

**Social, legal, and political assessment
in case studies of the BIOCORE project**

**Developments in Sustainable Biomass Valorisation
EU-India R&D Collaboration on Biomass and Biowaste**

28-29 October

Utrecht, the Netherlands

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Imperial College

- **Facts & figures**

- Founded 1907
- 13,019 full-time students (08-09)
- 10.9:1 student/staff ratio (08-09)
- Students from 158 countries
- 238 taught courses
- 1997

- **IC position**

- 3rd in Europe and 5th in World
- Engineering and Information Technology
- 2nd in Europe and 6th in World
- Life Sciences and Biomedicine
- 3rd in Europe and 17th in World
- Natural Sciences
- 3rd in Europe and 10th in World

- **Centre for Environmental Policy**

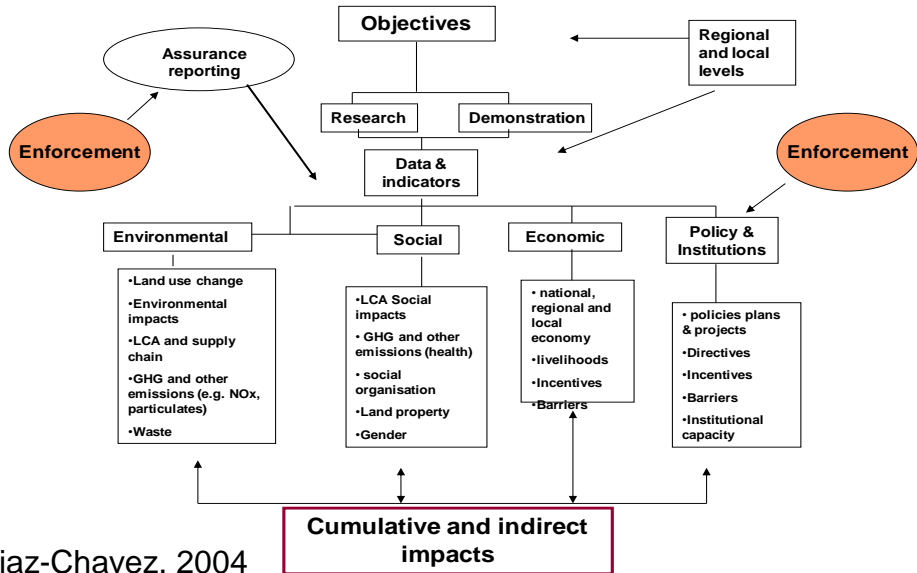


Key objectives

- To understand existing social, legal and political framework at the regional, national and international level
- To evaluate and analyse potential impact of 'biocore' on social legal and political structures in the selected sites

Combined methodology

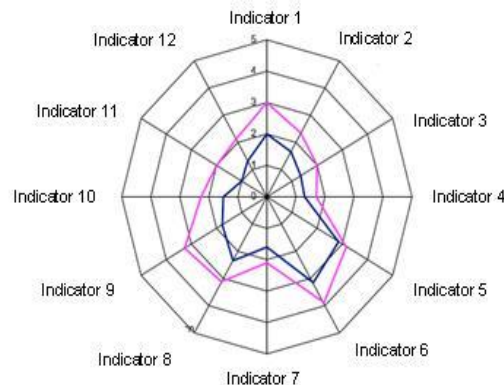
Sustainability assessment framework



Diaz-Chavez, 2004

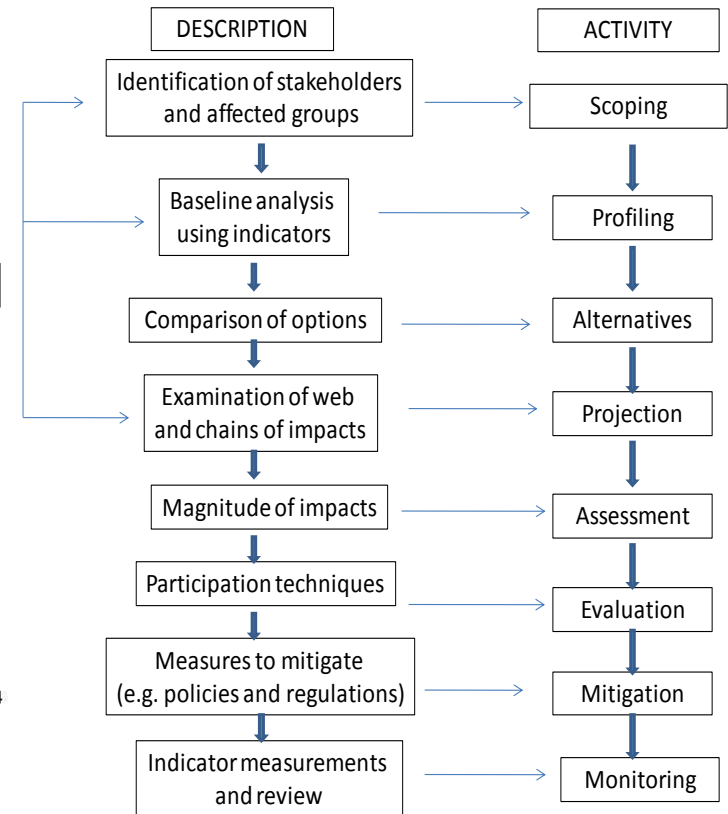
MCA- Task TERI

Used for complex multi-criteria problems that may include qualitative or quantitative aspects (or both) of the problem in the decision-making process



