

Italy Workshop Report

Palermo 27 Feb-1 March 2012

Green Credential Report (27 Feb – 28 Feb)

- The 'Green Credentials Report' was a term to denote the concept of a biofuel activity that was sustainable and had a low carbon footprint. The new working title was proposed as "**Biofuels – Putting together the Green Jigsaw**" with a design for the report to include the following:



- Non-food bio-oil supply chains:**

The original project was predicated on oils in particular, Jatropha oil and algal lipid.

- Jatropha has now been banned from cultivation in many parts of Africa including South Africa and Namibia, whilst in those countries where cultivation is still possible, many jatropha-producing organisations (the majority in Ghana) have failed.
- Algal oil technologies are unlikely to be available for implementation within the next 10-15 years.

Consequently and with ACP support, the project scope has been expanded to include all biofuels including biomass and biogas.

1. Assessment tools to analyse the 'green credentials' of biofuel case studies:

- Life cycle analysis (LCA). (see G.A. Reinhardt, E. von Falkenstein (2011) [Environmental assessment of biofuels for transport and the aspects of land use Competition Biomass and Bioenergy](#), 35 (6) 2315-2322). For a given case study, a LCA might be available. Alternatively any published LCA literature for a given biofuel could be drawn into the analysis as indicative evidence for the case study.

Note: LCA was introduced in the late 1980's as a technique for compiling an inventory of material inputs and environmental releases associated with the production, use and disposal of a product or service. LCA's have been widely adopted by different stakeholder groups such as environmental advocacy organisations, business groups and policy practitioners, but serious differences have started to emerge across and within the groups. These have been attributed to the definition of the system boundary including indirect emissions and indirect land use change, the definition of the fossil fuel baseline and the methodologies.

- The effective environmental impact of a given biofuel in a case study will relate tightly to the technological and geographical context in which the system performs, so data regarding these parameters should be collected.

- Supply chain management. (see A Zamboni, R J. Murphy, J Woods, F Bezzo, N Shah (2011) [Biofuels carbon footprints: Whole-systems optimisation for GHG emissions reduction](#) *Bioresource Technology*, 102(16) 7457-7465.



The component parts of a given case study could aim to contextualise the whole supply chain, which would also identify awareness of the stakeholder groupings i.e.

- Cultivation of the biomass/feedstock in the agricultural sector or collection of biowaste,
- Production of the energy carrier/biofuel in a conversion plant, and

- 3) Product distribution in a network to deliver the final product to consumer.
 - 4) Strategic and operational planning of the whole supply chain to achieve maximum efficiency.
4. Evolutionary Innovation Systems Analysis (see Henny A. Romijn, Marjolein C.J. Caniëls (2011): [The *Jatropha* biofuels sector in Tanzania 2005–2009: Evolution towards sustainability?](#) *Research Policy*, 40(4) 618-636. Case studies should be characterised over a given time frame to deduce the nature and role of two so-called ‘change motors’ that may have shaped the progress of the system;
- 1) Human controversy i.e. how have different stakeholders attempted to safeguard their interests in processes of debate, coalition formation, power play and conflict
 - 2) Evolution selection amongst a range of options because they simply ‘work better’.

To facilitate the analysis data should be collated to describe the landscape, as shown in the table for *jatropha*:

	Proto-stage 2005 Section 5.1	2006-2007 Section 5.2	Early 2008 Section 5.3	Late 2008 – 2009 Section 5.4
Landscape				
Regime				
<i>Jatropha</i> niche development 1.networking 2.learning 3.expectations				
Change motors 1. Evolutionary variation & selection (in terms of technology and business organisation) 2. Contestation & conflict between stakeholders	↓	↓	↓	↓ ↑

5. Business Maturity The current position of a biofuel case study system could be assessed on a relative scale (0-100%) in terms business maturity.

2. ACP team conclusions for Case Study Analysis: PEOPLE, PLANET PROFIT, TECHNOLOGY (P3T)

When we want to study the emergence of radical ‘sustainable’ technologies such as biofuels, contestation and conflict need to be an integral – and often constructive – part of the innovation process itself, rather than merely forming a contextual drag on it by hampering progressive innovation forces in the niche.

We require an analytical tool that is capable of integrating a focus on gradual variation and selection in a newly emerging innovation system, with a more explicit analysis of human controversies and actions around People Planet and Profit issues as a second dominant driver of change.

