RURAL PLANNING IN THE 2020S

Technical Report 1

Thematic reviews

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Document purpose

This document summarises the thematic reviews carried out by different members of the Rural Planning in the 2020s project team. These reviews focus on the different thematic areas as they relate to the Forces for Change – Climate Change, the countryside as a site for adaption, COVID-19 and Brexit – as they play out in different sectoral domains and reflect on country-specific examples of these. (Refer to the National Policy Assessments (Technical Report 4) for more specific analysis by the different nations under study, the UK and Ireland, carried out by our project nation leads). Each full thematic review is compiled in this document to enable the reader to explore the different issues.

This document is one of five Technical Reports that accompany the main Rural Planning in the 2020s Report, available on the RTPI website:

- Technical Report 1 – Thematic Reviews
- Technical Report 2 – Housing Market Analysis
- Technical Report 3 – Roundtable Analysis
- Technical Report 4 – National Policy Assessments
- Technical Report 5 – Case Studies

Key issues arising from the Thematic Reviews - summary

Here, we summarise the findings and conclusions that can be drawn from the thematic reviews carried out by the project team, highlighting issues that were further explored in the analysis of thematic, national and regional roundtables (see Roundtable analysis (Technical Report 3) and the national policy assessments (Technical Report 4). Below, we assess what the reviews add to our focus in our study of what sustainable development looks like in rural contexts and how and can land-use planning support more sustainable futures.

Community-led and Neighbourhood Planning

The Community-led and Neighbourhood Planning thematic review outlined the overarching key trends common to community planning in the different national contexts, with examples of best practices and landmark initiatives that have helped to advance (rural) community planning in recent years (such as the 1998 Cork Declaration on rural development which enshrines the principle that rural development should be community-driven and the EU LEADER programme[1] which established rural Local Area Groups (LAGs) at the sub-national level in different European Union (EU) countries to support bottom-up decision-making and partnerships).

1 https://www.leader-programme.org.uk/

Common to many UK countries and Ireland has been the perception that statutory planning has been a barrier to rural development and there have been moves towards localist rural planning which reflects ‘governing through communities’ where communities have the ability and responsibility to help themselves. Here, communities are considered to act in partnership with local authorities to facilitate effective knowledge exchange - and a variety of partnership models emphasizing co-production with planners and service providers have ensued. These have had various degrees of success, in terms of ‘rural proofing’ (and ‘community proofing’ planning). But a common criticism relates to misalignment between the tools available and community needs.

The thematic review draws attention to four key areas of limitations in community-led and neighbourhood planning: take-up and capacity issues (such as entrenching existing patterns of privilege and disadvantage, the appropriate skills and capacities for local groups to take forward key rural issues); issues of power and knowledge (such as dependency on expert intermediaries or attracting ‘the usual suspects’); support issues (such as a lack of resources or a desire for outcomes compromising the time it takes for community ownership to take hold); and impact and coverage (such as not addressing rural issues holistically, a confounded sense of what rural innovation looks like and a lack of attention to rural economies, such as agriculture and tourism).

In response, the thematic review suggests some ways to bridge the divide between the ideas and limitations of community planning in three key areas. 1. Participation: ensuring that participatory practices are more inclusive and a need for tools that can recalibrate uneven relationships between rural communities and planning professionals. 2. Integrative mechanisms: creating opportunities for greater orchestration between actor groups such as planners, local councils, and community planners through governance that reconfigures their interaction. In addition, planning needs to take a more integrative approach to land use (Burchardt, et al, 2021; see Case Study 12: The Food Farming and Countryside Commission Land Use Framework in our Case Study and Think Piece Appendix) so that community planning is ‘stacked’ within broader land-use agendas. 3. Tools and strategy: rural politics should reflect a more progressive approach to the diversity of the countryside, rather than established actors as well as understanding that rural identities are rooted in traditional practices often rooted to historic land practices.

Rural Housing Markets

The rural housing thematic review reveals the key themes and issues relating to the structure of housing markets. It discusses how supply and demand dynamics are affected by the underlying structural conditions of the market, whereby access to funds for the better off or an inability to access funds for the less well-off is causing a crisis of affordability in rural areas. The review explores how there is a bias towards the most profitable development, which often precludes affordable housing and favours a bias of rural amenity value in exchanging areas (i.e., rural areas that are in demand), based on a nostalgia of the rural idyll and higher housing value in or near protected landscapes. Yet 'depleting areas' (i.e., rural areas that are less desirable and have a low tourist value) are facing a declining economic base, poverty and intergenerational housing ownership lock-out. Exchanging areas, the thematic review suggests, see the future house price protected due to scarcity of traditional rural housing stock in protected areas, often within conservation areas or Areas of Outstanding Natural Beauty (AONBs), which have additional planning constraints to protect their environmental and historic value.

The access to funds within a free-market property system favours 'adventitious' purchasers who are able to access funds through existing capital assets, low interest rates and mortgage availability. This also leads to speculative development as investors see housing markets as sources of 'good inflation', encouraging an increase in value for landowners, such as investment in property to enable buy-to-let purchasers rather than first-time buyers. Such markets thus favour a concentration of wealth in housing assets. This then causes a crisis of affordability and a highly unequal housing market where second home ownership proliferates and leads to gentrification as 'local' people on lower wages are priced out of their communities. In addition, the planning system, while different across the different nations, is left to manage the externalities of unequal housing access through non-market alternatives, which is often left to rely on exception sites and landowner goodwill to accept a lesser value for development for social and community benefit than those seeking a profit from an unequal housing market.

The thematic review makes a number of suggestions to rectify this. To address issues relating to unequal access to funds and structural market inequalities, the review makes the case for a more redistributive housing market (see Dorling, 2015). Here, there would be penalties on second home ownership (through progressive property taxes to replace and complement the outdated system of council, see Monbiot et al., 2019), a suspension of the

right to buy and a bolstered grant-funded social housing scheme that was integrated with an overarching rural economic development strategy. The Government could also intervene in the taxation system so that capital gains from property were aligned to top tier tax rates with less tax relief benefits, and profit from rental income could be taxed to fund social care in the form of an additional levy with extended Stamp Duty Land Tax (SDLT) surcharges.

In terms of recommended planning interventions, the review suggests that there could be an additional 'right' for communities to purchase agricultural land under an amended Land Compensation Act at an affordable price and that land should be further allocated for community-led uses through land trusts with affordable occupancy covenants in perpetuity and an extended permitted development system for community-led development with an adjustment in use classes favouring such schemes, e.g. reclassifying housing for local use rather than second homes. Such issues have been picked up in recent policy debate in Wales.

The review also outlines how the Forces for Change are exerting pressure on rural housing. For instance, Brexit's end to the freedom of movement for EU nationals may shift in seasonal housing demand, with owners of properties in Europe replacing them with second homes in the UK. Meanwhile, climate change may affect emissions from transport due to a chronic undersupply of housing in rural areas, or that COVID-19 may have led to a challenge in existing planning orthodoxy to restrict planning in rural areas, and instead see smearing of growth across local authorities that allows for greater flexibility in development in the countryside.

Ecosystem Services

The ecosystem services review outlines the distinction between the classification of ecosystem services (ESS) within internationally recognised definitions such as the Common International Classification of Ecosystem Services (CICES), the Millennium Assessment, The Economics of Ecosystems and Biodiversity (TEEB) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). The review details the key characteristics of these definitions as cultural, provisioning, regulating, and supporting/habit functions. It reveals how the ecosystem services approach takes a system-based and inter-

relational view to understanding the relationship between human health well-being and nature's goods and services.

The review highlights the dramatic decline in 14 of the 18 categories outlined in IPBES since 1970, highlighted by the Dasgupta Review (Dasgupta, 2021), partly owing to a global intensification of agriculture and development's inability to prioritise nature, which is now being corrected through the Environment Act and development's 10 per cent mandatory contribution to biodiversity net gain from 2023 (though of course, many planning authorities and developers have already started to put net gain measures in place – roundtable findings later in this report).

The policy and regulatory framework for ecosystem services is rooted in the 1992 Convention on Biological Diversity, which introduced the concept of monetisation or a valorisation of nature in capital terms. A number of national policies have developed around the principles of natural capital and its goods and services to promote human well-being, such as the Welsh Well-being of Future Generations Act (2015) Scotland's third Land Use Strategy (2021), the UK's Natural Capital Committee (formed in 2011) and Ireland's National Biodiversity Strategy (2017-2021). In England, natural capital is central to the goals set out in the 25 Year Environment Plan (2020). Several coordinating bodies have also been established to oversee the coordination of ecosystem service approaches, such as the UK's Natural Capital Committee, whose responsibilities have now been mainly transferred to the new Office for Environmental Protection, established by the Environment Act 2021.

However, as the thematic review outlines, there are issues with both the valuation and measurement of natural capital which underlies many ecosystem service-based approaches. While 'nature accountancy' has grown in recent years, such as through the UN's System of Experimental-Ecosystem Accounting (SEEA)2 and NatureScot's Natural Capital Asset Index3 (which currently excludes goods and services arising from the marine environment), measurement can overlook other benefits, such as recreation in rural areas (e.g., play parks). More fundamentally, economic valuation introduces economic terminology such as substitutionally and opportunity costs which can disregard the contingency of ecosystem services. Meanwhile, the commodification of ecosystem services can also encourage investment in nature (such as emerging biodiversity net gain offsetting markets, see Case Study 14: Bristol Avon Catchment Market) and it puts nature on a par with other capitals,

2 https://seea.un.org/ecosystem-accounting
3 See: https://www.nature.scot/professional-advice/social-and-economic-benefits-nature/natural-capital/natural-capital-asset-index

e.g., financial capital.

The review proposes that a broader range of Payments for Ecosystem Services (PES) are likely required to support ecosystem functionality, which may include widening access to Environmental Land Management Schemes (ELMS) to other land users/owners other than agricultural landowners and agents. In addition, the value of ecosystem services should be co-produced with different stakeholders to ensure that value is reflective of different experiences of nature and help to mainstream biodiversity into decision making across all sectors.

Green Infrastructure

Green Infrastructure (GI) is a relatively new policy concept which describes the delivery of socio-economic and ecological benefits through the network of trees and woodland, parks, green space, waterways and public rights of way. GI is typically delivered through discrete projects at specific locations, such as the Ely Country Park and Wiken Fen projects in East Cambridgeshire, or the Glasgow and Clyde Valley area initiative which linked GI in urban areas to the wider landscapes at the urban fringe.

Access to nature has grown in prominence as an indicator of quality of life for both urban and rural areas, yet access and mobility can affect the subjective value one affords to GI, particularly in rural areas. However, the thematic review suggests that it is a largely urban concept which fails to sufficiently distinguish between the 'greenness' inherent to rural areas and the latter's connective capacity to link different ecosystems.

However key questions are posed by the review with regards to what does GI mean in practice for rural areas, what benefits does it provide to policy and practice, how does GI relate to broader social (planning) issues, and is the classification of GI contingent on access to experience it?

The review suggests that local nature recovery strategies and national recovery networks can provide an environmental structure that maps effectively onto existing rural resources and can help to create specific proposals for creating or improving habitat for nature and

wider environmental goals. Though these may be more specific than GI and focus more on wider biodiversity or ecosystem service benefits and GI can be defined in narrow land management terminology.

The review reflects on the wider lack of consensus in the application of different nature-related terminology (see Technical Report 3, Roundtable Analysis) which can emphasise different but overlapping characteristics, e.g., provisioning and well-being benefits. There are also contrasting stakeholder perspectives as to what is important to whom and why (e.g., tourists, 'locals' and land agents or investors). The value of natural resources to different cultures is also a consideration, where the historic occupation of land can be tied to cultural identities of what is valued. There is also an inequality of access or prejudice towards black, Asian, middle eastern minority groups, as experienced by some of these groups as they sought to experience nature during the COVID-19 lockdowns.

