

**SIXTH FRAMEWORK PROGRAMME**  
**FP6-2004-INCO-DEV-3**  
**PRIORITY A.2.3.: Managing Arid and Semi-arid Ecosystems**



**Third Periodic Activity Report**  
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**ANNEX 3-3-3: Good Practice Guidelines to Project Implementers**  
**Deliverable D3.4/D1.4 (Lead contractors: Imperial College, UKZN)**

## **COMPETE**

**Competence Platform on Energy Crop and Agroforestry  
Systems for Arid and Semi-arid Ecosystems - Africa**

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## 1. Introduction

Different drivers have been identified for the promotion of bioenergy crops in both developed and developing countries. The interest in bioenergy projects and biofuels has been driven by a combination of factors, but primarily by initiatives on climate change to reduce GHG, to reduce dependency on oil fuels and by the potential for socio-economic development. The growing interest in bioenergy projects and particularly biofuels has led to increasing concern with their wider implications, particularly if grown in large scale. Such concerns include environmental sustainability, greenhouse gases (GHG), land use changes and impacts on food prices.

Particularly in the EU and the USA where targets have been imposed to achieve GHG reductions, the development of the biofuels industry has seen many arguments in favour of the use of biomass (e.g. security of energy supply, diversification of energy sources, low carbon emissions, alternative markets for agricultural products, land rehabilitation, among others). Furthermore, it has been considered that importing biofuels from developing countries will not only allow developed nations to diversify their energy mix and meet environmental requirements, but could also create new economic opportunities for rural areas, allowing low-income countries to become vital producers and exporters of a valuable new good.

Nevertheless, some possible negative social and environmental implications have also been raised for both developed and developing countries, especially on issues such as land competition, the questionable reduction of emissions, 'the fuel versus food' debate and the indirect effects of land use change (Diaz-Chavez & Woods, 2008). To counterbalance the possible negative effects some measures are being put in place to ensure their sustainability (e.g. certification, accreditation, and traceability) that will have a major impact, either positive or negative, in the development of the biofuels industry.

For this, different standards and criteria have been developed as explained in the COMPETE Guidelines for Certification. Main environmental and social criteria<sup>1</sup> have been included in a number of proposals for standards such as the Roundtable on Sustainable Palm Oil (RSPO), the Roundtable on Sustainable Biofuels (RSB) and some country initiatives such as the meta-standard from the Renewable Fuel Agency of the UK which considers the use of available standard systems (i.e. Forest Stewardship Council, Rainforest Alliance<sup>2</sup>).

Despite the efforts from some organisations (e.g. the RSB) to include the opinion of developing countries, where a major production is expected to be able to provide enough biofuels for the EU to comply with its targets, some aspects of the criteria developed have different relevance in developing countries (such as Brazil and a number of African countries). This is the case for instance for socio-economic criteria and some environmental issues of biofuel production. However, through different conferences, meetings and field trips within the COMPETE project, it has been clear that there are already some efforts in Africa and political will to work on bioenergy projects in a sustainable form.

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<sup>1</sup> For reference to the criteria and indicators please review the COMPETE Guidelines on Certification, 2009.

<sup>2</sup> See ECCM, 2006; Woods and Diaz-Chavez, 2007.

The current report on **Good Practice Guidelines** aims to provide a more balanced view including the perspectives of different stakeholders to what is considered necessary to assure sustainability issues in practice for a bioenergy project.

## 2. GOOD PRACTICES DEFINITION

The Food and Agriculture Organisation (FAO) defines **Good practices** as:

“Any collection of specific methods that produce results that are in harmony with the values of the proponents of those practices. In agriculture, applies available knowledge to addressing environmental, economic and social sustainability for on-farm production and post-production processes resulting in safe and healthy food and non-food agricultural products”<sup>3</sup>.

Definitions of Good Agricultural and Ecological Practices (GAEC) within the EU are included in the Common Agriculture Policy (CAP). The GAEC regulations are not necessarily part of national legislation, but the intention is to set up a framework within which member countries can develop regulations that are relevant to local conditions. For example, the requirements for GAEC (detailed in Annex IV of the Regulation) aim at the protection of soils, the maintenance of farmland habitats and avoiding the abandonment of agricultural land.

According to the International Organisation for Standardisation (ISO, 2007) the definition of a standard is: “A *normative document, developed according to **consensus** procedures*”

The ISO provides the following definitions:

A ‘**standard**’ refers to a set of principles and criteria to be used consistently as rules, guidelines, or definitions of characteristics to ensure that materials, products, processes and services meet their purpose. The ‘standard’ will also define indicators and methods that are used to measure compliance with principles and criteria.

‘**Certification**’ refers to the issuing of written assurance (the certificate) by an independent, external body – a certification body – that has audited an organisation’s management system and verified that it conforms specifically to the standard.

‘**Accreditation**’ refers to the formal recognition by a specialised body – an accreditation body – that a certification body is competent to carry out certification.

‘**Assurance scheme**’ generally refers to the overall framework relating to the development of a standard, the accreditation of certification bodies, and the certification of products and services<sup>4</sup>.

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<sup>3</sup> FAO/Netherlands Conference „Water for Food and ecosystems“.

[http://www.fao.org/ag/wfe2005/glossary\\_en.htm](http://www.fao.org/ag/wfe2005/glossary_en.htm)

<sup>4</sup> Woods and Diaz-Chavez, 2007

In practice a certificate is issued when a producer of a product (or process) has answered, or confirms that it is capable of answering a set of standardised questions categorised by the principles that make up the standard as follows:

**‘Principles’:** Defined as *‘general tenets of sustainable production’*

**‘Criteria’:** *‘Conditions to be met to achieve these tenets’* and which help to define the indicators to be answered.

**‘Indicators’:** The individual questions that show *how a farm, producer or company could prove that a particular criterion is met.*

Therefore, it is the indicators that need to provide sufficient detail to ensure that the principles underpinning the standard are being adhered to. However, in complex systems a ‘value judgment’ may be necessary to set the detail, total number and complexity of the indicators. Too much detail and the certification procedure becomes too unwieldy, expensive and difficult to administer. Too little detail and serious doubts will be raised about the ability of the scheme to assure that its products meet the standard (Woods and Diaz-Chavez, 2007).

This balance between coverage, detail and simplicity can only be met by a transparent decision process that uses a ‘representative’ set of stakeholders encompassing a ‘balance of interests’ to define the principles, criteria and indicators of the standards. More often than not, for consumer-based environmental and social assurance schemes, the public credibility of a scheme is a function of the degree of participation of high profile NGOs in the decision making process.

### **3. METHODOLOGY, BOUNDARIES AND USEFULNESS**

#### ***3.1. The sustainability framework***

The sustainability framework for COMPETE was fully explained in previous reports<sup>5</sup>. The purpose of the sustainability assessment is to assess the social, environmental and economic effects of projects and policies to ensure that they are as sustainable as possible. It is an integral part of good plan-making and should not be seen as a separate activity. Though it is always difficult to draw an understanding of the relationships of the different pillars it is still possible to do it through different principles, especially through the understanding of international agreements, policies or directives which reflect consensus on the approaches to achieving sustainability. The framework adopted in COMPETE<sup>6</sup> included the “traditional” environmental, social and economic pillars or themes and an added one on policy and institutions (figure 1).

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<sup>5</sup> COMPETE. Annex3-2 WP3 First year Report. <http://compete-bioafrica.net/>

<sup>6</sup> Diaz-Chavez, 2006.