1. Expectations: Voicing and shaping of people’s expectations concerning the innovation. This is necessary in order to match the promises held out by the innovation and the stakeholders’ expectations about it, with the needs in society that the innovation is meant to satisfy.
 - a. Understand what was promised vs what was presumed to be promised
 - b. Socio and political contestation
 - c. Written substantiation/ contractual agreements
2. Learning: Experimentation-based learning about the possibilities and constraints of the innovation, specific application domains, its acceptability, suitable policies to regulate or promote it, and so on.
 - a. Interrogation of suitability of technology vs who has introduced it (vested interest)
 - b. Evidence of evolution in the selection process
 - c. Degree of market/user acceptability of the technology
3. Networking: The constitution of a co-operating actor network, especially to enable early feedback from users and for the actors to develop a common core vision (‘alignment’).
 - a. Move from a non conflict situation- predicated on lack of awareness of stakeholders to a more realistic, conflicted situation where interests are identified and conflicts appear and are managed
 - b. Are opaque procedures and institutional weaknesses used/abused to attract investors
 - c. Feedback of lessons learnt into the greater environment (reflexive learning)- accompanied by evidence of an exponential growth in network
4. Evolutionary variation selection: Move from experiments to clear, articulated business model

- a. Evidence of selection of cultivation and business practices and business model
- b. Suitability of supply chain/ evidence of control
- c. Sustainability of business model
- d. Projected growth rates- evolutionary process versus revolutionary
- e. Alignment of business model with likely financial support/ subsidies

A non-exclusive list of questions was formulated. [See link to case study questionnaire](#)

- **Data collation methods.**

Data could be sought from stakeholders by email, telephone, one-to-one interviews, interrogation of stakeholder groups at a workshop, and from publicly available literature.

- 1) *Interviews.* In-country partners will train student volunteers in interview technique then support them in data gathering from stakeholders and the consolidation of the information using a standardised template (see below for more details). To facilitate interview techniques a training course will be established.
Note: selection of suitable candidates will be important, as will the decision to either encourage them to probe deeply or stick to the questions.
- 2) *Workshops* Stakeholders will be invited to in-country workshops in Ghana and Namibia to present an overview of their activity.
- 3) Draft questions were formulated that might serve to elicit email responses where necessary / used as a template by interviewees to formulate face-to-face questions.

Training courses for Capacity-building in Africa

Background

Stated Aim:

To build capacity in the research institutes and universities of Partner countries to develop relevant training programmes to support the overall objective e.g. training for staff in ESCos offering biofuel CHP /training for staff in plant processing businesses that are extracting oil from seed or microalgae.

Stated Output:

6 biofuel training programmes offered by African universities to train up a new workforce fit for purpose in an emerging biofuels industry.

Year 1 Output:

At the end of year 1 we had delivered and reported to the ACP the following training outputs, which were accepted as valid training:

1. Stakeholder Management training
2. Training in business plan production delivered to workshop attendees in Namibia and Ghana
3. Training of stakeholders in biofuels and CHP delivered to workshop attendees in Namibia and Ghana

We also identified areas of further training need:

- For researchers: Training in microalgae analysis –marine and freshwater
- For government officials: Training – awareness raising - of Directors just below ministerial level, government administrators to understand developments in the field and make appropriate decisions
- For business entrepreneurs: Training to write effective business plans

Workshop

Accreditation: Professional accreditation might be sought from e.g. Renewable Energy Association should they wish to offer training. However accreditation typically requires university ratification of standards and quality assurance.

University validation: Validation of standards should be sought from host universities wherever possible

Continuing Professional Development (CPD) versus Master's training: there appears to be a global trend in favour of short-course professional training (CPD) to support workplace jobs. Skills training needs for the biofuel sector would be better served with CPD short course training. However courses were developed and validated by a given university at Master's level, then they might form one of a suite of such courses offered together for an MSc Microalgae training is required globally to meet perceived demand based on recognition that microalgae will lower costs to oxygen water, utilise saline water, sequester nutrients from water and harness sunlight energy.

A survey of courses by the partnership identified a short course in biogas production by anaerobic digestion offered by KNUST and a short course in marine microalgae identification offered by the MBA. South Africa and UK universities tended to offer taught MSc training and this could be flagged to partner organisations via the ACP project website.

With these factors in mind CPD courses were identified that could be created and delivered within the timeframe of the project:

- Freshwater microalgal identification courses for SA, Ghana and Namibia – total 3 courses;
- Marine microalgae identification courses for SA, Ghana and Namibia, currently offered by the MBA – total 3 courses
- Waste management leading to biogas production courses for SA and Namibia, currently offered by KNUST — total 2 courses
- Business Support Training courses for the Biofuel Sector Training Program for SA, Ghana, Namibia UK and Italy created as a bespoke course – total 5 courses;