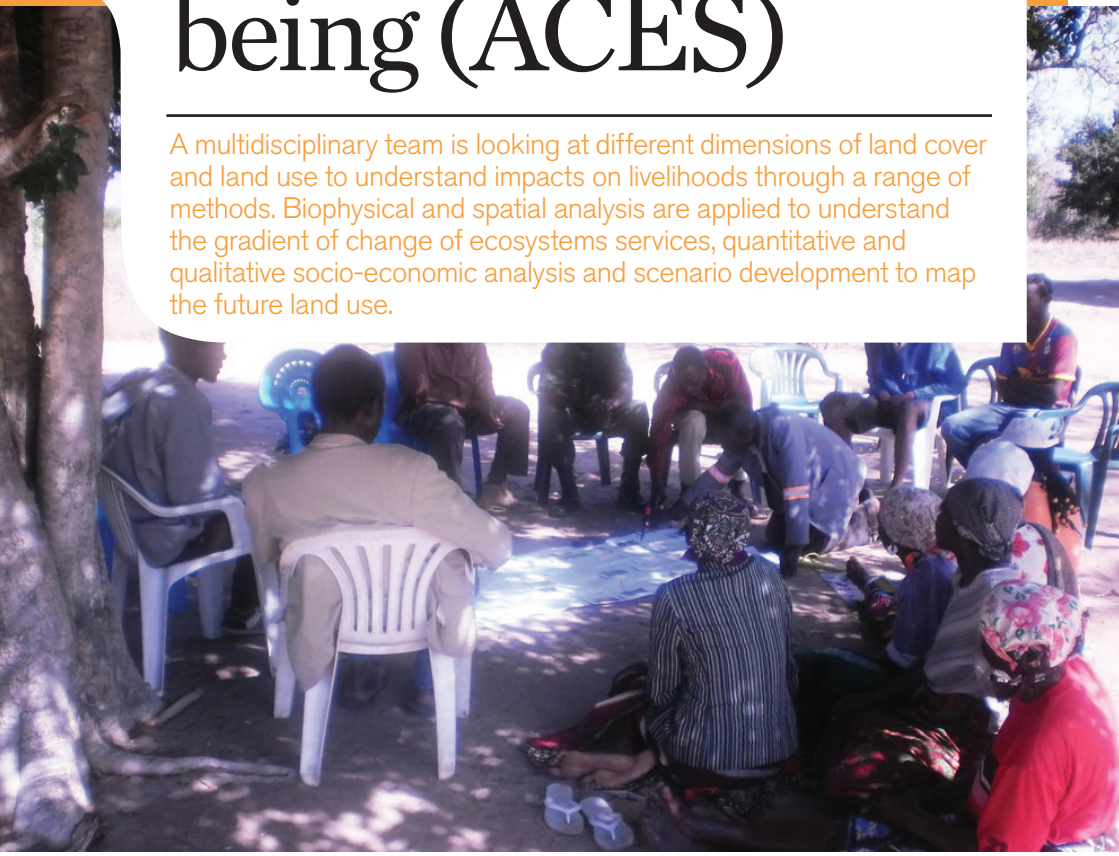
# Abrupt Changes in Ecosystem Services and Well-being (ACES)

A multidisciplinary team is looking at different dimensions of land cover and land use to understand impacts on livelihoods through a range of methods. Biophysical and spatial analysis are applied to understand the gradient of change of ecosystems services, quantitative and qualitative socio-economic analysis and scenario development to map the future land use.



iied

INPE

UNIVERSIDADE EDUARDO MONDLANE

THE UNIVERSITY OF EDINBURGH

# ACES is a three-year (2014 -2017) research project being implemented in Mozambique that examines how woodland loss is changing ecosystem services (ES) and wellbeing of rural poor in the country. It will integrate this new information into land use policy and practices.

Poor rural households depend vitally on ecosystem services derived from woodlands. However, little is known about change: how the impacts of woodland loss and agriculture expansion affect rural wellbeing. Gradual land use change can cause abrupt or non-linear changes to ecosystem services and rural livelihoods, but given the complexity of the system, the key ecological and social processes remains opaque. The research sites include Gaza, Zambézia and Niassa Provinces, considering for each site charcoal production, commercial agriculture with focus on soy production and forest plantation land use change drivers. The project is being implemented by the University of Edinburgh (UoE in United Kingdom) in partnership with University Eduardo Mondlane (UEM in Mozambique), International Institute for Environment and Development (IIED in United Kingdom), University of Zimbabwe, National Institute for Space Research (Brazil) and Lund University Centre for Sustainable Studies.