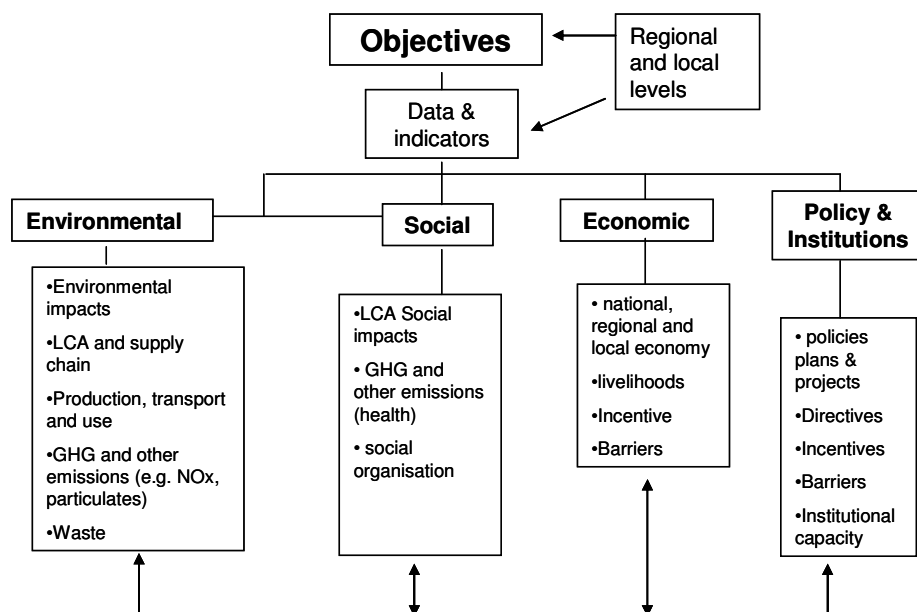


Figure 1. Sustainability assessment framework (Modified from Diaz-Chavez, 2006).

The main objective of the sustainability assessment is to evaluate the sustainability performance of the economic, environmental, social and political processes or products (in this case bioenergy projects or initiatives). For an effective sustainability assessment there must be clear delineated principles and if possible decision criteria based on well integrated understanding of the key requirements for sustainability. The links between the different themes of sustainability will also contribute to the better understanding of the sustainability process and assessment.

### **3.2 Benchmarking with other certification, standards and verification systems**

As mentioned in the introduction of these guidelines, a review of other systems was conducted within the COMPETE Guidelines on Certification (2009). This benchmarking process and the consultation within the project allowed to select the principles that are described below. One noticeable point is that some of the principles and criteria widely discussed in the EU and the USA context, do not present the same relevance for the context of developing countries, particularly those participating in the project and conferences.

An example of this is the greenhouse gas (GHG) emissions calculation, land availability, the debate of indirect land use change (ILUC) and the food versus fuel debate. This last one is considered more in terms of competition of feedstock and land availability which in several African countries is not meaningful due to the availability of land (see the COMPETE Arusha Declaration, 2008).

Social issues are also seen in a different context between North and South. For instance, child labour concerns are not seen in the same context as long as children collaborate (not under exploitation circumstances) with the family tasks in the farms and do not leave their studies.

### **3.3 Selection of principles**

During the COMPETE project a series of activities were conducted in order to achieve the principles that are incorporated in this Good Practices Guidelines.

These activities included:

1. Set of a sustainability framework
2. Attendance to meetings and conferences on biofuels and bioenergy (e.g. UNIDO in Addis Ababa, Ethiopia)
3. The COMPETE partners interviewed during the conference and meeting in November 2007, Ouagadougou, Burkina Faso (see COMPETE website)
4. Interviews with Policy makers and expert meetings
5. Focus groups with different stakeholders
6. Benchmarking with other certification, standards and verification systems (e.g. RSB (2008), RSPO (2004), UK RFA (2007)).
7. Internet survey on the opinion of the standard from the UK RTFO
8. Sustainability Conference and Sustainability Declaration Arusha Tanzania, 2008
9. Zambia Policy Conference and Guidelines, 2009
10. Countries that have participated in the different conferences and meetings include: Ethiopia, Burkina Faso, Senegal, Mali, Zambia, Tanzania, South Africa, Ghana, Malawi, Botswana, Kenya, Nigeria

During the meetings and conferences, different stakeholders ranging from producers (companies and farmers), policy makers, NGOs, academics and consultants have provided their opinion, which have been compiled mainly in the following documents:

- COMPETE Declaration on Sustainable Bioenergy for Africa, Arusha, Tanzania, June 2008<sup>7</sup>
- COMPETE Document on Bioenergy Policies for Sustainable Development in Africa, November 2008, Bamako, Mali.<sup>8</sup>
- COMPETE International Conference 'Bioenergy Policy Implementation in Africa, May 2009, Lusaka, Zambia.<sup>9</sup>

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<sup>7</sup> [http://compete-bioafrica.net/publications/publ/2nd\\_Report/Annex3-2-3-COMPETE-032448-2ndReport-Declaration-Final-Final.pdf](http://compete-bioafrica.net/publications/publ/2nd_Report/Annex3-2-3-COMPETE-032448-2ndReport-Declaration-Final-Final.pdf)

<sup>8</sup> <http://compete-bioafrica.net/events/events2/competeevents.html#mali>

<sup>9</sup> <http://compete-bioafrica.net/events/events2/zambia/COMPETE-Conference-Summary-Lusaka-090813.pdf>

### **3.4 Boundaries and usefulness**

The principles were selected within the sustainability framework (according to the definitions of principles provided in section 3) with the intention to provide a clear and balanced guideline for *Good Practices*.

There is no intention of these guidelines to provide definitive criteria and indicators as the principles do not attempt to be a certification or verification system in any form. Nevertheless, according to the methodology followed and the benchmarking review, it is expected that the guidelines will be used by different stakeholders when considering:

- i) To initiate or assess a bioenergy proposal or project
- ii) To assess the sustainability of a feasibility report for a bioenergy proposal or project
- iii) To review policy guidelines and assist in the decision-making process of a bioenergy proposal or project
- iv) To review and/or assess an ongoing bioenergy proposal/project

Finally, the principles are not exhaustive and may differ under different frameworks, projects, experts, countries or any other stakeholders opinion.



#### 4. Selected Principles

This section presents the principles selected and provides a brief explanation of what is considered in each one of them. Some of the principles have clear links among them, especially regarding the compliance with policies and regulations (Principles 10 and 11). Table 1 presents the 12 principles and the topic they are related to (environmental, social, economic, policy and institutions).

Table 1 Principles for sustainability assessment for bioenergy initiatives

	<b>Principle</b>	<b>En</b>	<b>S</b>	<b>Ec</b>	<b>P</b>
1.	Good agro-ecological and forestry practices (biodiversity, soil)	✓			
2.	Not affecting water supply and quality	✓			
3.	No land use change that detrimentally affects food security	✓			
4.	Community participation (from planning)		✓		
5.	Women's participation (from planning)		✓		
6.	Skills transfer (management, business, agriculture)		✓		
7.	Community inclusion in business or economic model (Contract with investor or NGO)			✓	
8.	Added value in the community (individual, money, assets, land, co-products)			✓	
9.	Improvement in services and infrastructure (energy supply, health) reinvestment of revenue within the community			✓	
10.	Compliance with National guidelines for bioenergy policy in place				✓
11.	Compliance with Local programmes, regulations and/or plans in place				✓
12.	Respect Land rights and avoid displacement				✓

## **Environmental Principles**

### **Principle 1. Good agro-ecological and forestry practices (biodiversity, soil)**

This principle considers that the basic environmental characteristics to grow bioenergy crops will be followed according to the agro-ecological and forestry conditions of each country, region or community willing to grow them. They include: land use type, soil conditions (adequate for the selected bioenergy crop), soil management and protection, no negative effect on biodiversity, good agriculture practices (e.g. use of fertilisers and pesticides), good forestry practices (e.g. conservation and management).

### **Principle 2. Not affecting water supply and quality**

This principle seeks to consider that especially in areas where water is constrained it will not be used for bioenergy crops or the water use will be limited or managed according to the good agricultural practices. It also seeks to avoid the pollution of water that negatively affects its quality (e.g. overuse or bad use of fertilisers and pesticides). The principle considers the use of water first for human consumption and for food crops.

### **Principle 3. No land use change that detrimentally affects food security**

Land use for bioenergy crops should be considered within the national policies and agro-regionalisation along with the other policy instruments and guidelines (if available). The change of land use for bioenergy crop production should not affect food security.

## **Social Principles**

### **Principle 4. Community participation (from planning)**

It considers the community participation in the bioenergy project, programme or plan since the early stages of the planning process. Community participation is not only part of a sustainability process but will also contribute to the success of the project and will allow the community to participate in the decision-making process. Additionally, it provides a feeling of “ownership” and “recognition” by the community.

