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AI and Evidence Synthesis for Nature-based Solutions and Food Systems Workshop Report

Facilitators: Dr. Christian Reynolds and Dr. Ferne Edwards, Centre for Food Policy, City St. George's, University of London.

This report was drafted by Ferne Edwards.

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This report provides a summary of workshop, hosted by the Joined Up Landscapes project. It convened leading experts from projects using AI-driven evidence synthesis, to share learning, explore the opportunities to apply these approaches to Nature-based Solutions and food systems, and identify potential collaboration opportunities.

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Workshop Details

Date: Tuesday, 25th November 2025, Online

Organisers: Joined Up Landscapes Project

Facilitators: Dr. Christian Reynolds and Dr. Ferne Edwards, Centre for Food Policy, City St. George's, University of London. This report was drafted by Ferne Edwards.

Attendees:

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Kelly Parsons, University of Cambridge
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Daniela Orschanski, Universidad Nacional de Córdoba
Gert van Valkenhoef, The Cochrane Collaboration
Anna Noel-Storr, The Cochrane Collaboration
Sam Reynolds, University of Cambridge
Charlotte Williamson, Kings College London
James Thomas, University College London

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Executive Summary

The Joined Up Landscapes project focuses on Nature-based Solutions for climate adaptation and mitigation in the UK. The first work package developed a systematic map of literature on the relationship between Nature-based Solutions and food systems in the UK. The ambition is to scale this map globally and transition to a living evidence synthesis model using AI. This workshop brought together leading experts to explore the opportunities for AI-driven evidence synthesis for Nature-based Solutions and food systems. The event showcased existing innovative evidence synthesis projects covering a range of topics, including: health; conservation; biodiversity; climate adaptation; and climate-health emergencies. Each project presented their activities. This was followed by a general discussion, including on challenges such as grey literature integration and responsible AI use, considerations around policy engagement. Opportunities for collaboration and future funding bids were discussed, including the potential for shared taxonomies and repositories.

Workshop Background and Objectives

The Joined Up Landscapes project focuses on Nature-based Solutions for climate adaptation and mitigation in the UK. The first work package developed a systematic map of literature on the relationship between Nature-based Solutions and food systems in the UK. Manual (human led) methods were utilised to search for and extract data for the review. The ambition is to scale this map globally, and transition to a living evidence synthesis model using AI, recognising that AI capability and tools are increasingly being applied to make evidence synthesis more efficient and effective. The Joined-up Landscapes team are also involved in other projects, such as the Food System Transformation Solution Bank, with obvious potential to utilise AI-driven evidence synthesis.

A workshop was therefore organised to bring together leading experts, to understand the state-of-the-art in AI-driven evidence synthesis, and explore its application to Nature-based Solutions, food systems, and beyond. The aims of the workshop were to:

- Provide a forum for existing AI-driven evidence synthesis projects to present their work
- Present recent Nature-based Solutions and food systems evidence synthesis projects, and explore the potential for application of AI-driven approaches to
- Discuss collaboration opportunities and funding bids
- Lay the groundwork for a community of practice

Presentation Summaries

Existing evidence synthesis projects were presented, a summary of which is provided below. These cover a range of topics, including: health; conservation; biodiversity; climate adaptation; and climate-health emergencies. Key insights from each project summary are highlighted, where relevant.

Joined Up Landscapes, Christian Reynolds

[Joined Up Landscapes](#) is part of a broader initiative on multifunctional landscapes and Nature-based Solutions for climate adaptation and mitigation in the UK. The first work package involves creating a **systematic map of literature** on the relationship between Nature-based Solutions and food systems to inform system models. Various evidence synthesis tools were used to create this systematic map, including Rayyan, Sysrev, and Eppi-Reviewer.

Food System Transformation Solution Bank, Kelly Parsons

The [Food System Transformation Solution Bank](#) is a database of over 3,500 solutions designed to help researchers, policymakers, and practitioners identify actions to change food systems. The database includes interventions, policies, recommendations, proposals, and evaluated actions, using an inclusive

approach where all existing solutions are eligible. Solutions were manually extracted and coded from approximately 200 sources, guided by a collaboratively-designed taxonomy that classifies solutions according to instigators, impacted stakeholders, targeted outcomes, system level, and other appraisal criteria. Outputs of the project include an Excel spreadsheet and a web interface for easy searching, supported by a hierarchical taxonomy. While not an evidence repository of “what works,” the project represents a step toward that goal, with future plans to expand and integrate AI-driven evidence synthesis and link with other projects for scaling and automation.

The Food Loss and Waste Solution Review, Christian Reynolds

This review extended the Food System Transformation Solution Bank project, by analysing solutions to reduce food loss and waste. The review examined 25 academic, NGO, and policy sources, identifying 700 actions, but found that only 149 had quantifiable impact data, revealing a significant evidence quantification gap. Examples include national strategies such as Australia’s 41 modelled actions and the USA’s 73 proposed actions, with similar policy bundles in other countries. These actions have been integrated into the broader Food System Transformation Solution Bank. Future opportunities include scaling this work into an AI-driven evidence synthesis initiative and linking with global databases to create living repositories of food waste solutions.

Cochrane CENTRAL, Anna Noel-Storr and Gert van Valkenhoef

Cochrane is a global network producing rigorous health evidence and has a [CENTRAL database](#) of over two million controlled trial references. In response to evidence synthesis challenges of rapidly growing research output and slow, siloed manual processes, Cochrane developed a supervised machine learning RCT classifier. It is trained on 200,000 high-quality records, achieves 99.5% recall and significantly reduces manual workload through automated triage combined with human validation. This approach has improved efficiency and accuracy, missing fewer than 1% of relevant trials. Looking ahead, Cochrane aims to move beyond broad identification and deep systematic reviews, toward intermediate synthesis levels, foster human-machine partnerships, and reduce duplication through shared infrastructure.

