Food, Farming & Countryside Commission

Learning Paper
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KEY MESSAGES

CONSIDERATIONS FOR POLICYMAKERS

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.

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Spatial data and land use modelling initiatives work better when there is greater integration.

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Access to data can be a challenge and there is demand for better standards around data sharing and utilisation.

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Wider utilisation of spatial data depends on designing a tool that makes it easy for non-experts to access, understand and manipulate that data.

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Spatial data could be improved by devolving power to amend datasets to trusted actors at the county level.

Multifunctional Land Use Framework Action Research: Data & Evidence Lessons

This practitioner learning paper sets out the core data and evidence findings from our pilot testing of the Multifunctional Land Use Framework (MLUF) process in Devon and Cambridgeshire & Peterborough Combined Authority.

Through these pilots we wanted to understand how a MLUF could help decision-making at the county, or 'larger than local' level.

In Devon, funded by the Environment Agency and the Geospatial Commission, we worked with leaders across the county to understand how a MLUF could be used on the ground by people working to balance the land use demands of flood risk and resilience, water quality, food production, nature recovery and housing development.

In Cambridgeshire, funded by the Geospatial Commission and WWF, we worked with county-wide stakeholders to explore how a MLUF could help local leaders manage competing pressures on land.

We took a developmental evaluation approach to the project, which meant adapting to new findings as they emerged, and following at times divergent evolutions of the action research projects in each county. The process generated case studies – both as part of the pilots and already operating on the ground – which illustrate the principles and ways of working of the MLUF approach, and demonstrate how these foundations can support effective action on the ground. The evidence concerning MLUF-style components gleaned from these local level examples illustrates the dynamic relationship between bottom-up and top-down forces that any MLUF approach will need to address in order to be successful.

For a broad overview of FFCC's work on the MLUF, please see our 2023 report and the Rough Guide resources on the FFCC website.

Land use decision makers would benefit from a shared evidence base to help break down silos and encourage multifunctionality.

In the Geospatial Commission's 2023 report, Finding Common Ground, they point out that the United Kingdom lacks 'a shared, spatially explicit, evidence base that integrates data, technology and scientific knowledge to underpin land use decisions.' The Geospatial Commission therefore recommends that the government should 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.' In both Devon and Cambridgeshire, there was excitement around the idea of creating a neutral source of spatial data about land that was owned and maintained at the county level. The Geospatial Commission's proposal for a shared evidence base is targeted at national government, but we heard similar frustrations about disconnected policy and land use decision-making at the county level. We also note that while national government sets the conditions for land use decision-making through policy, most land use decisions are made at a county or local scale. That is why we propose the creation of a detailed cross-sector shared evidence base at the county level to support land use decision-making within that area.

Richard Kay, Manager of Planning Policy and Environment Lead, East Cambridgeshire District Council described how a shared evidence base could support him in his work.

"I think it would be really helpful to have a centralised place for data and information, at least at the county level. This would include up to date, free to access, high quality data, covering things like key nature sites, flood risk, water quality and information about agricultural land. If these and other important considerations were mapped out, it would help local authorities and other stakeholders make quicker and better informed decisions about land use. It would help us shift from asking 'which location will cause the least harm?' to 'which location has the most potential for making the greatest contribution to a particular policy objective?', whether that's tree planting, biodiversity, or new housing."

In the creation of a local plan, a local authority will collect a vast amount of quantitative, qualitative and spatial data and consult with other bodies on key land considerations such as flood risk, energy capacity and protected species. A Multifunctional Land Use Framework should seek to bring in additional data sources from areas outside the scope of the planning system into this process. In the pilots, stakeholders from the planning sector suggested that this could be used as an additional resource at the early stage of local plan development. The framework could help investigate suitable areas for development, opportunities for obligations such as Biodiversity Net Gain (BNG) and identify multifunctional land use opportunities. A key part of our Multifunctional Land Use Framework proposal is that the information it contains is public facing, thus supporting planning departments by having an additional resource to refer to in their communication and consultation strategies.

