Delivering better integrated land use decision-making: evidence review

A report for CPRE

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Summary

Land is under increasing pressure to deliver multiple objectives – from energy, housing and transport infrastructure to timber, food, nature recovery, flood and drought management – all whilst reducing emissions. Achieving government objectives at different levels and across sectors is only possible with an integrated approach to managing land use change and its impacts. The effectiveness of Department for the Environment, Farming and Rural Affairs' (Defra) Land Use Framework (LUF), due to be published later in 2025, will rest on the systems, processes and structures by which it is put into practice both locally and regionally.

CPRE, the countryside charity, commissioned Grounded Insight to conduct a rapid evidence review to investigate the tools and enablers for delivering integrated land use decision-making. These include:

- governance arrangements
- public and stakeholder engagement
- metrics and maps
- delivery mechanisms including financial incentives, standards, regulation and skills

The review is part of a larger project which will provide research and analysis on how to deliver integrated land use decisions. This will include a toolkit to support integrated decision making at all levels across England to make more strategic use of land.

Land use system governance
Numerous strategies exist to deliver the Westminster government's many ambitions through land, including: the UK-wide Strategic Spatial Energy Plan (SSEP), Industrial Strategy and Infrastructure Strategy; and England's Environmental Improvement Plan (EIP) and Planning and Infrastructure Bill, which introduces Spatial Development Strategies (SDSs). Mechanisms to improve integrated land use governance include establishing a legally binding common purpose in legislation, creating a committee, such as the Climate Change Committee, and implementing a Framework such as Defra's forthcoming Land Use Framework.

Land use decision-making: spatial data and evidence
Good quality, accessible data, expressed visually at different spatial scales, is necessary to achieve integrated and effective land use decision making. There are strengths but also significant gaps in data across land use sectors, for example:

- housing and infrastructure: inconsistent data on the location of brownfield sites and a lack of available data on the pipeline assigned for development
- biodiversity: inconsistent and often publicly unavailable species data and local habitat data
- agricultural land quality: the Agricultural Land Classification (ALC) system uses out-of-date data

An accessible, shared evidence base is needed which can feed into better decision support and visualisation tools to enable multifunctional benefits from land to be delivered.

Citizen engagement for better land use decision-making
Citizen engagement in land use decision-making helps lend it democratic legitimacy through deliberative processes such as citizens' panels and juries. Citizen science can ground truth land use evidence and data, filling gaps, boosting accountability and restoring public trust. It can help to manage and de-escalate land use conflicts, whilst a lack of transparency and effective consultation can derail land use planning processes. Various tools exist for exploring and balancing trade-offs with citizens in land use decision making, such as Systematic Conservation Planning and the NATURE Tool for Urban and Rural Environments.

Delivering integrated land use decision-making
A range of mechanisms are available to the government for managing and influencing those who own, manage and develop land. Mechanisms include:

- markets, incentives and taxation: establishing markets for ecosystem services is an important tool for encouraging multifunctional land use, but market-making requires the confidence of landowners, developers and private companies. This needs stability in the policy environment, including in regulation and incentives.
- standards to build trust and develop market confidence can help overcome investment barriers.
- an equipped workforce: there is a green skills gap in the UK and a need for local, regional and national government officials to be skilled up and empowered to deliver strategic land use decision-making.

Recommendations for the Land Use Framework

We make the following recommendations to policymakers developing the Land Use Framework:

Recommendation 1: The LUF should be published without further delay and clarify its interactions, governance mechanisms and accountability with other departments, policies and strategies with land use implications. Cross-departmental buy-in and oversight of the implementation of the LUF, including by Cabinet Office and Treasury, is essential. This could be achieved by establishing an entity such as an integrated land use delivery panel or a commission such as the Social Mobility Commission, located in the Cabinet Office.

Recommendation 2: Regional expression of the LUF should sit at the strategic authority level. This is where the Spatial Development Plans and many of the policy levers and funding will sit. The LUF will need to find expression in other geographic scales by articulating its interactions with catchments and landscapes, and the individual local authority level.

Recommendation 3: Guide future spending on farming policy, particularly the Environmental Land Management (ELM) schemes, through the LUF. This should lead to better management and realisation of the potential of the Green Belt through more tree and hedgerow planting and prevent it from becoming 'grey belt'.

Recommendation 4: Articulate how the LUF and land use data informing the LUF – as well as LNRSs and SDSs - will integrate with NISTA's new national infrastructure spatial tool.

Recommendation 5: Prioritise updating and making available the data which are the basis of land use decision-making, including the Agricultural Land Classification system, species and habitats and the housing development pipeline. Defra could establish a biodiversity data task and finish group with representation from Local Environment Record Centres to crack historic and entrenched data challenges.

Recommendation 6: Prioritise an accessible, shared evidence base for land use decision-making, with better decision support and visualisation tools to enable multifunctional benefits from land to be delivered.

Recommendation 7: Resourcing and valuing citizen engagement in high quality deliberative land use decisions is critical and should be prioritised in the implementation of the LUF.

Recommendation 8: Local citizen science projects can help overcome data challenges and prevent environmental damage, such as the Evenlode Catchment Partnership in Oxfordshire and the Wye Alliance in Herefordshire. Such partnerships should be a part of local expressions of the LUF.

Recommendation 9: The LUF should be used as a tool to guide long-term land use policy and investment, as the WINEP does, for example, in the water industry. This could help land use actors, including farmers and developers, engage with government land use change incentives.

About this report

CPRE, the countryside charity, commissioned Grounded Insight to conduct a rapid evidence review about the tools for delivering integrated land use decision-making, including making recommendations to the policymakers developing the LUF. These tools, or enablers, include:

- governance arrangements
- public and stakeholder engagement
- metrics and maps
- delivery mechanisms including financial incentives, standards, regulation and skills

These elements are crucial to implementing integrated decision-making and to enabling practitioners to buy into the significant shift in thinking and approach heralded by the LUF. This evidence review is part of a larger project in which we will gather, develop, test and share innovative tools that communities and government bodies are using, or could use, to take more integrated and strategic decisions about land use.

This review builds on and complements current work by others. The Food, Farming and Countryside Commission (FFCC) has championed the creation of a multifunctional LUF and tested some of its principles in two local pilots in Cambridgeshire and Devon. A wider community of practice, involving more relevant decision-makers from more than a dozen local authorities, is now engaged with this work, keen to share their own approaches and test new ideas.[1]

CPRE has a long history of exploring competing uses for land and first supported the idea of land use framework in 2017 in its influential report, Landlines.[2] This work coincides with CPRE's Centenary in 2026, a core theme of which is encouraging a more integrated, multi-functional approach to land use to minimise unnecessary losses of the countryside to development.

