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## Rebalancing Agri-Food Sustainability in the UK and EU: From Insight to Policy Coherence

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# Workshop Report

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A Participatory Roadmap for Policymakers, Industry, Farmers, and Academia



## Executive Summary

This report presents a participatory approach for evaluating sustainability across natural, produced, and human capital domains to assist targeted, evidence-based UK and EU agri-food policies. Developed as part of the BBSRC-funded Healthy Soil, Healthy Food, Healthy People (H3) project under Cross-Cutting Theme 1 (CCT1), this work draws on a series of multi-stakeholder workshops, expert interviews, and quantitative modelling using the Analytical Hierarchy Process (AHP) within a Multiple Criteria Decision-Making framework.

Results reveal that natural capital is crucial, with land use and biodiversity being the top intervention goals. CO<sub>2</sub> emissions were the most significant negative effect, but participants also identified soil and water deterioration as serious but frequently underestimated dangers. This indicator system shows that long-term agri-food resilience relies on ecological integrity as much as production, and policy must rebalance its priority.

Stakeholders from diverse sectors, including farmers, policy experts, researchers, and environmental specialists, engaged in a structured process to assess and prioritise key sustainability factors. Through this collaborative effort, the project identified the most critical drivers and trade-offs in agri-food production, offering a roadmap for nation and regional sustainability assessments, policymaking, and targeted interventions.

## Introduction

Agri-food systems are central to addressing many of the UK's most pressing challenges, including climate change, environmental degradation, public health, and food security. The H3 project initiative brings together leading researchers and practitioners to co-develop strategies for sustainable transformation of the food system. Within this framework, CCT1 focuses on sustainability metrics and policy tools that reflect the complex interplay between productivity, environmental impact, and social outcomes. In line with national goals including the Environmental Improvement Plan<sup>1</sup>, Net Zero Strategy<sup>2</sup>, and UK Food Strategy<sup>3</sup>, this report provides a decision-support framework for UK and EU agri-food policy. This report has been written to support DEFRA, Food Standards Agency, and local and regional food systems planners.

The goal of this assessment is to build a robust, evidence-based tool to evaluate the sustainability of agri-food production at the nation level. This involves identifying key sustainability indicators, establishing their relative importance, and integrating them into a decision-support model that can guide investment, regulation, and innovation across the sector. An actionable agri-food sustainability framework is presented in this report. It supports nation and regional strategic decision-making, investment planning, and adaptive policy creation using stakeholder-defined priorities and analytical models.

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<sup>1</sup> UK Government, Department for Environment, Food & Rural Affairs. (2023). [Environmental Improvement Plan 2023](#).

<sup>2</sup> Department for Energy Security and Net Zero & Department for Business, Energy & Industrial Strategy. (2021, October 19). [Net Zero Strategy: Build Back Greener](#) (Ref. ISBN 978-1-5286-2938-6; updated April 5, 2022). UK Government.25

<sup>3</sup> Department for Environment, Food & Rural Affairs. (2022). [Government Food Strategy: A prosperous, sustainable and healthy food system](#). UK Government.

# Methodology and Participatory Engagement

A participatory approach was employed to identify, compare, and weigh sustainability indicators. Two expert workshops were held in March 2025, bringing together 23 participants from academia, industry and civil society. The workshops applied the AHP, enabling participants to conduct pairwise comparisons across key sustainability categories:

- ▶ *Inputs: Land, water, labour, capital, livestock, feed, fertilisers, machinery, and energy*
- ▶ *Outputs: Total agrifood output, nutritional health, and biodiversity*
- ▶ *Undesirable Outputs: CO<sub>2</sub> emissions, soil degradation, and water degradation*