FFCC and Vizzuality co-designed a prototype data tool with leadership group members in Cambridgeshire to address the need for a shared evidence base. Working from the principle that it should be a simple and easily replicable intervention which is easy to maintain and use, we arrived at these core requirements:

- Users should be able to overlay data sets in way that demonstrates spatially the tensions and potential convergences in land use ambitions. The tool should help users to think about land use in its full complexity and enable strategic spatial thinking.
- The tool should be a first port of call for land use decision makers and people wanting to find out more about either their land or the landscape around them. The tool should effectively signpost to more specific resources

or tools where appropriate. The tool should help people navigate the complex range of existing land use resources in an intuitive way without requiring expert knowledge.

- The tool should be seen as a useful resource, a source of neutral information about the landscape around them. This information should help land use decision makers to make decisions with greater confidence.
- This should be a communication platform for professionals generating data within particular fields, enabling them to share their work with an inter-disciplinary audience across all land uses. For example, when a new local plan is published, the relevant information should be uploaded to this data viewer.

Working from these requirements we prototyped a data viewer that had six priority land uses identified by the Cambridgeshire leadership group (housing & development, water, farming, nature, energy and transport) with five datasets corresponding to each land use. The six land uses that were included in the prototype correspond with those highlighted by the Geospatial Commission in their report, but we have heard from stakeholders that public health is another issue with a strong spatial component (we can map health factors such as proximity to green space or active transport networks) which should be included in a fully developed tool.

Testing of the prototype created by Vizzuality for the Cambridge pilot showed that there is clearly an appetite for tools with intuitive data visualisations that empower citizens to better understand land, both their own and of the wider landscape around them. There is a wide range of tools currently being created, and there is some confusion about which are best to use for which purpose. This means there is an opportunity for a tool acting as the first port of call, as an overarching tool that can synthesise data from key land use sectors and signpost to other more specific tools where appropriate.

CASE STUDY: THE VALUE OF A SHARED EVIDENCE BASE

Key Themes: River Catchment; Co-Creation; Visioning; Financial Incentives; Ground-Truthing; Generational Knowledge
MLUF Principles & Ways of Working: Adaptive & Resilient; Evidence Based

The Connecting the Culm (CtC) project in Devon is working with nature and local communities, to help make the River Culm and its catchment better for wildlife and people, and more resilient to flood and drought. The team running the project were key members of our pilot. The project has used co-creation and visioning approaches to set an ambition for the catchment in 2050, and a blueprint plan of how to get there. To support them to fulfil this ambition they commissioned a hydrological map of the catchment and used this to inform their integrated catchment model. This detailed spatial data is used to identify Potential Areas for Improved Resilience (PAIRs) that should be focused on to deliver Nature Based Solutions (NBS) that support the achievement of the outcomes that have been collectively set.

As an example of how this works in practice, in the Kentisbeare sub-catchment (13 km2), the team used a virtual whiteboard (Covid restrictions were still in place) to lay out the best available data & evidence, which included the PAIRs. Using this shared evidence base to underpin their conversation, they facilitated a discussion amongst practitioners and specialists about the optimal land use in the right locations (using a set of principles and logic), in order to deliver ecosystem services (in this case flood, drought, biodiversity, heritage and carbon). The highest priority areas were refined based on spatial data, knowledge from practitioners working on the ground and where existing relationships increased the likelihood of action taking place. This is then ground-truthed to ensure that nothing has been missed or mispresented by the data – and to gain a clear understanding of the multifunctional

benefits that the change can offer, for instance former catch meadows being reinstated that could help improve infiltration, attenuate flows, conserve historic features, restore wildlife habitat and catch sediment.

This work is linked to financial incentives for the landowner/land manager in order to make a financial case for change alongside the ecological and social factors that will play a role in the final decision. It's key that landowners and land managers are seen as partners in this process. Lucy Jefferson, the CtC Catchment Officer, said "Landowners and managers can tell you exactly how a river functions over time. And if we're talking about rivers going back to a more natural state, many of the longstanding landowners know what that looks like. They know where the orchards and hedges used to be, and when they were taken out. They know things you can't get from a historical map or data set. It's generational knowledge."