In agreement with the conclusions in the community-led and neighbourhood planning thematic review, this review suggests there is scope for an integrated approach to land management, emphasizing collaboration between farmers, land managers, water companies and other stakeholders at a catchment level. Specific opportunities are suggested to enhance or reform how GI is understood. Firstly, nature-related terminology can be aligned to ensure that it is appropriate to rural areas and the wider socio-economic benefits afforded by nature. Secondly to map the regional differences in the application of GI-based approaches (in planning) and align these to nature recovery networks. GI best practice in rural areas should be captured and shared more widely to understand the validity and relevance of the term to rural planning and how it can support just transitions that capture the transformative potential of a grown appreciation of nature arising from the COVID-19 pandemic and the 'eco-economy' that benefits rural communities and landscapes. Making explicit the links between effective management, functionality of GI/nature-based resources, economic sustainability and variance between urban and rural planning policy is also fundamental to enhancing the relevance of GI.

Agricultural Transitions

The agriculture sector is thought to be responsible for 10 per cent of the UK's greenhouse gas emissions (DEFRA, 2019), though some challenge the methodology used to calculate this impact. In response, the sector has committed to reducing its environmental footprint to reach net-zero by 2050, and 61 per cent of UK farmers have already taken action to do so (DEFRA, 2019).

The Agricultural Transitions thematic review discussed some of the key strengths of the current UK and Irish agricultural system, which is diverse in terms of farming type, size and tenancy (e.g., farmer-owned or tenanted farms). Well-connected rural and lowland areas were showing signs of innovation, for instance, the growth of the viticulture sector in southern England. The agri-food sector is more adept at dealing with short-term issues, such as outbreaks of livestock pandemics such as bird flu and having to deal with the demands of short supermarket supply chains. Such experiences put the sector in a strong position to deal with the structural change required to respond to climate change, Brexit and the changes arising from COVID-19 as well as new food trends such as veganism. Moreover, there has been a growing popularity of locally grown (organic) food box schemes which are key opportunities for many farms (though community-supported agriculture is estimated to account for only 3 per cent of UK fruit and vegetable production). However, UK food self-sufficiency is estimated to be only 60 per cent (while in Ireland the sector produces large meat and dairy surpluses).

However, there have been significant losses in the number of farms, while the average UK farm size has increased (which is now 87ha / 209 acres compared to 32.4ha / 78 acres in Ireland, as of 2018 figures). Many county farms owned by local authorities have been disposed of due to austerity measures and overall, there has been a 30 per cent reduction in the number of UK farms since 1990. This is reflective of the emphasis on industrial food production and distribution systems which has resulted in a consolidation of wider agri-food infrastructure (though still approximately 75 per cent of UK farms are below 100ha / 240 acres), and a loss of local farming infrastructures, such as market town cattle markets and abattoirs. This squeeze on agri-food production has compromised the voice of farmers for alternative land use, such as rewilding.

The role of the planning system to support diversification and make use of subsequent redundant farm buildings caused by farm loss and rapid production shifts. There are

opportunities to embed wider social goals of sustainable production (e.g., circular economies and regenerative farming) to promote a wider land use agenda to support rural development, social justice, tourism as well as food security. Indeed, thus far, 66 per cent of farm businesses have adopted some form of diversification (NFU, 2019) and UK farms generate 10 per cent of the total electricity supply, with 70 per cent of solar produced on farms. New post-Brexit environmental incentives based on the delivery of public goods set out in the Agriculture Act 2020, such as the ELMS from 2024 provide new opportunities for farm diversification and the stacking of environmental and food production benefits with potential carbon sequestration services.

To do this, initiatives that support rewilding need to consider how to incorporate agriculture and the planning system needs to remain flexible to support adaptive farm business, including hosting domestic 'staycation' tourism that proliferated during the COVID-19 pandemic, though there is a risk this market may be temporary and not pay back the investment made by farmers in associated infrastructure. Meanwhile, uncertainty in the future of post-Brexit trading relations and the change to seasonal migration are real risks and challenges to securing resilient supply chains and may see a rise in automation of production processes or emission leakage through increased freight travel. Climate change, instability and crop sensitivity are other major threats. The age of farmers (average of 59 years in the UK) is a threat to encouraging new blood and innovation to the sector. Change in the agri-food sector can de-stablise the wider services provided through the planning sector, such as employment, educational facilities and land use change. The thematic review concludes that it is imperative that competing claims on the land are managed fairly and balanced between social, economic and environmental benefits.

Rural Mobility, Connectivity and Energy

The thematic review covering the related, but differing, issues of the infrastructure within and between places covers the topics of rural mobility (e.g. the modes through which people access services and recreation, sustainable transport and issues with car-centric travel patterns in rural areas), connectivity (e.g. digital and physical infrastructure that enables connection within and between areas) and energy (notably the energy policy mix for the

different nations and net-zero ambitions and the extent to which low or zero-carbon energy solutions are adequate for rural communities' needs). The review points out that recent trends in technology are affecting the traditional logistical networks underpinning both transportation and other infrastructure, such as energy, through increasing electrification, automation and real-time data analysis (DfT, 2021; Innovate UK, 2021). Due to the extent to which these three elements interact they are considered to be integrated issues within this thematic review, often overlapping in the way they are planned for.

The review first explores mobility issues and how under-investment in rural areas and exacerbated by the Beeching cuts to the railway network in the 1960s has led to increased car ownership and the consequential adverse impacts on health and well-being. In the UK, the transport sector is the largest contributor of greenhouse gases, responsible for 28 per cent of emissions in 2018 (BEIS, 2018; DFT, 2020). Urban residents also tend to have a lower carbon footprint than rural areas (Centre for Cities report Net-zero: de-carbonising the city; Catapult, 2020) and those without public transport in rural areas may miss out on employment opportunities (DfT, 2021). Meanwhile, planning decisions have exacerbated this trend so that developments are still built away from an integrated public transport network (CIHT, 2019) and rural areas struggle to access long-term investment to build such a network tailored to specific rural needs. The COVID-19 pandemic has also put huge financial pressure on already struggling public transport services (e.g., there has been a £1bn cut to Network Rail, resulting in a £2.9bn shortfall in revenue (Topsham, 2021b), and some routes have since been cut altogether.

The review then assesses the suitability of solutions such as the 20-minute neighbourhood, which can be a more urban-centric ideal (RTPI, 2021). It also explores experiences of creating Mobility-as-a-Service (MaaS) initiatives and on-demand public transport schemes which require higher coordination of services to provide different services, including promoting tourism, such as the Dales Bus in the Yorkshire Dales National Park, using smartphones to access buses, such as the ArrivaClick on-demand minibus scheme in Leicestershire or the VeloCity shared bike scheme in rural Scotland (CILT, 2021). The review also examines ways in which planning and transport policy might become better integrated in rural areas and some of the challenges of doing so; for instance, a lack of accessibility targets in Local Plans or a lack of coordination between stakeholders, hampering innovation or a lack of tools, data and flexibility in the system.

The review draws attention to potential solutions to rural mobility, such as increased access to data, more reliable funding streams - particularly for the community transport sector - and

moving towards outcome-oriented planning approaches, tied to societal benefit (see RTPI, 2020). Though, as the review suggests, whether the reforms to the rail network to create an accountable public body within a largely privatised UK rail network under Great British Railways to deliver locally-driven, 'common good' solutions that can be more closely tied to the planning system remains to be seen (see Salveson, 2020). Key differences in transport planning exist in the UK, however, due to the expectation for devolved nations to deliver transport through a national plan, while in England transport planning is more dispersed.

In terms of connectivity, the review explores how 'digital poverty' and rural area 'not-spots' in telecommunication network coverage are holding back rural communities and recent policies that aim to address these issues. Broadband is often not considered 'a planning issue' by some LPAs, planning policy guidance is clear on the role of planning in enabling the roll out of such infrastructure and enhancing connectivity, particularly in rural areas. In addition, the review discussed how digital connectivity is helping rural communities to bridge previous remoteness that prevented rural regeneration, particularly in Ireland and since the COVID-19 pandemic and the increase in home-working. As discussed in the review, tools such as Parish Online can help to bridge a spatially-informed digital data management hiatus in local councils to support climate, environmental and community resilience building and community-led planning. The review suggests that data-driven solutions and indexing data on the rural green economy with wider rural mobility and infrastructure needs can help to better inform planners and rural communities on their progress towards a connected, zero-carbon transition. Moreover, the review discusses the potential for rural enterprise and mobility hubs to facilitate such a transition.

The different energy mixes across the UK and Ireland are assessed and discussed, including the overall 13 per cent reduction in UK energy consumption between 1990 to 2019 and the increased share of renewable energy to this mix. For instance, Scotland has a much higher onshore wind electricity capacity (71 per cent) than the rest of the UK and Ireland and has a high proportion of biomass for heat (81 per cent) but does not reflect non-electrical heat generation. Northern Ireland is in a less energy secure position, importing most of its oil and gas from abroad and is highly dependent on oil and petroleum-based fuels for heat and electricity generation, respectively. In Ireland, some rural households are even more dependent on fossil fuel sources to heat their homes in some rural counties, such as the Border region and the West.

The review details how community energy schemes and innovations in a more decentralised energy network offer opportunities to address these energy lock-ins and foster energy action related to social justice, fuel poverty and community resilience in the face of climate change. The review also discusses energy issues, and the net-zero challenge as it relates to

decarbonisation of the transport sector, domestic energy infrastructure, and energy and farm diversification. Though to achieve this there needs to be 'rural-proofing' of decarbonisation in the rural environment mainstreamed across national and planning policy (see CILT, 2021), or through the suggested net-zero test for policy development (see Climate Change Committee, 2021). It also reflects on how changing, localised climate governance in the wake of climate emergency declarations, such as citizens assemblies, bottom-up GIS technologies (such as Parish Online, see Case Study 11 in Technical Report 5) or supplementary planning guidance on climate change and emergencies, can complement national (low-carbon) planning policy.

Thematic Review: Rural Community-led and Neighbourhood Planning

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Introduction

This Thematic Review discusses the role and potentials of community planning in and for rural areas. We provide a brief review of the literature, explain what tools are being deployed currently and emphasise how they may be applied or modified to help address issues and challenges discussed in other elements of the wider research project.

There is a direction of travel, shared to at least some degree across the nations, towards 'localist' approaches to planning. A parallel or alternative label applied to a subset of practices is the advent of the 'neo-endogenous' paradigm which advocates a re-localisation of rural economies (Gkartzios and Lowe, 2019; Marango et al, 2021). Most clearly these underpinning ideas are seen through the introduction of forms of community planning processes in the past two decades or so. Although expressed with some variation across the UK and Ireland (see Table 1), communities are being engaged in formal planning processes in rural areas with a variety of partnership or co-production models evident. These feature forms of partnership working with formal planning actors and other service providers, or in the case of England with communities leading on the production of a statutory land-use plan. This trend has also been pursued through schemes such the EU LEADER programme with

its Local Area Groups (LAGs) system operating out with formal land use planning and into the space of rural community and economic development (see Bosworth et al., 2016). Both strands are of interest here and as explained there should be scope to see processes dealing with land use planning operating more closely or in conjunction with other related rural economy-society governance arrangements. This is notable if integration of lessons from neo-endogenous growth strategies with localist planning forms is to be achieved with a view to more integrated local action.

Indeed, rural development practitioners (as opposed to planners in rural areas) have adopted the principle that rural development should be community-driven. This was enshrined in the Cork Declaration on rural development in 1996 and has been applied in delivery mechanisms (e.g., LEADER and other EU regional development programmes). These efforts introduced a new strategy of 'governing through communities' in which the countryside was represented as a set of communities with both the ability and responsibility to help themselves, while the direct involvement and responsibility of the central state in addressing rural problems was reassessed. More recently the environmental planning domain has also experimented with a third form of community involvement, namely citizen science activity (e.g. Ferrari et al., 2021) which attempts to enrol the resources and knowledges derived from civic society, that can enrich local policy and decisions. This formulation bears some point of connection with earlier forms of community planning experimented with in the 1980s (Moseley, 1997), where the emphasis was on research and information collection or local evidence base establishment (Parker, 2008).

Despite widespread support in principle for localist, citizen science or neo-endogenous activity, mechanisms and outcomes that have followed over the past decade or so have not been without criticism. We spend less time here on the third strand (as above), yet there is a need to ensure that community planning is relevant and effective for existing and emerging rural challenges. To do this an appropriate breadth or scope needs to be conditioned and support for such activity is needed as we describe below.