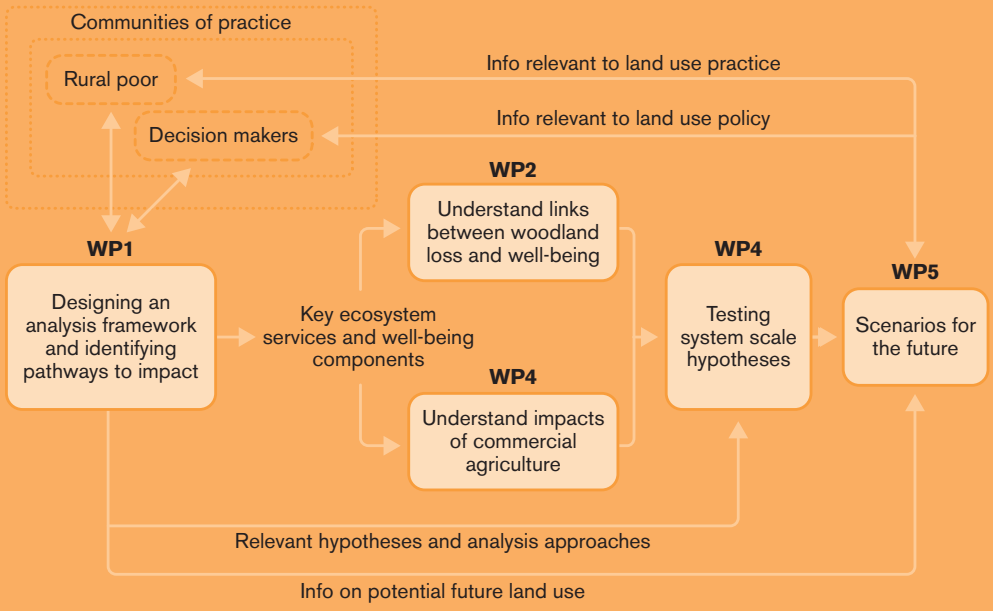
Fire is one of the major drivers of land use change

# Why now?

Developing and implementing effective land use policy is a great challenge, and the confluence of a declining woodland resource, growing populations, and new external pressures mean that it will not get easier. Overall there is little at the national policy level, let alone practice, that acknowledge the importance of ES for wellbeing or which tries to manage the decline in ES as woodlands are converted or degraded. ACES will build on a track record of successfully influencing national land use policy in Mozambique. Through the co-production of a research framework, the generation of robust empirical data, the articulation of realistic future scenarios and the creation of communities of practice, ACES will contribute to improve land use policy in the woodlands of Mozambique.

# Our ambitions

ACES intends to contribute to the process of poverty alleviation in Mozambique by co-producing new knowledge on the dynamic links between land use change, ES and the wellbeing of the rural poor, meeting the demand from policy makers and practitioners for ways to better manage the country´s woodlands. This will be achieved through 5 work packages:



# Outputs and outcomes

## Work package 1. Designing framework for analysis

1.1. A master BBN for local, regional and national understanding of land use change and rural wellbeing;

1.2. A policy brief summarising the actors and current understanding of land use change in Mozambique.

## Work package 2. The links between woodland conservation and degradation and wellbeing

2.1. A paper describing how ecosystem structure and function changes along the gradients;

2.2. A modelled description of the determinants of households ES;

2.3. A quantitative and qualitative investigation of adaptive responses to changes in provisioning, regulating and cultural ES;

2.4. A quantitative examination of the impacts of changing ES use on the wellbeing of the households along the gradients, analysed by poverty groups and gender.

## Work package 3. Understanding the impacts of commercial agriculture

3.1. A journal article mapping the commodity chain of new commercial agriculture modes in central Mozambique;

3.2 and 3.3. A paper examining the impacts of commercial agriculture expansion in Mozambique, on local people, particularly the poorest, quantifying implications for household' wellbeing;

3.4. A police briefing analysing the trade-offs in terms of ES use and wellbeing involved in the development of commercial agriculture, and the export of ES.

## Work package 4. Testing system scale hypotheses of abrupt change

4.1. A short, high-profile paper documenting the empirical relation between land use intensity and ecosystem services provision and rural wellbeing;

4.2. A more in-depth analysis of linkages between land use intensification and wellbeing;

4.3. Maps, at provincial and national scale, of proposed new agriculture expansion and associated estimates of rural wellbeing.