This case study is a clear example of how a shared evidence base is a critical element in supporting decision makers and organisations need to come together to discuss and plan for the future. The process in the Culm focuses on the granular detail necessary to make concrete decisions on the ground. It largely mirrors the steps of the process that are necessary at a strategic scale to balance needs across nature, agriculture, built development, transport, energy and health and wellbeing. A strategic Multifunctional Land Use Framework can support the development and implementation of projects like Connecting the Culm – giving both landowners and organisations/institutions increased access to relevant, quality data and analysis that supports multifunctional land use decision-making.

Spatial data and land use modelling are being increasingly incorporated into land use decision-making. These initiatives would benefit from greater integration.

Investment in a shared evidence base for citizens and decision makers would coincide with existing efforts to standardise data usage such as work on digital planning in the new National Public Planning Framework as well as the data gathered as part of Local Nature Recovery Strategies. Our stakeholders recognised the need for greater standardisation and consistency with regards to use of spatial data and GIS tools, integrating these existing policies to create a combined platform for planning and nature recovery data. This would be a valuable first step towards the creation of a shared evidence base.

Opportunity maps can enable users to benefit from the insights of powerful land use models, without using them directly. Through the use of opportunity mapping, large amounts of spatial data can be synthesised into insights in the form of map layers. Land use decision makers can see where, for example, planting trees might have the greatest positive impact on a suite of factors including air quality, flood risk management and biodiversity, simply by looking at an opportunity map. There are highly sophisticated land use modelling tools producing opportunity maps or similar outputs across a wide range of land uses. Examples we encountered in the course of our pilots include:

- EcoservR - this tool maps ecosystem services such as air quality and flood risk mitigation and allows users to assess possible environmental impacts of land use interventions.

- Newcastle City Council's National Land Data Programme Pilot - this model uses machine learning to assess and suggest land use scenarios that could deliver the council's policy objectives such as access to jobs, house prices, air quality and access to green space.
- Dr Gemma Delafield's research at the University of Exeter - this model uses spatial data (such as wind speed and solar radiation) to find the optimal siting of renewable energy infrastructure.

A tool like the one prototyped in Cambridgeshire could bring together the outputs of the detailed sector-specific research that is already taking place, whether these are based on land use models such as those above or use other methods. Layering opportunity maps from different land use sectors would offer users a complex view of the demands on land, revealing the areas of highest demand where tensions may arise as well as areas where there may be opportunities for multifunctional land use.

Access to data can be a challenge and there is demand for better standards around data sharing and utilisation.

Despite the large amount of data available to users, certain datasets of particular importance were often stated to be lacking. This was either because they had a cost (or other licence restriction) that prevented stakeholders from using them, or the dataset simply did not exist in an adequate form for their purposes (e.g. very low spatial resolution, out-of-date, inaccurate data collection method). Key datasets that were seen to be lacking or difficult to access included: soil data (specifically carbon-related) and habitats and species data (with data around the condition of these being highlighted as a key area to improve); land ownership data; and public usage of land.

Given that the prototype developed with Vizzuality in Cambridgeshire is intended to be accessible to non-expert users, our stakeholders shared some important cautions about data quality, maintenance and trust. Some datasets that are useful at a county or national scale do not bear close scrutiny, habitats data was cited as an example of this. Those working with these data on a daily basis know this well, but those encountering this data for the first time may be misled or may find that individual data is in error which leads them to mistrust the veracity or reliability of the data viewer as a whole. To maintain trust in the spatial data viewer, it is crucial to keep the tool up to date with the best data available but sometimes the best data available is still not accurate at a local scale. Managing expectations is one approach, a suggestion from the Cambridgeshire leadership group was to use a traffic light system to indicate the reliability of the data. In Devon we heard that a good way to ensure that data is as current as can be managed is to create automatically updated tools, using APIs, to ensure maximum efficiency. Participants told us that this is imperative not only to save resources being spent on chasing updates from data holders, but also that it will build trust in the tool through its usefulness.

In Devon we heard that finding data can be a challenge, but for the non-expert there is an additional hurdle of understanding what different datasets or modelling tools can be used for. We heard that the essential resources - primarily time, money and skills to work with data and tools - are something that only a few organisations have. Alongside the development of any data visualisation and modelling tools, stakeholders told us that support in navigating what exists already would be a useful addition to the data landscape.