A shift towards localist rural planning

Localism (as an expression of decentralisation of responsibility) and participation in 'rural solutionism', is expressed differently across nations, with a common aim of developing

greater trust and enhancing community input to planning, as well as make-weighting for lack of capacity in the public sector. In a context of wider community action such as that brokered through LEADER over the past 25 years or so, the impulse has been to ensure that local knowledge and priorities are reflected in resource allocation. Indeed this was the emerging implication of the English Parish Planning model that had strong take-up in the 2000s (Parker and Murray, 2012), to establish local need and priorities and then to look towards formal planning as one source of resolution. Within the Irish context, local approaches to rural development build on a well-established tradition of rural community self-help initiatives, which have tended to emphasise social and economic objectives. In contrast, statutory planning has often been perceived as a barrier to rural development leading to a dichotomy between socio-economic and environmental dimensions of rural spatial policies (Scott, 2008). This gap is one that is found across the UK as well.

Furthermore, it has been recognised in rural planning circles that the idea of rural communities undertaking socio-economic development activity without support or knowledge exchange was problematic (Lowe et al, 1993). It was recognised that communities needed to interact with, and draw on support from, extra-local sources such as local authorities or national institutions to deliver their area-based strategy (Juppenlatz, 2015) as part of a cross sectoral partnership. This neo-endogenous approach (i.e., localist); acknowledges interactions between top-down programmes and bottom-up approaches (Gkartzios and Lowe, 2019). The neo-endogenous approach is grounded within institutional theories of development in which the key to development is building local institutional capacity that can mobilise internal resources as well as the external forces acting on the territory (Ward et al, 2005). Bosworth et al. (2016) argue that the goal of such an approach is to achieve sustained cooperation and partnerships amongst the complex web of networks that exist in one area, accepting that knowledge of rural development is produced and shaped by many different actors. In this way, the notion of neo-endogenous development offers an alternative model to the dualistic top-down and bottom-up perspectives (Bosworth et al, 2016)

and provides a contrast to the design of neighbourhood planning in England, but shows greater similarity with the Welsh approach. The LEADER scheme's approach differs from other planning forms is that it carries a capital budget. It therefore also bears some resemblance to participatory budgeting forms given that spend is decided by the local partnership (see Moir and Leyshon, 2013; Scott, 2004).

The aims of government in establishing such spaces for local deliberation and action are sometimes sustained through rationalities of self-help and placing responsibility on civic society i.e. 'governing through community' and also practical or pragmatic questions of cost and political management of dissent. At their best, models of community planning can

enable greater voice, a richer input of knowledge types and a mix of democratic forms to shape planning and effect greater accountability. There is also a rationale found in such measures which attempts to improve relations between communities and local planning authorities. In Wales for example, there is an explicit recognition that place planning that can help show the evidence-based priorities for action in improving local prosperity, health and the local environment. Table 1 gives an overview of the community planning forms being deployed currently across the nations (strand 1).

Table 1 Community planning across the nations (overview)

Country / title	Brief description
England – Neighbourhood Development Plans (NDPs)	Since 2011 and the Localism Act, amended by Neighbourhood Planning Act 2016. Volunteer led statutory plans. Around 2500 Plans were in place or in progress by 2021. They have to meet a set of 'basic conditions', including conformity with strategic policies in the local plan and the policies set out in the National Planning Policy Framework (NPPF). Only land use planning matters can be included.
Northern Ireland - Community Plans	The Local Government (Northern Ireland) Act 2014 places a statutory duty on councils to produce and implement community planning through the production of a Community Plan for their area. The Community Plan is based on engagement with the community and provides the strategic framework within which councils, departments, statutory partners and other relevant organisations must work together to develop and implement a shared vision for promoting the economic, social and environmental well-being of their area through the delivery of better services. The 2014 Act provides for the production of a list of statutory partners that must participate in and support community planning. There is a statutory link between the Community Plan and the development of Local Development Plans under Section 77 of the Local Government Act 2014. (See also Circular LG 28/15 – Statutory guidance for the operation of community planning).

Ireland - LECPs	Local Government Reform Act 2014 created new Local Economic and Community Plans (LECPs). LECPs are six-year plans for the local authority's administrative area. They are prepared by the local authority in association with the Local Community Development Committee (whose establishment was provided for under the Local Government Reform Act 2014). The LECP must be consistent with the core strategy and objectives of the County Development Plan (CDP) and any Regional Spatial and Economic Strategy (RSES) that apply to the area. LECPs are intended to help facilitate better integration of public bodies, social and community partners to collaboratively work on integrated plans for improving the social, economic and environmental wellbeing of communities (see Department of Environment, Community and Local Government (Irish Government) Guidelines on LECPs, 2015).
Scotland - Local Place Plans	Introduced under the Planning (Scotland) Act 2019 Local Place Plan (LPP) provides a framework for communities to take forward community actions themselves. The Scottish government say that a local place plan is a proposal as to the development or use of land. A LPP "may also identify land and buildings that the community body considers to be of particular significance to the local area." (Part 1, Schedule 19). Local Place Plans should have regard to the Local Development Plan for their area, as well as the Scottish Government's Strategic National Planning Framework which covers the whole of Scotland.
Wales – Place Plans	Place Plans were introduced in 2015, to be authored by local communities, as Supplementary Planning Guidance. The 2015 Planning Act gives a particular weight to Place Plans and requires LPAs to work with communities to prepare their plans, given that in common with the English NDPs place plans are created by local people who know the area well and can add more detail to the work done by the local planners.

A review of some key desirable features that community planning might aspire to is found in Wargent and Parker (2018) who argue that community (neighbourhood planning specifically) should involve:

1. More equitable plan-making (i.e., geographic distribution);
2. Deeper co-production (principally between local government and communities);
3. Promote greater social inclusion;

4. Improved quality and value added to planning policy;
5. Help in the reconciliation of hyperlocal and strategic concerns; and
6. Be characterised by enhanced community control (ibid, 2018: p390-91).

In a specifically rural context, those high-level characteristics are useful to frame both how existing tools perform and to overlay new issues for different and future iterations of community planning. The design, use and responses (to Neighbourhood Planning specifically) also reflects some of the dynamics of rural (community) politics. So, we include this review of community planning here as this aspect of planning is important as means (modality) to discern, debate and act or apply actual issues and challenges for rural areas. This is the mainstay of the work in this research project (i.e., across the Table 2 axes below) but needs consideration of the tools applicable to rural planning.

Pressures (faced) and essential dynamics in rural community planning

The dynamics of community planning can be usefully distilled into four themes: take-up and capacity issues, knowledge issues, support issues and impact and coverage and these are discussed below. This section discusses how community planning (first strand discussed above) has been actualised.

Take-up of community planning across the UK and Ireland

The focus on 'community control' has in practice in England resulted in formal Neighbourhood Planning from 2011. Research shows a good level of take-up of Neighbourhood Planning, particularly in rural areas; indicating interest in planning and which may reflect mobilisation of rural communities in the past. However, there has been a higher take-up in affluent, rural and semi-rural areas who largely benefit from stable communities

and active local government bodies (i.e., parish or town councils). The profile of Neighbourhood Planning take-up also shows more deprived communities being significantly less likely to participate in the English experience (Parker and Salter, 2017). Lessons for rural areas relate to ensuring that the participatory practices (design and support) are more inclusive both in terms of type of participant but also the range of issues considered. The research for the Ministry of Housing, Communities and Local Government (MHCLG)[4] in England in both 2014 and 2020 showed that there have been a number of difficulties in the production of Neighbourhood Plans and that few had been comprehensive in considering or seeking to address rural planning issues in the round. Instead, a more selective or focussed orientation had been fostered by a mix of governmental direction, local capacity and extant knowledge.

In terms of other countries, the Local Place Plans initiative in Scotland has not had time to manifest itself fully. In Wales, there has been some take-up of the opportunity for local communities to prepare Place Plans. These have typically been taken up by small towns within rural communities where the local planning authority has been active in promoting consideration of Place Plans. Some Place Plans have subsequently been endorsed or adopted as supplementary planning guidance as a way of giving some degree of weight to community planning activity in planning decisions.

The limited status afforded to Place Plans in comparison with similar community planning activity in England in the form of Neighbourhood Planning, as well as more limited financial and other support, has meant that Place Plan preparation has been limited to certain well-organised communities. There has nevertheless been some preparatory work in supporting Place Plans through the work of Planning Aid Wales, the development of the Understanding Welsh Places initiative by Carnegie UK Trust and the Institute for Welsh Affairs, and the Shape My Town toolkit co-produced by The Design Commission for Wales. These have largely supported proactive communities in exploring the possibility of Place Plan preparation.

In Ireland, LECPs have been enabled for seven years and all Irish local authorities were mandated to produce them with a condition that they be reviewed mid-term (i.e., after 3 years) and be ‘consistent’ with regional and national policy. The LECP sets out, for a six-year period, the objectives and actions needed to promote and support economic development and the local and community development of the relevant local authority area,

4 Now DLUHC – Department for Levelling Up, Housing and Communities

both by the local authority directly and in partnership with other economic and community development stakeholders. LECPs are intended to and appear similar to the community strategies (then renamed Sustainable Community Strategies) that were initiated from 2000 in England but effectively ceased after 2010. There is little published research on the LECPs, but some commentators have criticised the speed at which these were produced. The Waterford LECP was finalised a year after the legislation. This prompts questions over whether the plans are for communities but are not with communities.

LEADER local action groups remain key to delivering community-led rural development programmes, focused on economic and enterprise development, job creation, social inclusion and supporting the rural environment. In recent years, rural policy has also focused significant attention in the renewal of villages and rural towns through project support funding. For example, the Town and Village Renewal Scheme was first introduced in 2016 and targeted at towns and villages with a population of 10,000 or less. Since the launch of this scheme, over 93m Euros of funding has been approved for more than 1,340 projects across Ireland[5]. The current round of the programme prioritises projects supporting remote working and enhancing town centre living in the wake of the COVID-19 pandemic. This scheme resembles 'tournament' style funding, which funds project delivery at a community scale, but projects can lack contextualisation from wider community planning.

In Northern Ireland (NI) seven years since the enabling Local Government (Northern Ireland) Act 2014, Community Plans have been adopted in all eleven NI council areas. Community planning in NI is focused on establishing community need, leading to the identification and coordinated delivery of services (Table 1). Local Development Plans (LDPs) are expected to take account of priorities identified in the Community Plan. Whilst significant effort was made to ensure public participation across both Community Plan and LDP processes, a spatial expression is, however, delayed. To-date, only one NI planning authority (Belfast City) has completed the public examination process, necessary for adoption of the LDP. Other – separate – participatory processes and schemes have operated in parallel during this period, such as LEADER-funded village renewal projects.

What emerges in comparing these forms of community planning are that differences in their design tend to obscure levels of interest as they are led by public agencies. Thus, a dilemma emerges about where the lead or initiative lies in such mechanisms. Further questions may be pursued at later stages of the research, in relation to the merits and benefits of the community planning forms above and linked expressions of community action, such as

5 https://www.gov.ie/en/collection/0012f5-town-and-village-renewal-scheme/

community land trusts and asset ownership.

Capacity issues

There was early recognition that Neighbourhood Plans are created by those with capacity (e.g., retired, relatively affluent individuals) rather than the need to participate (that is, they are driven by conditions of supply rather than latent demand) has become widely recognised (Davoudi and Cowie, 2013; Cowie and Davoudi, 2015). Many commentators have highlighted the impact of communities' internal capacity and skills on their ability to utilise these new rights (Holman and Rydin, 2013; Gallent, 2013; Sturzaker and Shaw, 2015; Gunn et al., 2015; McGuinness and Ludwig, 2017; Brookfield, 2017). There is also a moral question also about private individuals as volunteers being asked to embark on time and scope-extensive activity of this type (Parker et al., 2020) unless the activity provides some reasonable chance of positive effect.

Thus, if there is an appetite to extend forms of community planning to embrace the range of rural planning issues, there will need to be greater thought given to the support given – as below and the related issue of appropriate partnership intimated above. Alternatively, such tools and processes may be revised or reorganised by using different tools (deliberative forms, enhanced participation on local plan-making), or by adjusting the scope of these efforts (i.e., focus), rather than assume that the scaling/rescaling of these efforts make them tractable for communities.

