

# Supporting Scotland's Land Use Transformations: Overview



The James  
**Hutton**  
Institute

Keith Matthews, End of Year 3 meeting with Scottish Government  
25 March 2025, Summary Slides for JHI- C3-1.

# End of Year 3 Meeting

- Previous year end meetings, in years one and two, have been online seminars with summary presentations and Q&A.
- For Year 3 there is a ‘marketplace’ format meeting in Saughton House, 25 March 2025 so the slide decks now function as a primer for the meeting and as a ‘readout’ for those unable to attend.
- This slide-deck reproduces the year three reporting as an update for those familiar with the projects and also has introduction slides and links for new contacts.

# Year three progress report

This year has seen completion of longer-term activities (from years 1&2) with five key deliverables and the initiation of several strands of more exploratory work with new tools and datasets and a new strand of work on the topic of climate impacts and resilience.

- **Opportunity and Risk Mapping** saw the computer-based land capability for agriculture submitted for peer review and a review of datasets needed for land capability for forestry (with Forest Research). **Peatlands mapping** was integrated with other data to create a tool in which peatland restoration can be prioritised (WISE2). The peatland mapping was also tested and opportunities for improvement identified, with datasets acquired from external partners.
- **Multi-scale Analysis** has submitted the **land use change (LUC) analysis methods** for peer review highlighting the benefits of considering farm structure in assessing the burden sharing of LUC scenarios that deliver net zero emissions. The LUC analysis has also added new models (Nitrogen and sediments export) to allow the assessment of trade-offs and synergies between achieving net zero and other environmental objectives. Parametrisation is being refined. Options were also explored for new datasets with which to assess LUC scenario implications, looking beyond land based production to wider rural population (**Landscapes of Consumption**).
- **Damage Screening** work focused on the integration of future climate scenarios and their impacts (such as water shortages) with mapping of farm types, cropped land, grasslands and peatlands. Creating interactive maps and dashboards to generate pressure and impact scenarios for combinations of regions, sectors and activities and (12) alternative future climates.

# Year three progress report, cont.

- **Land use / Land use Change (LU/LUC) Governance Analysis** completed an international literature review seeking examples of joined up land use policies to follow in Scotland. Very few full examples were found, but the review confirmed the main factors. Many government and non-government actors are involved in designing, implementing and supporting shared policies, creating synergies if coordinated. Analysis found few policies had both targets and indicators. It proved difficult to trace budgets for instruments and implementation. Policy coherence can be supported by more explicit information on inputs, processes and outcomes.
- **LU/LUC Story Telling** has completed their analysis of narratives from responses to SG consultations and stakeholder interviews, creating a synthesis report and a digital story. These were shared with the LAJTP and LUTPB teams. Work on lesser heard voices using novel visual methods was also begun.
- **Quantitative Story Telling (QST)** supported the development of future agriculture policy via options appraisal of alternative payment regions. The team tested online dashboards and scenario generation tools with SG analysts and policy leads to provide capabilities for analysis to be used within government.
- **Monitoring and Evaluation of Inter- and Transdisciplinary Methods** completed their analysis of two phases of QST (across years 1-3) and published a synthesis report reporting implications for science-policy interactions. There are lessons for how MRP staff undertake policy-led analysis and how SG staff can dovetail research into their internal processes.