Wider utilisation of spatial data depends on designing a tool that makes it easy for non-experts to access, understand and manipulate that data.

A common theme through our research has been participants sharing their feeling of being overwhelmed by the amount of data and tools available to users online. Stakeholders often felt that they were either not aware of all that existed, or they were aware but they did not have the time to pursue the use of such resources. Researching the available data and tools, then deciding which is the most appropriate for a certain task is often a daunting or time-consuming task as it requires a detailed understanding of the accuracy, licence conditions, costs, etc. Some stakeholders experienced conflicting advice from experts regarding the best data or tools to use.

Some of the stakeholders who were data producers (as well as users) stated concerns over the use of certain data, believing it to be sometimes incorrectly interpreted. A common challenge shared by many of the stakeholders was having insufficient resources (time, money or skill) to pursue the use of data and tools properly. Therefore, data was either not used at all or used in a bare-minimum manner. It was often stated that the abundance of data was not an issue, but the capacity to analyse it and use it to full effect was difficult.

This view from both strategic and granular stakeholders on data related challenges supported FFCC and partners to design workshops to interrogate these further – and begin to work up prototypes that might be able to address some of these issues. In particular, the lack of knowledge around where to get authoritative and easy-to-use spatial data is a challenge that needs to be addressed. Our two pilot prototypes come at this question from different angles.

In Cambridge the challenge has been approached from a strategic perspective – looking to understand how data layering techniques and intuitive interface design can bring much needed clarity to decision makers looking to understand competing demands on the land from a county level perspective.

The key requirements of our data visualisation work in Cambridge were that we designed a tool that was simple, replicable and easy to both maintain and use by non-experts. We wanted to ensure that this work could be taken up widely both by local authorities and by citizens. Budgetary constraints mean that a highly sophisticated land use modelling tool would likely be out of reach for most local authorities. It is also not clear that it would even be possible to create a model that considers the full range of land uses, as existing examples of land use models tend to focus on particular areas of land use (e.g. ecosystem services). Highly sophisticated tools also tend to be more technically challenging and therefore more expensive to maintain while also being difficult for non-expert users to navigate, limiting uptake. It is the simplicity of our approach that enables us to bring together spatial data covering the full range of our demands on land.

We heard in both pilots that the skills to manipulate spatial datasets or engage with land use models are unevenly distributed. In some sectors these skills are more widespread than others but even within sectors there is a mixed picture. Those with more resources will be more likely to benefit from insights based on spatial data than others. For example, large agricultural estates may have a GIS specialist on staff while a smallholder may not be engaging with spatial data at all. This is why stakeholders in both pilot areas emphasised the need for greater standardisation and consistency with regards to use of spatial data and GIS tools. Our prototype of an intuitive data viewer covering all major land uses is a valuable first step towards greater alignment within and across sectoral boundaries.

In Devon, the design sprint approached this question from a more granular perspective. Through facilitated sessions a small group of stakeholders considered what it might look like to build a prototype that put easy to interpret data about potential land use change into the hands of land managers and landowners. This output resembles services that exist, with Land App being a particularly good example of providing detailed (and editable) suggestions for change. However, the process of building a prototype and then testing it with Multifunctional Land Use Framework stakeholders unlocked conversations that the project team may not have otherwise had about how spatial data could best show up as part of the Multifunctional Land Use Framework process.

National Land Data Programme work in Devon taught us that for stakeholders to engage with data and tools they need to be easy to find and access and easy to use for non-specialists. We also heard that many stakeholders do not have the skills in their organisations to be able to manipulate spatial data, and where they do this capacity is often limited. To ensure that stakeholders can participate in the creation, refinement and delivery of a local Multifunctional Land Use Framework, it is essential that consideration is given to these findings when using data as part of the process.

Spatial data could be improved by devolving power to amend datasets to trusted actors at the county level.