Support issues

Given how even at the neighbourhood scale spatial planning is a complex and technical undertaking, some have argued for a community development phase or formulation that precedes any phase of more focussed 'planning work'. The premise being that communities can go through a more open process. In any formulation there is a need for support to develop the requisite knowledge and construct the required governance structures needed to recalibrate the otherwise uneven relationship with planning professionals (Parker and Murray, 2012; Stainer, 2014; Cowie et al., 2015; Parker et al., 2017).

A second inhibiting factor is the changing regulatory and policy frame which hampers communities and can create mistrust and possible NIMBYism ('Not in My Back Yard') in the

English experience. Support is linked to knowledge and understanding both in terms of breadth and depth of planning and live issues to be tackled (i.e., across the Table 2 axes range). Hence the balance and form of co-production present reflects the need and import of support.

Impact and coverage

The strongest and widest take-up of community planning has been in England where, according to the research literature published on Neighbourhood Plans, there is some change in terms of attitudes to development (Sturzaker, 2011; Field and Layard, 2017; Parker et al, 2020) and relations with planning authorities but less on specifics of rural policy, with only a few examples where innovation is clear. What this leaves is potential based on glimpses of the possible. The literature indicates opportunities to deepen Neighbourhood Planning and community planning efforts in a rural context to facilitate and support forms of localist planning so that communities engage with rural challenges across the economic, environmental and social dimensions and apply these to locally-specific circumstances. In terms of LEADER, there has been criticism of its limits in terms of limited coverage to eligible groups, bureaucracy and timing, and whether the funded projects represent the best spend.

In terms of issues tackled in such plans, the focus on housing has reflected governmental emphasis but this sits alongside local environment and design of development as the most prominent. Rural economy questions have been relatively neglected (Parker et al, 2020) and opportunities to better orchestrate existing mechanisms seems fruitful – e.g., alignment / extension of Leader (and possibly similar 'rural development' groups and community planning mechanisms such as Neighbourhood Plans).

In Wales, Place Plans may be adopted as supplementary planning guidance by the relevant local planning authority when complete. Place Plans in Wales may also adopt a wider scope than Neighbourhood Plans in England, given the lack of formality of process and prescription as to content. Place Plans will nevertheless continue to need to align with the Local Development Plan as a means of accruing some weight as supplementary planning guidance. They present much more like the parish planning experiment conducted in England from 2001 which saw 4000 such Plans produced in the period 2001-2014 and which acted as a wider basis for local priority setting and action (see ACRE, 2014; Parker, 2016). We have learned that Place Plans can be prepared successfully by proactive rural communities, often focused on small towns, and that these can be successfully adopted as supplementary planning guidance by local planning authorities.

Preparation of Place Plans also appears to be most successful when the local planning authority considers their role carefully as part of the wider Local Development Plan process, with Conwy County Borough Council promoting the use of Place Plans as part of its Local Development Plan activity. Examples where Place Plans have been produced include Crickhowell in the Brecon Beacons, Welshpool and Mold (Future Generations Commissioner, 2020). The promotion of the concepts of well-being and placemaking in national planning policy in Wales also offers a supportive environment for the further development of Place Plans alongside community planning activity. Some of the constraints on the roll out of Place Plans continues to be the status of the documents produced, especially compared to Neighbourhood Plans in England, and the capacity and resources of both local planning authorities and community and town councils.

In Northern Ireland, an added dimension to community planning processes is the legal requirement arising from the Rural Needs Act (NI) 2016 on central and local government and other public authorities to have “due regard to rural needs when developing, adopting, implementing or revising policies, strategies and plans and when designing and delivering public services”. This is an emerging area in terms of literature. Essentially, the requirement goes beyond ‘rural proofing’, impacting particularly on those institutions that are directly spatial, including social housing providers and business support agencies.

Within Ireland, community planning in relation to statutory planning (related to land-use and settlement) is underdeveloped compared with community-led social and economic development in rural places. There are opportunities (defined in legislation) for community input into the development plan-making process and within development management; however, community-led plans focused on physical and settlement planning have not been a notable feature of the planning system. As part of local government reforms in 2012, Strategic Policy Committees (SPCs) were established to support local authority policymaking, including planning. These SPCs involve a range of stakeholders (including community group representatives) working in partnership with local authority officers and elected councillors. While SPCs have potential to shape planning policy, in practice they tend to have a limited scope (e.g., tasked with maintaining records of historic structures) rather than fully involved with statutory plan-making. Local authorities are also required to establish local Public Participation Networks (PPN) to enable the public to take an active, formal role in policy-making and oversight (Rafferty and Lloyd, 2014).

Current national planning priorities are outlined in the National Planning Framework (Government of Ireland, 2018), which places significant emphasis on strengthening the role of villages and rural towns as important settlement and economic hubs to rebalance the rural settlement system away from the dominant pattern of rural housing development in the open

countryside. This is supported by the recently published *Our Rural Future* strategy (Government of Ireland, 2021), which supports a 'town centre first' policy as a rural investment priority. This is reflected in local funding opportunities through the Town and Village Renewal Scheme outlined above. This provides an opportunity space for potentially developing more interactive styles and community-led approaches to plan-making to support village-level planning.

New change drivers and consequences

If there is a need to facilitate and sustain positive planning, the conditions that the 'forces for change' (that is, key drivers identified in the Rural Planning in the 2020s project: *Brexit, Climate Change*, *COVID-19* and the *Countryside as a site for adaptation*) deliver up highlights difficulties of coordination and resolution of apparently incommensurate objectives.

Given that community plans will reflect communities' needs and knowledge, there is a clear role for planners and others to play in appropriately informing and supporting localist planning activity. Furthermore, such activity will need to play a more integrative role in fashioning policy to local place across multiple objectives and issues, as the Royal Society state (Burchardt et al., 2021: p3), 'objectives for food and fibre production, development, climate change mitigation and adaptation, nature recovery and societal health and wellbeing – this will require integration of planning for development with other aspects of land use'.

As an example, pressure for housing may reinforce opposition to change or climate change could provoke greater policy innovation. Table 2 below summarises the issues drawing from our conceptual grid in relation to community planning – noting that there will be overlaps and 'stacking' of issues for community planning to engage with in relation to the issues addressed in the other thematic papers produced for this project.

Table 2 Impacts of forces for change on community planning

Forces for change (A-D) Rural Area Elements (1-4)	A. Brexit	B. Climate change	C. COVID-19	D. The Countryside as a site of adaptation
1. Built rural	1A – Possible need to allow rural (largely land-based) businesses to reshape and develop new premises in rural areas. Community planning will need to engage with this.	1B – Likelihood of community plans reflecting concerns over the environment. Could clash or compete with other needs. Challenge of interpreting and applying climate science locally.	1C – Greater recognition of the role of rural areas in the health and well-being agenda. New pressure could present a danger of increased resistance to development in rural areas but also pressure from incomers and recognition of new solutions to affordability.	1D - Community planning can help give clearer and more detailed direction to the type and form of built environment but will need facilitation and better access to information. More work on partnerships of knowledge and support will be needed.
2. Economic rural	2A – Greater focus on types of jobs available and needed in localities, particularly as agri-env restructuring works through (less applicable to Ireland but still some aspects pertain).	2B - Opportunities to embrace green innovation and energy. Most community planning mechanisms have not engaged with this - with the	2C – Could result in greater interest and therefore local policy oriented towards more localised economic activity. An instance here of possible link-ups with existing and emerging rural econ development governance	2D – Adaptation to new economic opportunities would require better information and facilitation of community planning. Linkage across silos need to overcome.

		very few exceptions proving the rule.	arrangements. Greater urgency in modernising digital and other rural infrastructures.	
3. Land-based rural	3A – New agri-enviro schemes or iterations of existing and green finance will impact on rural spaces and community plans will need to reflect this. Secondly, less European travel may be a long-term feature which could put pressure (as well as opportunities) for rural land and related economy.	3B – Greater use of land to address climate change issues either adaptation or mitigation e.g., on the one hand flood resilience and use of land for green energy production.	3C – Greater need for planning tools to consider multi-functionality. COVID has indicated that existing trends towards use of rural land for leisure, recreation and tourism is likely.	4C – Adapt to challenges faced societally by more effective use of land for development and other activity / functions (e.g., biodiversity, CO_2 sequestration).
4. Social and cultural rural	4A – Greater emphasis possibly on local occupancy of housing, greater collaboration across local groups and inhabitants – can aid community cohesion.	4B – Climate agenda highlights use of space (land) to mitigate and adapt, need to foster green rural communities.	4C – COVID experience places more value / recognition of community ties and relations. Remote working patterns may impact on retention of some workers. Local recreation spaces and routes and need to plan for visitor use one aspect.	4D – Adaptation in terms of changing perception of the role and functions of rural space via deliberative planning forms. Continued use of heritage assets to drive both socio-cultural activity but also economic.

Note: The table is indicative and based on the review material. Further detailing will be generated as the research progresses. Cases across the 1A-4D range will be exploring the issues raised here and across other thematic review papers.

Why intervene?

This section discusses why we might consider it necessary to intervene in the existing dynamics of rural economy-society through the lens of community planning forms. The rationales to embark on and sustain community planning coheres around political and considerations (democratic engagement, developing trust) and those relating to knowledge exchange and co-production. Both sets of reasons engage with questions of political support for change and how to develop more stable agenda-setting at scale.

The role of the tools mentioned above to inform and reduce opposition to development has been apparent both in governmental statements and in the research literature. The induction of local and lay knowledge is also an aim that is visible but less is understood about how effective this has been - certainly there is scope to facilitate and support such efforts in this respect. The literature indicates that the relationship between the tools of community planning and the range of issues faced is out of alignment. However, addressing this gap is not straightforward. Options include widening the scope of community planning, widening / improving the partnership base or using community planning in a more focussed way and relying on greater use of integration upstream (i.e., via local plans, strategic planning / governance arrangements).

As wider discussion about rural politics has identified, there is a challenge for a progressive rural politics to develop strategy for rural governance that recognises the diversity of the contemporary countryside, while also respecting the importance to many individuals of a rural identity rooted in a traditional way of life; whilst also to embrace challenges posed by macro-threats such as climate change and wider challenges, such as nature recovery.

Efforts to help rural communities build the capacity to govern themselves has been compromised by the lack of resources, normative expectations as to how communities should act, and the limited ability of communities to really engage with the processes affecting them. Altogether, the intervention rationales are growing rather than diminishing.

What interventions are needed?

In considering this question in relation to community planning the foregoing sections have indicated some of the potential and various reformulation ideas. Firstly, understanding the positive and progressive aspects of the range of tools (across the strands and nations) is a useful first step.

Then we can begin to break down interventions or changes that would develop more effective community planning in and for rural areas, wider access to knowledge and interlinkages. This may require effective and insightful facilitation by intermediaries - with a possible role for professional planners here. There is a need to reduce siloes by focussing on appropriate integrated thinking and recognising conflicts together with opportunities to synergise. The following list speaks to factors that require attention:

- Leadership (locally but also across silos);
- Appropriate and effective forms of partnership (with community / interests);
- Governance and policy integration;
- Land use strategy for reference point for community planners / plans;
- Resourcing;
- Ongoing understanding of implications of change.

As such, it is still undecided how to best inform and empower across topics and engage with the diversity of ‘rural’ issues. There are trade-offs regarding knowledge, scope and time taken that need balancing with benefits derived.

Reflections of regional and national variations

Key differences across the nations relate to the degree of intended and actual partnership involved in community planning, as well as the scope of such activity (e.g., housing focussed, 'rural economic development etc.) in relation to longevity, 'ownership' of the tools and the scope or frame that each of the key tools discussed exhibit (i.e., Place plans, LPPs, the English Localism Act and Neighbourhood Plans, LECPs). This means that we are presented with more understandings of the actual dynamics of community planning from the longer-lived approaches that are deployed, but also from past efforts (such as parish planning in England) and where community input has been critical to the success of the planning tool. It is against such findings that discussions over how community planning can assist in better planning for rural areas across the four built, land-based, economic and social/cultural 'elements' can be more effectively critiqued.

