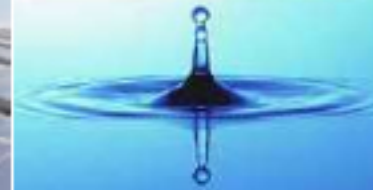


WIP



Sustainability indicators for socio-economic impacts of biofuels



Dominik Rutz, Rainer Janssen

WIP – Renewable Energies

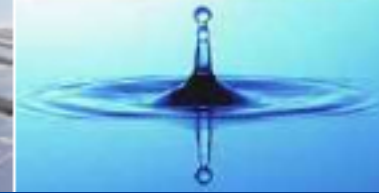
IEA Bioenergy

IEA Bioenergy Conference 2012

Vienna, Austria, 13 November 2012



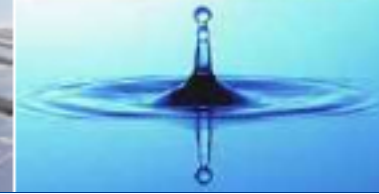
www.wip-munich.de



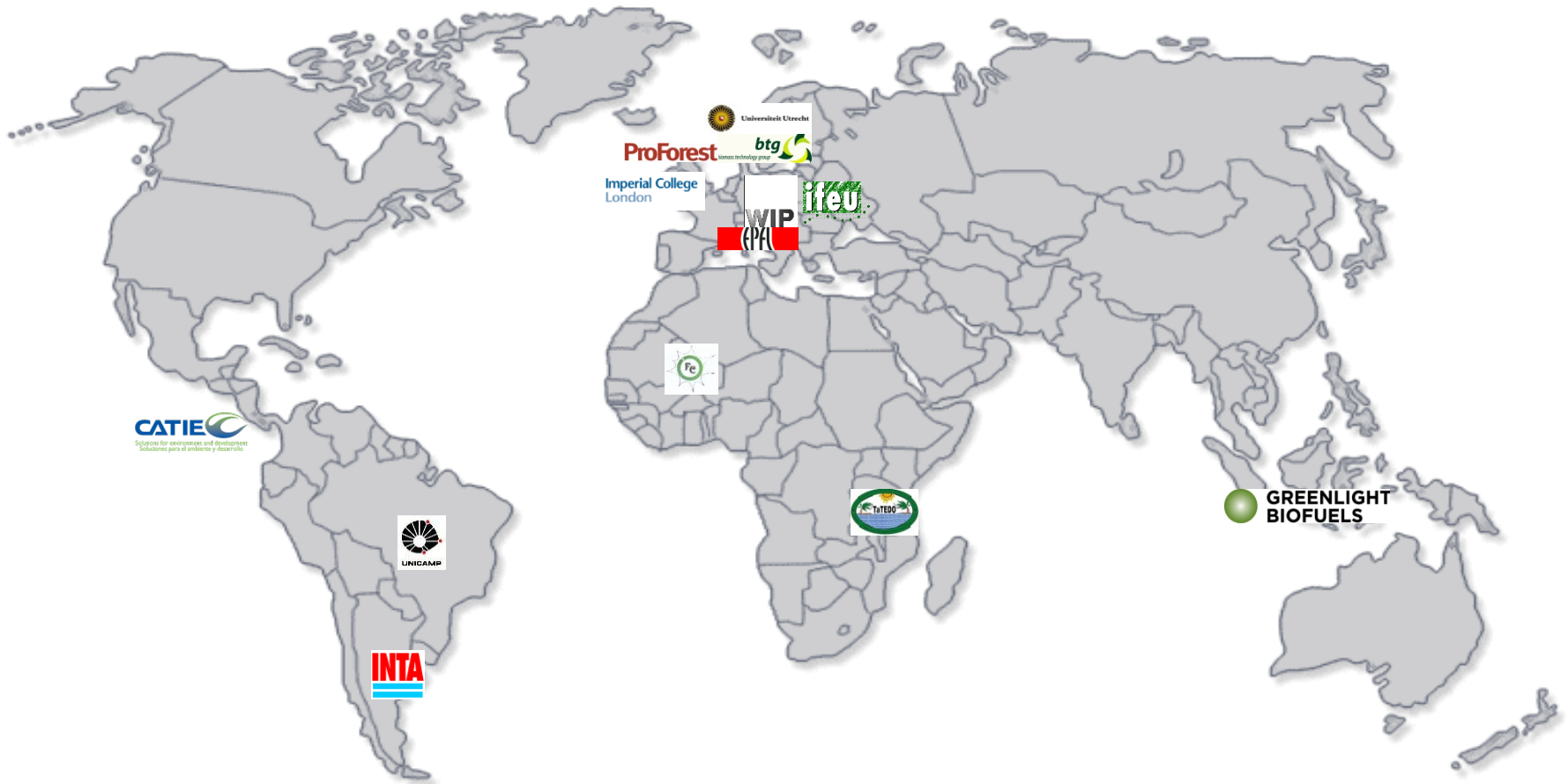
Global-Bio-Pact

- Supported in the 7th Framework Programme of the European Commission
- Coordinator: WIP Renewable Energies
- Duration: February 2010 – January 2013





Global-Bio-Pact Partners



Global-Bio-Pact – Partnership

- **WIP – Renewable Energies**, Germany
- **Imperial College London**, United Kingdom
- **Utrecht University**, The Netherlands
- **BTG Biomass Technology Group**, The Netherlands
- **Institute for Energy and Environmental Research**, Germany
- **ProForest**, United Kingdom
- **Roundtable for Sustainable Biofuels (EPFL)**, Switzerland
- **Universidade Estadual de Campinas**, Brazil
- **National Institute for Agricultural Technology**, Argentina
- **Tropical Agricultural Research and Higher Education Center**, Costa Rica
- **Tanzania Traditional Energy Development and Environment Organization**, Tanzania
- **Mali-Folkecenter**, Mali
- **Greenlight Biofuels Indonesia**, Indonesia



Imperial College
London

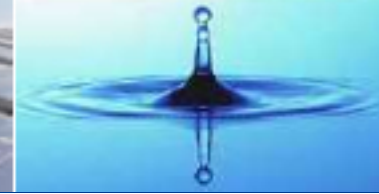


Universiteit Utrecht



ProForest





Global-Bio-Pact Idea

Development and harmonisation of sustainability schemes
for biofuels and bioproducts
to prevent negative socio-economic impacts



Directive 2009/28/EC

on the promotion of the use of energy from renewable sources: Article 17

L 140/38

EN

Official Journal of the European Union

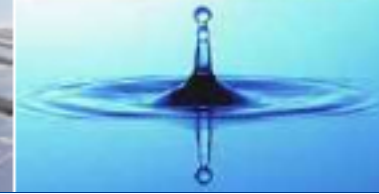
5.6.2009