Context

Land is under increasing pressure to deliver multiple objectives – from energy, housing, transport and digital infrastructure to timber, food, nature recovery, flood and drought management – all whilst reducing emissions. Yet from the very top level of government decision-making to the local level there is a tendency towards a siloed approach to land use, largely based on the post-war model of separate systems for planning, farming and landscape protections.

This can't continue - land is over-committed, with an area estimated to be twice the size of Wales needed to deliver the UK's land use policy targets.[3] It is neither realistic nor feasible to assume that the answers lie in creating more efficiencies within individual parts of the system, such as increasing agricultural productivity: achieving government objectives at different levels and across sectors demands an integrated approach to managing land use change and its impacts. Multifunctional land use must be prioritised to enable multiple benefits and services wherever possible from the same piece of land at broadly the same time.[4,5,6]

A strategic approach which overcomes the existing silos is needed, along with effective tools for delivery. A Land Use Framework (LUF) for England is planned to be published by Defra in 2025 which aims to make more space for nature recovery, water and emissions reduction, support sustainable food production and deliver new infrastructure and housing. CPRE support these ambitions but also want stronger protections for greenfield land and high-quality farmland, better management of urban fringes and protected landscapes to be enhanced.[7]

Although all spatial, these ambitions cross organisational and sectoral boundaries – and operate at different geographic scales, from local planning authorities to multi-county river catchments. They involve a wide range of players, most of whom are unused to making decisions or recommendations that consider land use in the round. Despite this, integrated decision making about land has the potential to deliver a wide range of benefits,

not least the ability to maximise the potential of what is a finite supply of land, enabling the delivery of infrastructure in the right place, and protecting the countryside and landscapes.

As a framework without a clear delivery mechanism, the LUF will not determine decisions or make the process of agreeing them any easier. At best, it will provide a consistent national reference point for the ongoing challenge of balancing competing demands and developing synergies through land use decisions. How effectively the intentions behind the Land Use Framework are achieved in practice will rest on the systems, processes and structures by which it is put into practice locally and regionally.

Land use system governance

The current land use governance system is incoherent and inconsistent. It is characterised by different government departments which prioritise different sets of issues (e.g. housing, energy, biodiversity) with multiple regulatory processes, led by different agencies. These different sets of issues are then cascaded down through the policy ladder to be acted upon. There is no systematic way of addressing land use issues, including how to achieve multifunctionality, from a single set of principles or a single agency, based on uniform evidence. This hinders the creation of a process for integrated land use decision-making.

Sectoral approaches

There exist numerous strategies, plans and schemes, as well as several frameworks, to deliver the Westminster government's many ambitions through land. There is also currently a concerted move for the whole government to take a spatial approach across key policies including energy, housing and infrastructure, climate change, biodiversity and food production.

Energy

The UK-wide Strategic Spatial Energy Plan (SSEP) is in development to deliver the energy system's transition to net zero by 2050 and meet the 2030 goal of transition to clean power. The National Energy System Operator (NESO[8]), owned by the Department for Energy Security and Net Zero (DESNZ) and regulated by Ofcom, has been charged with producing the SSEP. This blueprint for energy policy will map out the optimal locations, quantities and types of energy generation and storage infrastructure needed to meet the government's goals. The SSEP is intended to become part of the framework of planning systems across Great Britain and as such may require amending the UK government's National Policy Statements (NPS) in the future to incorporate the SSEP or its spatial outputs. It focuses on the spatial aspects of energy infrastructure.

The SSEP introduces a three-tier energy planning system, which includes the national SSEP, Regional Energy Strategic Plans (RESP) and Local Area Energy Plans (LAEPs). Whilst its focus is energy, the SSEP will consider wider demands on land and sea, including food production, transport, water supply, nature recovery, fisheries, tourism and military. The SSEP commission to NESO outlines the importance of effective governance to ensure accountability and that the SSEP is underpinned by a clear, democratic mandate while respecting NESO's operational independence. Governance arrangements include a committee and a handful of advisory groups.

Housing and infrastructure

The Planning and Infrastructure Bill[9] is making its way through Parliament. This Bill, overseen by the Ministry of Housing, Communities and Local Government (MHCLG), aims to facilitate the delivery of the goal of 1.5 million new homes in this Parliament and accelerate the delivery of 150 Nationally Significant Infrastructure Projects (NISPs). The Bill aims to boost the development of new towns across England by strengthening development corporations, making it easier for central and local government to deliver large scale developments. It introduces strategic planning in England at larger than local/sub-regional level through the production of Spatial Development Strategies (SDSs) and places a duty on strategic authorities to prepare an SDS for their area. The Bill also enables the government to establish 'strategic planning boards' to prepare SDSs on behalf of specified groupings of these authorities.

SDSs signal a return to regional spatial planning, the architecture of which was removed in 2010 with the abolishment of Regional Spatial Strategies (RSS) which were introduced in the Planning & Compulsory Purchase Act (2004). RSSs were intended to co-ordinate all aspects of land use, not just land use changes that could be controlled through planning decisions. Their abolition created a gap between national and local levels[10] and added to the complexity and incoherence of the land use planning system. SDSs are closely modelled on the system in place in London for over 20 years. The London Plan[11] is a formal spatial development strategy, with a statutory foundation and clear lines of leadership, accountability and scrutiny through the London Mayor and the Greater London Assembly. Nine districts in the Greater Manchester Combined Authority (all except Stockport) adopted a strategic spatial plan, Places for Everyone,[12] in 2024.

The National Planning Policy Framework[13] (NPPF) is a key part of the architecture of land use planning, setting out the planning policies for England and how they should be applied in local development plans to achieve sustainable development, either in a joint or individual local plan and/or a spatial development strategy.