The scope and engagement of such planning tools differ, with the English model going furthest in making the production of a Neighbourhood Development Plan (NDP, a 'made' plan) a right and yet also placing responsibility for its production on communities themselves. The Commission on the Future of Localism (England-focussed), argued in their 'People Power' report (2018: p25) that 'people shaped parameters' should be allowed to determine the activity pursued. Other nations have recognised the breadth of partnership that a community planning model could embrace and reach beyond the narrower confines of land-use planning that NDPs are restricted to. In the research literature artificial bounding of issues that can be expressed or actioned in the formal NDP has created some frustration (i.e., that some community issues are crowded out of the plan, and channelled into 'action points', for instance). This highlights a tension over other forms of community planning that attempts to engage with ALL live issues, i.e., comprehensive, those that that are selective (determined by communities) or thirdly, forms that are deliberately focussed by higher authority.

In rural contexts, a recognition of the connectedness of policy aims and issues is an advantage in a conceptual sense but with this come issues of practicality and of capacity. This brings into view parallel policy tools, that invoke a degree of local oversight, but which have rarely, if ever, been considered 'community planning'. The most obvious example that applies to rural areas exclusively, and across the nations which are in scope, and mentioned here has been the EU LEADER programme as it has developed over time.

Questions arising

The consideration of rural community planning for this research project raises a series of questions about the knowledge and awareness of issues and priorities for rural areas held by communities. How they make decisions about what to focus on is dependent on both pre-existing understanding of issues, of the planning system and thirdly of the type, form and quality of advice or other support received. So ultimately the questions derived from this include:

Q. What do we want community planning to embrace?

Q. How best to facilitate it? (and guarantee that it incorporates community inputs and knowledges)

Q. What role for professional planners and other knowledge-carriers?

The reflections drawn together in Table 2 above indicate how community planning activity will need to respond and be alive to the multiple issues and changes emerging in the 2020s with keywords being integration, partnership and support.

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Thematic Review: Rural Housing and Community Change

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Part 1 - Introduction – Exchanging and Depleting Areas

Housing is more expensive, and less affordable relative to local earnings, in 'predominantly rural' compared to urban areas. The crisis of rural housing affordability for working households has been deepening over the last twenty years, although it is rooted in post-war counter-urbanisation. Planning protections for rural areas were strengthened in the second half of the twentieth century and, at the same time, the demand for rural homes amongst urban households gathered pace. That demand has many roots that are peculiar to rural places: nostalgia for the countryside, urban escape, the perceived advantages of rural lifestyles, investment opportunity, and the search for identity and status. It also has structural drivers that are common across all areas: widening access to mortgage loans, preferential tax treatment for private housing consumption, increased credit supply as banks connected to financial markets, and latterly, historically low interest rates.

The peculiar attractions of *rural amenity areas*, and the scarcity of housing supply in those places, combined with the big drivers of housing demand to create a perfect storm for many communities. It pitted adventitious buyers, with their wealth rooted in property and salaried occupations, against rural wage-earners – a competitive mismatch that has since produced gross housing inequalities in many villages and small towns. Amenity areas have been

exchanging population, because of counter-urbanisation and constraints on the supply of new homes, for several decades. That exchange involves a loss of households engaged in the productive economy and a net gain in households motivated by the consumption of amenity – from second homeowners and retirees to lifestyle downshifters and mobile professionals. But not all rural areas are characterised by extensive amenity, in the form of attractive landscapes, built heritage, and opportunities for rural or coastal recreation. Rural areas in deprived fringes or in less accessible regions with a declining economic base may be more accurately described as depleting areas.

This distinction between exchanging and depleting areas is important. Whilst some rural areas have been losing population without replacement, others have been exchanging population through displacement. *Depleting* areas face significant economic challenges coupled, in some instances, with amenity attributes judged to be lower quality than elsewhere: perhaps lowland rural hinterlands in regions suffering economic decline or rural landscapes under mono-cropping that seem to offer fewer amenity attractions. *Exchanging* areas may be subject to economic restructuring – perhaps a shift from productive industries to place-based consumption through tourism – but have higher amenity value. Anchoring (of people and communities) is the central housing (and economic) challenge in depleting areas; perhaps anchoring for an economic reason – the preservation of farming and food security. But the problem in exchanging areas is displacement of a working population by market entrants, with potentially many investors venturing into the housing market and thereafter supporting a more conservative approach to land use planning for reasons of amenity and equity (housing wealth) protection. Exchanging rural areas are associated with a conservative attitude to planning and development.

Housing is an *indirect* problem in depleting areas: economic decline drives poverty and the state of housing becomes a symptom of that. On the other hand, housing is a *direct* problem in exchanging areas, with market entrants and mismatched competition becoming the primary agent of change and subsequent driver of socio-economic inequalities. Further, in depleting areas, incomes are insufficient, in absolute terms, to secure decent housing situations *and* the drift away is driven by a lack of economic opportunity. In exchanging areas, incomes are relatively insufficient, causing housing-class based displacement. In both area types, intervention (that is, a response to the housing problem, however contrived) is vital because people, and communities, need to be in these rural areas: to live their lives and support, and be supported by, essential economic activity.

More broadly, measures to address rural housing problems are essential, firstly, for reasons of socio-spatial justice – to combat market exclusions; secondly, to support rural economies and new industries, including vital post-carbon transitions; thirdly, to protect rural tourism

(and the wider service sector) by ensuring labour supply for this industry; and fourthly, to support the culture and cultural identity of rural areas, including land-based industries. Simply allowing rural areas to transition into 'retirement landscapes' would impact negatively on economic activity and hence on valued landscapes. We outline the case for attention to housing injustice later in this review. But more broadly, the purpose of this analysis is to introduce the dynamics that underpin rural housing outcomes and the pressures that shape individual and community housing circumstances (in Part 2). This overview of dynamics is followed by a consideration, in Part 3, of the impacts of new change drivers – the decision to 'Brexit' from the European Union, the added pressures brought by climate change, the market shifts linked to the COVID-19 pandemic, and the opportunities to situate critical adaptations to environmental risk in rural areas.

Our consideration of dynamics alludes to necessary interventions, but the case for intervention (grounded in a vision of opportunity for rural areas and social justices) and its potential forms is detailed in Parts 4 and 5. Significant variations of dynamics, outcomes and interventions are then examined in the final section, which draws out differences across the nations of the United Kingdom and Ireland, building on the distinction between exchanging and depleting areas.

Part 2: Rural Housing Dynamics & Pressures

Rural areas and communities across the UK and Ireland face different combinations of similar challenges. These relate to economic profile (and reliance on industries and sectors that tend to deliver lower wages), development constraint, and external interest in their housing markets – from mobile professionals, life-style downshifters, retiring households and second home investors. Forty years ago, Shucksmith (1981, p.11) claimed that '[…] the essence of the housing problem in rural areas is that those who work there tend to receive low incomes and are thus unable to compete with more affluent 'adventitious' purchasers from elsewhere in a market where supply is restricted'. This statement references those three 'drivers' - economy and earnings, market intrusion, and development constraint - and holds true today: they are present in varying degrees in different places.

In some rural areas – those labelled 'depleting' in Part 1 - there may be little in the way of a tourism-related service economy whilst mixed farming delivers low incomes. Both market intrusion and development constraint may therefore be less pronounced. This may mean that there is less of a housing affordability and access issue to compound income-based deprivation. Elsewhere – in our 'exchanging areas' - tourism may be stronger, employment opportunities greater and (local) incomes higher. But where tourism is more important, there may well be associated housing market intrusion (in the UK's national parks or other areas of high amenity and good accessibility). The tourists and the seasonal residents are attracted by two things: amenity (the landscape, character of villages etc.) and the protection of that amenity through land-use planning, especially where regular constraint (i.e., a presumption against development in open countryside or outside village envelopes) is amplified through various landscape designations – AONB, Sites of Specific Scientific Interest (SSSI), National Parks, or Heritage Coast etc. – or Green Belt. Market intrusion has both an amenity and investment motive, with buyers drawn to areas where the likelihood of further development being permitted is less and therefore where house prices will be driven up by long-term scarcity.

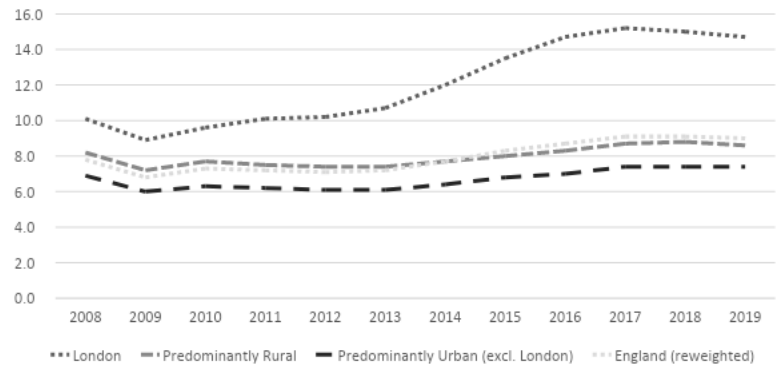

Figure 1 Urban and Rural Housing Affordability (House prices as a multiple of earnings: ratio of lower quartile house prices to lower quartile residence-based earnings, by local authority rural-urban classification, England, 2008 – 2019), Worksheet 45, DEFRA, 2021

Numerous researchers have worked on categorising rural areas according to this combination of change drivers. Lowe and Ward (2009), for instance, have mapped rural economies in England and Wales, showing where those economies (and housing markets) tend to be dominated by retired households (many coastal areas) or commuters (around

London). They also flagged peripheral amenity areas (e.g., the Lake District, Snowdonia, and Pembrokeshire) with many second homeowners and deeper rural areas where employment and economy questions often over-ride issue of (housing) market intrusion. But despite such spatial variations, housing in *all* rural areas (across all regions) is less affordable (relative to local earnings) than housing in predominantly urban areas (excluding London). This point was made at the beginning of this review. Recent affordability figures for England are shown in Figure 1. Regional data, showing comparative urban and rural ratios are available, but the most recent figures are for 2004 from the now-defunct Commission for Rural Communities. The affordability 'crisis' – measured in these ratios - is more pronounced in the English countryside, although it affects fewer households than the urban crisis because of the lower population share in rural areas.

Affordability ratios for other parts of the UK have been classified by Coulters (2021) as increasing by 20.8% in predominantly rural areas, 19.5% in 'urban with significant rural' and 17.5% in predominantly urban areas between 2015-2020. Figure 2 shows analysis by the Resolution Foundation (2021) which demonstrates that across the UK the more rural areas saw the average house price increase by a greater extent than cities and large towns, while housing growth in Ireland grew at a faster rate outside of Dublin (Figure 3).

Figure 2 Index of average house price growth, by city and town classification of local authorities UK February 2019 to February 2021, ONS, Land Registry data (Resolution Foundation, 2021, p.3)

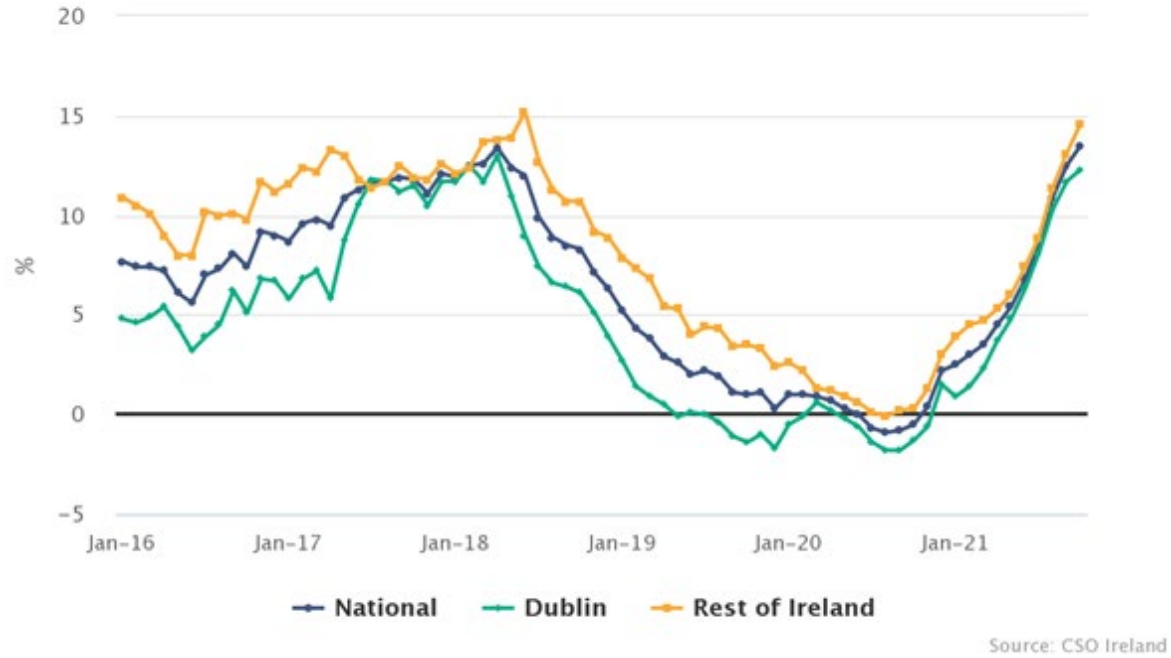

Figure 3 House price rises in Ireland as percentage change (2016-2021) (CSO, 2021)

Another important point is that in urban debates we constantly argue about the role of *new supply* versus *new consumption patterns* (buy to let, overseas investors, second home buyers etc.) in driving prices and therefore affecting affordability and housing access (see, for example, Mulheirn, 2019). To make housing more affordable in cities – and to extend housing wealth – it is argued that we need to build many more homes, and this means reducing the 'burden' of planning. Therefore, this 'urban housing debate' divides into two opposing perspectives: a) increased housing access can only be achieved by having a 'bigger cake' (building many more homes) versus b) fairer housing access can be achieved by distributing the existing cake differently, by reducing the incentive to consume ever-greater quantities of housing (see Dorling, 2015). Consumption patterns are sustained by the tax treatment of housing and the supply of mortgage credit (for second homes, buy to let etc.), so these things – tax and lending – need to be adjusted.

