

Sustainable Crop Biofuels in Africa

EIA or ESIA process

Issues and Challenges

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What is Environmental and Social Impact Assessment (ESIA)?

- Simply:
 - Systematic examination of environmental (social etc) consequences of a project in order to protect the environment from unacceptable, unnecessary damage.
- Involves core activities:
 - Scoping for predicted impacts
 - Stakeholder engagement and public participation
 - Assessment of significance for each impact
 - Mitigation recommendations
 - Independent opinion of author of the acceptability of the impacts of a project

How are Impacts Assessed?

- Typical best practice methodology for assessing Environmental and Social Impacts:
 - Temporal (Timeframes)
 - Spatial (Geographical extent)
 - Severity (How easily is it mitigated?)
 - Certainty (How likely is it?)
- = Overall Significance**

ESIA/EIA approval process:

- Facilitate implementation of Biofuel/Biogas/Wind power projects (Sugar cane, Jatropha, Sweet potato, Palm oil, etc)
- Also at interface of POTENTIAL Biofuel projects (e.g. aquaculture, sewage treatment, landfill sites)
- ESIA/EIA has been slow on the uptake: regulations, regulators, but ALSO environmental consultants

Legislation: National (RSA)

- **Constitution**
 - Everyone has a right to a safe environment which is not harmful.
- **National Environmental Management Act**
 - Integrated Environmental management
 - Precautionary approach
 - Polluter pays
 - Duty of care from cradle to grave
 - Transparency and democracy
 - Accountability and liability
- **Environmental Impact Assessment regulations**
 - Provided regulatory activities to be carried out and information to be provided for submission to authorities who make final decision.

RSA: legislation continued

- Air Quality Act: burning fuel for energy generation requires Air Quality license.

- Waste Act: Waste license

11. The processing of waste at biogas installations with a capacity for receiving five tonnes or more per day of animal waste, animal manure, abattoir waste or vegetable waste, including the construction of a facility and associated structures and infrastructure for such processing animal manure and abattoir waste.

- No guidelines for assessing Biofuels in terms of sustainability

Legislation: International/Funding requirements

- **Equator principles (Best practice)**
 - Review and categorisation of project
 - Social and Environmental Assessment
 - Applicable Social and Environmental Standards
 - Action Plan and Management System
 - Consultation and Disclosure
- **International Finance Corporation: Performance standards**
 - Social and Environmental Assessment and Management System
 - Labour and Working conditions
 - Pollution prevention and abatement
 - Community Health, Safety and Security
 - Land acquisition and involuntary resettlement
 - Biodiversity Conservation and Sustainable Natural Resource Management
 - Indigenous people
 - Cultural Heritage

European Policy

- **EU Renewable Energy Directive (RED) on Biofuels and associated requirements:**

- Biodiversity not impacted
- Demonstrated GHG savings

- **EU RED methodology**

- Total emissions formula (TEF) :

$$E = e_{ec} + e_l + e_p + e_{td} + e_u - e_{sca} - e_{ccs} - e_{ccr} - e_{ee}$$

Biofuels: Impact Assessment

- **Relatively new in the realm of ESIA.**
- **Methods of assessment still need to be adopted and refined to include assessment of sustainability and climate change factors.**
- **Probably one of the most complex ESIA's as it directly affects extremely diverse, inter-dependent fields.**

Opportunities

- **ESIA can detect non-sustainable projects and screen projects at early project inception.**