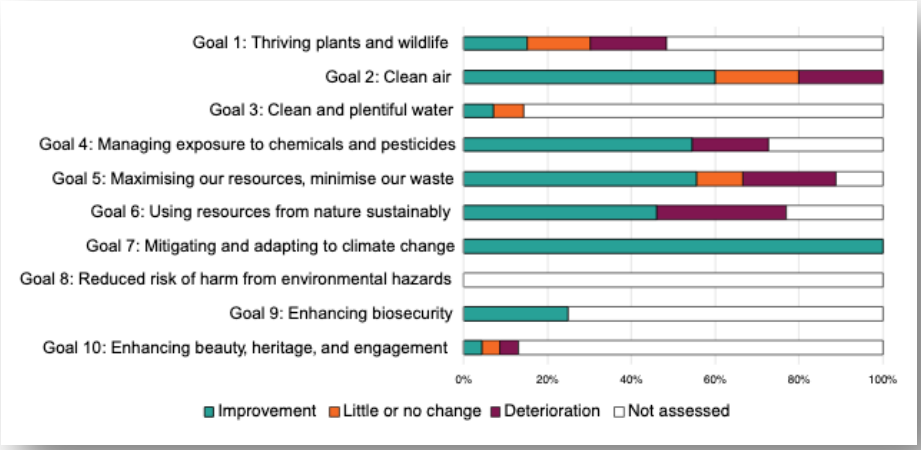
The newly created National Infrastructure and Service Transformation Authority[14] (NISTA) will accelerate the delivery of major government projects. The infrastructure delivery architecture includes:

- UK Infrastructure Strategy
- National Infrastructure Commission Commissioners
- A memorandum of understanding between HM Treasury and the Cabinet Office
- Development of a new national infrastructure spatial digital tool: a single digital platform bringing together strategies, data and tools to identify local infrastructure needs and constraints such as energy, water and transport for housing, industrial growth and land use scenarios. The tool will test how policies, strategies and decisions interact spatially with infrastructure to capture spatial trade-offs.[15]
- Over £725 billion of government funding over the next decade.[16]

Environment

There are numerous government goals on the environment, some of which have associated legislation. The Environmental Improvement Plan (EIP) is the delivery mechanism for the Environment Act, which includes legally binding targets on certain elements. The Office for Environmental Protection (OEP) provides an independent assessment[17] on progress against the ten goals of the Environment Act (see Figure 1).

Figure 1: OEP's short-term assessment of environmental trends of the 10 EIP goals[18]



Some of the environment goals have their own separate legislation and all have different governance arrangements, operating at different geographic scales.

Climate change policy is governed by the Climate Change Act 2008[19] which formalised the UK's approach to tackling climate change mitigation and adaptation and established the Climate Change Committee[20] (CCC). The CCC advises the UK and devolved governments on emissions targets and reports to Parliament on progress made in reducing greenhouse gas emissions and preparing for and adapting to the impacts of climate change, including an annual assessment on progress towards the net zero by 2050 target.

Water quality and availability is subject to the Water Environment (Water Framework Directive) (England and Wales) regulations,[21] which are the foundation for delivering the 'clean and plentiful water' goal in the EIP. Currently, River Basin Management Plans (RBMPs) are the delivery plan for each of the 12 UK River Basin Districts.[22] RBMPs operate on 6-yearly cycles and set the legally binding locally specific environmental objectives that underpin water regulation. There is one central aim: to achieve good status in all water bodies as well as all the objectives of the Water Framework Directive.

RBMP has Ministerial Guidance, and guidance on cross-border areas. RBMPs provide a stable planning base for economic development including investment programmes for the water industry such as the Water Industry National Environment Improvement Programme (WINEP) and for land managers, namely Environmental Land Management schemes (ELMs). The Independent Water Commission Review recommended a new long-term and cross-sectoral National Water Strategy should be published by both the UK and Welsh governments, with a clear framework for managing the many demands on water. It also identified a 'missing middle' of governance in the water sector, proposing that current planning responsibilities are devolved and resources transferred from the regulators to 8 new regional water authorities in England. These would be responsible for developing water investment plans that reflect local priorities and voices.[23]

Biodiversity is subject to a legally binding target of protecting and conserving at least 30% of land and seas for biodiversity by 2030, known as 30 by 30. The EIP sets out that Local Nature Recovery Strategies (LNRSs) are the spatial plans to release nature recovery ambitions at local levels.[24] Under the current Devolution White Paper, LNRSs will fall under the remit of strategic authorities. The White Paper's proposals for the devolution of environmental functions do not include any requirement to produce a strategic environment plan; this contrasts with the Greater London Authority which must publish an environment strategy.[25]

Beauty, Heritage and Engagement: Protected Landscapes are important for delivering several EIP goals, including climate change and thriving plants and wildlife, as well as enhancing beauty, heritage and engagement with the natural environment. They have a target to improve and promote accessibility to and engagement with protected landscapes[26] which should be included in their management plans, a statutory requirement, and through the relevant LNRS(s).

Food

Agriculture is by far the largest land use accounting for 67% of the total area of England.[27] The government is committed to maintaining levels of domestic food production, has published a Food Strategy for England[28] and plans to publish a Farming Roadmap. Yet these policy levers are less robust than those for energy, housing and infrastructure and the various environmental strategies and targets. Much of the highest-grade agricultural land, often in highly desirable locations, is at increasing risk of flood and drought and at risk of loss to development and infrastructure. Current measures to protect high quality agricultural land are not wholly effective. For example, the NPPF aims to protect best and most versatile (BMV) land from development, but in practice this is not always being achieved.[29] CPRE research found that since 2010, planning appeals which involved BMV land had a 46% allowance rate in comparison to a total appeals allowance rate of 25% and that over 14,000ha of BMV land has been lost to development.[30]

An incoherent land use governance system

A raft of studies and evidence over recent decades point to the flaws in the current, fragmented landscape of land use governance and the need for a systematic approach. The government's 2010 land use futures

foresight project,[31] for example, noted the disconnect between institutional arrangements for land use policies with private ownership of land and property rights. It also highlights a lack of clarity about which issues take priority in planning policy decision making, whether the cumulative effect of such decisions (e.g. on the environment) is recognised, and how strategically important or unique the effect of a given change in that location may be.

The 2022 House of Lords inquiry on the Land Use Framework[32] argued that aspects of governance including siloed working and conflicting priorities, a lack of coordination between national, regional and local government and policy uncertainty were standing in the way of making the best decisions on land. Defra's Land Use Consultation Analytical Annex[33] highlights the complexity and incoherence of governance for land across housing, infrastructure, agriculture and the environment, with different institutions and regulatory frameworks operating at different levels, according to different boundaries – some ecological (e.g. landscapes and catchments), but many administrative (e.g. local or strategic authority level). This incoherence reflects a wider centralisation of policy and power, manifested at local, sub-regional and national levels and limits the ability of governance structures to drive coherent land use changes and prioritise environmental outcomes. The result is unclear decision-making processes, reducing transparency and accountability, and hindering the strategic prioritisation of competing land demands.'[34]

Governance mechanisms to realise strategic land use

There are various mechanisms for creating the architecture for strategic and aligned land use governance including through the statute book, and through mechanisms such as creating cross-government committees, mandates and frameworks.

