



# Biocultural Restoration of Kenyan Ecosystems

**School:** School of Animal, Rural and Environmental Sciences

**Study mode(s):** Distance learning

**Starting:** 2024

**Funding:** UK student / EU student (non-UK) / International student (non-EU) / Fully-funded

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## Overview

Restoration of degraded ecosystems is a predominant component of the environmental agenda. However, uncertainty on how methods of ecosystem restoration can also meet social needs still remains unclear. This project aims to develop and test biocultural methods for restoration of degraded ecosystems. It will involve a combination of conceptual and analytical tools from functional ecology with ethnobotanical assessments and socioeconomic evaluations. The goal is to devise and develop participatory, science-based and socially accountable restoration methods for socio-ecologically significant landscapes in Kenya.

## **Main Activities**

### **1. Inventory biocultural core of species**

A series of ethnoecological surveys will be conducted in three demonstration ecosystems: a) montane forest; b) savanna and; c) coastal forests. The target populations are indigenous people with good knowledge on local flora and fauna and its traditional uses (both men and women). Key informants will guide the interviews until accumulation curves of new species and uses stabilize in each location. Information on the uses and utilities of species will be recorded based on ethnobotanical and ethnozoological understanding established from the literature and local expertise. This will comprise a database of plants, locations, uses and relative importance (measured with salience indexes) for local communities.

### **2. Modeling distribution of species under climate change and land-use scenarios**

The second phase will generate maps of potential distributions of the biocultural core of species for the whole Kenyan territory. These models can thus be adjusted to climate change projections in order to help predicting species expansion and/or shrinking, can guide restoration and also help to estimate the potential losses and changes to ecosystem services associated with the biocultural core of species.

### **3. The biodiversity-ecosystem functioning experiment**

We will establish a network of experiments following a randomly stratified approach, to control for the most important local drivers of ecosystem change. For montane and coastal forest, we will establish a series of forest plots in restoration and natural regrowth areas to test the role and performance of different species from the biocultural core, controlling for functional attributes of plants. Additionally, we will monitor ecosystem functioning, notably primary productivity (biomass) and soil properties. For the savanna site, we will establish a series of vegetation plots that can be manipulated to assess different drivers of vegetation change such as community assembly, recovery rates, community resistance and resilience to disturbance and nutrient addition. In all cases, we will follow experimental design that allows experiments to be part of globalwide networks of long-term experiments such as NutNet/Dragnet <<https://nutnet.org/dragnet>> (for grasslands) and 2nd For <<https://sites.google.com/view/2ndfor>> (for forests). This will allow the experiments established to follow world-class protocols for ecological studies and integrate locally conducted research with global networks of research, thus supporting the long-lasting of experiments in Kenya.

#### 4. Landscape assessment of priority areas for biocultural restoration

This chapter aims to create a map of priority areas for restoration using biocultural approaches. This is intended to map the areas where participatory methods and community-led restoration initiatives are more likely to act as triggers of community-based restoration projects. This is intended to have a nation-wide scale and use information on both natural and socioeconomic data overlapped as layers in a mapping exercise similar to others made before and published elsewhere in the literature.

Candidates must contact Dr. Felipe Melo via email ([felipe.melo@ntu.ac.uk](mailto:felipe.melo@ntu.ac.uk)) and send:

A one-page cover-letter with a brief description of the early phases of the candidate's career and skills as well as plans for the future.

A two-page CV or Resumé

## Staff profiles



Felipe Melo

## **Entry qualifications**

The successful candidate will hold a degree in ecology, environmental biology, geography, or a related discipline, plus research experience and/or a MSc or MRes with a minimum of merit/commendation in a relevant subject. The candidate must be able to drive in Kenya to access the research sites.

EU and International students must hold an IELTS English qualification at 6.5 or above, with minimum sub-scores of 6.0 in all component sections (writing, reading, listening and speaking). The successful candidate is responsible for ensuring they have the legal right to reside in Kenya as a PhD Candidate.

## How to apply

The application deadline is 8th March 2024, 11:59 pm GMT.

The application deadline may be brought forward if sufficient applications are received. For a step-by-step guide and to make an application, please visit NTU's [how to apply page](#).

## Fees and funding

Funding for this PhD at Distance will be provided by the [NTU Eastern Africa Centre](#).

The NTU Eastern Africa Centre **fully funded PhD at Distance studentships** will:

- cover the full cost of your PhD at Distance fees.
- provide a stipend for your living expenses in Kenya.
- cover two research visits to the UK.

## Guidance and support

Find out about [guidance and support for PhD students](#).

### Still need help?

Dr. Felipe Melo

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## Contact us

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Lines are open:

Monday – Thursday 8.30 am – 5 pm

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