Whilst it cannot be claimed that rural housing debate is more 'advanced' (it seldom touches on the broader political economy questions), there has long been a recognition that housing outcomes (spatial inequality, hyper-consumption and over-investment, gentrification and residential displacement) are rooted in economic inequalities (reflected in earnings and wealth), low supply potential (because of the values attached to the countryside, including

food security, amenity protection, nostalgia and sustainability) and the 'inessential' consumption of housing for amenity and investment.

It is also the case that supply cannot be turned on, at volume, in rural areas – because of amenity and infrastructure constraints. This supply constraint sits in tandem with the free market reality of rural housing being consumed for status and exchange value by Shucksmith's 'adventitious purchasers'. It also offers locational amenity for leisure rather than for work. Since the initial surge in rural second home ownership in the UK in the 1960s, a heated debate has centred on whether this form of housing consumption is a 'blessing' or a 'curse' for rural areas (Coppock, 1977). Those areas rapidly lost population after the Second World War. Counter-urbanisation reversed that trend and brought new investment to the countryside (Satsangi et al, 2010). But eventually, the population stabilised: jobs were created in new footloose industries and in the tourism-related service sector. Niche farming also had a revival (Gallent et al, 2015). But rural earnings remained below those of urban areas during a period (through the 1970s to 2000s) when house-prices took off, underpinned by investments in owner-occupation and a relatively low tax regime for housing consumption. If adventitious purchasing had faded in the late 1970s, it may well have been viewed, in hindsight, as a lifeline and blessing for rural areas. But its continued growth brought serious spatial inequalities.

By the late 1990s, the UK government was arguing that '[…] without adequate provision of […] affordable housing, large parts of rural England risk becoming the near-exclusive preserve of the more affluent sections of society. This risk poses an important challenge to the goal of achieving balanced communities' (Cabinet Office, 1999). Numerous government and pressure group inquiries during the last 20 years have repeated that same conclusion. Investment overload – the scramble to consume (rural) housing in increasing quantities – underpins inequalities that will be amplified across generations (Bangham, 2019) as those without a family history of housing ownership are locked out of the housing market.

Notwithstanding the different balance of drivers in different places, the rural housing problem looks (in general terms) something like this:

a) Rural areas are not a focus of planned growth.
b) Housing supply is heavily constrained (through planning) for reasons of amenity, landscape protection and sustainability.
c) There is a 'free market' for property.
d) There is high external demand for homes, especially in picturesque areas – that become characterised by socio-economic 'exchange'.

e) ‘Adventitious’ purchasers often have greater market power, derived from urban jobs or a prior history of property ownership (they form a discrete ‘housing class’).
f) Rural wages do not provide an effective means of competing against the market power of purchasers from urban areas.
g) This can result in gentrification and a displacement of local households, resulting in a debate that has been focused on local rights and needs.
h) Rural housing, in many areas, has a scarcity value that is attractive to investors of various kinds.

Sticking with the three drivers noted at the beginning – economy and earnings, housing supply, and market intrusion – there are three potential levers for re-shaping housing outcomes in rural areas. These drivers are linked to actual interventions later in this review. But for now, we focus only on making broad connections between the change drivers and responsive actions, with planning-based responses examined in greater detail in Part 5.

Economy and Earnings

Very broadly, there is a case for economic development as a response to housing inequalities (close the economic divide between advanced and peripheral areas and therefore shrink the ‘rent gap’ that is sought out and exploited by investors). A whole literature focuses on the exogenous strategies and endogenous actions for revitalising rural economies (Woods, 2011, provides a good overview). For a long time, emphasis was placed on investment in infrastructure and creating new and better jobs. But still, the divide between urban and rural job opportunities and earnings remained. Infrastructure – especially new roads – opened areas up to investment. It addressed the economic disadvantage of peripherality but also increased accessibility to rural housing markets. Economic development is vital, but it is no guarantee of rising equality in housing access in an unrestricted market.

The extension of the A55 across the River Conwy into Gwynedd in the 1980s, for example, was an important milestone for the rural economy of north-west Wales (especially the tourism sector) but also caused an acceleration of second home buying (Gallent et al, 2005). Economic levers that impact on investment and business growth versus housing consumption are of course very different, but the latter require re-regulation of mortgage

lending and adjustment to tax rules. They will effect change across the business and housing markets but have never been part of a general rural economic development strategy, as they impact on 'property rights' and would signal a more fundamental shift in the land/housing status quo (see below for additional reflections in this area). To date, rising housing consumption has been part of (or at least a signal of) the 'positive' economic trajectory and well-being of hitherto laggard areas – something to be welcomed, with externalities managed through social housing programmes or occasional market interventions. House price inflation is 'good inflation' and a measure of economic success. Housing consumption (underpinned by the movement of mobile capital) channels wealth into rural areas, benefiting existing homeowners, but not renters.

Potential areas of remedial action for later consideration might include:

a) Enhanced support for rural businesses and diversification through planning and regional investment banks.
b) Further improvements in rural infrastructure – from roads to broadband – in support of economic development whilst managing housing consumption impacts through taxes on consumption (e.g., extended SDLT surcharges, extended Council Tax bands and wider application of Capital Gains Tax (CGT), with fewer tax reliefs) (see Monbiot et al, 2019).

Housing Supply and Development Constraint

Additional speculative development tends to fuel further housing investment. Developers will build for the most lucrative segment of the market, delivering high-end executive homes, if they are allowed to do so. Local attempts to force the private sector to only build for 'local need' of 'full time residents' have tended to result in reduced development activity, transfer of housing land to other uses, and further inflation of house prices – to the benefit of existing owners (Gallent et al 2016 and 2019). Therefore, the general and popular conclusion is that non-market housing must be provided: council or housing association homes, usually concentrated in key settlements or market towns and either grant-funded or procured, in part, through planning agreements. Combined with development constraint in the most attractive (lowest tier) villages, we see a concentration of social / affordable housing in larger settlements and greater market exclusivity in the 'commuter villages' or second-home ghost villages.

The upshot is very stark patterns of spatial segregation (i.e., gentrification), especially since the 1980s when we started to experience the accelerated loss of social housing in smaller village locations through the right to buy. Targeted provision on 'exception sites' can help deliver against the needs of households on lower incomes, but such exceptions are dependent on the willingness of landowners to release land at below market price (some will not be inclined do so, preferring to wait for future changes in a village's development boundary), support from the local community (which may or may not see the need for such housing) and involvement of a housing association willing to invest time and grant funding in a small scheme rather than pursue larger, bigger impact sites in the nearest market town. Planning exceptions, and other flexible circumventions of 'normal' planning practice, are evidence of deeper structural challenges in the housing market, the role assigned housing in the national economy, and consequent patterns of consumption (Gallent, 2019).

At a more prosaic level, rural politics, dominated by parish councils, may prioritise amenity and village character over new housing. That politics may put the interest of current homeowners ahead of the needs of future residents on lower incomes. There is a convergence of political economy and local politics that limits solutions: house building and housing consumption are private matters and profit-driven, land is under monopoly control, and the goal of government has been to keep house prices on an upward track. All of this restricts the space for alternate housing models, from community land trusts to individual self-build.

Interventions linked to the supply driver might follow these general rules:

a) Avoid local planning restrictions (e.g., on full time or local residency) as these simply transfer problems around and can have adverse impacts on housing supply and prices (see Part 5).
b) Focus instead on structural (national) solutions, including a reclassification of housing for local use as opposed to second homes, or family occupation rather than pure investment (see Monbiot et al, 2019 or Gallent, 2019, for thoughts on a combination of adjusted Use Classes and differential tax liabilities).
c) Allocate land for community use (i.e., land trusts) or plots for self-build, placing covenants on occupancy if necessary (see Part 5).
d) Deliver a community 'right to housing' through Neighbourhood Planning (in England) – something akin to the 'right to bid', but which allows communities to acquire land (rather than buildings) for housing at close to agricultural value for local needs

(replacing the current rural exceptions approach) (see Part 5 for suggested Land Compensation reforms).

e) Permitted Development (PD) rights granted to communities for 'barn-to-residential', subject to good planning and safeguards on standards (and subject to consideration of impact on working farms or loss of opportunity for business use) (see Part 5).
f) Suspend the right to buy and embark on a programme of grant-funded council house building (but see this as secondary to tax adjustments designed to impact on patterns of private housing consumption). The primary goal of policy should be the fairer distribution of housing wealth and the promotion of *home*ownership over asset ownership.

Market Intrusion

Finally, the volume of 'adventitious' purchasing in the housing market is far greater today than it was in the 1980s. Recent work by the Resolution Foundation shows that housing wealth is now concentrated in fewer hands (Bangham, 2019). A rentier class – engaged in 'residential capitalism' – has been driving growth in the housing market for at least the last decade. The belief that a functional housing market only works with a good supply of first-time buyers has been supplanted by the idea that the UK market can functional perfectly well (for those in a position to benefit) if it has a decent supply of buy-to-let investors. Governments may become wary of the political cost of this as the rentier class ages and younger voters, locked out of the market, express their disquiet. Hence, the recent stamp duty surcharge on second homes (from 2016) and a scaling back of tax relief benefits on buy to let. But these tentative steps towards rebalancing homeownership and private renting are short of the big strides needed if housing wealth is to be redistributed and the benefits of homeownership extended. Patterns of ownership in rural areas reveal a concentration of wealth in housing, expressed through multiple-property ownership and the command over land rent though buy to let and holiday lettings (and probably short-term platform-based rentals including AirBnB).

Housing has been 'assetised', and that 'assetisation' has been underpinned by a combination of bank lending (on property rather than business investment; Ryan-Collins et al, 2017) and the tax treatment of housing. Recently, Monbiot et al (2019) have argued for a

reform of council tax that would see it transformed into a progressive property tax, paid by owners rather than tenants, and changes to capital gains rules that would result in liability being aligned to the top rate of income tax. Additional penalties would be imposed on second home purchasing. Kate Barker (2014) has previously argued that the under-taxing of housing has contributed significantly to over-investment in this 'asset', with all the resulting social costs that are now visible. Housing rights have been sacrificed to the interests of the rentier class, producing deep inequalities centred on housing ownership and access.

