

## Aims

This two-year project aims to provide clear empirical evidence about the conditions under which biofuel production and use can improve human wellbeing and become an agent of poverty alleviation in sub-Saharan Africa. In particular, it will:

- compare the environmental and socioeconomic impacts of different modes of biofuel production and use;
  - provide a clear picture of how biofuel-driven ecosystem change affects human wellbeing;
- identify institutional arrangements that can improve pro-poor benefits of biofuel projects.

## Background

The production of biofuel feedstocks – particularly sugar cane and jatropha – has grown significantly across sub-Saharan Africa in the past decade. Several African governments have developed biofuel strategies to tap in to global markets, to boost national energy security and rural development, and to provide the rural poor with access to cleaner energy sources.

Yet it is hotly debated which biofuel crops and modes of production (e.g. scale, ownership, linkages to markets) and use have the greatest potential for poverty alleviation in the continent.

Biofuel production and use interact with ecosystems and poverty in complex ways. While some biofuel projects have provided new income and employment, others have failed and left local communities poorer. Less analysed have been biofuel impacts – positive or negative – on the flow of ecosystem services, and their subsequent effect on the wellbeing, poverty alleviation and food security of rural communities.

Finally, while recent campaigns in Africa to substitute traditional biomass fuels with biofuels for cooking are well meant, the potential trade-offs involved in large-scale substitution are not yet fully understood.

# Unraveling biofuel impacts on ecosystem services, human wellbeing and poverty alleviation in sub-Saharan Africa

The project runs from October 2013 to October 2015. It is funded by a grant from the UK National Environmental Research Council (NERC) through the programme Ecosystem Services for Poverty Alleviation (ESPA).

## Project partners

- University of Oxford, UK
- Stockholm Environment Institute (SEI), Sweden
- Council for Scientific and Industrial Research (CSIR), South Africa
- Centre for Agricultural Research and Development (CARD), Malawi
- University of Tokyo, Japan

## For more information

<http://zoo-oxlel.zoo.ox.ac.uk/research/projects/unravelling-biofuel-impacts-on-ecosystem-services-human-wellbeing-and-poverty-alleviation-in-sub-saharan-africa/>



This interdisciplinary project aims to build the first truly comprehensive understanding of the impacts of biofuel production and use in sub-Saharan Africa. It will collect empirical evidence to identify strategies that could minimize any potential trade-offs at the interface of ecosystems, human wellbeing and poverty alleviation.

## Project approach

Extensive field-based research is taking place at four case study sites in Malawi (Illovo and Dwangwa, BERL), Swaziland (RSSC/SWADE) and Mozambique (Niqel; see map). These case studies represent a combination of small-scale and large-scale biofuels investments using sugar cane or jatropha as feedstock.

The project captures trade-offs between ecosystem services, human wellbeing and poverty alleviation using methods from the social and the natural sciences, from household surveys and focus groups to lifecycle analysis, ecological methodologies and remote sensing.

The main ecosystem services captured are:

- feedstocks for fuel
- food, fodder and fibre
- woodland products
- water
- climate regulation
- pollination
- cultural services.



Jatropha

Some of the multiple dimensions of poverty considered in the project include income, employment, energy poverty, food security, education and public health.

Additionally, the project investigates the interlinkages between urbanized regions and the rural areas from which fuelwood and charcoal is sourced. In particular it assesses the potential environmental and social co-benefits of substituting these traditional fuels with modern biofuels for cooking.

The project puts special focus on Malawi, as it may yield valuable lessons for other countries in the region being the only African country that has been blending biofuels (sugar cane ethanol) with conventional transport fuel in high quantities in the past 30 years.



★ Case study sites



Harvesting sugar cane, Swaziland

The results will be disseminated to various stakeholders, including local biofuel/feedstock producers; national, regional and global policy-makers; practitioners, NGOs, and academics in the case countries and beyond.

Strategic knowledge partnerships have been forged with Solidaridad Southern Africa, Bonsucro, the Roundtable on Sustainable Biomaterials (RSB) and the New Partnership for Africa's Development (NEPAD).