Legally-binding common purpose

Wales's Well-being of Future Generations (Wales) Act[35] is a landmark piece of legislation in that it gives a legally binding common purpose to national government, local health boards and other specified public bodies through seven well-being goals. The overarching principle guiding the goals is sustainable development and includes resilience – defined as '*A nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change).'* The architecture of the Act is such that everything cascades from the seven goals, including assessing progress, placing duties on public bodies, following principles/ways of working and providing accountability through a Commissioner, the Auditor General for Wales and the Senedd Cymru.

WWF-UK are currently campaigning for a Living Planet Act,[36] a piece of framework legislation to ensure that the decisions on the future of land and sea are joined up to meet climate, nature, and nutritional needs into the future. This legislation would hold successive UK governments legally accountable for their policies for the use of land and sea to meeting the three goals in an integrated way. It includes clear objectives, supports existing climate and nature targets and a target for nutritional security to ensure the nation's food supply fulfils per capita requirements for both macro and micronutrients, in a resilient and sustainable manner by 2030. As with the Welsh Act, it includes an independent commission or committee to advise on and assess progress.

Establish a committee

The UK governance arrangements on climate change – legally binding targets and an independent oversight committee in the CCC – have been widely regarded as world-leading and have been copied elsewhere.[37] For example, Ireland established a Climate Change Advisory Council in 2015, and New Zealand established a Climate Change Commission in 2019 (preceded by an interim committee in 2018).

Mandate a Duty to Cooperate

The Conservative government abolished regional spatial planning in 2010 and introduced the 'Duty to Cooperate' into the Localism Act (2011) which required Local Authorities to work with neighbouring authorities, statutory consultees, Local Enterprise Partnerships and Local Nature Partnerships in preparing local plans. The NPPF outlines relevant cross boundary issues to be considered under the Duty to Cooperate (DtC) including homes and jobs needed in a geographical area; infrastructure projects; retail, leisure and other commercial developments; social infrastructure; and landscape and the natural and historic environment. The DtC is regarded as an insufficient tool for aligning and integrating land use decision making given the complexity of the issues, and the need for long-term strategic planning with proactive engagement from a range of stakeholders across functional geographies and sectoral boundaries.[38] The chief limitation of the DtC is that it isn't a duty to *agree*, allowing some individual local authorities to pull out of joint plans, for example Stockport Metropolitan Borough Council withdrawing from the Greater Manchester Places for Everyone plan.

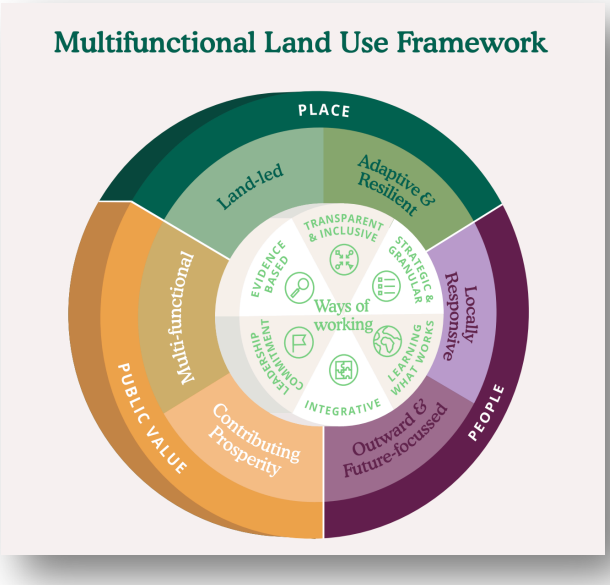
Use a Framework

The Food, Farming and Countryside Commission (FFCC) set out how a Multifunctional Land Use Framework[39] could operate in England. The FFCC argues that using a framework (rather than a strategy) gives choices and freedom to act collaboratively to all involved, whilst defining boundaries and interlinkages to encourage holistic systems thinking. Guided by six principles (see Box 1) and a six-step systems approach to implementation organised around the six principles (see Figure 2), it proposes creating an independent cross-departmental body to provide clear national leadership by integrating priorities, setting targets and supporting local arrangements.

Box 1: FFCC MLUF Principles

Place: Land use decisions should be **land-led** to ensure that land is used for what it is best suited – ensuring that the best agricultural land is used to produce food and not afforested, for example – and that that land is managed to be adaptive and **resilient** to future climate impacts.
People: A Land Use Framework must be **locally responsive**, ensuring that local stakeholders and citizens can be genuinely included in decision-making, and those land use decisions strongly relate to their connections with other places and **future generations.**
Public value: Land must be used to encourage **multifunctionality** in order to meet the challenges of the country and contribute **prosperity** to local communities.

Figure 2: FFCC's Multifunctional Land Use Framework



The FFCC's Multifunctional Land Use Framework is structured similarly to the government's Public Value Framework,[40] a tool for maximising the value delivered from public spending and improving outcomes for citizens.

In Scotland, the Climate Change (Scotland) Act 2009 placed a duty on the Scottish Government to produce a Land Use Strategy (LUS) and to revise it every five years. The first LUS, published in 2011, emphasised the need for land to deliver multiple benefits to achieve sustainability of the economy, environment and communities; yet it remains unclear how the LUS and its principles will be integrated across these policies in practice. Recent analysis proposes that, 'the Land Use Strategy must be the kernel for a 'whole-of-government' and 'whole-of-society' approach, including the means by which the Scottish Government's Economic Strategy applies to land and water.' [41]

Governance of the Land Use Framework

Defra's Land Use Consultation[42] gathered views on several elements of a LUF for England, including the principles for decision-making, improving access to data and developing targeted land management incentives. It states that an LUF will develop and support the delivery of a shared vision for English land use. This is an essential first step and could draw inspiration from the common purpose of Wales's Wellbeing of Future Generations Act, for example by stating a vision of, say, resilient land for future generations and all species.

Land use decision-making: spatial data and evidence

Optimal land use decision-making should be based on a consistent approach, taking account of the full range of services and values that land could deliver.[43] For alignment on land use decision-making which achieves multifunctionality where possible, there needs to exist good quality, accessible data, expressed visually at different spatial scales.