Challenges posed by Agri-Biofuels in the ESIA

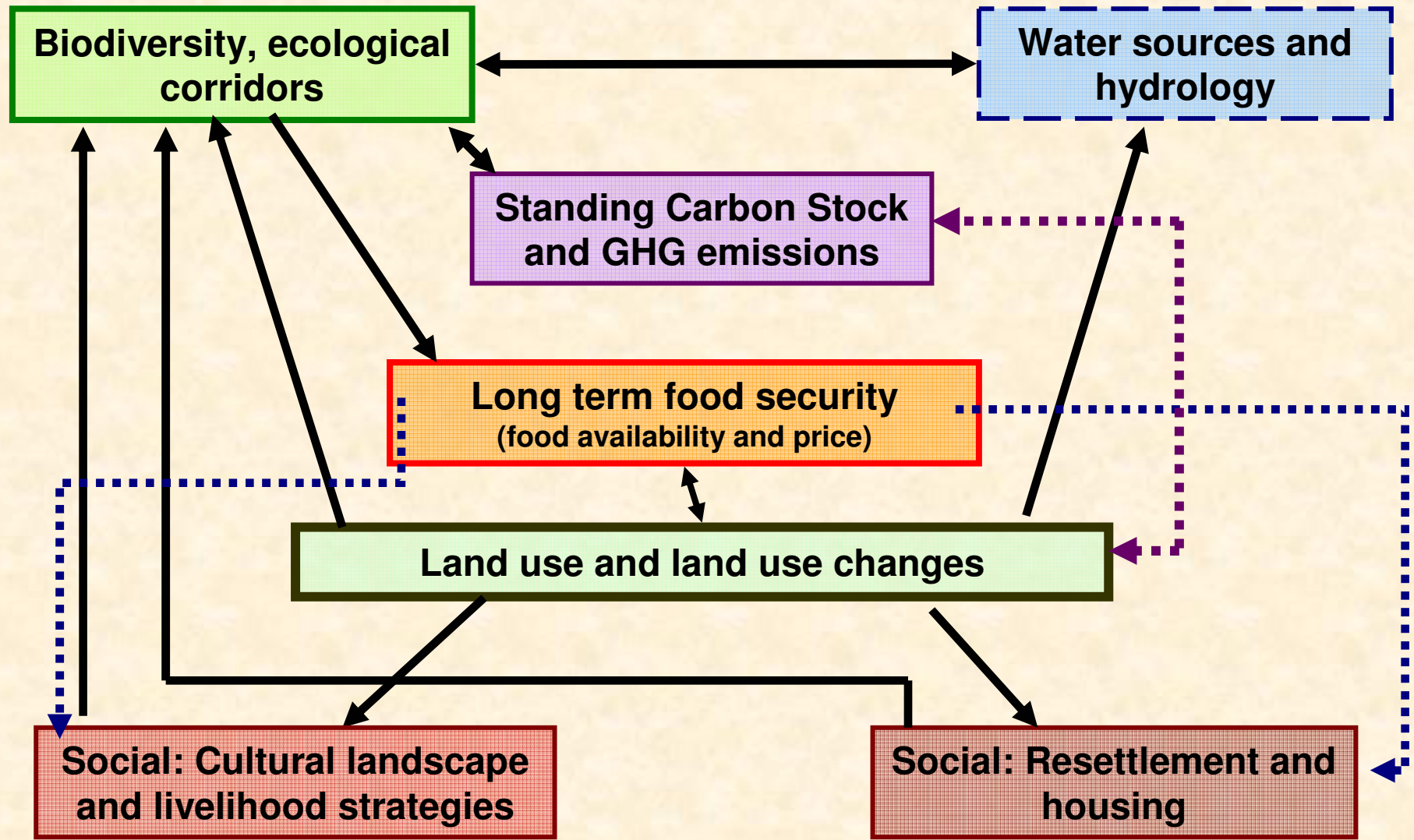
- Highly dynamic and complex parameters: land-use, land ownership, biodiversity, carbon stock and GHG Life-cycle assessment, ecological corridors, waste, water requirements, resettlement etc.

Natural landscape of Biofuel project in Sierra Leone

Complexity of natural landscape which needs to be taken into account (projects often over 20 000+ ha).