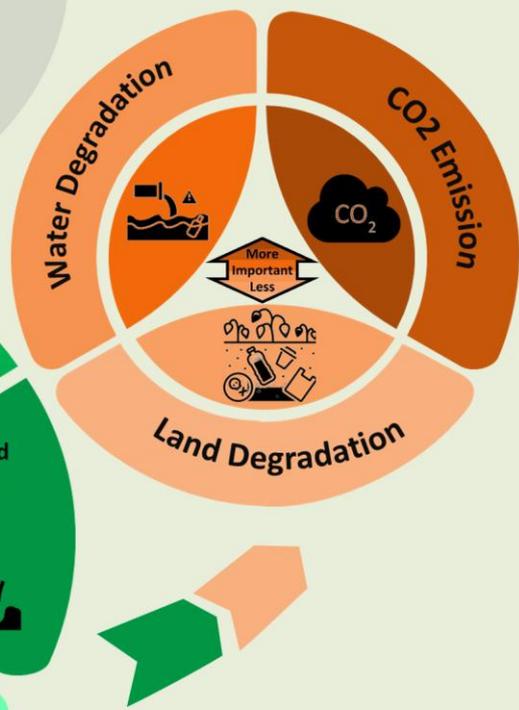
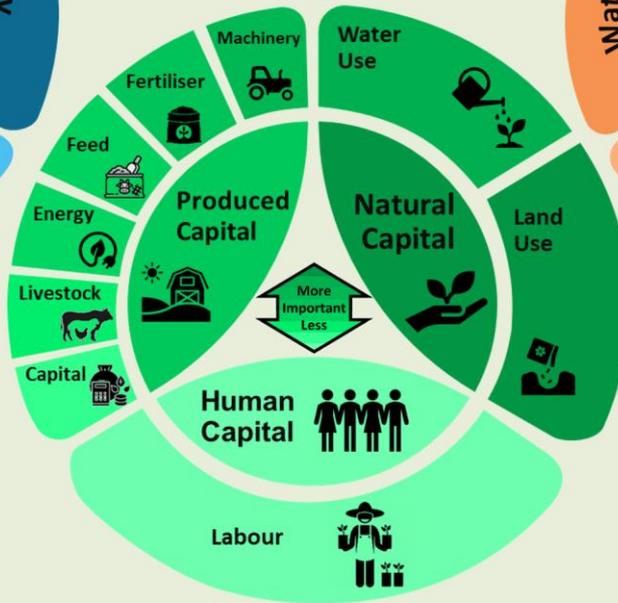
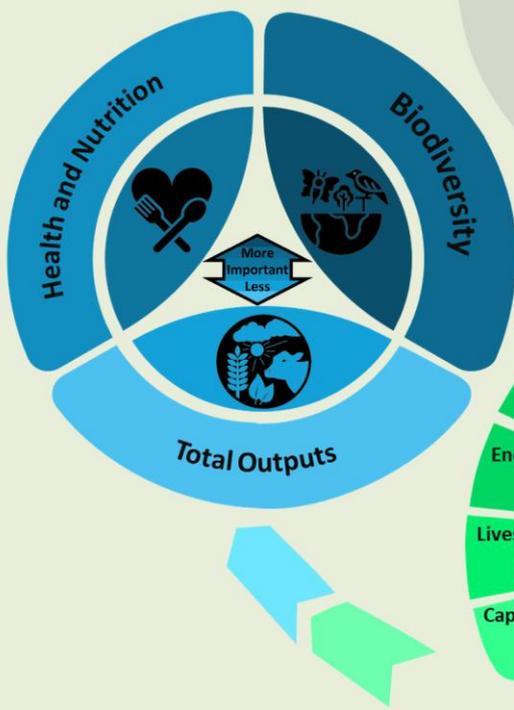


Figure 1: A screenshot from the online workshop

Participants evaluated criteria using structured matrices, while qualitative discussions provided depth and context. These sessions were complemented by three follow-up interviews with leading experts, who helped interpret patterns, address inconsistencies, and explore the implications for policy and practice

## Relative Importance

The Analytical Hierarchy Process (AHP) was employed to determine the relative importance of inputs, outputs, and undesirable outputs in sustainable agrifood production at the nation level.



# Indicator Framework and Results

The workshop and interview processes led to a refined framework for evaluating sustainability, structured around three types of capital, natural, produced, and human, as well as outputs and undesirable outputs. Natural capital (especially land use) emerged as the most critical input, while biodiversity was highlighted as the most valued output. CO<sub>2</sub> emissions were prioritised among undesirable outputs, although follow-up interviews revealed strong concern about the underappreciated risks of soil and water degradation.

Factors	Indicator	Relative Importance	Policy Relevance
Inputs	Land Use	Very High	Core to ELMS and land-based subsidy reform
	Water Use	Moderate–High	Affects resilience to drought and climate shocks
	Machinery	Moderate	Substitute for labour; relevant in tech-intensive systems
	Fertiliser	Moderate	Affects emissions, soil health, and input dependency
	Energy	Moderate	Relevant for farm-level decarbonisation
	Livestock	Moderate	Associated with land use and methane emissions
	Feed	Moderate	Linked to livestock emissions and import dependency
	Capital	Moderate–Low	Influences access to sustainable practices
	Labour	Low	Reflects mechanisation; interviews suggest need to refine
Outputs	Biodiversity	Very High	Indicator of ecological health in country food strategy
	Nutrition & Health	High	Linked to public health and sustainable diet targets
	Total Output	Moderate	Tied to yield targets and economic viability
Undesirable Outputs	CO <sub>2</sub> Emissions	Very High	Tracked under Net Zero and carbon budgeting frameworks
	Water Degradation	High	Lacking consistent nation data or oversight
	Soil Degradation	Moderate-High	Critical for productivity; poorly monitored nationally

**Table 1:  
Normalised  
Relative Importance  
Scores for  
Sustainability  
Indicators**

## Insights from Workshops and Interviews

The participatory sessions revealed important qualitative insights:

- ▶ Participants valued the inclusion of biodiversity not just as an ecological metric but as an enabler of food system resilience.
- ▶ Several stakeholders noted that while emissions attract more attention in public policy, degradation of soil and water resources poses more immediate threats to agricultural productivity.
- ▶ Labour was ranked lowest in terms of importance, reflecting the high degree of mechanisation in UK farming, but follow-up interviews suggested the need to differentiate between high-skilled and low-skilled roles as well as regional development.
- ▶ Experts highlighted the role of worldview and personal experience in shaping sustainability priorities, calling for the clustering of stakeholder responses in future analysis to capture this diversity.