### **Principle 5. Women’s participation (from planning)**

This principle looks for women participation in bioenergy initiatives from the early stages of the planning process. Including women since the beginning will allow to provide direct gender benefits and will empower women in activities directly related to them.

### **Principle 6. Skills transfer (management, business, agriculture)**

Transfer of skills is related to the added value of growing bioenergy crops. This includes different stages of the business cycle and it applies to the different production and scale schemes (e.g. out-growers, small, medium and large scale). It also includes productive areas (agriculture), transformation (e.g. extraction of oil from seeds), management and business skills (e.g. revenue and trading).

## **Economic Principles**

### **Principle 7. Community inclusion in business or economic model (Contract with investor or NGO)**

The inclusion of the community in the business or economic model will prevent the exploitation of its members and will provide the mechanisms to comply with other principles such as Principles 6 and 8.

### **Principle 8. Added value in the community (individual, money, assets, land, co-products)**

The added value from the bioenergy initiative can be translated not just in terms of an increment in the income of the community and at individual level (e.g. savings or additional income) but also with additional assets (e.g. animals, food production), land (e.g. individual or communal land) and co-products (e.g. income from soap making).

### **Principle 9. Improvement in services and infrastructure (energy supply, health) and/or reinvestment of revenue within the community**

At a community level, the possibilities of reinvesting the revenue to improve services and infrastructure (if previously agreed within the community) are considered as a main objective. These services can be related to energy supply or better access to health services.

## **Policy Principles**

### **Principle 10. Compliance with National guidelines for bioenergy policy in place**

Where available National policies or guidelines regarding bioenergy production exist, these should be followed by all stakeholders involved in the bioenergy initiative such as the proponent, the community, national and international consultants and developers, investors, NGOs among others. Working with national, regional and local authorities is considered to be important especially for developers and investors in order to adequately address cross-cutting sectors (e.g. environment, social, industry, agriculture sectors).

### **Principle 11. Compliance with Local programmes, regulations and/or plans in place**

Working with the National, regional and local authorities is considered to be important to create awareness of all programmes, plans and regulations at local level. Compliance will strengthen the bioenergy initiative and avoid conflicts with the different stakeholders and the regulators.

### **Principle 12. Respect Land rights and avoid displacement**

The debate on land rights in developing countries (mainly in Africa) led to this principle to be considered by communities, governments and investors. It aims at avoiding displacement. In cases where displacement can not be avoided (based on the decisions of authorities), adequate compensation and further studies for relocation need to be performed according to international practice (e.g. such as the guidelines from the World Bank<sup>10</sup>.)

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<sup>10</sup> <http://www.worldbank.org/>

## 5. Assessing bioenergy initiatives

The principles described above have been included in a form to assess a bioenergy initiative or project. The assessment is considered to be done according to basic information given from the initiative or project. This information needs to have as minimum the following points:

- Type of initiative (e.g. private, government, community, NGO, other)
- Agreements or reviews of the initiative with local, regional and national authorities (e.g. for the compliance with regulations and policies of Principles 10 and 11)
- Type of land use for the bioenergy project (agricultural land, forest, grassland, other)
- Type of feedstock (e.g. cassava, Jatropha, palm oil, sugar cane, other)
- Production scheme (community, out-growers, cooperative, private, other)
- Scale of the plantation (number of hectares/ agriculture land in the farm, community or region<sup>11</sup>)
- Contract or agreement type with the farmers or out-growers (e.g. fixed contract, employment, number of years, fixed price or alternative price model)
- Final use of the feedstock, co-products and sub-products
  - Feedstock to be sold without any treatment,
  - Oil or fuel processing in place,
  - Oil or fuel to be used for electricity,
  - Oil or fuel to be sold for local, regional, national use,
  - Fuel for export
- Community participation in the business scheme since planning (meetings organised, community decisions, women's included in scheme)
- Overall benefits for the community (individual income including new assets such as animals or land, electrification scheme, cooperative benefits)

The assessment is conducted with an Assessment Form following a qualitative score system. Although it is recognised that the assessment will be of a subjective nature, it is expected that the assessment will be conducted by stakeholders or experts with experience on bioenergy projects and independent from the proposed project in order to avoid bias.

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<sup>11</sup> Determining the scale of the plantation on small, medium and large will vary according to the farm, community or region where the initiative is proposed and to the type of feedstock. This is the reason why it is considered here as a relation between the number of hectares and the total agricultural area in the community or region.

The scale used to assess each principle and provide a score is as follows:

- 1 The project does not consider this principle (0%)
- 2 The project covers this principle partially <30%
- 3 The project covers partially this principle in 30-70%
- 4 The project covers partially this principle in <70%
- 5 The project fully covers the principle (100%)

The assessor needs to validate the score given by writing short statements on the reasons for giving the score. Thereby, subjectivity is reduced and decision-makers are provided with additional elements for the final decision or for seeking improvements in the initiative.

A maximum of 60 points can be scored. It is considered that projects scoring less than 35 points need to be reviewed.

## 6. Assessment of COMPETE examples

In order to provide aid for the use of the guidelines, a series of examples of current projects or initiatives were assessed according to the principles of these guidelines. These are presented in the Annex and include the following projects:

- Winrock International India (WII), Electrification Village in Ranidehra, Chattisgarh
- Integrated Sustainable Energy Services for Poverty Reduction & Environmental Conservation, Arusha, Tanzania
- Kilombero Sugar Company Ltd (KSCL), Tanzania
- Bagamoyo (SEKAB Bioenergy) Tanzania

## 7. Conclusions

As explained in the content of these guidelines, their main aim is to provide a general assessment on principles that are regarded as “What is important” in some developing countries, particularly in Africa where most of the opinions were collected for the selection and definition of the Principles.

The assessment of the bioenergy initiatives will provide further information in terms of the sustainability reliance of the project or proposal to the different stakeholders including decision-makers, investors, NGO’s and community leaders.

These guidelines for Good Practice do not attempt to replace any kind of regulation, verification or certification system that are in place within national interpretations.

## 8. References

- COMPETE Competence Platform on Energy Crop and Agroforestry Systems for Arid and Semi-arid Ecosystems- Africa <http://compete-bioafrica.net/>
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### ANNEX 1. Good Practice Assessment Form for Bioenergy Projects

Good Practice Assessment for Bioenergy Projects			
<b>General data</b>			
1. Name of Assessor	<input type="text"/>		
2. Institution	<input type="text"/>		
3. Date of Assessment	<input type="text"/>		
4. Name of Project	<input type="text"/>		
5. Contact name at project	<input type="text"/>		
6. Place of Project	<input type="text"/>		
7. Characteristics of Project	Tick if project is a initiative from :		
private	<input type="checkbox"/>	community	<input type="checkbox"/>
government	<input type="checkbox"/>	NGO	<input type="checkbox"/>
other	<input type="checkbox"/>		<input type="checkbox"/>
8. State how do you know the project			
a) information in annex	<input type="checkbox"/>	b) field trip	<input type="checkbox"/>
a) and b)	<input type="checkbox"/>	other	<input type="checkbox"/>
specify other <input type="text"/>			
9. After reading the characteristics of the project (in Annex) please assess the following principles according to the sc			
1 The project does not consider this principle (0%)			
2 The project covers this principle partially <30%			
3 The project covers partially this principle in 30-70%			
4 The project covers partially this principle in <70%			
5 The project fully covers the principle (100%)			
<b>Principle</b>	<b>Name</b>		<b>Score</b>
1	Good agro-ecological and forestry practices (biodiversity, soil)		<input type="text"/>
<b>Comments</b>	<input type="text"/>		
	<input type="text"/>		
	<input type="text"/>		
2	Not affecting water supply and quality		<input type="text"/>
<b>Comments</b>	<input type="text"/>		
	<input type="text"/>		
	<input type="text"/>		
3	No land use change that detrimentally affects food security		<input type="text"/>
<b>Comments</b>	<input type="text"/>		
	<input type="text"/>		
	<input type="text"/>		
4	Community participation (from planning)		<input type="text"/>
<b>Comments</b>	<input type="text"/>		
	<input type="text"/>		
	<input type="text"/>		
5	Women's participation (from planning)		<input type="text"/>
<b>Comments</b>	<input type="text"/>		
	<input type="text"/>		
	<input type="text"/>		
6	Skills transfer (management, business, agriculture)		<input type="text"/>
<b>Comments</b>	<input type="text"/>		
	<input type="text"/>		
	<input type="text"/>		