TERI, 2011

Adapted Social Impact Assessment Task Imperial and Hotspots



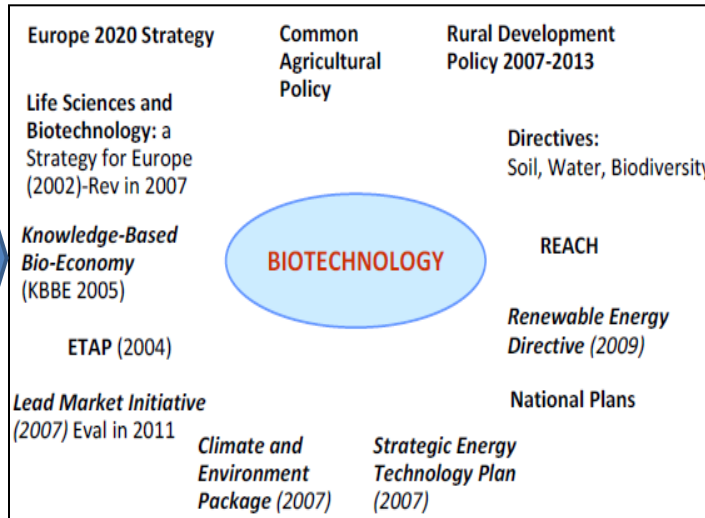
Diaz-Chavez, 2011

Stakeholders Workshop (Brussels 2013)