## Work package 5. Scenarios of the future

5.1. Draft of the scenarios based in the initial stakeholder consultation;

5.2. A quantitative map-based output to aid an understanding of the effects of different land use pathways in Mozambique;

5.3. A series of events to present the scenarios to stakeholders by accessible means.

| | TITLE | Jun-13 | Sep-13 | Dec-13 | Mar-14 | Jun-14 | Sep-14 | Dec-14 | Mar-15 | Jun-15 | Sep-15 | Dec-15 | Mar-16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project Management | Kick off / GLP / interim / final meeting | X | | | X | | | X | | | | | X |
| **WP1: Blueprint protocol** | Create Blueprint Protocol with stakeholders, including meeting and draft BBN and scenarios | | | | | | | | | | | | |
| | Creating draft BBns + scenarios at local / regional / national scale | | | | | | | | | | | | |
| **WP5: Scenarios of the future** | Populate Cond. Prob. Tables, based on expert opinion, data, literature | | | | | | | | | | | | |
| | Create storylines and iterate with stakeholders | | | | | | | X | | | | | |
| | locally / regionally / nationally. National meeting to agree storylines. | | | | | | | | | | | | |
| | Create quantitative output and feedback | | | | | | | | | | | | |
| | Translate to impact: Policy brief, video, policy report | | | | | | | | | | | | |
| **WP2: Woodland loss** | Agreeing data collection protocols and pilot. | | | | | | | | | | | | |
| | Plan logistics and community involvement | | | | | | | | | | | | |
| | Remote sensing data analysis | | | | | | | | | | | | |
| | Fieldwork planning (X) / campaigns | | | | X | | X | | | | | | |
| | Data analysis and QA / QC | | | | | | | | | | | | |
| | SEM modeling and A2.3 - 2.5 analysis | | | | | | | | | | | | |
| **WP3: Commercial agriculture** | Agree data collection protocols | | | | | | | | | | | | |
| | Agree study area and engage local communities and companies | | | | | | | | | | | | |
| | Commodity chain analysis (including Brazilian postdoc doc) | | | | | | | | | | | | |
| | Fieldwork planning meeting (X) and campaign | | | | X | | | | | | | | |
| | Data analysis and QA / QC | | | | | | | | | | | | |
| | Analysis for 3.2 - 3.4 | | | | | | | | | | | | |
| **WP4: Systems analysis and upscaling** | Abrupt changes analysis | | | | | | | | | | | | |
| | SEM modeling analysis | | | | | | | | | | | | |
| | Commercial Agriculture Upscaling - assemble data | | | | | | | | | | | | |
| | Commercial Agriculture Upscaling - model impacts and summarize | | | | | | | | | | | | |
| **Pathways to impact** | Engage stakeholders and begin CoP establishment | | | | | | | | | | | | |
| | Media work to highlight issues. Policy brief release (X), videos produced (O) | | | | X | | | XO | | XO | | X | X |
| | Facilitate CoP events. Launch synthesis report (+). Comm. Agric report (x) | | | | | | | | | + | | x | |

# Who is who

We are a group of academics and practitioners interested in land use change, ecosystems, livelihoods and rural development.

**National Institute for Spatial Research, Brazil:** Implementing institution that will provide spatial data for the research and is involved in work package 3 and 5.

**University of Edinburgh, UK:** Institution coordinating all activities including the administrative component of the project;

**Eduardo Mondlane University, Faculty of Agriculture and Forest Engineering, Mozambique:** Implementing institution involved activities of all work packages, as well as part of the Advisory committee;

**International Institute for Environment and Development, UK:** Implementing institution involved in the design of the conceptual framework of the project, the engagement of the stakeholders and management the pathways to impact activities;

**Lund University, Sweden:** Is part of the advisory committee and is guiding the pathways to impact activity;

**University of Zimbabwe, Zimbabwe:** Implementing institution involved in the work package 4 activities;

# Get involved

In order to guarantee the involvement of the interested stakeholders ACES will produce a bulletin twice a year to provide information on the project progress.

### Visit our website

http://miomboaces.wordpress.com/ (English)
http://miomboacespt.wordpress.com/ (Portuguese)

### Get in touch

Genevieve Patenaude - genevieve.patenaude@ed.ac.uk
Casey Ryan - casey.ryan@ed.ac.uk
Isilda Nhantumbo - isilda.nhantumbo@iied.org
Maria Matediane - mjummatediane@gmail.com

## About our funders

**ESPA is a 7-year, £40.5 million interdisciplinary research programme funded by the United Kingdom's Department for International Development (DFID), the Natural Environment Research Council (NERC) and the Economic and Social Research Council (ESRC), as part of the UK's Living with Environmental Change partnership. ESPA's goal is to ensure that, in developing countries, ecosystems are being sustainably managed in a way that contributes to poverty alleviation as well as to inclusive and sustainable growth. See more at: http://www.espa.ac.uk/about/espa#sthash.RjW7Z7E4.dpuf**

Funded by:

espa
ecosystem services for poverty alleviation

Project Materials

**Forests**

*Keywords:*
Ecosystems services, wellbeing, land use change, commercial agriculture

Photo credits:
Pedro Zorrilla Miras