7	Community inclusion in business or economic model (Contract with investor or NGO)	<input type="text"/>
<b>Comments</b>		
8	Added value in the community (individual, money, assets, land, co-products)	<input type="text"/>
<b>Comments</b>		
9	Improvement in services and infrastructure (energy supply, health) reinvestment of revenue within the community	<input type="text"/>
<b>Comments</b>		
10	Compliance with National policies and/or guidelines for bioenergy projects in place	<input type="text"/>
<b>Comments</b>		
11	Compliance with Local programmes, regulations and/or plans in place	<input type="text"/>
<b>Comments</b>		
12	Respect Land rights and avoid displacement	<input type="text"/>
<b>Comments</b>		
<b>Overall assessment</b>		<input type="text"/>
Additional comments on the project		



## **ANNEX 2. EXAMPLES OF ASSESSMENT OF GOOD PRACTICES**

Four cases are presented in this document

1. India Jatropha electrification initiative of Winrock International India (WII)
2. Leguruki Ward, King'ori Division of the Meru District in Arusha Region, Tanzania
3. Kilombero Sugar Company Ltd (KSCL), Tanzania
4. Bagamoyo (SEKAB Bioenergy) Tanzania

According to the methodology explained in the report, each case study presents information on the characteristics of the project and the location of it as well as the evaluation form.

## 1. India Jatropha electrification initiative of Winrock International India (WII)

The remote village electrification initiative by Winrock International India (WII) aims to promote bio-fuels for improving access to clean and affordable energy to the rural population in Ranidehra, Chattisgarh. It is designed to be a replicable model and a real example of how Jatropha oil can empower rural isolated communities to be energy independent and self-sustaining by using straight run no-edible vegetable oil. It is not only the first in India but in the world. It had an overall budget of near \$89 thousand USD with a generating capacity of 3\*3.5 KVA to serve 107 households, 553 people. with 3 hours of electricity for the households and 3.5 hours of streetlights using 1 ton of Jatropha seeds per month.

Against a background of addressing energy security, poverty reduction, environmental concerns, livelihood issues and the overall quality of life, all major issues for India, the initiative assumes great significance for distant villages like Ranidhera that are remote and underdeveloped with very limited access to education and healthcare. Bio-diesel's big advantages are in its local uses, oil from plants provides new opportunities of relative prosperity because it makes it possible to run tractors, pump sets and generators. The mainly tribal village has relied on natural sunlight for studying, cooking and house chores were carried out under dimly lit lights from kerosene. With the support of WII, the villagers planted Jatropha curcas saplings on the periphery of their agricultural lands in July 2005 and have had electricity since April 2007, without even one day of downtime.



This is an evolving project with heavy emphasis on community participation and alternative livelihood opportunities. It aims to improve weak elements as they are identified. Some key issues of the project include:

- 28 streetlights located at key areas, collection of drinking water from the public hand pumps has been easy and possible during the evenings.
- Rice dehusking machine installed through the project within the village helps to save both time and money.
- Formation of women self-help-group (SHG) has strengthened the financial power of the women as they can have access to economic resources during emergency.
- Children are having computer training within the project area. The trainer is a young woman from the village itself and has been employed through the project.
- Street lights have made it safer for women
- After the commissioning of the power plant- people from the village itself were trained to operate and maintain the equipment.
- It is a self sustaining closed system with minimum dependence on external support,
- Bank accounts for the village were opened in the nearby bank.
- Electricity from Jatropha is costlier than that from the power grid but is cheaper than kerosene,
- More information on: [http://www.winrockindia.org/act\\_proj\\_ene\\_prom\\_bio\\_1.htm](http://www.winrockindia.org/act_proj_ene_prom_bio_1.htm)

**Good Practice Assessment for Bioenergy Projects**

**General data**

1. Name of Assessor: Kaysara Khatun & Rocio A Diaz-Chavez
2. Institution: University of Bristol and CEP Imperial College London
3. Date of Assessment October 20 2009
4. Name of Project: India Jatropha electrification initiative of Winrock International India (WII)
5. Contact name at project: Sobhanbabu Patragadda and Mr. Nilanjan Ghosefrom
6. Place of Project: Ranidehra, Chattisgarh, India
7. Characteristics of Project

Tick if project is an initiative from:

Private  community  government  NGO  other

**8. State how do you know the project**

information from investor/promoter  field trip  a) and b)  other

specify other \_\_\_\_\_

**9. After reading the characteristics of the project (in Annex) please assess the following principles according to the scale:**

- 1 The project does not consider this principle (0%)
- 2 The project covers this principle partially <30%
- 3 The project covers partially this principle in 30-70%
- 4 The project covers partially this principle in <70%
- 5 The project fully covers the principle (100%)

**Principle Name**

**Score**

**1. Good agro-ecological and forestry practices (biodiversity, soil**

4

**Comments**

- Intercropping
- Improving water supply and quality
- Press cake may be used for manure in the near future and thus completes the nutrient cycle- this is still under scientific study as toxicity needs to be ruled out

**2. Not affecting water supply and quality**

5

**Comments**

- WII undertook a study to assess the water resources in the area, based on which a water management plan has been developed to meet competing water resource needs in the future
- The soil and moisture conservation works helped to reduce the surface water flow and increased the periodicity of the available water for agricultural use

**3 No land use change that detrimentally affects food security**

5

**Comments**

- The village had unused barren land where Jatropha saplings could be planted.
- Villagers grew Jatropha around their fields in the boundaries, in addition to their normal crops. This activity was undertaken to ensure no conflict between food and fuel.

**4 Community participation (from planning)**

5

**Comments**

- Community mobilization is a very crucial aspect using a bottom up participatory approach, for management of facilities, including the tariff setting, bill collection. The initiative has resulted in improved awareness for the processes undertaken
- Various stakeholders are being engaged for designing intervention, which would ensure ownership of the initiative by the local community and ensure sustenance of efforts beyond the period of project intervention.
- A village energy committee manages the demand for extra fittings; it has equal representation from the two main communities in the village, the Gond and the Baiga
- All planting activities were carried out by the villagers themselves. They managed to plant more than 25,000 saplings over a number of months through voluntary labour.

**5 Women's participation (from planning)**

4

**Comments**

- With domestic electricity in place, women can complete their household chores more easily after sunset. The project has installed 63 improved cooking stoves and 2 biogas plants through the project. This initiative has reduced the duration for cooking and has also improved the indoor air quality within the households
- Women spend much more time in the agricultural field as they are assured of domestic electricity for a stipulated period of time during the evening. The increased time in the agricultural field is yielding to marginal improvement in their income
- With 28 streetlights located at key areas, collection of drinking water from the public hand pumps has been easy and possible during the evenings
- Rice dehusking machine installed through the project within the village helps to save both time and money. Women generally bring paddy in smaller quantity at regular intervals rather than carrying large quantities to the nearby town located approx 12 km away from the project location
- Formation of women self-help-group (SHG) has strengthened the financial power of the women as they can have access to economic resources during emergency. The members of the SHG are now providing loans to women beyond the group for addressing their emergencies
- Children are having computer training within the project area. The trainer is a young woman from the village itself and has been employed through the project. There is now an increasing demand for this training within the village
- Street lights have made it safer for women

**6. Skills transfer (management, business, agriculture)**

5

**Comments**

- A power house was designed to be built at a suitable spot on the village. The village electricity committee owns the system. WII trained the committee members in the proper administration requirements
- After the commissioning of the power plant, people from the village itself were trained to operate and maintain the equipment. A series of training and capacity building exercise were carried out to train local technicians who will carry out minor repairs of the machinery. They are also capable of maintaining the distribution network, the oil expeller and the filter press
- The villagers will also have the skills to manage the supply of Jatropha seeds and ensure that they are available in adequate quantities to keep the system running