London

Legal and Political Sustainability Assessment

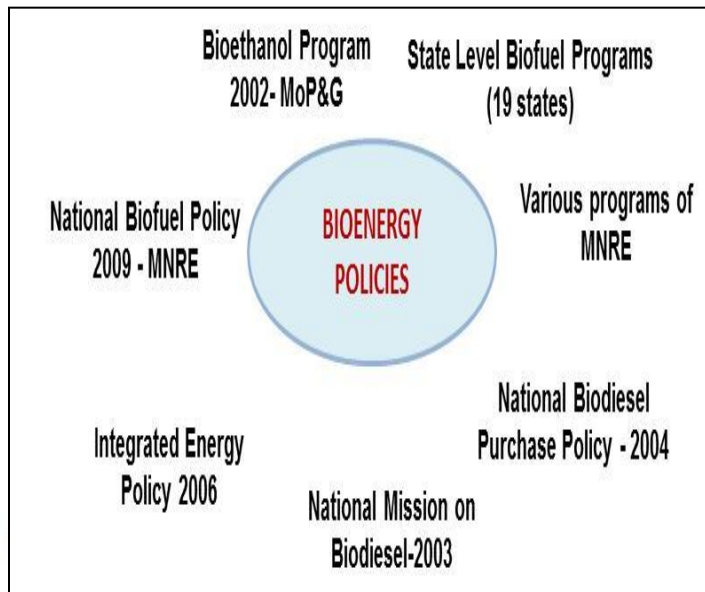
European Policies



Assessment

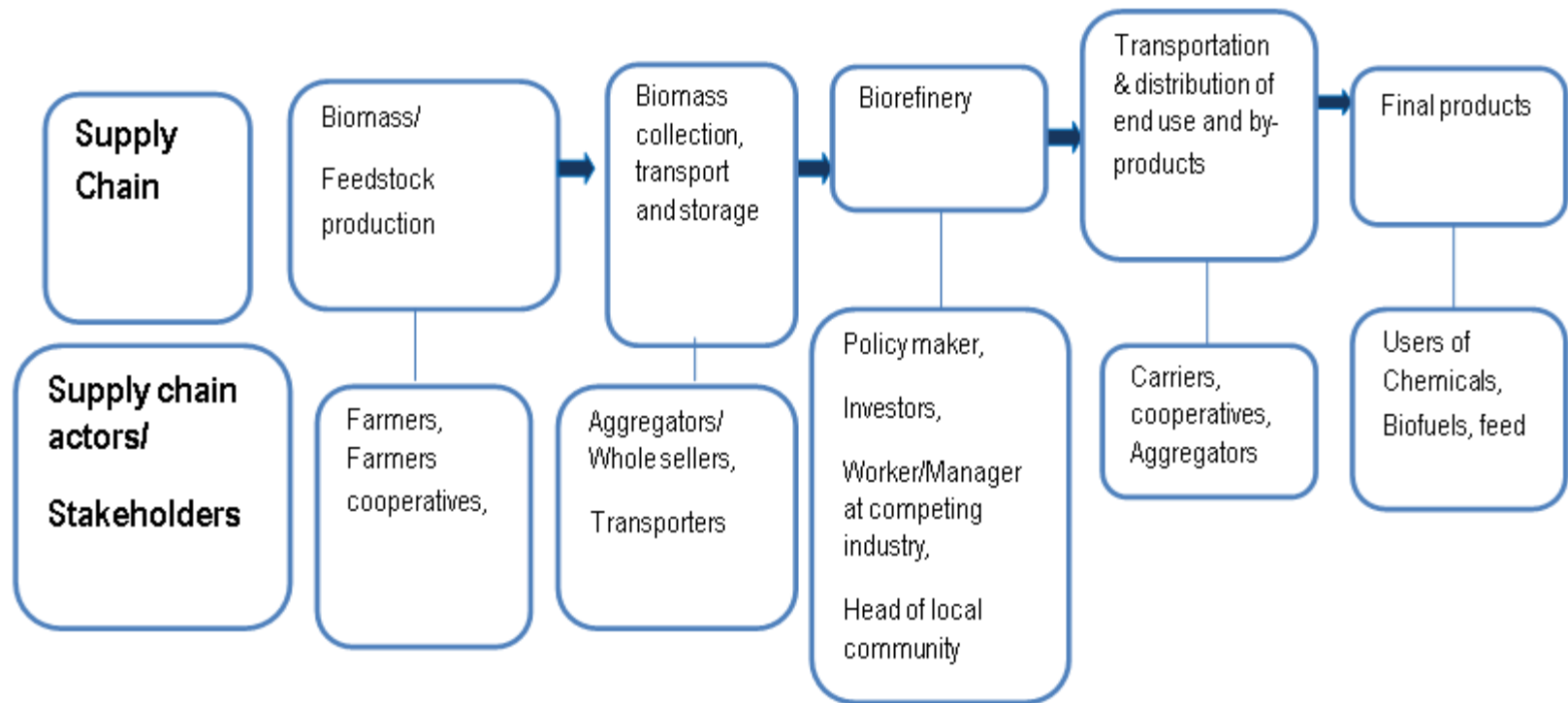
- ❑ Different policy and regulatory instruments in place at EU and National level
- ❑ Policy changes a problem for some stakeholders
- ❑ No sustainability framework for lignocellulosic feedstock
- ❑ Changes after 2020 mainly for lignocellulosic
- ❑ Need standards for particular issues such as C content

Indian Policies



Assessment

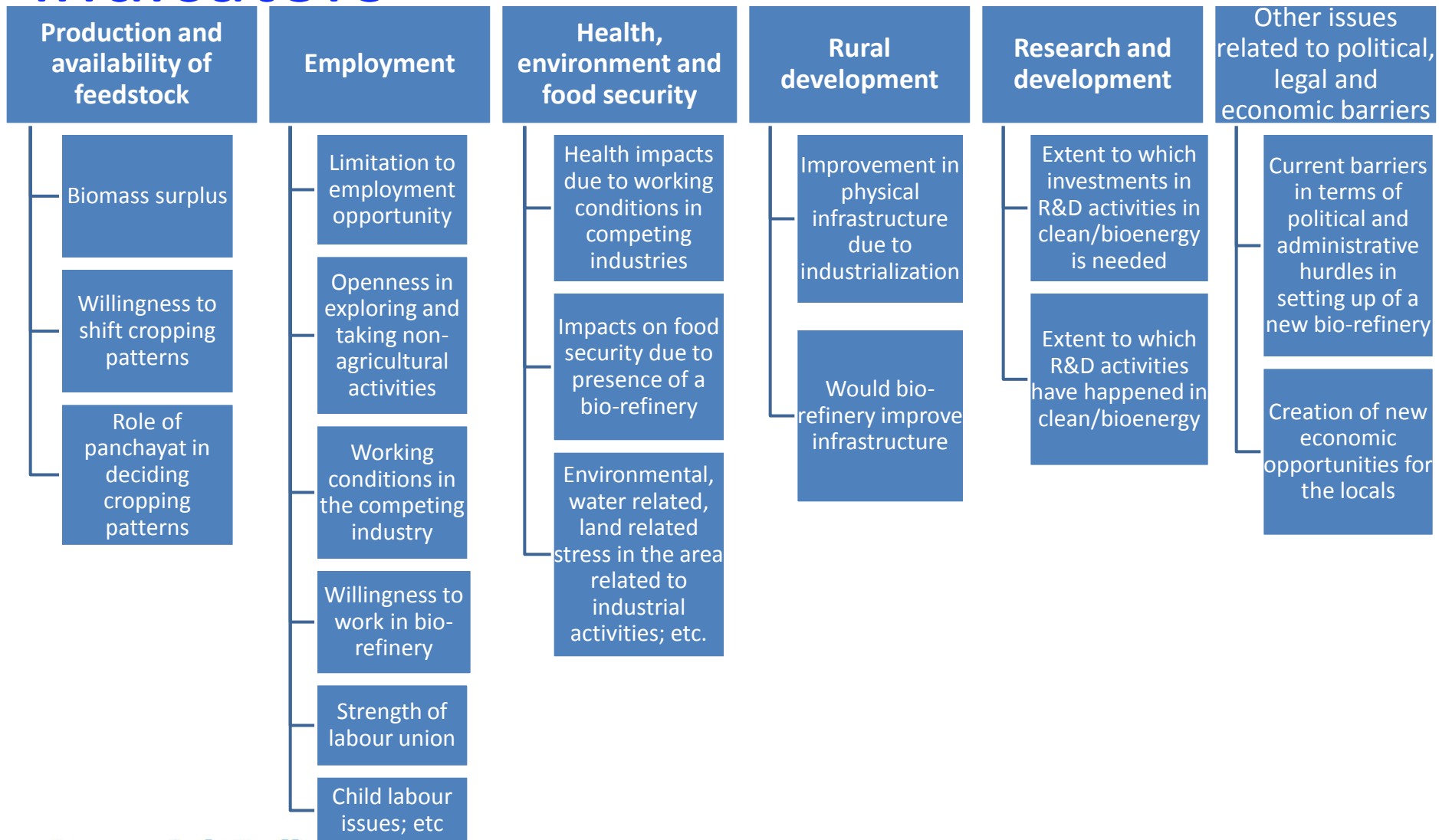
- ❑ A dedicated thinking on bioenergy and its derivative products need to be mainstreamed; awareness for use of bio-products need to be promoted
- ❑ Policy discussions on second generation biofuel, bioenergy has not gone beyond lab-scale applications; policy support for R&D required
- ❑ India's biofuel policy is silent on the market creation of agricultural residues and market based incentives and enforceable targets need to be created for promotion of bioenergy