Issues and Impacts



Challenges posed by Agri-Biofuels in the ESIA

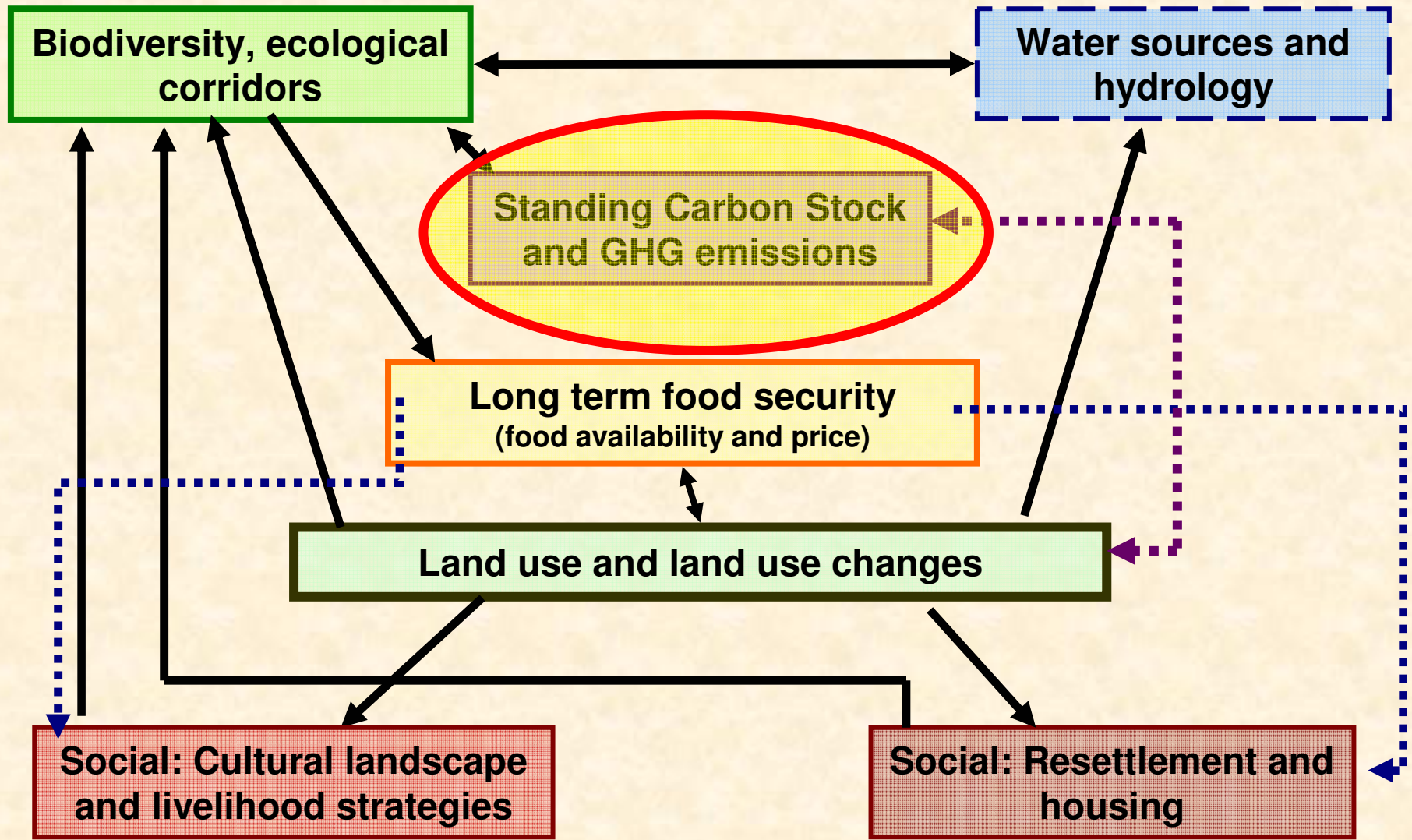
Many levels of sustainability

- Highly dynamic and complex parameters: land-use, land ownership, biodiversity, carbon stock and GHG Life-cycle assessment, ecological corridors, waste, water requirements, resettlement etc.
- Project should demonstrate net savings of GHG in order to comply with climate change strategies.
- Issue of food security (Biofuel crops replacing food crops) especially considering climate change predictions.
- In SA: reluctance of regulator to implement EE, Renewable/Alternative energy recommendations, without the legislated support

Recurring considerations:

- **Biodiversity, ecological corridors and natural resources:**
- Co-production and management
- Green House Gas emissions reductions
- **Sustainability of water sources** and hydrology
- Infrastructure, housing and transport
- Social impact and resettlement
- Current land-use and ownership (is there space?):
linked to...
- **Long term food security**
- **Standing Carbon stock and Life cycle assessment**

Issues and Impacts



New ESIA/EIA methodologies

In event Biofuel is destined for EU, EU RED invokes:

1. Need to calculate current Carbon Stocks
 2. Need to calculate GHG savings
- CES carried out these studies and encountered challenges in terms of ESIA/EIA reporting.

Carbon Stock and GHG: not typical impacts!

- Traditional criteria and ranking cannot be applied to potential impacts:
 - Temporal = indefinite
 - Spatial = global
 - Certainty = definite
 - Severity/Benefit on global scale?
- Does not allow elucidation of actual significance of impact

Findings and tools:

Carbon Stock Impact Assessment

1. Carbon pool/potential of vegetation type
2. Total area of vegetation type to be cleared as percentage of total carbon stock

E.g. Scale 1

<u>Severity</u>	<u>Carbon pool</u>	<u>Rank</u>	
Slight	= 1- 5 tonnes C/ha	= 1	(Typical of poor grasslands)
Moderate	= 5- 80 tonnes C/ha	= 2	
Severe/Beneficial	= 81- 200 tonnes C/ha	= 3	
Very severe/beneficial	= 201+	= 4	(Typical of Forest)

Findings and tools: GHG Life-cycle assessment

- ***In-situ* carbon stock measurements are a vital pieces of information, which may “make or break” renewable energy project.**
- **Rated *each* life cycle impact with respect to the GHG impact of fossil fuel-based “reference gasoline”.**
- **IPCC (2006) biomass and carbon defaults: misleading due to site specific circumstances**

Concluding remarks:

- Issue of food security does not only relate to food crops: the areas required may indirectly affect food crops by replacement: rural isolated African communities
- Layout of Biofuel projects need to secure much larger area that required to incorporate the following factors:
 - Biodiversity hotspots as “No-Go” areas in the area
 - Natural preservation of representative vegetation types
 - Preservation of areas for food crops in rural communities
 - Resettlement
 - Infrastructure

....continued

- Identify and utilise previously impacted land.
- ESIA is extremely complex and specialist studies are intrinsically connected.
- Sustainability can be achieved?
 - Perhaps with combination of:
 - Co-generation
 - Grow-out schemes of food crops for rural communities
 - Usage of existing impacted/marginal land (avoiding eco-sensitive areas)

Thank you!



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