The Commission shall, every two years, report to the European Parliament and the Council on the impact on social sustainability in the Community and in third countries of increased demand for biofuel, on the impact of Community biofuel policy on the availability of foodstuffs at affordable prices, in particular for people living in developing countries, and wider development issues. Reports shall address the respect of land-use rights. They shall state, both for third countries and Member States that are a significant source of raw material for biofuel consumed within the Community, whether the country has ratified and implemented each of the following Conventions of the International Labour Organisation:

- Convention concerning Forced or Compulsory Labour (No 29),
- Convention concerning Freedom of Association and Protection of the Right to Organise (No 87),

9. The Commission shall report on requirements for a sustainability scheme for energy uses of biomass, other than biofuels and bioliquids, by 31 December 2009. That report shall be accompanied, where appropriate, by proposals for a sustainability scheme for other energy uses of biomass, to the European Parliament and the Council. That report and any proposals contained therein shall be based on the best available scientific evidence, taking into account new developments in innovative processes. If the analysis done for that purpose demonstrates that it would be appropriate to introduce amendments, in relation to forest biomass, in the calculation methodology in Annex V or in the sustainability criteria relating to carbon stocks applied to biofuels and bioliquids, the Commission shall, where appropriate, make proposals to the European Parliament and Council at the same time in this regard.