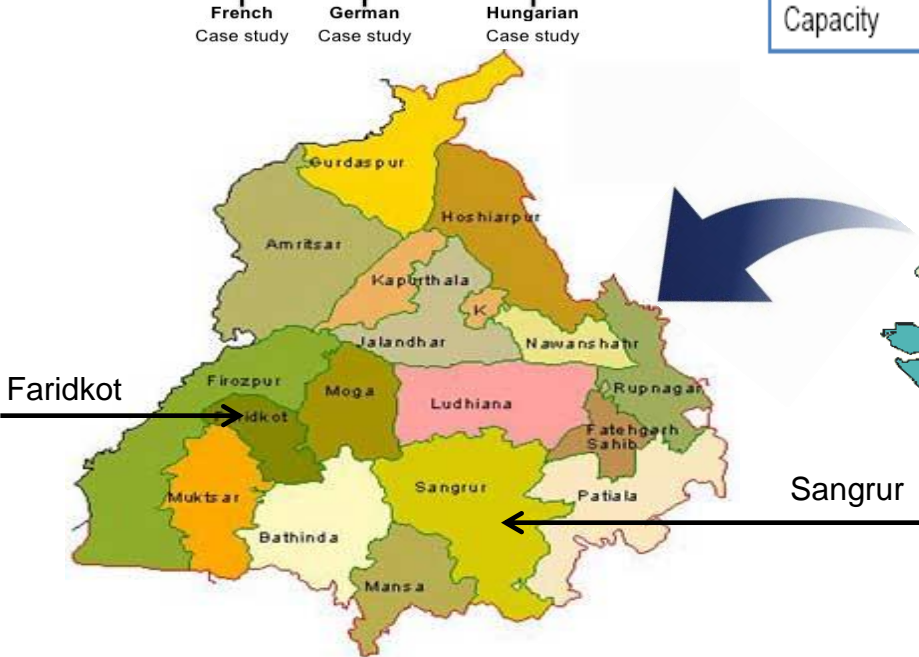
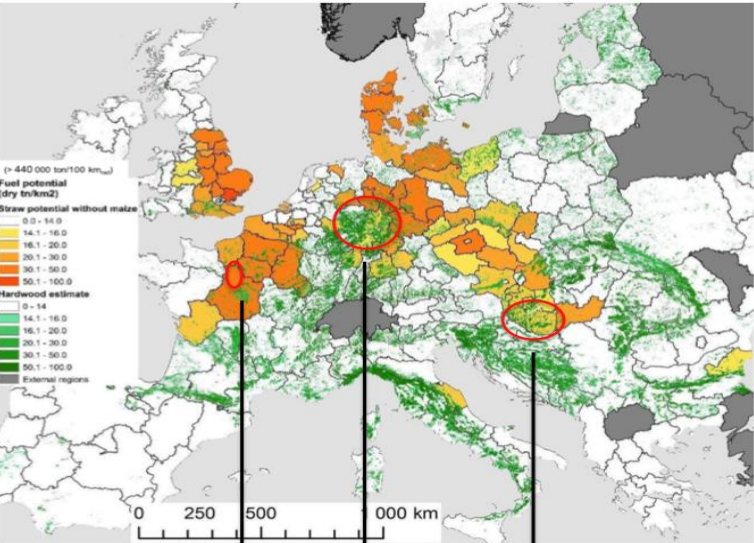
The main products that the sLCA will assess include:

- Bioplastics
- Food and pharma block (sugar and alcohol)
- Technical products (polymers, organic acids, pigments, inorganics)
- Feed (animal)
- Fuel

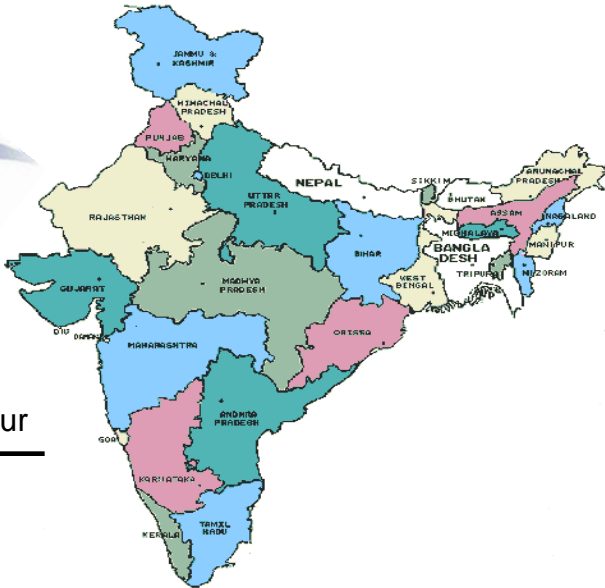
Key variables and sustainability indicators



Summary of the BIOCORE case studies



Property	France	Germany	Hungary	India 1	India 2
Location	Centre (Beauce)	Mid-West	South-West	Sangrur	Faridkot
Case study area (ha)	900 000 ha (farmland 800 000 ha)	7.7 Mha (farmland 3.5 Mha, forest 2.6 Mha, urban 1.5 Mha)	1.6 Mha (farmland 1 Mha, forest 450 000 ha)	500 000 ha (farmland 440 000 ha)	150 000 ha (farmland 130 000 ha)
Main feedstock	Wheat / barley straw	Hardwood	Wheat / barley / maize straw	Rice straw	Rice straw
Other feedstock	Miscanthus	Softwood	SRC poplar Hardwood	Wheat straw	Wheat straw
Capacity	150 kt	150 kt	150 kt	150 & 500 kt	150 kt



Social assessment

- Three cases in the EU (France, Hungary and Germany) demonstrate the differences at national and regional level as well as with the Indian case study
- Limited availability of feedstock in some cases along with negative willingness to sell to a biorefinery
- Skills in place but may be limited to isolated areas where feedstock is available
- Job creation limited to the feedstock treatment and transport not so much production and conversion
- Some gender and health issues to be considered at the production and transformation level
- **Methodology developed by IMPERIAL combined social assessment is better than sLCA on its own**