In both counties, we heard concern about errors in spatial datasets and the difficulty in correcting these when they occur. In Cambridgeshire, we heard of a long running disagreement between the ONS and the County Council as to the population of Cambridge: the council had strong evidence that the ONS figure was incorrect but there was no mechanism by which they could feed this back to the ONS. It was only when the census was done that the figure was amended, revealing the council's figure to be much more accurate. This example reveals some of the shortcomings of data approaches, where national datasets are incorrect it can be very difficult or impossible to amend them. This top-down approach, especially where spatial data is concerned, can make people feel that their land has been zoned or that a judgement has been imposed on their land which they are powerless to change.

This does not just risk alienating on-the-ground actors, it also misses the opportunity to benefit from their knowledge. Stakeholders in Devon proposed that any mapping or spatial modelling tool used in the process should contain the capability for landowners to feed in more accurate information to tackle this issue. It may be difficult to create a data viewer where any user can amend or update the data held on it, but those who maintain the shared evidence base at the county level should be empowered to amend datasets which are known to be inaccurate. This could go some way to mitigating the top-down feeling of certain data approaches and towards creating better and more useful data.

Ground-truthing data in this way is hard because local knowledge is rarely codified and translated into a form that others can access, this accumulated knowledge and experience is often known exclusively to the practitioner(s) who are engaged in a particular field. For example, the knowledge that farmers have of their soil type is frequently of a drastically higher resolution than it is practical to map at a national scale. These practitioners need not necessarily be land managers or landowners, recreational land users can also have highly valuable local knowledge (e.g. birdwatchers, anglers, ramblers, etc). The Fenland Soil case study illustrates how working with on the ground actors to gather local knowledge can lead to improved data and better outcomes.

CASE STUDY: FENLAND SOIL – PEAT MAPPING PROJECT IN CAMBRIDGESHIRE

Key Themes: Nature-Based Solutions; Financial Incentives; Peat; Soil Mapping

MLUF Principles & Ways of Working: Locally Responsive; Strategic & Granular

The lowland agricultural peats of the fens have been the subject of much discussion recently, following the government's Lowland Agricultural Peat Taskforce report. There are many who advocate rewetting these areas in order to protect the valuable carbon store and realise the carbon sequestration and wildlife potential represented by rewetting deep peats, while others point to the importance of lowland agricultural peat to food production, especially to the horticulture sector with 33% of UK field vegetables produced in the Fens.

Against the backdrop of this debate, researchers from Fenland Soil and National Institute of Agricultural Botany (NIAB) have highlighted the urgent need to update our peat soil maps and have been working with farmers to produce detailed soil maps of their farms. Conventionally farmed peats can erode at a rate of up to 2cm a year, so soil mapping rapidly becomes outdated in peatland areas. It is important to know where areas of deep peat remain because it is environmentally harmful to rewet areas of wasted peat, also known as skirt fen, as this is associated with higher methane emissions. Those looking to rewet parts of the fens based on outdated maps, could be rewetting unsuitable areas and causing environmental harm. Farmers have by far the best knowledge of the current state of peatlands, and this knowledge is not held by anyone else.

Fenland Soil and NIAB researchers engaged with farmers to map their soil types, inviting farmers to draw their different soil types onto maps of their farm. This approach generated very intricate soil maps showing in-field variations in soil type. Fenland Soil and NIAB are now working to create opportunity maps for rewetting based on this newly recorded soil data. They are hoping that this approach can be adopted more widely in the fens.

Conclusion

Data and evidence are at the heart of every Multifunctional Land Use Framework discussion, and adopting the MLUF approach can increase stakeholders' understanding, integration and access to this data. An effective and well-designed tool will help users to manipulate the data and deepen the insights they gain from it, but ensuring high-quality data is key. National datasets can contain inaccuracies that are clear to local users, and it will be important to find mechanisms for bottom-up amendments to correct data using a wide range of local knowledge sources.

This paper is one of four setting out the findings from our pilots. The series is available on *A Rough Guide to the Multifunctional Land Use Framework*, which brings together learnings, discussions and tried and tested ideas about a MLUF.

To find out more about FFCC's work and join the MLUF Practitioner Community, contact georgie.barber@ffcc.co.uk