This is arguably the most important area of intervention. In a context of low borrowing rates and economic uncertainty, housing consumption becomes increasingly attractive to mobile capital. Interest rates are below 0.5% on most Individual Savings Accounts (ISAs) and short-term bonds. They are even lower on general accounts. Tax is also payable, at personal rates, on bank or building society interest above £2,000 per annum. On the other hand, house price growth in many amenity areas is running at between 10% and 20% per annum. CGT is not levied on first homes. Gains on second homes (on sale) are taxed below the personal rate and can be offset with a range of reliefs. Even factoring in transaction costs and tax liabilities, housing offers better investment returns over the long term than savings. And unlike bank savings, investors benefit from the amenity of housing services during the period of ownership, or rental income if this is part of their investment motivation. The intervention in this area is to alter the appeal of housing consumption as a form of investment – to make it less attractive relative to other asset classes or cash savings.

But this is an incredibly difficult thing to do, economically and politically. It was noted above that wealth is channelled and distributed through housing. Mobile capital (from overseas and from urban to rural areas) scaffolds the housing market. Most owners want to see the value of their biggest asset grow (and the relative size of mortgage debt on that asset shrink). Second homes have a role in scaffolding the market and growing housing wealth in rural areas. They benefit existing homeowners, to the extent that prices grow. The removal of this market support would see prices fall, and that fall would not be welcomed by homeowners. It is also the case that house price growth supports consumer confidence, leading homeowners to spend on their homes and therefore spend in the local economy (creating jobs in the service and construction sectors). Taking actions that cause prices to fall is politically difficult. It is also economically difficult as the wealth locked up in housing drives spending, and also corresponds with the size of the mortgage market, which is a visible marker of the dominance of the financial services sector in the UK. Looked at superficially, that services sector includes banks, building societies and transaction services such as estate agents, surveyors, and other property professionals. Looked at a little

deeper, the origination of residential mortgages links to an international investment market in debt securities. If house prices fall significantly, the implications for the UK economy could be very serious, putting jobs of all kinds at risk.

However, the investment appeal of housing relative to other assets also has negative implications for the economy. Bank lending is skewed towards residential mortgages, limiting investment in business start-ups. Actions to calm investment consumption therefore seem sensible, which could be achieved through these actions (to be reconsidered later in this study):

a) Altering the stamp / land tax changes or surcharges on different types of residential property, possibly increasing the rate on second homes.
b) The extension of capital gains tax to principal homes has been proposed (see Barker, 2014) but has gained little political support. However, the equalisation the CGT rate with the personal PAYE rate has broader support and would equalise tax on work and property (the social care levy, announced in September 2021, could also be extended to rental income).
c) A reform of council tax grounded in a new valuation of homes, the first since 1991. This would also be politically fraught as it would alter the liability of all owners. Many commentators have argued for an extension of bands to better reflect property values alongside much higher bands for second homes. Some, including Monbiot and colleagues have argued that the liability for council tax should fall on owners rather than renters (with the tax reconceived as a progressive property tax) (Monbiot et al., 2019). However, that move is likely to push up rents rather than increase the affordability of rents as owners seek to recoup costs.

Market intrusion into rural areas, especially ‘exchanging’ areas, has a long history. It has been an important change driver for many decades. Whilst the exploitation of the rural ‘rent gap’ has long been a motivator of that intrusion, it has arguably become more important during the period of sustained house-price growth since the 1990s (which survived the global financial crisis of 2008). Households priced out of expensive cities may join the queue of buyers trying to get a foot on the housing ladder in rural areas, reinforcing a decentralisation of housing choices and price pressure.

Over the last 5 years, new change drivers have emerged. Some have amplified existing pressures, whilst others present rural areas with new opportunities.

Part 3: New Change Drivers

An important goal of this review is to update the view of general dynamics and pressures facing rural areas, identifying new change drivers and how they may impact on rural places and the challenge facing rural planning. Three critical drivers appear particularly significant. The UK's decision to leave the European Union in 2016 (with effect from January 2021); climate change pressures and goals; the mobilities and consumption pressures arising from the COVID-19 pandemic; and the opportunities to deliver important adaptations to environmental risk in rural areas. Each of these is briefly examined in turn.

Brexit

The decision to leave the European Union and the Single Market has not slowed house price growth in the UK. Non-domiciled European buyers are not a key source of investment in the wider housing market, which is dominated by permanent residents (UK/EU) and by overseas investors from beyond Europe (Hamnett and Reades, 2019; Wallace et al, 2017). 'Brexit effects' on the market have been complicated by 'COVID effects', which are reviewed below, and have helped scaffold the housing market during a period of significant economic uncertainty in which the value of other assets has been volatile.

Whilst the COVID-19 pandemic has resulted in significant travel restrictions, Brexit ended freedom of movement (i.e., the movements of capital, people, goods and services) in Europe for UK nationals. This may deliver a more introverted pattern of seasonal housing demand and a potential shift in retirement plans. UK nationals cannot spend more than 90 days in the EU (apart from in Ireland, which is in the Common Travel Area) in any 180-day period. This rule has implications for property ownership in Europe, reducing the potential utility of second homes in popular European markets such as Italy, Spain, and France. It also disrupts retirement plans for those unable to obtain EU citizenship.

Any shift in retirement patterns or the 'reshoring' of second homes may amplify housing demand in rural amenity areas, adding to existing counter-urbanisation pressure and

attendant price uplift.

On the other hand, the exodus of European workers from the UK (as seasonal workers struggle to navigate new visa rules) may ‘relieve’ pressure on rented housing in areas of intensive farming. But far from being a positive, reduced labour supply threatens those farm businesses dependent on foreign workers. It may ultimately have a detrimental effect on local incomes and on the ability of local workers to compete in a housing market subject to mid- and post-COVID decentralisation.

Brexit has brought a mix of housing challenges in different parts of the UK. Its full impacts on the market, and on construction capacity, are not yet fully known. A key area of interest relates to how Brexit may potentially reshape cross-border housing markets on the island of Ireland, with its land border between the UK and the European Union. For example, it is common in the border region for people to live in one jurisdiction and work in another, with Brexit initially posing concerns for labour mobility, mobility of capital (including mortgage services) and ease of travel. Eurostat estimates that there were 7,600 cross-border commuters from Northern Ireland and 13,900 from the Republic of Ireland in 2015. In the 2011 Census, Newry, Mourne and Down District Council area had the highest number of people who were usually resident in Northern Ireland working in the Republic of Ireland (28%). The Northern Ireland Protocol has eased concerns over the potential impact of restrictions on cross-border mobility – and immediate impacts on the cross-border housing market appear to have been limited.

Like the rest of the UK, Northern Ireland may see a fall in demand for rented housing in rural localities due to declining migrant workers (following the end of freedom of movement) which may have the same effect on farm businesses, especially food processing, and hence on local incomes as that noted above. Labour shortages are affecting a range of sectors across the UK at the time of writing (September 2021).

Construction output is buoyant in Ireland. How Brexit might affect rural areas south of the border will depend on the evolving EU-UK trade relationship. There is a possibility of surging migration, as businesses relocate entirely or set up EU-based offices, which may place short-term pressure on rental markets. There is also a potential for increased construction costs arising from divergent trade regulations or new tariffs, which might inflate material costs. Housing construction in Ireland’s rural areas is dominated by self-build and may be impacted by supply chain issues, which could have a wider economic effect if this sort of building slows.

Climate Change

Climate change will impact on many aspects of human settlement and habitation in the years and decades ahead. How we *prepare* for climate change and how we *respond* to its consequences are major change drivers. Preparation begins with research. But although rural places are critical locations for addressing climate change, they are often neglected in research and policy development. This neglect weakens the foundations of environmental decision-making. It also means that the case for new activities and mitigation infrastructure to locate in rural areas is not being clearly articulated. The net result is that rural populations and places may feel that climate change mitigation (and adaptation) brings additional costs for farming and the rural landscape (as new energy sectors emerge), but with limited benefits.

Thinking for the moment just about housing (broader adaptive responses are considered below), preparation is also about limiting the eventual impacts of climate change by taking small, but hopefully cumulative, steps that reduce carbon use. Those steps include making new homes more energy efficient, through better insulation, grey-water capture, reduced energy expenditure on heating and hot-water and so forth. Existing housing can be retrofitted to make use of the latest advances in glazing technology or the use, for example, of ground source heat pumps. Many registered providers of social housing have become sector leaders delivering green housing, largely because they measure housing affordability as a composite of rent and running costs and aim to reduce both.

Preparation is also about planning, and about trying to promote and facilitate patterns of living and working that also contribute to reduced energy and carbon use. For rural areas in the UK, the concentration of development in key settlements, whilst limiting the amount of new building in lower tier villages, has been presented as good planning practice. But Taylor (2008) has shown that this model tends to accelerate the gentrification of villages whilst also starving farms and services of key workers. Those workers are forced to 'back-commute' to villages, negating any gains resulting from development constraint and the concentration of housing in key settlements.

There has been a tendency in the past, especially in lowland England, for groups opposed to development in lower-tier settlements – in the prettiest and most exclusive villages – to use 'character' and 'sustainability' arguments to thwart development. However, such arguments are easily countered – on economic, social, and environmental grounds (see Part 4). Rural places are significant sites for low carbon transitions – such as the roll-out of renewable

energy infrastructure, increased woodland land cover or biomass crop production. These land-uses compete with housing and are often contested amongst rural communities, with planning as a key arena for community opposition to renewable energy infrastructure.

Elsewhere there is often a more dispersed settlement geography (linked to the rights of rural dwellers to self-build their own homes in many instances). This is the case in Ireland and Scotland. Dispersion results in car and carbon dependency. Although these patterns of development may not be ideal in 'carbon terms' they are nevertheless a lived reality. Climate actions such as carbon taxes will have a differential impact on urban and rural populations, due to the scale of car dependence amongst the latter and the likely lag in rolling out electric vehicle infrastructure to more sparsely populated rural areas. Headline climate actions of this type therefore present 'just transition' challenges and need to be tailored to different rural contexts. Whilst engineering more concentrated settlement patterns may be neither possible nor desirable, there is some hope that new technologies will make it easier to work remotely and reduce car use. However, the pandemic has underscored the socially selective nature of home-working opportunities, which tend to privilege salaried professionals over key workers, who are often tied to traditional workplaces.

Another climate impact that links to the next section is the possibility that rising summer temperatures across the UK and Ireland could trigger additional seasonal urban flight. This already happens in southern Europe where second home ownership provides a means of escaping hot towns and cities during the summer months. Higher summer temperatures over the longer term could have profound impacts on rural areas and their housing markets. At some point, it could provide the impetus for the construction of many more purpose-built second and holiday homes, especially in coastal locations.

COVID-19

The impacts of the COVID-19 pandemic on mobility and housing consumption are well documented. One of the objectives of this wider project is to test the veracity of more anecdotal evidence, and reporting, of market shift and a decentralization of housing choices across the UK. That evidence and reporting, noted by Gallent and Madeddu (2021), suggests that the 'panic mobility' observed during the early stages of the pandemic, the urban flight observed in many countries, has given way to more sustained mobility and

consumption choices. Families are reassessing their domestic situations given new opportunities to work from home more often. They are forsaking expensive urban homes for relatively cheaper, and more sizeable, rural properties. This process is socially selective. Not everyone is able to 'up sticks' in this way. A great many jobs remain on-site: key workers in healthcare, education, other public services, and retail are fixed to workplaces. But many salaried professionals are finding that new working patterns enable them to decentralise.

This can mean that suburban houses are preferred to flats, that near urban (and urban fringe) homes are becoming more popular, and that ultimately the decentralization sees accessible rural homes increase in value as the queue of buyers for such properties lengthens.

This pattern of change is underpinned by a shift in utility choice. During the pandemic, people's everyday existence has re-centred on the home. It has become the focus of work and leisure – a first, second and third space all rolled into one. Numerous reports have contrasted the misery of people stuck in small flats, with no private outdoor space, with the good fortune of those living in suburban homes with large gardens and even garages (Carmona et al, 2020; Judge and Rahman, 2020). Gardens are now exercise and entertaining venues; and garages offer the potential for conversion to home-offices. Housing inequalities have been brought into sharp relief by the pandemic, impacting on people's expectations of what a 'home' needs to be - and its required utility.