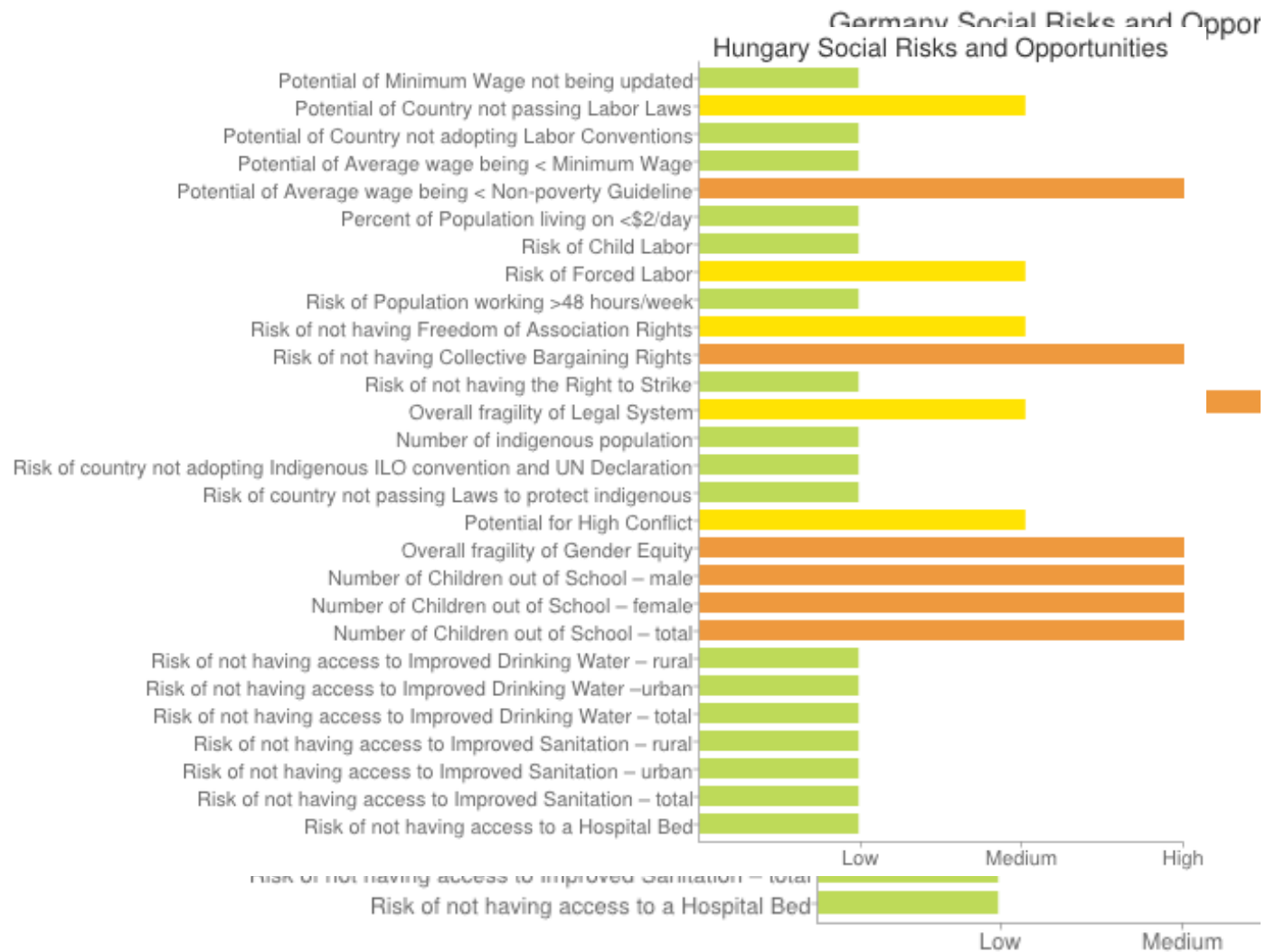
No	Parameter	Characteristics/Criteria	Level of assessment	Stage of the supply chain	Type of data
1	Trade of feedstock	Incentives and barriers	EU/National	Feedstock	Qualitative
2	Identification of stakeholders along the supply chain	Producers (farmers) Regulators Business Traders	Local	All	Qualitative, literature and interviews
3	Policies and regulations	International National Regional Local	National and International	All	Qualitative (section 5)
4	Potential biorefinery location Logistic	Availability of feedstock Current use of residues Potential for supply of feedstock	National and local	Feedstock, Transport and storage, Biorefinery	Included in Reports of WP1
5	Land use tenure	Land ownership rights	National	Feedstock	Qualitative, literature
6	Community participation	Acceptance of community to: - Residues of feedstock used for biorefinery - Dedicated feedstock for biorefinery use - Biorefinery construction Indigenous communities	Local	Feedstock, Transport and storage, Biorefinery	Qualitative, interviews HSDB
7	Quality of life	Improvement of quality of life Improvement of livelihoods Improvement of socio-economic conditions	NA	NA	NA

8	Rural development and Infrastructure	Sanitation Roads Water	National level	Feedstock, Transport and storage, Biorefinery	Qualitative, hotspot database
9	Jobs creation and wages	Labour involved on residues collection or dedicated crops Jobs created for biorefinery Jobs created for transportation Wages paid according to national/regional regulation (minimum wage) Poverty reduction	National Local National	Feedstock, Transport and storage, Biorefinery	Qualitative Interviews Hotspots database wages Interviews Hotspot database
10	Gender equity	Inclusion of women	National	Feedstock, Transport and storage, Biorefinery	Hotspot database
11	Labour conditions	ILO conventions and human rights including: - Child labour - Right to organise - Indigenous rights - Forced labour	National	Feedstock, Transport and storage, Biorefinery	Hotspot database
12	Health and safety	Compliance with health and safety regulations at the different supply chains	National	Feedstock, Transport and storage, Biorefinery	Qualitative interviews
13	Competition with other sectors	Competition of residues use for biorefinery and impact on other industries and sectors that affects negatively	Local	Feedstock, final products	Qualitative interviews