Strengths and gaps in data by sector

The Geospatial Commission's 2023 report, *Finding Common Ground*, highlighted in 2023 that the UK lacks 'a shared, spatially explicit, evidence base that integrates data, technology and scientific knowledge to underpin land use decisions.'[44] The Commission outlined six land use sectors and found that although the UK's geospatial data is world leading and there is a wealth of land use data, improvements to data sets are needed across the six sectors. Table 1 provides analysis and a summary of the availability and quality of the UK's geospatial data from the Geospatial Commission's report.

Several points stand out from the gaps and limitations in data identified by the Commission:

- **Housing**: identifying the location of brownfield sites is challenging, the accuracy of local planning authorities' brownfield land registers varies and the volume of housing that brownfield sites could potentially provide is often unavailable. MHCLG occasionally provide data on brownfield sites suitable for housing, but not consistently - in practice, CPRE provides the most regular updates.
- **Development and infrastructure pipeline**: there is a lack of data on what land or infrastructure has already been assigned for development. For example, data on housing schemes supported by Homes England isn't included in MHCLG's planning data API (Application Programming Interface).[45] The lack of any public data on the development pipeline was also picked up by the Letwin Review.[46] Further, details of new developments are not usually available in formats compatible with other GIS spatial data, making it difficult to use, and data is often not shared between stakeholders involved in a typical infrastructure project.
- **Biodiversity – Species:** Various organisations collect species data at a range of spatial scales in the UK and share this to the NBN Atlas,[47] the UK's largest repository of publicly available biodiversity data. Around half of this data is "currently inaccessible" due to a reluctance to share data to the NBN Atlas and there are important species taxonomy and spatial gaps in data, especially outside protected areas.[48]

- **Biodiversity – Habitats:** Local Environment Record Centres (LERCs) collect granular data on local priority habitats which can be used commercially by developers and Local Planning Authorities. This is not available on a shared national platform and there is no central government support for LERCs to make the data they collect, manage and validate more accessible and available. A current project is exploring these issues is underway by The Royal Society of Wildlife Trusts (RSWT) in partnership with Natural England and funded by Defra's Natural Capital and Ecosystem Assessment (NCEA).[49]
  Natural England holds the Priority Habitats Inventory (PHI) national data set, an open data layer on the Defra MAGIC platform, but there are concerns with its accuracy and consistency, for example because data sets are in many cases not generated by direct survey and have not been systematically reviewed against existing local data.[50]
- **Quality of agricultural land:** the Agricultural Land Classification (ALC) system's climate data is extremely out-of-date, being based on the period between 1941 – 1970, for rainfall and field capacity days, and between 1961 – 1980, for temperature.[51]

Improving data, evidence and visualisation tools

The Geospatial Commission's National Land Data Programme[52] worked with the FFCC and Vizzuality to explore how spatial data and modelling can enable a local land use framework in Cambridgeshire and Peterborough. In Cambridgeshire, they developed a prototype of a spatial data visualisation tool which layers data about housing & development, water, farming, nature, energy and transport together on a single map, illustrating both where the conflicts lie and where the potential for synergies can be found. As part of its wider piloting, the FFCC tested its Multifunctional Land Use Framework process in Devon and Cambridgeshire and Peterborough Combined Authority, sharing data and evidence findings in a learning paper.[53] Key considerations for policymakers identified through this work include:

- land use decision makers would benefit from an accessible shared evidence base to help break down silos between policy sectors and encourage multifunctionality of land use
- spatial data and land use modelling initiatives work better when there is greater integration
- access to data can be a challenge and there is demand for better standards around data sharing and utilisation
- wider utilisation of spatial data depends on designing a tool that makes it easy for non-experts to access, understand and manipulate that data (for example, an application programming interface like the Planning Data API)
- spatial data could be improved by devolving power to amend datasets to trusted actors at the county level (although the data would be updated consistently across the country to provide a national picture)

CPRE conducted research on one land use decision-making tool, the Agricultural Land Classification (ALC) system, which found that it has severe limitations, primarily due to being based on old datasets. The research led to four recommendations, including conducting a review and update of the ALC system, re-surveying and protecting lowland peatlands, better protecting England's best and most versatile (BMV) land in the planning system and using an updated ALC system as one tool in the Land Use Framework.[54]

Making Land Digital is a current initiative to improve the quality and availably of spatial data, supported by numerous academic, practice, charitable and commercial organisations. Inspired by HMRC's Making Tax Digital, it aims to modernise land management and agricultural grant systems across the UK. Its three core asks are for a Defra ID to authenticate users across Defra systems and third-party apps; enable digital submissions and evidencing (e.g. RLE1 forms) and creating a centralised grants database.[55]

Table 1: Geospatial Commission analysis of UK geospatial data availability and quality[56]

Sector	Strong evidence (i.e. good data generally available on…)	Evidence gaps (i.e. good geospatial data generally lacking on…)
Energy	**Energy assets**. Source: UKERC, Energy Data Centre	Capacity of power assets at DNO level
	Energy Consumption. Source: DESNZ annual statistics on UK energy consumption	Social and human factors, e.g. visual impact and scenic beauty
Housing	**Land use change** statistics. Source: MHCLG	Brownfield sites
	Ownership of registered land. Source: HM Land Registry	Development & infrastructure pipeline
	Planning permission & construction rates. Source: MHCLG; paid for databases	
Biodiversity	**Land cover.** Sources: UKCEH Land Cover maps; CORINE land cover maps; Google Earth	Species: approx 50% of species data inaccessible and not shared to the NBN Atlas; species taxonomy and spatial gaps in data, esp. outside protected areas.
	Tree planting & woodland cover. Sources: Forest Research & National Forestry Inventory Forestry Statistics; Forestry Commission Forest inventory	Local-level priority habitats Natural England holds the Priority Habitats Inventory (PHI) data set on MAGIC but concerns re accuracy & consistency
	Climate change & net zero. Sources: Met Office UK Climate Projections; UK Gov Climate Change Data portal	
Food	**Agricultural land registration.** Source: Rural Payments Agency, Rural Land Register (not publicly available).	**Quality of agricultural land.** Source: Agricultural Land Classification (ALC) system based on old datasets
	Crop mapping. Source: RPA Crop Map	**Soil condition.** Source: NSRI Soilscapes behind paywall and insufficiently accurate at local scale
	Land parcels. Source: RPA (data available to individual farm holdings)	
Water	**Flood risk.** Source: Environment Agency and National LIDAR Programme	Water resource availability
	Water cycle. Sources: EA Hydrology Data API and CEH's National River Flow Archive	Water quality
		Non-public water abstraction
Transport	National road and rail networks. Source: Ordnance Survey OpenMap Local; Ordnance Survey's MasterMap.	Movement of people and goods in near-real time data to account for patterns changing over time
	Traffic flows. Source: Data on traffic flow and density, collected by Highways England	Planning & construction: Details of new developments are not usually available in formats compatible with other GIS spatial data, making it difficult to use. Data is often not shared between stakeholders involved in a typical infrastructure project.

