

PROJECT TITLE: Carbon Dioxide Removal in the UK and Brazil: Using Systems Mapping, System Dynamics, and Multi-criteria Decision Analysis to Explore Impacts on Poverty, Food Security and Biodiversity Conservation

Project Science Theme: Climate Change and Risk

Project keywords: carbon, climate, mitigation, land-use, sustainability

Lead Institution: Bristol

Lead Supervisor: Joanna House, Bristol, geographical science

Co-Supervisor: Luiz Aragao, Exeter University, Geography

Co-Supervisor: T.C. Hales, Cardiff University, School of Earth and Environmental Sciences

Co-Supervisor: Harley Stoddart, Defra

Project Enquiries: jo.house@bristol.ac.uk

Webpage: <https://www.bristol.ac.uk/people/person/Jo-House-52652fec-7711-498c-a7c4-dbe18abfbada/>

Project aims and methods:

This research examines deployment of carbon dioxide removal (CDR) technologies (afforestation, bioenergy with CCS and biochar) in the UK and Brazil, balancing climate goals with sustainable development (eg. poverty reduction, food security, biodiversity). The quantification of trade-offs with development objectives, is particularly relevant given that the UK might rely on Article 6.4 carbon credits from CDR projects in countries like Brazil to meet their own climate commitments. Brazil has a large carbon sink potential on forest, agricultural and degraded lands, with many rural communities dependent on natural environments and living below the poverty line.

The Doctoral Researcher will decide which focus areas of CDR activities or countries (Brazil-Exeter link, Borneo-Cardiff link), and research direction e.g. more data science/AI or more qualitatively/policy focused. Training offered: Remote sensing and GIS techniques (Cardiff, Exeter); land, hydrology, biodiversity and economic modelling tools and AI (Exeter, Bristol, Cardiff); policy and societal contexts, stakeholder engagement, qualitative methods and providing evidence for policy making (Defra, Bristol).

A PhD previously co-supervised by these academic supervisors published papers in Nature and received Bristol's PhD prize. Bristol and Defra supervisors collaborate on the UK Greenhouse Gas Removal Programme (2021-2026) and development of standards for CDR and carbon and nature markets.

Project CASE partner:

Defra will provide staff time to inform of policy context and evidence needs, include the candidate in team meetings and give them access to relevant email discussions. This will be a mixture of in-person and online meetings. Training in stakeholder engagement, how to provide evidence to policy makers in a useful and timely manner, writing policy briefings, and general policy processes. Support them in networking with stakeholders in the UK and internationally.

Useful recruitment links:

For information relating to the research project please contact the lead Supervisor via:
jo.house@bristol.ac.uk

Bristol NERC GW4+ DTP Prospectus:

<https://www.bristol.ac.uk/study/postgraduate/research/great-western-four-doctoral-training-partnership-nerc/>

How to apply to the University of Bristol:

<http://www.bristol.ac.uk/study/postgraduate/apply/>

The application deadline is Thursday 8 January 2026 at 2359 GMT