**Based on the evidence gathered, the following recommendations are made:**

## Policy and Industry Implications

- ▶ **Biodiversity as System Resilience.** Biodiversity influences pest management, pollination, and soil function, making it an ecological and system resilience issue, according to most participants. It always led to outputs. National food planning and sustainability reporting must emphasise biodiversity. This involves combining the Government Food Strategy (2022), Environmental Land Management (ELM) Schemes, and legally enforceable biodiversity objectives in the Environmental Improvement Plan 2023 to stop species loss and develop wildlife-rich habitat on agricultural land.
- ▶ **Soil and Water: The Invisible Risks.** Initial scoring placed land and water degradation below emissions, but interviews demonstrated a significant feeling that policy undermonitors and underprioritizes these risks. Many impacts become apparent as productivity diminishes. Government monitoring and subsidies should evaluate long-term viability using soil health criteria. The Sustainable Farming Incentive (SFI) and Farming Rules for Water are relevant frameworks, while the Environmental Improvement Plan's Soil Health Monitoring Programme integrates these characteristics into national baselines and subsidy eligibility.
- ▶ **Labour and Skills Differentiation.** Labour was least significant, indicating mechanisation. Follow-up interviews indicated this undervalues competent high-tech and data-intensive system personnel. To inform workforce policy and training, future indicators should identify low- and high-skilled jobs. The UK Strategy for Agricultural Technologies and The Institute for Agriculture and Horticulture (TIAH) activities support differentiated skills strategies, while the Automation in Horticulture Review (2022) recommends targeted high-skill training for farm-level automation and data-driven operations.
- ▶ **Epistemic Diversity and Interpretive Flexibility.** The worldviews of participants, from low-input regenerative farming to high-efficiency technology systems, influenced their indicator priorities. This variation reflects diverse stakeholder requirements. Future indicator development might isolate stakeholder input by worldview or supply chain role for adaptive modelling and nuanced policymaking. DEFRA's co-design of agri-environment schemes, the Food Data Transparency Partnership, and the planned Land Use Framework for England aim to balance several land-based goals.
- ▶ **Dialogue and Complementarity.** People preferred paired methods, but they underlined interrelated sustainability choices. Labour and machines are interchangeable, but water and fertiliser are not. Policymaking tools should include indicator interaction effects for realistic scenario planning. This matches DEFRA's Agricultural Transition integrated modelling tools and the UK Net Zero Strategy's scenario planning. These technologies might mimic co-dependencies and trade-offs (e.g., water and nutrient consumption or labour and automation) to make sustainability planning more relevant.



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## *Linking Research and Practice*

Across both workshops, participants voiced the importance of creating space for dialogue. The structured pairwise process, AHP, was appreciated for its clarity, yet many noted that sustainability decisions cannot be entirely reduced to numbers. A recurring theme was the concept of 'complementarity': how some inputs, like water and fertiliser, must be used together, while others, like labour and machinery, can substitute for each other.

Another strong theme was the visibility of impacts. While CO<sub>2</sub> is widely monitored and reported, soil degradation often remains invisible until it is too late. Participants stressed the need for public investment in soil monitoring and for revisiting agricultural training programmes to include ecosystem stewardship.

The workshops also revealed unexpected consensus. Despite disciplinary diversity, most participants agreed that long-term food system health depends on recognising ecological boundaries and social realities, not merely increasing desirable outputs while contracting undesirable outputs

## *Looking Ahead: Scaling and Translating Impact*

This participatory framework is highly adaptable. Future applications can include farm-level benchmarking, regional sustainability scoring, and collaborative policy simulations. Several next steps are envisioned:

- ▶ Piloting this model across UK farms using datasets from H3 Work Package 3 (including the 27-farm dataset mentioned); Q3 2025.
- ▶ Expanding the stakeholder base to include farmers' unions, environmental NGOs, and private sector actors; Q1 2026.
- ▶ Integrating the weight structure into digital dashboards for use by DEFRA, FSA, and Publishing a peer-reviewed methods guide for international replication; Q4 2025, local government planners; Q2 2026.

This framework's real-world usage and analytical sophistication make it strong. In addition to modelling, it mobilises. The CCT1 sustainability evaluation established a mechanism for integrating stakeholder interests into national and regional agri-food policy. This participative basis provides applicability across industries and blends scientific integrity with practical understanding. The approach may allow farm-level diagnostics, public funding, and food system actor cooperation as it matures. Developing interactive tools and engaging stakeholders will keep this framework relevant in a changing agricultural context.



## Acknowledgment

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