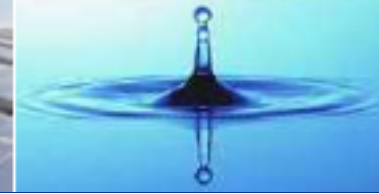
Article 18



Objectives

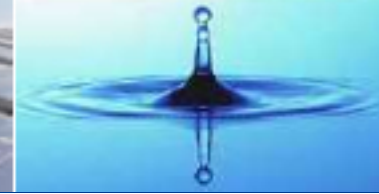
- Identify socio-economic impacts of ***feedstock production and conversion***
- Analyse impacts on ***food security***
- Investigate link: socio-economic and ***environmental impacts***
- Review current and future ***trading*** schemes
- Analyse ***public perception***
- Make ***recommendations***





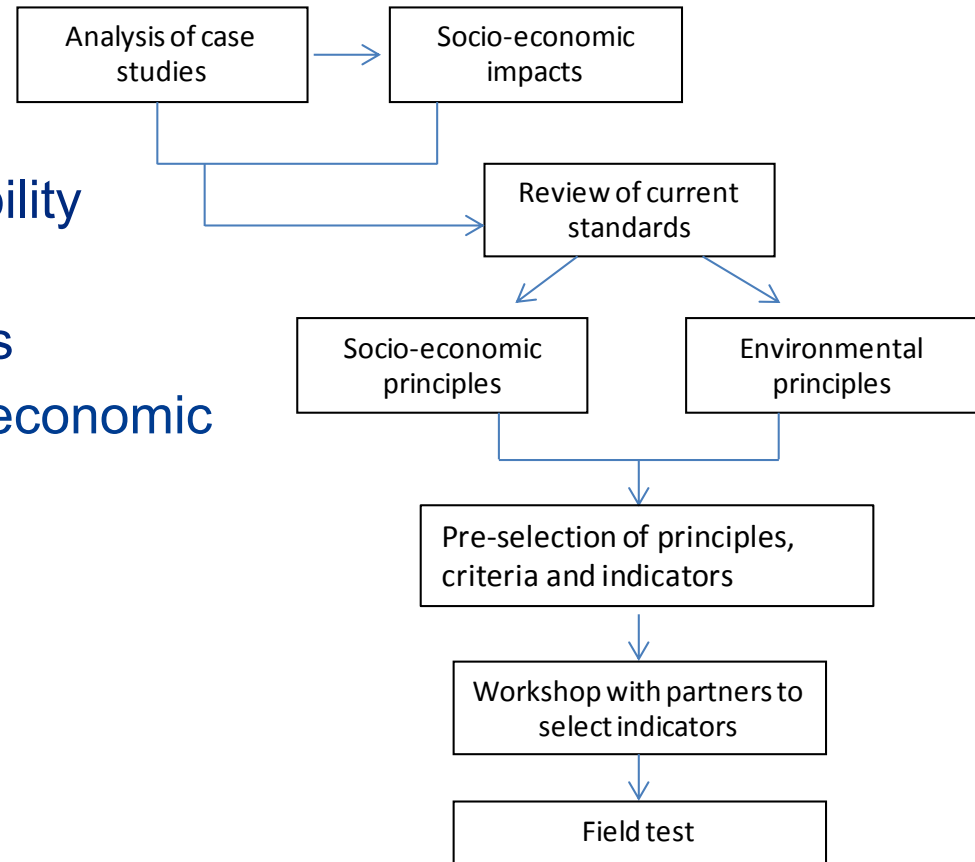
General questions addressed in Global-Bio-Pact

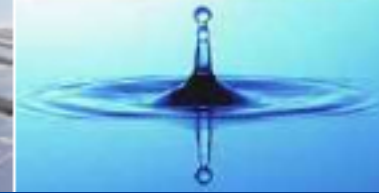
- Which indicators are useful **for assessing** socio-econ. impacts of biofuels/products?
- Which indicators are useful for sustainability **certification** schemes?
- Is it **generally possible/useful to integrate** socio-econ. aspects in a certification scheme?
- Which **measurable units and thresholds** would be suitable?
- Is it better to integrate general or country/region-specific socio-econ. aspects in legislation (since feedstock production needs to be addressed locally)?
- How can socio-econ. aspects be **audited**?
- Should socio-econ. aspects only be integrated in schemes for **biofuels** or also for **bio-products**?
- **Which recommendations** can be given to the EC?