The Geospatial Commission recommended that the government:

- establish a **Land Use Analysis Taskforce** to bring together a shared evidence base to help decision makers consider the range of [land use] opportunities and trade-offs, ensuring national priorities are delivered within the land available in the UK.
- **champion the market for decision support and visualisation tools** to enable better land use decisions which create multifunctional benefits. It cites two examples:
    - the University of Exeter's ADVENT model which identifies the optimal spatial configuration of energy infrastructure[57]
    - the University of Bath's modelling on how water security in the Thames river basin could be affected by urban development and land management change.[58]
- **strengthens the links between land use policy design, academic research and industry practice**. The Commission cites two examples:
    - Landscape Decisions Programme, funded by UK Research and Innovation (UKRI), created a network of over 60 projects and fellowships across multiple disciplines in institutions across the UK, to bring together expertise to enable a multi-lens framing for landscape level decisions that take a whole systems approach. The Programme had three headline findings:
        - The UK needs multifunctional landscapes
        - The arts, humanities and social sciences can make a vital contribution to landscape decisions
        - Researchers, policymakers and practitioners must work together to find solutions to the challenges facing our landscapes [59]
    - Land Use for Net Zero Hub (LUNZ-Hub) funded by UKRI, Defra and DESNZ aims to help drive the transformation of UK land use needed to achieve net zero by 2050 with a dedicated theme on land use change and builds directly from the Landscape Decisions Programme. [60]
- **develop a standard taxonomy for key land use data** to support improvements to the interoperability of land use data and analysis including defining rural and urban land and improving information about land ownership and control which can be opaque, causing inefficiencies in the property development and planning system.

Citizen engagement for better land use decision-making

Understanding multifunctionality inevitably means examining trade-offs and synergies between different land uses, thereby encouraging land to be used effectively – recognising where outputs can be stacked, and where they are best separated.[61] In this respect, citizen engagement is a crucial part of the jigsaw of land use decisions: decisions which affect every part of people's lives, from house prices and local jobs to flooding, availability of green space and air pollution.

Democratic legitimacy

Research emphasises that the UK public is generally dissatisfied with the state of democracy in the UK,[62] and England is one of the most centralised developed countries[63] with too few people making decisions for too many. Localising decision-making including through deliberative democratic processes such as citizens panels, participatory budgeting, community conversations and citizens juries are some tools which can overcome these issues.

The West Midlands Combined Authority's (WMCA) Greener Together Citizens' Panel, for example, brought together 44 residents from across the region to deliberate and provide actions for the WMCA to take, to help create a fairer, greener and healthier West Midlands. The panel met for two years (2022 - 2024) and helped to shape the Energy and Environment team's work on topics from retrofitting homes to climate adaptation, bus franchising and local transport plans.[64]

In Spring 2024, Hackney Council held its first Citizen's Climate Jury as part of Hackney's broader commitment to a fair and inclusive climate response, involving collaboration with institutions including the NHS and landlords. Fifteen residents, reflecting the borough's diversity, were selected to recommend how the council and others should prepare for extreme heat and protect the most vulnerable. An additional 501 residents contributed via surveys and community engagement. The jury's recommendations will shape Hackney's Climate Implementation Plan.[65]

Ground truthing data and using citizen science

Ground-truth evidence and data with local knowledge can also help data challenges alongside enhancing citizen democratic engagement. The freshwater environment faces challenges around data collection and monitoring and a steep decline in trust in the water sector, with citizen science taking a more prominent role in filling data gaps, boosting accountability, improving local stewardship of water courses and restoring public trust.[66]

The River Evenlode in Oxfordshire suffers from pollution from agricultural fertilisers and both treated and untreated domestic wastewater. Since 2018, Evenlode Catchment Partnership (ECP) has received funding from Thames Water to co-create river management plans with local communities. Via ECP, community-led water quality monitoring, supported by Earthwatch Europe's FreshWater Watch, occurs monthly at key sites. Volunteers have pinpointed pollution sources and timing, particularly linked to Thames Water sewage treatment facilities and are now in direct dialogue with Thames Water, the Environmental Agency and other stakeholders about developing potential mitigation actions. [67]

CPRE joined forces with other Citizen Science groups to take action on nutrient pollution in the River Wye, forming the Wye Alliance. Around 500 volunteer Citizen Scientists were trained with standards set by Cardiff University and the Environment Agency to monitor water pollution across the Wye Catchment. This ultimately helped lead to legal action being taken against both the Environment Agency and the food producer, Avara, whose chicken factory was polluting the river.[68]

Managing and de-escalating conflict

Land use planning processes can be derailed when decisions are felt to be imposed and lacking in transparency and effective consultation with the local community is questioned. The Ox-Cam Spatial Framework was dropped by Conservative Government in 2022 due to sustained opposition from local groups such as Stop the Arc,[69] environmental groups[70], CPRE[71] and local councils in the area. Concerns focused on the loss of greenbelt and agricultural land, increased carbon emissions, loss of biodiversity, concern over unaffordable housing, a lack of democratic accountability and meaningful consultation and the undermining of local planning powers. The concept of the 'Arc' has been revived by the Labour Government but has not to date been accompanied by proposals to produce a spatial framework for the area.

Public dialogue and citizen-led solutions

Community conversations and public dialogues are important ways to involve a larger number of citizens and gain a breadth of view than in the more in-depth, deliberative participatory approaches such as citizen's panels. Several initiatives about land use have happened recently.