**7. Community inclusion in business or economic model (Contract with investor or NGO).**

4

**Comments**

- WII has conducted mass awareness campaigns and regular visits to the site and has established a good rapport with the village community. WII has an agreement to utilize the seed obtained from these tree-borne oil plants for electrification of village
- Different models by which local communities and not just entrepreneurs can earn money from trees are being explored
- A Village Energy Committee has been set up, which oversees the operation and management of the power plant

**8. Added value in the community (individual, money, assets, land, co-products)**

4

**Comments**

- It is a self sustaining closed system with minimum dependence on external support, a rarity in rural electrification projects. It has eased the burden on household tasks, study times have increased, shops stay open later and street lights make it safer and utilize activities in the evenings
- Installation of rice dehusking machine which is being used by people within and beyond the project village
- Operational computer class within the village
- Increase awareness of electricity generation activities to ensure proper care of the existing resources (Jatropha saplings within the village)

**9. Improvement in services and infrastructure (energy supply, health) reinvestment of revenue within the community**

5

**Comments**

- The power plant provides the village with 3 hours of electricity for the 110 households and 3.5 hours of streetlights using 1 tonne of Jatropha seeds per month
- The village has cfl (compact fluorescent lamps). WII provided free wiring and gave each household one cfl, distributing more lamps as per demand and affordability
- Distribution lines to feed power to all households and house wiring work have been completed. The villages have been paying for the electricity voluntarily every month making the project financially viable
- Movies shows for villagers within the power plant

**10. Compliance with National policies and/or guidelines for bioenergy projects in place**

4

**Comments**

- The success of the project would go a long way in addressing the issue of energy security and influencing the Government of India's policy for improving rural India's access to clean and affordable energy. WII has established linkages with MNRE, Government of India, the Chattisgarh State Government, Chattisgarh Renewable Energy Development Agency (CREDA), Chattisgarh State Planning Commission, local Government departments - forestry, land and water resources

**11. Compliance with Local programmes, regulations and/or plans in place 4**

4

**Comments**

- One prime responsibility of WII was to design and set up the plant along with associated facilities. Benefits of the intervention were quantified in terms of indicators on energy security, livelihood opportunities, environmental benefits, and other social evolution.

**12. Respect Land rights and avoid displacement 5**

5

**Comments**

- As land ceiling laws have failed to bring about any significant redistribution of privately owned ceiling-surplus land, many states have sought to redistribute some public land referred to as 'wasteland' to landless households, usually in very small patches. However, as the term implies, much of the land redistributed is of low quality and generates low and uncertain crop yields

**Overall assessment**

48

Out of 60

**Additional comments on the project:**

Large amounts of forest and non-forest land belong to the government. Only around 58 percent of India's total land areas for which records are available are private, cultivable land. All other land is considered forest land (22%), uncultivated revenue land (7%) or common land or wasteland (20 %)

Agricultural marketing is only slowly being liberalised. Regulations has not increased farmer's incomes and in many cases have effectively limited much needed private investment in agriculture, due to this realization, in 2003 the Ministry of Agriculture formulated a Model Act that allows farmers to sell their produce directly to traders and processors and to enter into contract farming relationships. Most states (although partially) have amended their agricultural marketing acts on the lines of the Model Act (Government of India, 2008).

## 2. Leguruki Village: energy use profile

*Prepared for visitors to Leguruki Energy Projects.*

**Introduction:** Leguruki Village is located on the slopes of Mt. Meru in Leguruki Ward, King'ori Division of the Meru District in Arusha Region. Village population is estimated to be 4000 inhabitants in 2007. Total village area is 2185 hectares of which 1740 hectares are suitable for agricultural activities. More than 90% of the villagers are subsistence farmers. Other sources of income include livestock keeping, trading and employment in schools, churches and businesses.

**Energy profile:** Leguruki village is not connected to the national grid electricity. The closest village where there is electricity is King'ori Madukani which is located 6 km south. Majority of the villagers use kerosene for lighting and an average household spends approximately Tsh 9,000 per month on kerosene. Other means of lighting include dry cell batteries, car batteries and generators. A household uses four dry cell batteries per month for torches and radio. Each battery is sold at Tsh 600, making a total expenditure of Tsh 2400 per month.



Battery charging services is provided by one of villagers who own diesel generators in the village. One full charging of a 70Ah battery is Tsh 1000. On average a fully charged car battery can be used for 10 days. There are about 10 villagers owning generators and majority are located at the center of the village. Generators owners don't sell electricity to neighbors. *Jatropha* grows well in Leguruki and surrounding villages and is used for fencing and demarcation of farms and household land. Leguruki also grows sunflower whose oil could as well be used as a fuel.

The major challenges faced by villagers with regard to energy includes lack of cheaper options to generate electricity, lack of skilled technicians for installation, repair and maintenance of solar PV systems, high consumption of firewood and charcoal, unavailability and lack of knowledge on efficient/improved cook stoves. These issues were identified during a participatory energy planning meeting at the village in May 2007.

**TaTEDO's Interventions:** In August 2007, TaTEDO initiated energy project activities in Leguruki village. One energy service platform, also know as *multifunctional platform*, was installed and started providing milling and dehulling services. During evenings the plant generates electricity to power 60 houses and businesses which are connected to a small minigrid. TaTEDO is working with villagers and Meru District Cooperative Officer to develop management and operation structure. In February 2008, it was decided that the platform businesses will be managed and run by electricity consumers cooperative..

In October 2007, TaTEDO introduced improved cookstoves in Leguruki. One improved institutional cookstove was built at Nosheiya Primary School located in the north of the village. During the same period, improved charcoal baking technology was introduced through two local entrepreneurs, one being the owner of a popular restaurant in the village. Introduction of these technologies has raised significant awareness and interest of people from the village and outside.

**Impact:** Presence of electricity has benefited at least 40 households and 20 businesses where they can operate for longer hours after dark and have been able to initiate new businesses such as barber shops and video shows. Street lighting has improved security during evenings while children are able to study longer and under better lighting. Firewood consumption at the school has decreased dramatically to almost half from use of 8 m3 of wood per week.

## Good Practice Assessment for Bioenergy Projects

### General data

1. Name of Assessor Rainer Janssen
2. Institution WIP Renewable Energies
3. Date of Assessment December 4, 2009
4. Name of Project Leguruki Village Multifunctional Platform
5. Contact name at project Estomih Sawe
6. Place of Project Leguruki Ward, King'ori Division of the Meru District in Arusha Region, Tanzania

### 7. Characteristics of Project

Tick if project is a initiative from :

private                      community                      government                      NGO  other

### 8. State how do you know the project

a) information in annex                      b) field trip                      a) and b)  other   
specify other

9. After reading the characteristics of the project (in Annex) please assess the following principles according to the scale:

- 1 The project does not consider this principle (0%)
- 2 The project covers this principle partially <30%
- 3 The project covers partially this principle in 30-70%
- 4 The project covers partially this principle in <70%
- 5 The project fully covers the principle (100%)