HSDB

France

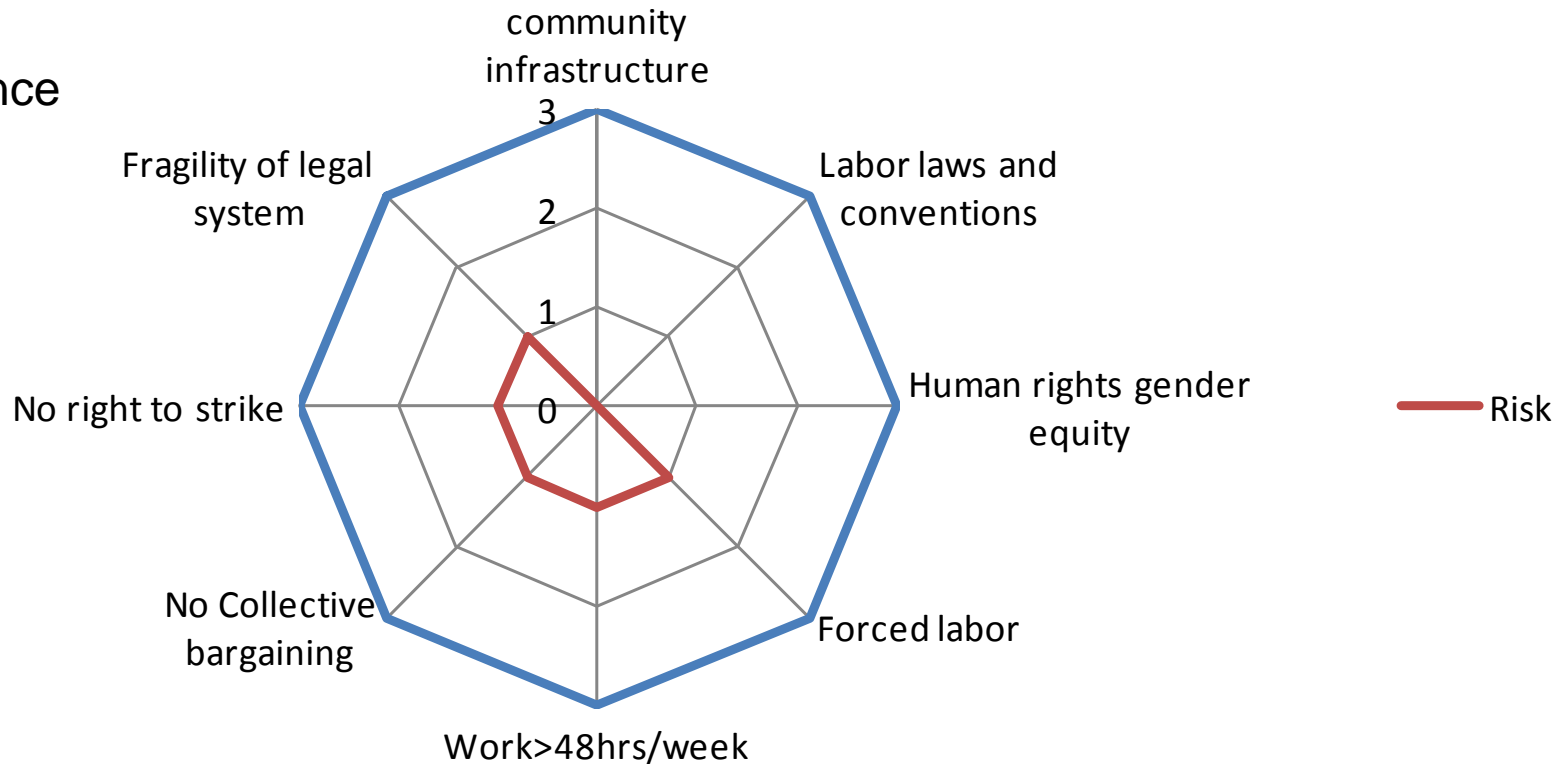




Main indicators assessment

India

France

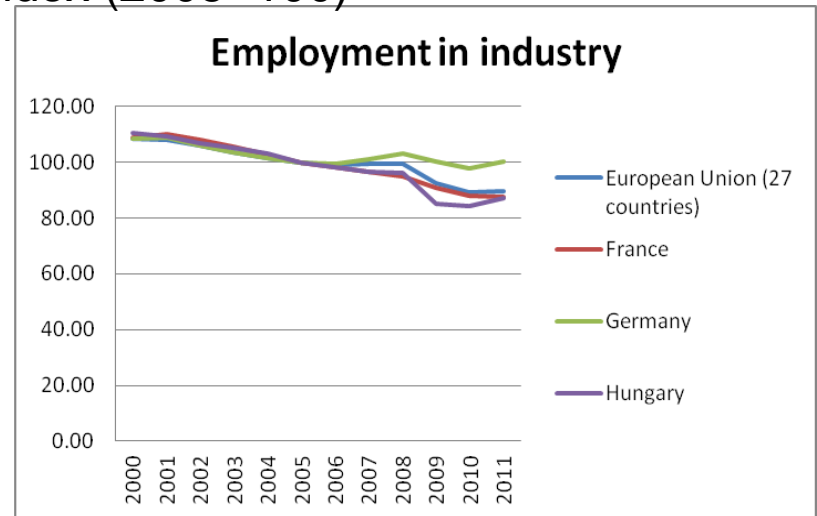
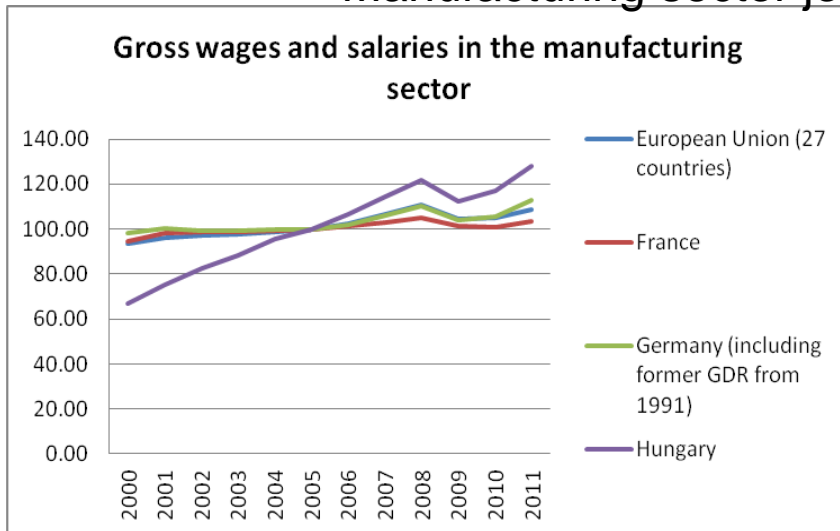


Market development

Manufacture production index

Region/year	2010	2011	2012
European Union (27 countries)	100.14	102.80	101.25
Germany	107.84	113.85	112.95
France	89.74	91.79	89.75
Hungary	110.95	115.16	114.55

Manufacturing sector jobs index (2005=100)



Stakeholder workshop Brussels 2013

- Workshop on production and conversion

TOPIC

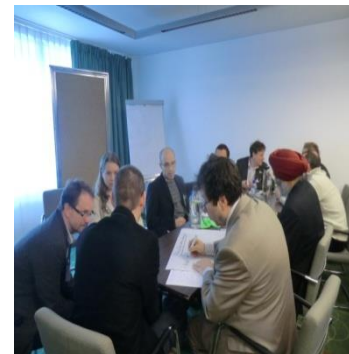
Introduction

Market development

Infrastructure and skills

Policy and legislation issues

Wrap up



Assessment

Type of impact: D direct; B background

Impact + positive; - negative; N neutral

Risk/Benefits: L low; M, Medium; H high; VH very high

NO	Parameter	Characteristics/ Criteria	Type	Impact	Risk	Benefit	Mitigation	Other
1	Production of feedstock	Incentives	B	+		M		There are not clear incentives in place that show current benefits for investment in biorefineries activities.
		Barriers	B	-	L		Local issues related to the collection of the residues	
3	Policies and regulations	National	B	+		M		A Policy framework is in place. Application and enforcement seem to have some issues on transparency.
		Enforcement	B	-	H		Potential high risk of overall legal fragility system.	
5	Land use tenure	Land ownership rights	D	-	M		Transparency on land deals.	Land deals are not an issue for the biorefinery project as it focuses mainly on residues. It would only apply to the land where the facility will be installed.

Conclusions