Method

1. Analysis of existing sustainability schemes
2. Development of Case Studies
3. Elaboration of a set of socio-economic impact indicators
4. Field test of indicators
5. Recommendations





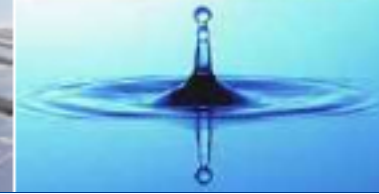
Case Studies

- **Argentina:** Soy production and conversion
- **Indonesia:** Palm oil production and conversion
- **Tanzania / Mali:** Jatropha cultivation
- **Costa Rica / Brazil:** Bioethanol production from sugarcane
- **Canada:** 2nd generation Biofuels

Case study levels

- National level
- Regional level
- Local/project level





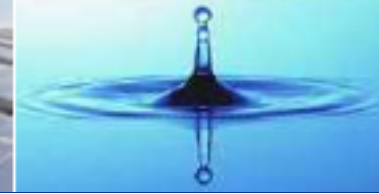
Case Study: Soy in Argentina



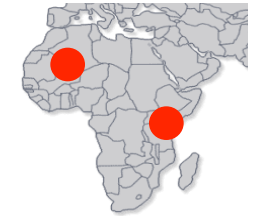
- Production systems mainly large-size
- Soy farmers usually have no influence on the use of the soy beans
- Main product of soy are proteins
- Only 15-25% of the soy bean is oil
- 99% genetically modified



→ **Which sustainability criteria can be applied here?**

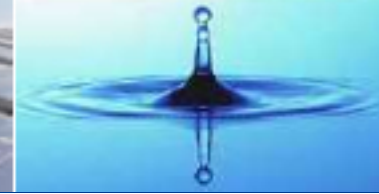


Case Study: Jatropha in Afrika



- Case Studies: small to large scale projects in Mali and Tanzania
- Jatropha – a miracle plant?
- High yields only on good soils with sufficient water and nutrient availability
- Interest of large companies in big plantations
- Jatropha is still to less investigated (Breeding)
- Wrong promises (especially to smallholders) have to be avoided



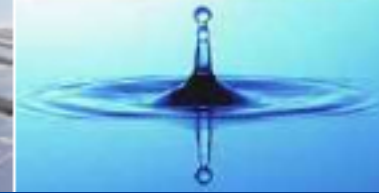


Case Study: Sugarcane in Latinamerica



- Brazil: longest history in ethanol use in transport applications
- Costa Rica: no ethanol use for biofuels so far; ethanol mainly from molasses; country with high biodiversity



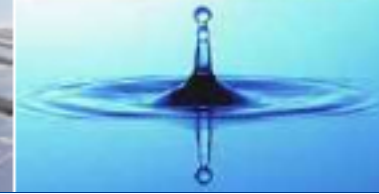


Case Study: Palm oil in Indonesia



- World's leading exporter of palm oil, few up-stream processing to biofuels and bioproducts
- Case studies in North and South Sumatra
(Comparison of ownership models)
 - Privately owned estates with associated smallholders
 - Government owned plantations
 - Independent smallholders





Case Study: Lignocellulosic Biorefinery Canada



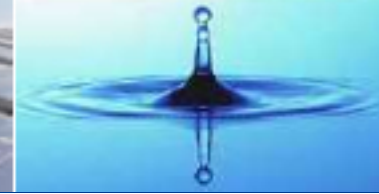
- Forestry products and industry residues
- Integrated cellulose-to-ethanol bio-refining
- Assessed company: Lignol



Set of socio-economic impact indicators

Copy of Biopact Indicators 02052012 final.xls [Kompatibilitätsmodus] - Microsoft Excel

#	Impact	Indicator	Measurement/ Monitoring/Units	Guidance
2	Socioeconomic indicators			
2.1	Contribution to local economy	Production cost	Breakdown of yearly production costs of the facility (incl. labour, raw material, energy, services, etc.) (EUR/t of feedstock)	Annual production costs within a 5-year period
2.2		Value added	Value added by the operation. Annual value of sales less the price of goods, raw materials (including energy) and services purchased. (EUR/t of feedstock)	Annual value added within a 5-year period
2.3		Taxes/royalties paid to the government	Breakdown of payments made to the government/year (EUR)	Payments made to the government per year within 5 years
2.4		Contributions made by the operation to allied industries in the local economy	Percentage of total production cost paid to contractors, suppliers per annum	Percentage of total production cost paid annually to contractors and suppliers of raw materials (excluding suppliers of feedstock within a 5-year period
2.5		Production farmed by smallholders or suppliers	% of feedstock that originates from associated smallholders and outgrowers	Percentage of feedstock that originates from associated smallholders outgrowers within a 5-year period. Number of associated smallholders or outgrowers.
2.6		Amount paid to smallholders and suppliers of feedstock	Annual amount paid to smallholders and suppliers of feedstock (EUR)	Annual value paid to associated smallholders and outgrowers per unit of product within a 5 year period.
2.7		Employment	Total number of employees and person days of employment per year	Total number of people employed each year and total number of person days per year within a 5 year period. Breakdown should be given for categories of employment for operation (management/office/processor/field labour, male/female, contract/no contract)
2.8		Ratio between local and migrant	Ratio of employment from local area / outside local area per category of employment	Local area is defines as state or province (however, assessor can further adapt this to local context). Absolute annual number of