<b>Principle</b>	<b>Name</b>	<b>Score</b>
<b>1</b>	<b>Good agro-ecological and forestry practices (biodiversity, soil)</b>	3
<b>Comments</b>	<p>Jatropha as fencing and demarkation of farms and household land.</p> <p>No specific measures are undertaken to improve agro-ecological practices.</p> <p>Press cake may be used for manure in the near future and thus completes the nutrient cycle- this is still under scientific study as toxicity needs to be ruled out.</p>	
<b>2</b>	<b>Not affecting water supply and quality</b>	4
<b>Comments</b>	<p>The Arusha region in Tanzania is well supplied with water of sufficient quantity and quality.</p> <p>No specific measures are undertaken to improve water supply and quality.</p>	
<b>3</b>	<b>No land use change that detrimentally affects food security</b>	5
<b>Comments</b>	<p>The village has used land which is not used for growing crops, i.e. fences and demarkation of farms, in addition to their normal crops. This activity was undertaken to ensure no conflict between food and fuel.</p>	
<b>4</b>	<b>Community participation (from planning)</b>	5
<b>Comments</b>	<p>Community mobilization is a very crucial aspect using a bottom up participatory approach, for management of facilities, including the tariff setting, bill collection. The initiative has resulted in improved awareness for the processes undertaken.</p> <p>A preparatory planning meeting with the village population took place in May 2007 to ensure the ownership of the project of the rural population. Regular meetings take place involving the villagers.</p> <p>In February 2008 it was decided that the platform businesses will be managed and run by electricity consumers cooperative.</p>	
<b>5</b>	<b>Women's participation (from planning)</b>	4
<b>Comments</b>	<p>With domestic electricity in place, women can complete their household chores more easily after sunset. The project has installed improved cooking stoves. This initiative will reduced the duration for cooking and has also improved the indoor air quality within the households</p> <p>Street lighting has improved security during evenings.</p> <p>Women are actively involved in the Energy Team of Leguruki village.</p>	
<b>6</b>	<b>Skills transfer (management, business, agriculture)</b>	4



**Comments** The presence of electricity has benefited at least 20 businesses which can now operate for longer hours. New businesses (barber shop, video shows) have been initiated. Support for business creation is provided by the project implementing organisation.

After the commissioning of the power plant, people from the village itself were trained to operate and maintain the equipment. They are also capable of maintaining the distribution network, the oil expeller and the filter press. An Energy Team was established to oversee the whole electrification project.

The villagers will also have the skills to manage the supply of Jatropha seeds and ensure that they are available in adequate quantities to keep the system running

**7 Community inclusion in business or economic model  
(Contract with investor or NGO)**

4

**Comments** An Energy Team has been set up, which oversees the operation and management of the power plant (including collection of fees).

4

**8 Added value in the community  
(individual, money, assets, land, co-products)**

**Comments** The energy service platform (multifunctional platform), was installed and started providing milling and dehusking services. During evenings the plant generates electricity to power 60 houses and businesses which are connected to a small minigrid.

In addition, TaTEDO introduced improved cookstoves in Leguruiki. One improved institutional cookstove was built at Nosheiya Primary School located in the north of the village.

Improved charcoal baking technology was introduced through two local entrepreneurs.

Reduction of expenditures for lighting (prior source: Kerosene).

**9 Improvement in services and infrastructure (energy supply,  
health) reinvestment of revenue within the community**

4

**Comments** Improved stoves reduce IAP. Firewood consumption at the school has decreased dramatically.

New services include lighting in the evenings for housework and chirdre studies, streetlights for improved security, a barber shop, video shows, milling and de-husking services.

<b>10</b>	<b>Compliance with National policies and/or guidelines for bioenergy projects in place</b>	<b>4</b>
<b>Comments</b>	The project is fully in line with Tanzanian national policies on increasing access to energy of the under-served rural population. The village of Leguruiki is 6 km away from the grid. The project is also in line with the National Poverty Reduction Strategy Paper (PRSP).	
<b>11</b>	<b>Compliance with Local programmes, regulations and/or plans in place</b>	<b>3</b> (default)
<b>Comments</b>	No information available.	
<b>12</b>	<b>Respect Land rights and avoid displacement</b>	<b>5</b>
<b>Comments</b>	This project does respect existing land tenure systems and land rights. The project will not lead to any displacement of rural population.	
<b>Overall assessment</b>		<b>49</b> Out of 60

#### **Additional comments on the project**

Leguruiki Village is located on the slopes of Mt. Meru in Leguruiki Ward, King'ori Division of the Meru District in Arusha Region. Village population is estimated to be 4000 inhabitants in 2007. Total village area is 2185 hectares of which 1740 hectares are suitable for agricultural activities. More than 90% of the villagers are subsistence farmers. Other sources of income include livestock keeping, trading and employment in schools, churches and businesses.

### **3. Kilombero Sugar Company Ltd (KSCL), Tanzania Good Practice Assessment for Bioenergy Projects**

#### **General data**

1. Name of Assessor: Dr Helen Watson

2. Institution: University of KwaZulu-Natal

3. Date of Assessment: 23 December 2009

4. Name of Project: Kilombero Sugar Company Ltd (KSCL), Tanzania

5. Contact name at Project:

6. Place of Project: KSCL operates two mills at Kidatu in the Morogoro region which is inland and south of the country's capital - Dar es Salaam. The company takes its name from the Kilombero River. However, the area where sugar cane is cultivated is drained by three rivers, from west to east they are the Great Ruaha, Kilombero and Rufiji. The area drained by the Great Ruaha ranges in altitude from 800 to 1500 m.a.m.s.l. The topography ranges from mostly flat to rolling plains, to low hills transitional to the medium altitude plateau, to strongly dissected uplands. The area drained by the Kilombero ranges in altitude from 200 to 1000 m.a.m.s.l. The topography is predominately gently undulating to rolling plateaux developed on Karroo sediments. Parts of the terrain are however, strongly dissected. The area drained by the Rufiji ranges in altitude from 200 to 500 m.a.m.s.l. and is mainly gently undulating to rolling plateaux developed on Karroo sandstones and Neogene sandy sediments (ARI – Mlingano, 2006)

7. Characteristics of Project: Sugar cane cultivation in the vicinity of the Kilombero River commenced in the 1920's. The Kilombero Sugar Company (KSC) and first factory were established in 1962 when out growers supplied 17,000 tons of cane. In 1976 this supply was up to 103 000 tons and the second factory came into production. However, by 1998 this supply had dropped below 100 000 tons, and sugar production had declined to about 29 000 tons. The company could not meet its tax obligations and it's work force was on half pay. In April 1998 KSC was privatized and became KSCL. That year US\$ 50 million was spent on rehabilitation. Over the following six years KSCL invested in infrastructure, staff housing, schools, health centres and a refinery, and established a Partnership Project and the Kilombero Community Trust. During the 2004/5 season, out growers delivered 535 000 tons of cane which produced 126 000 tons of sugar. Conditions have continued to improve to such an extent that the United States Trade and Development Agency undertook in September 2009 to provide the funding required to install bioethanol/bioelectricity plant at Kidatu by 2012.

Tick if project is an initiative from:

Private  community  government  NGO  other

KSCL's Shareholders are Illovo Sugar (ISL) 55%, the Government of Tanzania 25% and EDF& Man 20%.

**8. State how do you know the project**

information from investor/  
promoter  field trip  a) and b)  other

specify other : personal communication with Dr Jeremy Woods (Imperial College, London) and Mr Dennis Tomlinson (formally Corporate Affairs Development Manager, Illovo Sugar Ltd, P.O.Box 194, Durban, 4000, South Africa) in February 2006.

**9. After reading the characteristics of the project (in Annex) please assess the following principles according to the scale:**

- 1 The project does not consider this principle (0%)
- 2 The project covers this principle partially <30%
- 3 The project covers partially this principle in 30-70%
- 4 The project covers partially this principle in <70%
- 5 The project fully covers the principle (100%)

**Principle Name**

**Score**

1. **Good agro-ecological and forestry practices (biodiversity, soil)**

4

**Comments**

Demonstration farm established by KCT (see 6 below), to ensure good agricultural practices. Area comprehensively mapped and biophysiological information on it acquired in order to ensure that areas of biodiversity significance and vulnerable soils are not cultivated. As noted in 8 below, KSCL has established a Reforestation Program.

**2. Not affecting water supply and quality**

5

**Comments**

The Morogoro district has one of the highest irrigation potentials in the country (AQUASTAT, 2002) with the area under sugar cane in close proximity to three large perennial rivers see 6 above. In the district, the areas drained by the Great Ruaha, Kilombero and Rufiji rivers respectively receive 800 -1000, 800 – 1000 and 1000 to 1200 mm of rainfall per annum. The rainfall threshold below which sugar cane must be irrigated to obtain economically viable yields, is 800 mm per annum (Watson *et al*, 2007 ).