- A combined **methodology** for social assessment demonstrates to be better than considering only sLCA due to the multiple synergies of the sector
- It is possible to mitigate or prevent some of the possible negative impacts.
- **Willigness** to sell the feedstock and the possible **competition** with other sectors particularly other agroindustries and forestry associated sectors main considerations
- **Policies** need to consider the activities of stakeholders and create an environment for investment
- **Job creation** needs to be addressed for particular cases to avoid creating expectations and consider other stages in the supply chain
- Skills may be possible to improve from existing sectors
- **Multiple products will need to look for standards** (particularly in the EU) that are not yet available (mainly **C content**)

Recommendations

- For a biorefinery to be set up research and development and rural development need to be pushed further.
- For the establishment of a biorefinery a proper feasibility study along with social and environmental impact assessment will be required, for the whole supply chain.
- Large investments should consider the application of the Equator Principles to comply with international sustainability standards.

Other studies



- BIOCORE <http://www.biocore-europe.org/>

- Global-Bio-Pact

http://www.globalbiopact.eu/index.php?option=com_content&view=article&id=57&Itemid=56



- EC Baselines 2008 & 2010



- http://ec.europa.eu/energy/renewables/studies/renewables_en.htm

- Biobench

- EUBIONET www.eubionet.net



THANK YOU

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