

Forestry-Based Bioenergy for Sustainable Development

Providing regulatory and impact assessment frameworks, furthering sustainable forestry based biomass and biofuel production policies and reducing associated risks

Modern biomass and biofuel use is increasing rapidly in most developing countries. Rising fossil fuel prices, energy security, climate change and population growth are the main drivers for the renewed interest in using woody crops for biodiesel, heat and electricity production. Existing forest resources cannot meet the demand in many countries including India, China, South and Eastern Africa; where logging bans are in place to protect the remaining natural forests. To meet new wood-fuel requirements additional woodlots and bioenergy plantations are now being extensively promoted. However, changes in land use are always associated with environmental and social impacts and associated business risks.

RE-Impact is developing and testing an impact assessment framework to help identify and assess suitable locations for bioenergy plantations; and contributes to the ongoing discussion about the competition with food production.

RE-Impact will also guide policy makers, NGOs and bioenergy businesses with planning and implementing feedstock production systems; highlighting their implications for local communities, water resources and biodiversity.

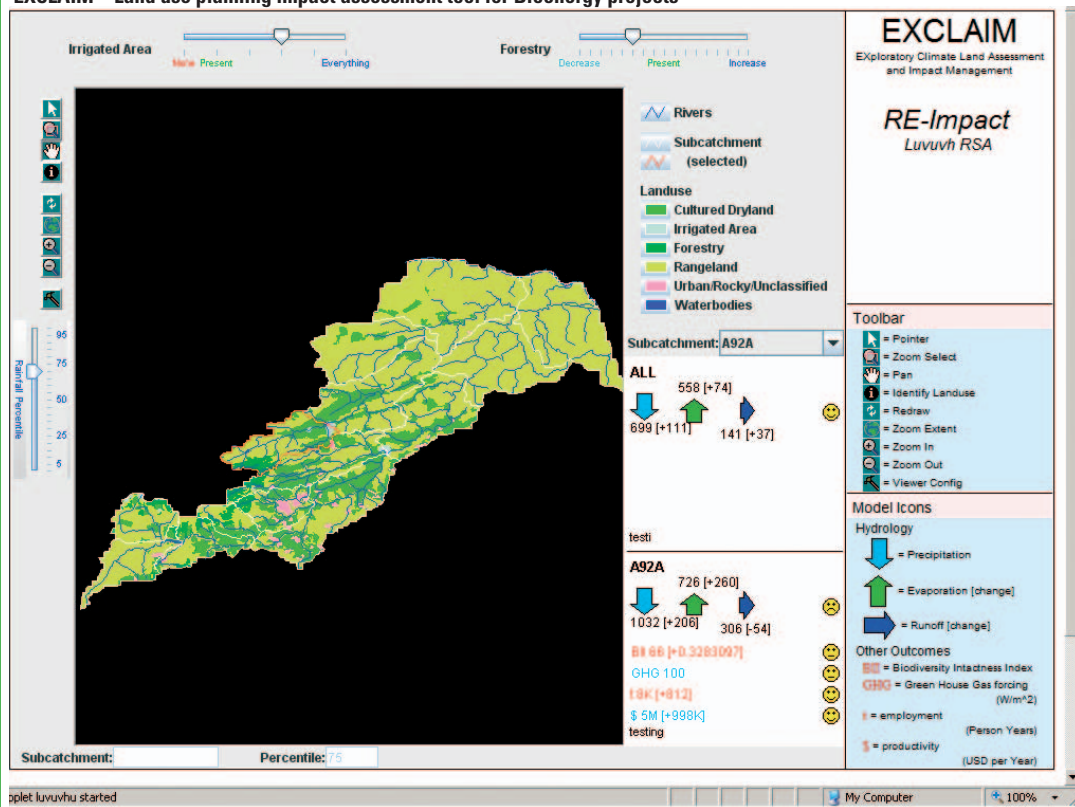
This prototype framework is being developed and tested using case studies in South Africa, Uganda, China and India. The aim is to identify and assess appropriate areas for integrated bioenergy landuse systems, considering sustainable (i.e. renewable production), pro-poor, water allocation quality and biodiversity issues. Impact modelling, using the EXCLAIM tool will demonstrate the tradeoffs in terms of water, biodiversity, green house gas forcing and socioeconomics associated with bioenergy plantations.

The project started in May 2007 and will run until September 2010 involving the creation of within-country stakeholder groups and impact modelling. Project out-puts will include workshops, manuals and teaching materials to promote the concepts of **RE-Impact**.

RE-Impact prototype Sustainability Framework for forestry based bio-energy projects

SCALE	WATER	BIODIVERSITY	CLIMATE CHANGE (Greenhouse gas emissions/sequestration)	SOCIO-ECONOMICS
GLOBAL	Change in large system ecological processes and social services	Change in biodiversity - Species extinction - Biome loss - Biodiversity richness	Net greenhouse gas forcing: - Carbon sequestration - Albedo change - Gaseous/aerosol emissions - Life cycle - Net radiative forcing	Millennium Development Goals Poverty alleviation Global food security Global political stability Impacts on global food and fuel markets (World Trade Organization)
TRANSBOUNDARY	Change in transboundary water systems			
NATIONAL	Change in ecological reserve for rivers	Change in biodiversity - Species extinction - Intactness of habitat - Introduction of alien invasive species	Power density (W/m ²) Energy Return on Energy Investment (EROEI) National carbon accounting (e.g. change in total national carbon emissions, carbon emissions per capita, etc.)	Macro-economic indicators (e.g. GDP, GBI, balance of payments) National food security Employment indicators - Jobs/ha vs Jobs/W (i.e. employment measured either by jobs created per unit of land or per unit of energy produced)
PROVINCIAL/STATE	Change in total streamflow and available water to downstream users Movement towards Catchment Closure Irrigation need			
LOCAL GOVERNMENT	Change in seasonality of streamflow	Change in ecosystem services provided by biodiversity - Provisioning (food, wood) - Regulating impacts (floods, droughts) - Regenerative capacity (supportive services) - Soil degradation	Ability to access and use CDM funds (i.e. Clean Development Mechanism, an arrangement for carbon credit accounting under the Kyoto Protocol)	Household income Equity of distribution (i.e. winner/losers across class, gender, age & urban/rural distinctions, for full product life cycle) Household food security (producing food vs earning money)
CATCHMENT	Change in security of supply			
COMMUNITY	Change in depth to groundwater or yield of groundwater			
HOUSEHOLD	Change in water quality			Employment indicator - Jobs/village Risk of failure Human health impact (e.g. poisons from Jatropha) Vulnerability

EXCLAIM – Land use planning impact assessment tool for Bioenergy projects



LINKS

The project is working with key organisations dealing with policy and regulation on biofuels:

The Roundtable on Sustainable Biofuels

The International Risk Governance Council's project on Governing the Risks and Opportunities of Bioenergy

The International Union of Forest Research Organisations' task force on Forest and Water Interactions

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