Key insight: Full automation is unlikely, but safe, reliable AI combined with expert review can transform evidence synthesis.

Conservation Evidence, Sam Reynolds

The [Conservation Evidence project](#) addresses the evidence gap in conservation by summarising the documented effectiveness of conservation actions; traditionally a slow manual process working through millions of published papers.

The project has developed synopses (evidence reviews) for over 26 species and habitats and now includes over 9,000 summarised studies from more than 700 journals, across 17 languages. To accelerate synthesis, a self-hosted [AI pipeline](#) was built, combining small language models for initial screening, and large language models for deeper evaluation and data extraction, ensuring full security without external API (application programming interface) calls. Tested on 150,000 papers, the pipeline achieved 97% recall, identified additional relevant studies missed by manual review, and reduced processing time from 1.5 years to about two weeks. Plans include creating living evidence databases that continuously update, and enabling decentralised, domain-specific repositories for conservation and other fields.

Key insight: AI pipelines can dramatically reduce time and cognitive load, making large-scale subject-wide evidence synthesis feasible.

AI-assisted systematic reviews, Pedro Jaureguiberry

This project evaluated AI approaches to assist systematic reviews, motivated by a biodiversity review that required 165 hours to screen around 4,000 articles manually. The objective was to test whether AI tools could replicate manual selection effectively while improving recall and specificity. Using Google's Notebook LM, articles were pre-processed into four formats and tested in batches of 30 and 50 files, with iterative prompt refinement. Results showed recall up to 95% and specificity around 60%, reducing screening time by 95% (from 165 hours to 7 hours). While false positives increased, cognitive load was reduced as fewer irrelevant papers required reading. Future steps include improving specificity through confidence thresholds and developing custom AI tools with agents for database access, multilingual support, and integration of diverse knowledge sources.

Key Insight: AI can dramatically accelerate systematic reviews, but human oversight remains essential for quality assurance.

GroundProgress, Biljana Macura

[GroundProgress](#) focuses on addressing the lack of systematic reporting in climate adaptation projects, which hinders global stocktake assessments under the Paris Agreement. The project aims to evaluate how adaptation initiatives contribute evidence toward global goals, using the UN Adaptation Framework with over 100 indicators. It prioritises grey literature such as project reports and evaluations, co-designing a data extraction framework with practitioners, funders, and policymakers to align outputs with internationally recognised indicators. To support this, [SEI developed the GPT-based Policy Reader](#), an open-source tool that extracts quotes, summaries, and performs semantic analysis across large

document sets, achieving around 85% accuracy in tests. Next steps include refining prompts, scaling to larger datasets, and improving multilingual support.

Key insight: AI can unlock valuable insights from grey literature, enabling better tracking of adaptation progress and informing global climate resilience strategies.

SOLACE-AI for climate-health emergencies, Charlotte Williamson

[SOLACE-AI](#) is a five-year Wellcome Trust-funded project aiming to design, deploy, and evaluate an AI-driven system for rapid evidence synthesis to support policy and humanitarian responses during climate-health emergencies. Led by King's College London with global partners, the system being developed on [Allen AI's ScholarQA](#) (now Asta) infrastructure and will be open-source, transparent, and capable of differentiating evidence quality while incorporating local sources from the Global South. It will generate context-specific summaries and downloadable reports, addressing limitations of existing tools such as lack of transparency, restricted evidence types, and poor usability. An early system prototype demonstrates automated keyword searches, evidence ranking, and structured summaries, with next steps focused on co-design with stakeholders, case study evaluations, and ensuring usability in low-resource settings.

Key insight: SOLACE-AI seeks to bridge the gap between speed and rigor, delivering actionable evidence during climate-health crises.

DESTINY and METEUS, James Thomas

[DESTINY](#) and [METEUS](#) are projects focused on building scalable, sustainable infrastructure for AI-assisted evidence synthesis to reduce duplication and enable shared resources across domains. DESTINY targets climate and health evidence through living repositories, data extraction robots, and human-in-the-loop validation, with evaluations spanning tool performance, integration into real-world reviews, and long-term impact. METEUS extends this infrastructure to education, crime/justice, and sustainable development, creating comprehensive repositories and new synthesis methods for complex questions. Both projects use automated pipelines and agentic mapping to classify millions of records, supported by taxonomies applied across over 3.5 million records and 13 million enhancements.

Key insight: Full automation is unrealistic; human-machine partnerships and shared infrastructure are essential to move from siloed reviews toward interconnected, living evidence ecosystems.

Discussion

Following the presentations, a group discussion was held, the highlights from which are outlined below.

- Crowded but promising space: diversity of approaches is valuable
- Living evidence repositories are emerging across domains
- Human-in-the-loop approaches ensure rigour and trust
- [Responsible AI use: RAISE guidance emphasised](#)
- Evaluation and validation needed across domains
- Grey literature challenges: accessibility and multilingual issues
- Collaboration opportunities: shared taxonomies and repositories
- Data privacy: preference for self-hosted models
- Policy engagement: balancing speed and rigour
- Discussion of the [Nesta Policy Atlas](#) as a case study of a new AI-powered tool to improve the way that policymakers use evidence.

Next Steps

Projects agreed to explore joint funding bids for grey literature and AI evaluation. A follow-up meeting will be held in 12 months to review progress.

Find out more about the [Joined Up Landscapes project at our website](#)