The Royal Society commissioned Ipsos MORI to conduct a public dialogue on the future of land use, called Living Landscapes, to understand public values and priorities around UK land use. Key findings included that talking about food was a valuable way to inform the public about the decisions and trade-offs in land use, and to help them begin to express their views on the topic. A central recommendation of the research was that policymakers and scientists should make clearer and stronger connections between individual choices such as about food waste and diet, and high-level issues of climate change or biodiversity loss.[72]

Between 2023-2025 the FFCC's Food Conversation hosted deliberations, or assemblies, in 12 parts of the UK and supported over 75 communities to host their own community-led food conversations reaching hundreds of citizens. The question asked was, 'So, what do we really want from food?' The FFCC's deliberations reports[73] give more details, whilst the Citizen Manifesto to Fix Food which sets out five areas of change that citizens want politicians to address:

1. Joined up food leadership, including through national food strategies
2. Real choice for everyone, including capping the cost of healthy foods and regulating ultra-processed food
3. Better food, less waste, including tackling food waste from farm to fork
4. A fairer deal for farmers, including developing fair pricing rules preventing supermarkets and big food companies from pushing out farmers and small producers
5. Flourishing local food, including investing in local food hubs and making more land available for community growing.[74]

Balancing and resolving trade-offs

Optimised decision-making in strategic land use includes balancing trade-offs, including how outcomes from decisions are understood, agreed and prioritised; how unintended and negative impacts/consequences are considered, and a temporal aspect in considering short- and long-term outcomes. All of the approaches outlined above aim to balance and resolve trade-offs in some way, but there are some more dedicated tools which are of particular relevance to trade-offs in land use decision making.

Several technical approaches are of interest, including a scoring system developed by the International Science Council for understanding interactions between sustainable development goals,[75] the NATURE Tool for Urban and Rural Environments,[76] developed to assess and manage the impact of development projects and sites on natural capital and Natural England's Environmental Benefits from Nature Tool[77] to assess the impact of land use change on 18 environmental goods and services to work alongside the biodiversity net gain (BNG) metric.

Systematic Conservation Planning is a technique to make decisions about the nature and location of conservation actions through a stakeholder-led process which combines spatial analysis and social engagement. It was used by Water Resources East to develop a natural capital plan for Eastern England, with much learning captured by Biodiversify and WWF-UK.[78]

Delivering integrated land use decision-making

Land use decision makers, working at different scales and geographies, include:

- Landowners / managers: influenced by incentives including government funding, planning permission processes, profit driven by consumer demand, environmental outcomes and maintaining natural landscapes and unique individual factors.
- Private companies: invest in land for various uses, for example developers buying land options or land for housing and companies buying land for carbon offsetting.
- Local planning authorities: carry out planning functions for a specific area to meet the needs of their communities and to help deliver national policy priorities at a local scale.
- Public bodies: deliver National Policy Statements and Nationally Significant Infrastructure Projects which can require significant land use change; Homes England supports a significant proportion of new housing development; Defra agencies influence land management programmes.[79]

A range of mechanisms are at the disposal of government for managing and influencing land use decision makers, including those responsible for owning, managing and developing land. Mechanisms include: markets, incentives and taxation; regulation and standards; and how well equipped and skilled their workforce is.

Market-making for ecosystem services

Establishing markets for ecosystem services is an important tool for encouraging multifunctional land use and the government is driving the creation of ecosystems services markets in several ways. Biodiversity Net Gain (BNG), for example, mandates developers to a minimum of 10% BNG for all new developments, whilst the ELM scheme provides financial incentives for farmers to take positive environmental action on their land. Private and third sector organisations are also creating markets for ecosystems services. LENs, or Landscape Enterprise Networks, for instance, is a system for organising the buying and selling of nature-based solutions (NbS) by bringing together private and public sectors organisations with an interest in funding NbS in a given geography. Exchange Market by Soil Association Exchange is a new funding scheme which pays farmers for reducing their carbon emissions.

Despite these and other initiatives, there is still a huge funding gap for nature restoration in England, estimated as being £21- £53 billion over the 10 years 2021 – 2032 in addition to public funding.[80] The main obstacle to private sector investment in nature at scale is interestingly not a lack of available capital but that the risks of investing in nature at scale outweigh the returns under current policy and regulatory settings. Four major barriers exist to scaling investment in UK nature according to Financing Nature Recovery UK including:

- limited sources of revenue from nature
- disincentives to invest in nature
- insufficient certainty to price long-term risk
- limited project pipeline and scale. [81]

Creating and adopting standards to build trust and develop market confidence can help overcome these investment barriers. Several initiatives are helping guarantee standards and integrity in carbon and nature markets and include: the Voluntary Carbon Markets Integrity Initiative (VCMI)[82] for how a business or company can use carbon credits in reporting; the Integrity Council for the Voluntary Carbon Market (ICVCM)[83] for ensuring the credit is additional, permanent and measured; the Woodland Carbon Code[84] and the Peatland Code[85] providing quality assurance and clarity for carbon sequestration in the UK; and the Taskforce on Nature-related Financial Disclosures (TNFD) reporting framework for companies to list their impacts and dependencies on nature.[86]

Beyond carbon, markets for other ecosystem services are needed to encourage multifunctionality. Stable policy environments are critical to enable this. The water industry's WINEP mandates water companies to undertake specific environmental actions to meet legal obligations by 2030. Funded by £22.1 billion from the water sector, it is regulated by the Environment Agency, with Natural England and Ofwat and integrated into water companies' business plans through the Price Review process. In contrast is the agriculture industry. With exiting the European Union's Common Agricultural Policy and its seven-year programme and funding cycles, farmers have been subject to domestic agriculture policy which has been marked by uncertainty and instability, for example in the pausing in Spring 2025 of the Sustainable Farming Incentive (SFI), part of ELM. Uncertainty and abrupt changes such as this, and changes to farm inheritance tax, erode trust in government and policy, undermining farmer confidence and willingness to participate in ELM schemes.

Misalignment between local land markets and land use policy

Private incentives in local land markets and planning institutions often conflict with the objectives of land use policy, resulting in delays and disputes within the governance system. Whilst new urban developments impose significant costs on local communities, the centralised control of business rates means that local authorities cannot increase local taxation to meet up-front costs without an undue burden on existing residents.[87]

In some parts of England, the misalignment between property rights, land prices and financial incentives have produced extreme land value disparities, particularly between agricultural and residential uses. Yet information about market prices isn't used to inform strategic land use policy, despite providing insight into public preferences and unmet demand for land.[88]

These factors led the government's Foresight Land Use Future's Project (2010) to recommend that to make land use policy more responsive, equitable, and capable of supporting both local and national development objectives, closer coordination between fiscal policy and planning is needed, alongside reforming the tax framework and better aligning incentives.[89]

Developing the workforce for multifunctional land use decision-making

Achieving government ambitions for land use, from house building, green energy and maintaining food production, to nature restoration and net zero, and, critically, integrating these agendas and achieving multifunctional land use requires new skills in the UK's workforce. A green skills gap has been identified in every major sector in the UK to reach net zero and other environmental goals, with housing and transport facing the most immediate skills shortages – sectors which, along with land use, already face skills shortages.[90, 91]

Farming is highly exposed to global market and geopolitical volatility and the impacts of climate change: the sector needs to adapt and innovate to meet these challenges. Critical green skills gaps in agriculture include soil husbandry, carbon auditing and advice, tree and biomass management, conservation and biodiversity expertise. In wider land use, skills gaps exist in planning and planting woodlands, in managing trees, and restoring habitats including peatlands. Land based businesses anticipate the need for more skills in agroforestry and silviculture, machine operation and digital, geographic information systems (GIS) in particular.[92] Producing profitable food in a multifunctional landscape which meets nature and climate goals will require greater investment in science, technology, skills and knowledge to help manage land assets into the future and diverse collaborations among many different public and private stakeholders.