Set of socio-economic impact indicators

Socio-economic impact topics

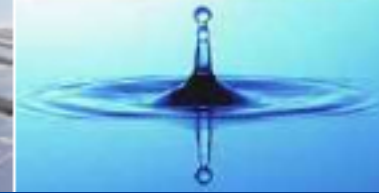
- Contribution to local economy
- Working conditions and rights
- Health and safety
- Gender
- Land rights
- Food security

Environmental impact topics

- Air
- Soil
- Water
- Biodiversity
- Ecosystem services

Example:

- Impact: on Land rights
- Indicator: Land rights and conflicts
- Measurement: **Area of land currently under dispute, land conflict. (ha)**
Has the operation had any land use conflicts, if so, what caused them, how were they resolved?
- Guidance: Land area currently under dispute. Qualitative description of any current or previous land use conflicts. If they were resolved, how this happened.



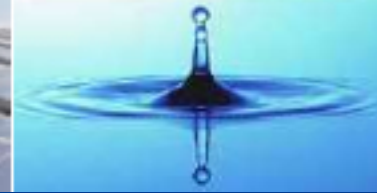
Testing the indicators

- Field tests in Argentina and Brazil

Key questions:

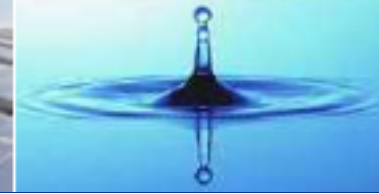
- Measurability
- Easiness to gather the data
- Usefulness for assessing socio-economic impacts
- Temporality





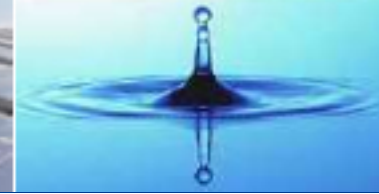
Conclusion 1: Audits/field test

- Field tests are important to **understand the local context**
- First information should be **requested before the audit**
- **Data are often missing** from previous years
- Economic details are often **confidential**
- **Reference levels** (baselines) have to be defined
- Indicators are a good tool to **measure impacts**



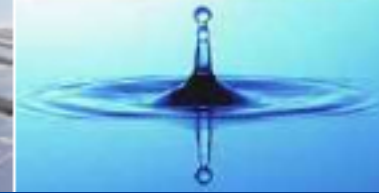
Conclusion 2: Certification

- Certification is a **suitable tool** to improve the sustainability of biofuels/ bioproducts
 - Certification is suitable to **increase awareness** about sustainability considerations
 - In most countries legislation on socio-economic issues is in place
 - Costs for certification has to be affordable also for smallholders and small producers
- Certification **can not avoid** the production of non-sustainable biofuels/products
- More important than certification would be the **enforcement of national legislation**



Conclusion 3: General

- Main socioeconomic sustainability aspects are related to the **production of feedstock** (same as for environmental aspects)
- The production of biofuels and bio-products has **positive AND negative impacts**
- **Quantitative AND qualitative aspects** have to be considered to evaluate socio-economic impacts
- Challenge in developing countries:
balance between **large- and small-scale projects**
- **Land use competition** is an increasingly important issue
- The use of **waste materials** has many positive advantages, however the job creation potential is smaller



Announcement

- **Final Global-Bio-Pact Conference** on:
„Socio-Economic Impacts of Biofuels and Bioproducts“
- January/February 2013
- Brussels, Belgium
- Information:
www.global-bio-pact.eu; dominik.rutz@wip-munich.de

THANK YOU VERY MUCH FOR YOUR ATTENTION!



Contact

Dominik Rutz, Rainer Janssen
WIP – Renewable Energies

www.wip-munich.de

www.globalbiopact.eu

dominik.rutz@wip-munich.de

rainer.janssen@wip-munich.de



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