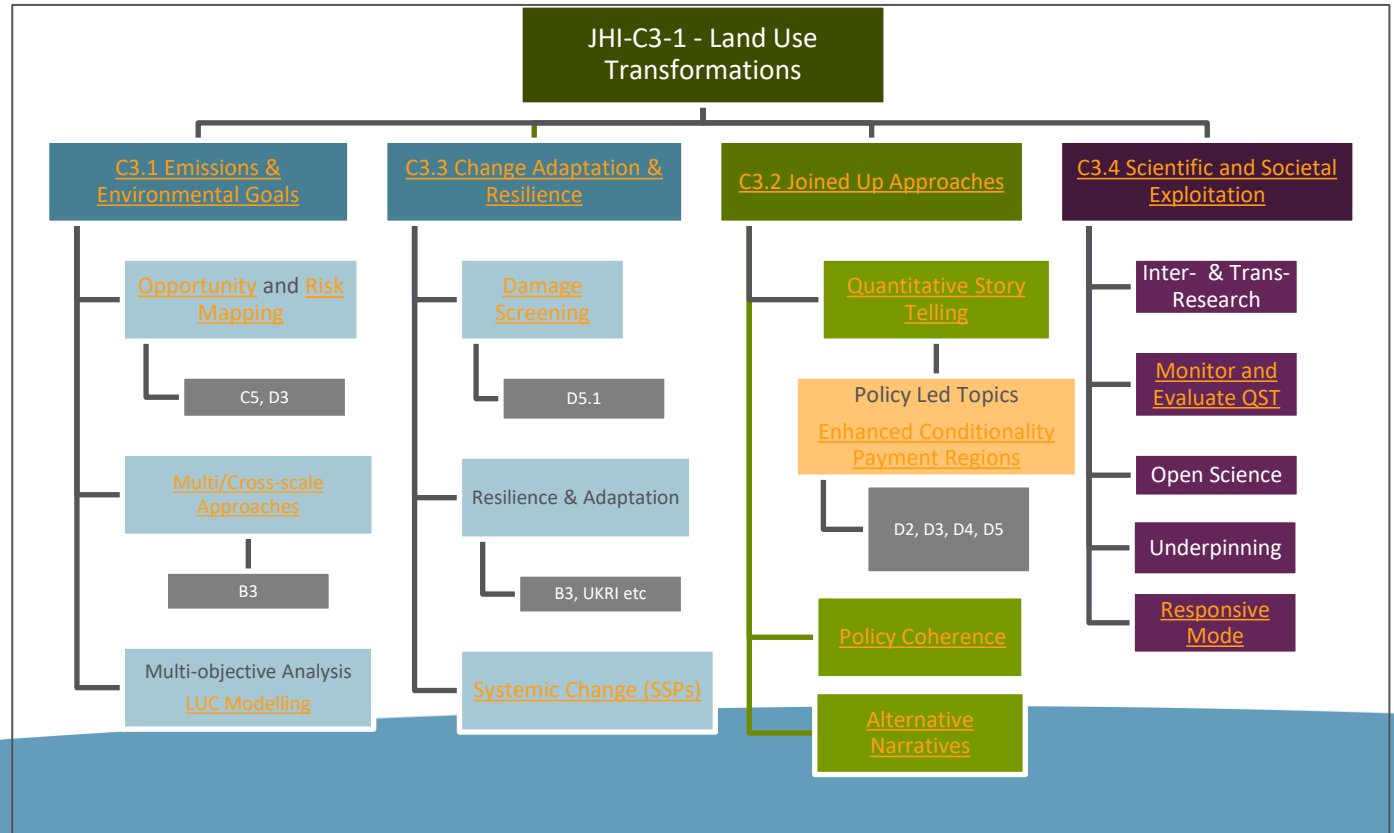
# Project Background

From the Land Use Transformation [project website](#):

- The [purpose of this project](#) is to generate new insights for how land use in Scotland needs to change to meet climate change mitigation, adaptation, and other environmental objectives. The project also considers how approaches to land use can be better joined up
- The project is [interdisciplinary](#) combining natural, social and computational research teams to conduct integrative, spatially explicit, computer-based modelling and social research.
- The research is [policy focused and transdisciplinary](#), with the expectation that the outputs from the research will be co-constructed and used with SG analysts, policy teams and other stakeholders to inform and shape their decision-making processes.
- A common thread across all this project's research questions is generating holistic understanding across systems as wicked problems rather than simplifying or narrowing the analysis to make it more tractable. This is a seriously challenging ambition, since it means grappling with the complexity, uncertainty and trade-offs inherent in large scale, closely coupled, social-ecological systems. Yet policy and land use decisions are often, necessarily, made in such domains.
- Such research must also consider Scotland from multiple non-equivalent perspectives, for example: as a nation; as part of a globalised world; as regions, landscapes and ecosystems; as sectors or businesses and as rural and urban communities. Research that considers these larger focal scales is more likely, despite its limitations, to be informative and impactful, even if only to highlight where policy and other stakeholder decisions are based on partial data, selective analysis, or wishful thinking.

# Projects, WPs and Activities

The four work packages of the project (C3.1) are linked in the figure to descriptions on the project website. With further links to some of the project deliverables and other outputs available via links in each of the activity's boxes.



# Project Team Leads and Topics

Team Lead		Topic	Notes
<a href="#"><u>Keith Matthews</u></a>		Project Overview	All topics
		Policy-led work - Quantitative Story Telling (QST)	Enhanced Conditionality and Regionalisation
<a href="#"><u>Mike Rivington</u></a>		Mitigation and Adaptation	Climate-soil interactions and land capability
<a href="#"><u>Alessandro Gimona</u></a>		Land use Change Analysis	Evaluating LUC scenarios and adding farm structure
<a href="#"><u>Matt Aitkenhead</u></a>		Peatland Mapping	New peatland extent and condition maps
<a href="#"><u>Kirsty Blackstock</u></a>		Governance Issues	Policy coherence
		Monitoring and Evaluation	Analysing the QST process
<a href="#"><u>Naomi Beingessner</u></a>		Land Use Narratives	SG consultation responses and stakeholder interviews

# Linked projects

The RESAS funding has built capacity and provided evidence that have allowed us to deliver further projects associated with land and water change.

- During 2024-25, we also contributed to the CREW [project](#): Future Predictions of Water Scarcity in Scotland: Impacts to Distilleries and Agricultural Abstractors. This ended in June 2024, but the work continues to inform discussions about climate adaptation and impacts on arable farming and distilling, including presentations to the distilling industry, and Scottish Parliament Cross Party Groups on Whisky and Science/Technology (see also MOVING below).
- We continued to lead the transformation WP in [H2020 MERLIN](#) (2021-2026) where six strategies regarding how sectors like agriculture can be involved in mainstreaming freshwater nature-based solutions have been published (see [blog](#)). Hutton has also been working closely with Forth Rivers Trust to support their case study in the Allan Water with information on land use and land management; and this is leading to potential further collaborations linking land use and water in Scotland, with relevance to supporting Scottish policies.
- The H2020 MOVING project ended in August 2024. The information on the project is available [here](#). However, the work continues to inform discussions about the link between land, water, whisky and rural development, including presentations to the distilling industry, and Scottish Parliament Cross Party Groups on Whisky and Science/Technology. It links directly with work undertaken in D2.2 and D5.3 in the Strategic Research Programme.

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Previous related analyses are also available from the Hutton Land Systems Research Team website -  
<https://ics.hutton.ac.uk/research/land-systems-research-team/>

The sets of slides and maps generated in Agriculture Policy analysis from 2010 onwards are available from -  
<https://ics.hutton.ac.uk/research/land-systems-research-team/cap-analysis/>

For woodland expansion analysis see - [online mapping](#) and [paper](#).

[Story Map for Land Use Transformations](#) - land use change modelling.

Further research in the RESAS Strategic Research Programme 2022-27, in the [Land Use Transformations](#) (C3-JHI-1) and [Land Reform](#) (E3-JHI-1) projects.

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