**3 No land use change that detrimentally affects food security**

5

**Comments**

The land that is now under sugar cane was assumingly previously used by local communities for acquiring non timber forest products and grazing. No information on the contribution or intensity of this use was found. It is assumed that the income from sugar cane has increased food security on the basis that it has enabled (a) greater flexibility in the purchase of food, and (b) the purchase of inputs such as fertilizer leading to greater yields and a greater range of food crops grown.

**4 Community participation (from planning)**

3

**Comments**

Not from planning but yes, since privatisation and the establishment of KCT (see 6 below). Have certainly been actively involved in planning for the future bioethanol/bioelectricity plant.

**5 Women's participation (from planning)**

2

**Comments**

As per "Community participation" above.

**6. Skills transfer (management, business, agriculture)**

5

**Comments**

KSCL initiated a partnership with out growers to stimulate community development. The partnership led to the establishment of the Kilombero Community Trust (KCT) which (a) set up a farm to demonstrate best agricultural practices to growers, (b) provides regular capacity building workshops on management and business skills required by growers, and (c) mapped growers farms and entered information on their biophysiological and production characteristics in a Management Information System in order to assist growers in planning their harvesting and delivery schedules to the factories.

**7. Community inclusion in business or economic model  
(Contract with investor or NGO).**

4

**Comments**

KCT set up the Kilombero Business Linkages Project which in turn established partnerships with a network of organizations resulting in out growers gaining increased access to finance. KSCL strengthened the out growers supply chain by establishing a Division of Proceeds and Cane Supply Agreements which (a) providing assistance to improve in farm infrastructure, (b) instituted a reliable cane payments system, and (c) supports retention fund/bulk input supply.

**8. Added value in the community  
(individual, money, assets, land, co-products)**

3

**Comments**

Between 1999 and 2004, KSCL contributed Tshs. 30 billion to Government tax revenues, and Tshs. 11 billion to the community in payments for cane and related services. KSCL currently employs 6000 people at peak season. KSCL instituted a Reforestation Program under which (a) a Pilot Nursery was established, (b) indigenous species were planted on company land, and (c) thousands of seedlings distributed to the community. One point has been deducted from the score because of recent strikes by factory workers for improved wages.

5

**9. Improvement in services and infrastructure  
(energy supply, health) reinvestment of revenue within the community**

**Comments**

Since privatisation, KSCL has reconfigured the electrical distribution system enabling interconnection between the two factories as well as the National grid. The Company has also invested over Tshs 3.5 billion in providing and maintaining the following: (a) housing for employees, 43 teachers and 56 police personnel, (b) a health clinic and hospital with a combined capacity of 10 000 patients per year, (c) six primary schools and four day care centres, (d) twelve buildings for primary courts, (e) supplying potable water, and (f) 800 kms of roads.

**10. Compliance with National policies and/or guidelines  
for bioenergy projects in place**

4

**Comments**

Tanzania established a National Biofuels Task Force in 2006 “to prepare enabling policy and a regulatory environment for sustainable biofuels development” (Sawe, 2008). This task is still in progress. The fact that the government is a shareholder suggests that compliance of future developments are likely to be vigorous.

**11. Compliance with Local programmes, regulations and/or plans in place**

4

**Comments**

The strong partnership established with the community suggests that there has been full compliance. No information to the contrary was found in the literature used.

**12. Respect Land rights and avoid displacement**

5

**Comments**

No information on land disputes or displacement was found in the literature. Therefore, assume that this was not an issue.

**Overall assessment**

49

Out of 60

**Additional comments on the project:**

I unfortunately have not had the opportunity to visit KSCL myself or to engage in conversations with employees, out growers and other members of the local community. My assessment is based on information gained from COMPETE partners who have visited it, information generated by KSCL and media reports.

**References**

ARI – Mlingano, 2006: Rainfed Agriculture – Crop Suitability for Tanzania, Ministry of Agriculture, Food Security and Cooperatives Report, Tanga.

Sawe, E.N., 2008: Bioenergy policies in Tanzania, ppt presentation at COMPETE International Workshop on Bioenergy Policies for Sustainable Development in Africa, November, Bamako, Mali, [www.compete-bioafrica.net](http://www.compete-bioafrica.net).

AQUASTAT, 2005: Information System on Water and Agriculture – United Republic of Tanzania, Food and Agriculture Organization, Rome, [www.fao.org/ag/agl/aglw/aquastat/countries/tanzania/index.html](http://www.fao.org/ag/agl/aglw/aquastat/countries/tanzania/index.html)

Watson, H.K., Garland, G.G., Dercas, N., Griffee, P. and Johnson, F. and Purchase, B. 2007: *Thematic Report on Agriculture: Agronomy, Harvesting and Delivery*, [www.carensa.net](http://www.carensa.net)

**Bagamoyo (SEKAB Bioenergy) Tanzania Good Practice Assessment for Bioenergy Projects****General data**

1. Name of Assessor: Dr Helen Watson
2. Institution: University of KwaZulu-Natal
3. Date of Assessment: November 30 2009
4. Name of Project: Bagamoyo (SEKAB Bioenergy) Tanzania
5. Contact name at project: Thomas Eriksson, Technical Manager, P.O. Box 23423, Dar es Salaam, Tanzania, Phone: +255 22 260 12 85/86, Fax: + 255 22 260 12 46, Email: thomas.eriksson@sekab.com
6. Place of Project: Razaba Estate, Bagamoyo, Tanzania. The 15 000 ha Estate is located on an old, uplifted and dissected coastal plain. Its topography rises gradually from the coast to 30-40 m.a.m.s.l. It is largely gently undulating to rolling, with extensive plains, low lines of hills, bottomlands and shallow valleys. It is bounded by coastal mudflats to the east, the Wami River and Sadani Game Reserve to the north, and the Ruvu River to the south-east. It is surrounded by three villages and four sub-villages with a total population of six thousand (ORGUT Consulting AB, 2008).
7. Characteristics of Project: SEKAB was founded in 1985 in Sweden and is currently one of Europe's largest producers of bioethanol. SEKAB BioEnergy Tanzania was formed to develop large scale bioethanol/bioelectricity plants in Tanzania. The feedstock for these plants was to be sugar cane grown on 400 000 ha in the Rufiji, Kilwa and Bagamoya districts. Razaba Estate in the Bagamoyo District was selected as the first pilot project site in order to "(a) develop a state-of-the-art role-model project that demonstrates sustainability best practice, for rollout within the cluster development; (b) demonstrate commercial viability of bioethanol production in the country; and (c) establish the necessary supporting infrastructure (maintenance, logistics, capacity building, policy framework etc.) for the National Platform" (SEKAB Bioenergy Tanzania – Company Profile, 2009, pg.5).

A seed nursery was established in 2007 on 240 ha of agricultural land leased from the Prisons Department in Bagamoyo in preparation for planting on Razaba Estate. In 2008, sugar cane was planted on 500 ha of the Estate. The company intended expanding this to 15 000 ha by 2012 by which time the ethanol plant would be constructed and ready for production. The company intended to develop outgrower capacity which was expected to cover an additional 5 000 ha within ten years. No further planting took place in 2009 and on the 23<sup>rd</sup> of October 2009 SEKAB sold its subsidiaries in Tanzania to EcoDevelopment in Europe AB. (SEKAB, 2009)



Tick if project is an initiative from:

Private  community  government  NGO  other

**8. State how do you know the project**

information from investor/promoter  field trip  a) and b)  other

specify other \_\_\_\_\_

**9. After reading the characteristics of the project (in Annex) please assess the following principles according to the scale:**

- 1 The project does not consider this principle (0%)
- 2 The project covers this principle partially <30%
- 3 The project covers partially this principle in 30-70%
- 4 The project covers partially this principle in >70%
- 5 The project fully covers the principle (100%)

**Principle Name** **Score**

1. **Good agro-ecological and forestry practices (biodiversity, soil)**

2

**Comments**

Prior to 1974 the Estate was traversed by pastoralists on their way to markets in Dar es Salaam and used for seasonal grazing. Elephants migrated into the area during the two wet seasons. In 1974 it was given to the Revolutionary Government of Zanzibar to establish a cattle ranch. ORGUT Consulting AB (2008) report that inhabitants were compensated and settled outside the area. However, no indication of the number of inhabitants is given. Developing the ranch involved clearing forests and wetlands, establishing roads, housing and a primary school. It had 7000 head of cattle and employed 300 people. Nevertheless, it was abandoned in 1994 because of difficulties of keeping cattle year round in an area infested with tsetse flies. (ORGUT Consulting AB, 2008).