At the national, regional and local government levels, there is a corresponding need for identifying and developing the skills, knowledge and capacity for strategic land use decision-making to meet the aims of all government's spatial strategies and plans including the Land Use Framework and forthcoming regional Spatial Development Strategies. This will demand leadership and facilitation skills to mediate and navigate complex and contested spaces. The English Devolution and Community Empowerment White Paper[93]recognises this need and includes proposals on capacity building including a secondment scheme between central government and Strategic Authorities and working with third parties to help building local leaders' capacity. The Major Project Leadership Academy at the University of Oxford's Saïd Business School develops the institutional capacity of the civil service to deliver major and complex infrastructure projects[94] and could be a well-established example to draw inspiration from.

Conclusions and recommendations

Increasing multiple benefits from England's land requires a wide range of enablers, operating at different institutional, geographic and sectoral levels. Land use decision-making tools need to help decision-makers and those delivering systems change navigate this complexity, resolve trade-offs, and implement changes on the ground. If optimised, the tools and enablers outlined in this paper will enable systems thinking to be realised across different land uses. A number of recommendations flow from our review and research which are of relevance to policymakers developing the Land Use Framework.

Land use system governance

The Land Use Framework will need to establish and cascade UK-wide land use objectives and priorities, ensuring consistency and compatibility across policy domains and respecting devolution, as with the architecture of the Strategic Spatial Energy Plan and the UK Infrastructure Strategy. Accountability for decision-making at national, regional and local levels needs clarifying so that there is a balance between national objectives and regional or more local ones.

It is unclear how the Land Use Framework will work alongside other national government policies affecting land use, namely the Infrastructure Strategy, the Strategic Spatial Energy Plan (SSEP), the Planning and Infrastructure Bill and proposed National Water Strategy. Regionally, it is unclear how the LUF will work alongside Strategic Development Strategies, the Independent Water Commission's proposed regional water bodies, and how the LUF will guide government programmes for environmental land management (ELM) schemes or support join up between ELM and Local Nature Recovery Strategies (LNRSs).

Government land use policy is being developed with different timelines for different sectors, with nationally significant changes to land use being legislated for, planned and funded before the publication of the Land Use Framework. This means that prime land for, say, food growing, could be paved over; and brownfield land which could be used goes wasted. Schemes for new pylons are coming forward, for example, even before the LUF or SSEP has been decided. These schemes may therefore turn out to be unnecessary or in the wrong place. Given the extreme and increasing pressures on England's land, this must be urgently addressed.

These issues lead us to the following recommendations:

Recommendation 1: The LUF should be published without further delay and clarify its interactions, governance mechanisms and accountability with other departments, policies and strategies with land use implications. Cross-departmental buy-in and oversight of the implementation of the LUF, including by Cabinet Office and Treasury, is essential. This could be achieved by establishing an entity such as an integrated land use delivery panel or a commission such as the Social Mobility Commission, located in the Cabinet Office.

Recommendation 2: Regional expression of the LUF could sit at the strategic authority level. This is where the Spatial Development Plans and many of the policy levers and funding will sit. The LUF will need to find expression in other geographic scales by articulating its interactions with catchments and landscapes, and the individual local authority level.

Recommendation 3: The LUF needs to clearly guide future spending on farming policy, particularly the Environmental Land Management (ELM) schemes. This would then bring about better management and realisation of the potential of the Green Belt through more tree and hedgerow planting and prevent it from becoming 'grey belt'.

Land use decision-making: spatial data and evidence

Land use policies and decisions need a better knowledge base. Current gaps include the Agricultural Land Classification system and species data, too much of which is not shared to the publicly available National Biodiversity Atlas (NBN). There are issues with the accuracy of the status and condition of priority wildlife habitat, including Local Wildlife Sites and SSSIs. In terms of development, public data on the pipeline of housing developments is lacking which prohibits the ability to track of all the land with planning permission for housing but not built out, reported to be over 1.1 million housing plots.[95] This leads to inefficient use of land and continued pressure for greenfield land to meet planning policy targets.

Recommendation 4: Articulate how the LUF and land use data informing the LUF – as well as LNRSs and SDSs - will integrate with NISTA's new national infrastructure spatial tool.

Recommendation 5: Prioritise updating and making available the data which are the basis of land use decision-making, including the Agricultural Land Classification system, species and habitats and the housing development pipeline. Defra could establish a biodiversity data task and finish group with representation from Local Environment Record Centres to crack historic and entrenched data challenges.

Recommendation 6: Prioritise an accessible, shared evidence base for land use decision-making, with better decision support and visualisation tools to enable multifunctional benefits from land to be delivered.

Citizen engagement for better land use decision-making

As the pressures on land intensify and conflicts grow over what should happen, where and how, citizen participation in decision making can help in many ways. Participatory programmes and citizen engagement bring great benefits, from enhancing democracy to ground truthing plans and data, arriving at more elegant and innovative solutions and de-escalating conflict.

Recommendation 7: Resourcing and valuing citizen engagement in high quality deliberative land use decisions is critical and should be prioritised in the implementation of the LUF.

Recommendation 8: Local citizen science projects can help overcome data challenges and prevent environmental damage, such as the Evenlode Catchment Partnership in Oxfordshire and the Wye Alliance in Herefordshire. Such partnerships should be a part of local expressions of the LUF.

Delivering integrated land use decision-making

A range of mechanisms are at the disposal of government for managing and influencing land use decision makers. A key mechanism is through providing a stable regulatory and investment environment.

Recommendation 9: The LUF should be used as a tool to guide long-term land use policy and investment, as the WINEP does, for example, in the water industry. This could help land use actors, including farmers and developers, engage with government land use change incentives.

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