After 1994, pastoralists and elephants resumed their use of the area. (ORGUT Consulting AB, 2008). Hence, converting the area to a sugar cane monoculture could have potentially led to conflict with the elephants and definitely led to a decrease in biodiversity.

The soils are old, dissected sand dunes and are mostly grey, erodible sandy soils. Alluvial sands and clays predominate near the rivers. The soils are generally poor in organic matter, potassium and phosphorus (ORGUT Consulting AB, 2008). The application of fertilizers to the sugar cane crop and the mulch left behind after harvesting would potentially improve the structure, fertility and erodibility of the soils.

## 2. Not affecting water supply and quality

2
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### Comments

The Estate's mean annual rainfall ranges between 800-1000 mm therefore in order to get economically viable yields, irrigation needs to provide an additional 700-800mm of water per annum. The water is extracted from the Wami River. Most of the irrigation to be supplied was of the sub-surface drip type with PVC main lines and polyethylene laterals, and drains from the farm into ponds allowing for the water to be recycled. The ponds would further ensure that leakage of nutrients and other substances back into the river was minimized (ORGUT Consulting AB, 2008). However, damming the water draining from the area planted up in 2008 suggested that salinity could be a problem.

Although the water table is generally high, there is not enough information about the ground water either as a potential source of irrigation water or as a recipient of additional surface water (ORGUT Consulting AB, 2008).

Communities surrounding the Estate are totally dependent on the Wami and Ruvu Rivers for water. In normal years there is enough water in the Wami River for irrigation without detrimental down stream effects. However, in dry years there is not enough water for both irrigation and ecosystem needs between late July and early November (ORGUT Consulting AB, 2008).

## 3 No land use change that detrimentally affects food security

4
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### Comments

Once converted to sugar cane, pastoralists would once again be denied access to the land for seasonal grazing which could potentially have a detrimental effect on their food security.

ORGUT Consulting AB (2008) report that surrounding communities cultivate rice in close proximity to the Estate. However, there are no historic or contemporary reports of this activity within the Estate. The conversion of the Estate land to sugar cane therefore would not detrimentally affect food security. However, the envisaged outgrower activity could have potentially involved converting land currently used for food crops. The effect of this however needs to be weighed against the potential increase in food security that would have arisen due to (a) more money being available to purchase fertilizers and other inputs giving better food crop yields, and (b) bigger markets to supply food crops to.

5

**4 Community participation (from planning)****Comments**

The Environmental and Social Impact Assessment of SEKAB BioEnergy Tanzania's proposed development of the Estate was carried out in 2008 by the Swedish company ORGUT Consulting AB in association with Tanzania's Ardhi University. They estimated that six thousand people were living in three villages and four sub-villages surrounding the Estate. One thousand households were visited to elicit community views on the proposed development. The community were well informed about it. Most had already benefited from employment in the planting of the seed nursery the previous year and the planting actually on the Estate in 2008. While recognising the benefits of employment, improved roads, improved marketing opportunities, and skills acquisition enabling outgrower participation, there were concerns that workers from elsewhere brought in by SEKAB to construct the bioethanol/bioelectricity plant and to harvest the cane, would cause an increase in crime, overdrinking, prostitution, and AIDS, and would stretch social services, food and facilities.

4

**5 Women's participation (from planning)****Comments**

A substantial number of women had been involved in the establishment of the seed nursery and the subsequent planting of sugarcane on the Estate. During the Environmental and Social Impact Assessment, most household respondents were women.

4

**6. Skills transfer (management, business, agriculture)****Comments**

The bioethanol/bioelectricity plant SEKAB BioEnergy Tanzania envisaged building in Bagamoyo required feedstock from 20 000 ha for optimal production. Razaba Estate is only 15 000 ha. The company intended to implement a comprehensive skills transfer programme so that outgrowers would be able to provide the 5 000 ha feedstock deficit.

4

**7. Community inclusion in business or economic model  
(Contract with investor or NGO).****Comments**

During the Environmental and Social Impact Assessment designated senior representatives from the following were interviewed :- Bagamoya District Council Authority, Village Governments, Ministry of Energy and Minerals, Ministry of Natural Resources and Tourism, Ministry of Agriculture and Food Security, Ministry of Regional Administration and Local Planning, Ministry of Planning and Economic Empowerment, Office of the Vice President – Division of the Environment, National Environment Management Council, District

Commissioner, District Executive Director, District Agricultural Extension Officer, District Administration Officer, District Land Officer. Without exception, they had been informed of SEKAB BioEnergy Tanzania's proposed development by representatives of the company and invited to suggest how the sectors they were representing could be involved in the development.

**8. Added value in the community (individual, money, assets, land, co-products)**

3
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**Comments**

- Employment on the Estate.
- Opportunity to learn how to cultivate, harvest and supply sugar cane to the bioethanol/bioelectricity plant as an outgrower.
- Potentially more money available to purchase fertilizers and other inputs giving better food crop yields.
- Potentially bigger markets to supply food crops to.

**9. Improvement in services and infrastructure (energy supply, health) reinvestment of revenue within the community**

3
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**Comments**

SEKAB BioEnergy Tanzania intended improving roads to and within the Bagamoya District.

At present the communities surrounding the Estate use kerosene for lighting and wood for cooking. They harvest wood from natural woodlands and forests within the district and produce charcoal to sell. Although capable of regenerating rapidly, the natural woodlands and forests throughout most of the district are already depleted or degraded. Once the bioethanol/bioelectricity plant was operational, SEKAB BioEnergy Tanzania intended supplying inhabitants of the Bagamoya District will affordable electricity.

**10. Compliance with National policies and/or guidelines for bioenergy projects in place**

4
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**Comments**

Tanzania established a National Biofuels Task Force in 2006 "to prepare enabling policy and a regulatory environment for sustainable biofuels development" (Sawe, 2008). This task is still in progress. The Force however, did play an active role in ensuring that a full Environmental and Social Impact Assessment of SEKAB BioEnergy Tanzania's proposed development was carried out and submitted to the National Environment Management Council.

**11. Compliance with Local programmes, regulations and/or plans in place**

4
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**Comments**

As noted in (7) above, a wide range of high level district representatives were given the opportunity to give their input about the proposed development. The onus was on them to ensure this compliance.

**12. Respect Land rights and avoid displacement**

3

**Comments**

As noted in (1) above people living on the Estate were compensated to move in 1974 to make way for a cattle ranch. The land was not reoccupied after the ranch was abandoned in 1994. However, while no displacement of people actually living there would be involved, pastoralists using the land for seasonal grazing would be displaced.

**Overall assessment**

42

Out of 60

**Additional comments on the project:**

The reason given by SEKAB for selling its subsidiaries in Tanzania to EcoDevelopment in Europe AB in October 2009 is that it was unable to secure any land in addition to the Razaba Estate. Uninhabited land close to abundant surface water was required for the Bagamoya bioethanol/bioelectricity plant as well as the sugarcane plantings planned in the Rufiji and Kilwa districts. Some claim that SEKAB “ran into problems” because it did not adequately consult with the Kilombero Sugar Company which has a long history of producing sugar in Tanzania and plans to develop a bioethanol/bioelectricity plant. Several others attribute SEKAB’s “failure” in Tanzania the coinciding of the global recession and the anti-biofuels media hype towards the end of 2008. The “food versus fuel” debate was particularly vicious and misinformed in the Swedish media.

The proposed development on the Razaba Estate has been extremely difficult to evaluate. The field visit revealed excellent farming practices and enormous capital outlays to conserve water. The Environmental and Social Impact Assessment Report reveals very extensive and thorough consultation. Because the project never came to fruition, using the COMPETE assessment I have had to rate it on the basis of what they intended to do rather than what they did. Hence, the fairly good overall score despite the fact that the project “failed”.

**References**

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