Gallent and Madeddu explore what this may mean for London's housing market, for urban fringe areas adjoining London (and other big cities) and for the 'countryside beyond' (Gallent and Madeddu, 2021). They note that estate agents have been reporting increased interest in larger family homes located in London's neighbouring counties (Hamptons, 2020). Whilst London's house prices rose by 3.5% in the year to December 2020, the South East and the East of England saw rises of 6.1% and 7% respectively (ONS, 2021). There are indications that households are accelerating their plans to leave the capital or at least acquire homes in relatively accessible countryside, given changing work expectations (ibid.). This may not always mean that London homes – including central zone flats, see above - are being sold, but rather that the trend towards *multiple property ownership* is continuing – and being accelerated by the pandemic. Some London households are retaining homes in the capital but also buying adaptable property in metropolitan towns and villages (Hamptons, 2020) or in accessible coastal locations (Compare the Market, 2020). This trend, combined with changing market fundamentals (and increasing levels of unemployment, disproportionately affecting the young) is likely to exacerbate housing access and wealth inequalities in the years ahead.

Existing houses located in greenbelt towns and villages are particularly attractive: there is increasing competition for homes – or land on which to build new homes - in these constrained markets, with new buyers perhaps hoping that greenbelt restriction will protect their amenity and their investment (London Post, 2020). Indeed, pandemic pressures combined with the existing shortage of 'family' homes in London, and other big cities, may give new impetus to past calls to loosen restrictions on development in urban Green Belts, linking future development to either new transport hubs or existing ones with latent capacity. But whatever happens to containment policies, near urban housing markets appear to be shifting, reshaped by basic market dynamics: by households, often existing homeowners, uncertain as to their future working patterns, but anticipating some potential for lifestyle changes. This is splitting the market between urban centres and the accessible countryside – one foot in the city, and another in an accessible village, with access to open countryside and the sort of amenity denied to many urban households during lockdown.

Another general effect of COVID-19 lockdowns has been to make international travel more challenging: the inconvenience of travel restrictions during the pandemic may have a more general, worldwide, effect on patterns of property consumption, at least by individual investors who enjoy visiting their foreign property. Reduced access to overseas markets could concentrate second home demand within the UK – as households with properties abroad start thinking about 're-shoring' their portfolios or new investors looking for second homes choose to buy in the UK rather than in Europe (Knight Frank, 2021).

This potential change to the investment market will add to the domestic choices affecting rural areas. The changing shape of the market outside of cities, in less accessible areas of countryside beyond immediate urban influence – including important rural amenity areas such as national parks – may be rooted in more definite lifestyle changes. Those amenity areas already had well-established second home markets (Gallent et al, 2005). There is a prospect now of three big changes. The first is an intensification of demand for 'traditional' second homes (Knight Frank, 2021); the second is the conversion of some existing second homes to first-home use (as their owners 'flip' to living away from London – see Zoğal et al, 2020, for an insight into this phenomenon overseas); and the third is permanent life-style relocation of decentralising households (including earlier-than-planned retirement). Data from the ONS show that the South West saw the fastest house price rises in 2020 (10.2%) of any part of southern England (and an almost 13% drop in participation amongst first time buyers compared with 2019 (ONS, 2021; Halifax, 2021). Slightly faster rates were recorded in parts of the north of England, albeit from a lower base. There is a broad expectation of more intensive demand for family homes in rural amenity areas (see Peachey, 2020), which will challenge existing planning orthodoxy (i.e., strict limits on house building) and likely bring new market exclusions as those with the deepest pockets secure homes at the expense of

those most affected by the pandemic.

These housing market pressures will have significant repercussions for life in rural places, starting with the social reconfiguration of communities and the potential overloading of services in some locations. In the longer term, rural authorities (many of which believe they have reached environmental capacity for new housing) will need to rethink patterns of housing supply, whether they continue with plans to expand key service centres (including market towns) – and abandon villages to the gentrification caused by this new wave of counter-urbanisation – or look to 'smear growth' more evenly across settlement hierarchies, ensuring that more villages are able to expand. The challenge, here and elsewhere, is that private market choices are being reshaped by the experience and prospect of living with COVID-19. Lifestyles have been changed and lives disrupted. People have been rethinking the future, how they might live and the options available to them. This has been happening in a housing market shaped by the unequal capacities of different housing classes and driven, in part, by government's support for house prices; together with new demand patterns this could drive an expansion of housebuilding in London and beyond. But the challenge, going forward, is to ensure that increasing housing supply serves not only new lifestyle demands, expressed by existing homeowners, but also delivers affordability and expands access to good quality housing.

We examine these mobility and consumption shifts in a separate review, bringing together a range of spatial data to examine changing patterns of housing market interest and, where possible, changes in house price and affordability in rural areas (Review 1b).

Adapting to Environmental Risk

Adaptation to environmental risk is closely related to the climate change driver introduced above. But it is broader than rethinking the form of homes and the configuration of development across rural areas. The broader availability of housing, and of affordable housing, is a significant determinant of economic possibility: it facilitates labour movement and supply and is essential if new industries are to grow and prosper.

Housing affordability is already a barrier to the growth of traditional farm businesses and local services. Housing supply is often dislocated from these activities, with local workers denied easy access to jobs. If we take adaptation to environmental risk to mean the growth

of new green energy and related activities in rural areas – aimed at realising a 'post-carbon future' – then housing affordability, as a major determinant of labour supply, will become even more important in the years ahead. A combination of planning constraint and market sifting has configured the supply of housing to meet the needs of retired and seasonal residents rather than rural workers. This is, in large part, because rural areas are not treated as important sites of economic activity. Yet if those same areas are to play a leading role in a post-carbon future, the way these areas are planned will need radically rethinking. Critical here is the reframing of land as a fundamental resource for adaptation and how this interacts with the housing sector. This includes protecting essential land resources from housing, but also the role of land-based ecosystem services in protecting the rural built capital from environmental risk. For example, due to financial constraints, physical flood defences to protect rural property from increased flood risk may not be feasible. Instead, the use of green infrastructure, nature-based solutions (NBS), and upstream alternative land management, may be more effective as an adaptive approach (an issue explored elsewhere in this study).

Part 4: The Case for Intervention

In Part 2, we looked broadly across areas of intervention, connecting established change drivers – economy and earnings, housing supply, and market intrusion – to the sorts of corrective actions needed to shape different housing outcomes in rural areas. In Part 5, the forms of possible *planning* intervention are detailed. But here, we stop to reflect on another critical question: why should we concern ourselves with the operation of rural housing markets and with the outcomes they produce?

The answer to this question has already been summarised: measures to address rural housing problems are essential, firstly, for reasons of socio-spatial justice – to combat market exclusions; secondly, to support rural economies and new industries, including vital post-carbon transitions; thirdly, to protect rural tourism (and the wider service sector) by ensuring labour supply for this industry; and fourthly, to support the culture and cultural

identity of rural areas, including land-based industries.

Whilst the economic dimension is critically important – to ensure that rural areas retain working economies – the social justice rationale for intervening in rural housing markets has primary importance, underpinned by a belief that private markets should not be the sole determinant of either human and social welfare or the quality of life that people enjoy or endure through the life cycle. Access to good quality and affordable housing makes a clear contribution to quality of life across four domains. It is materially important for home-life (supporting physical and mental health); it situates people in important social networks and is therefore a net contributor to social-life (enabling people to live in their communities, to give and receive support); it provides access to jobs and supports local economies; and it is a source of community vitality, underpinning the community-life that migrants to rural areas, and also established residents, value.

It is also the case that *home ownership* has become a dominant pathway to enhanced quality of life for many people, in part because of the challenges that now beset other tenures. For much of the twentieth century, good quality council housing (built to Parker Morris standards after 1967) offered stability and security to many UK households. It provided them with residential choice and, through a system of fair rent, allowed them to predict costs over the long term. The promotion of homeownership was, in part, a means of limiting state expenditure on housing, as well as being part of a broader ambition to permit the penetration of global capital into fixed assets, creating new opportunities – through deregulated bank lending – to grow the UK's service economy and particularly its financial services. But despite the weakening support for other tenures, and the prioritisation given to homeownership by governments (of different colours) for at least 50 years, it would be wrong to present homeownership as an *exclusive pathway* to enhanced quality of life in rural areas.

Rather, it is the broader availability of *affordable housing*, irrespective of tenure, that is a net contributor to wellbeing – both for individuals and rural communities. Without it, those communities lose vitality, become exclusive and lose much of their capacity to respond to the challenges that rural areas face in the future. It was noted in Part 3 of this review that they will need to play a leading part in the post-carbon transition and will therefore require the social and economic infrastructure to facilitate labour movement and supply (Gkartzios et al, 2022). It was also noted in Part 3 that the COVID-19 pandemic of 2020/21 produced the spectacle of wealthier urban households escaping to the countryside. It revealed acute housing inequalities across Europe and North America. Its legacy may well be changed working practices and new perspectives on the utility of housing – as a social, work-life and educational space. There is now a danger of some rural areas facing a surge in counter-

urbanisation pressure that could impinge on the rights of existing residents if planning systems and land policies do not flex to cope with these new challenges. New exclusions, because of planning and market rationing, risk not only new socio-spatial injustices (that undermine the quality of life of those with less market power) but also the broader well-being and resilience of rural communities – whose futures depend on the capacities and innovation rooted in social diversity. Affordable housing has a key part to play in the future of rural places.

What is the role of land-use planning in relation to this challenge? We have already introduced the sorts of broad actions that might be needed in relation to the drivers of housing outcomes – economy and earnings, housing supply, and market intrusion. The intention now is to focus solely on planning interventions, to highlight common approaches and the debates that accompany their use.

Part 5: Forms of Intervention

Besides planning interventions that support economic development (working on the 'economy and earnings' driver of housing outcomes – see Thematic Review Tourism and the Rural Economy), land-use planning can also effect change in the supply of housing of different types, and also restrict the target market of new homes. Ahead of wider discussion, we identify seven broad ways in which intervention through the planning system can shape housing outcomes:

a) Facilitate the provision of *additional private housing*, through national and local flexibilities in policy and practice.
b) Facilitate the provision of *additional public and third sector housing*, through a combination of planning flexibilities and national support.
c) Support community-led housing, including through the system of Neighbourhood Planning.
d) Use PD rights to advance the conversion of farm buildings to residential use.
e) Restrict the occupancy of new housing to full-time residents.

f) Seek to restrict the conversion of existing homes to second home use.
g) Where appropriate, *support alternative forms of low-impact development* (LID) through the planning system.

Additional Private Housing

There is not enough housing in many rural areas to meet demand. A more permissive approach to planning would undoubtedly trigger additional development in areas of unmet demand. That more permissive approach (larger allocations) would prioritise key settlements and market towns and is unlikely to be acceptable in lower tier villages. If it happens in key settlements, then these will continue to absorb some of the unmet demand in villages. The problem is that key settlements suffer from over-development in order to 'save' villages, which then remain popular with mobile professionals, second home buyers and retirees – all bringing their mobile capital to the countryside. Those groups consume second-hand housing in villages, generating the demand for new housing higher up the settlement hierarchy. This pattern of displacement, or *exchange* as we have referred to it above, has underpinned social change in the countryside since the 1960s.

If, on the other hand, private development is allowed to happen in lower-tier villages (despite the objections of mobile professionals, second-home owners, and retirees) then it will tend to be high-end. Executive style housing on larger plots is more profitable than starter homes, price linked to local earnings. Only if larger village sites are allocated (e.g., in a Local Plan, or equivalent, that seeks to 'smear' and distribute housing growth) will it be possible to insist on mixed housing types. But this will fundamentally change the character of villages and encounter significant opposition. Acceptance of a large proportion of investment housing could end up being the price of a small amount of more affordable homes, either in the form of starter homes for sale or homes to be managed by registered providers.

Additional market housing will have a role to play in meeting demand in larger settlements but would do little to address the needs of working households in villages. It would be a magnet to decentralising households, finding a ready and eager market in a post COVID-19 world.

As an aside, this notion of local working households being displaced in exchanging areas suggests sharp segregation between village and (market) town populations. That sharpness

is blunted by the attraction of (market) towns to some decentralising households, including retiring purchasers who seek proximity to services, and by the ability of some local working households to remain in villages because their families have a history of property ownership (i.e., through inheritance), because they are return migrants (with incomes and wealth derived elsewhere) or because they have been able to access professional occupations, with incomes to match housing costs, locally.

Additional Public and Third Sector Housing

The development programmes of registered providers (RPs) are very important to rural areas. In larger settlements, RPs work with private partners on larger schemes, eventually managing homes procured through planning agreements. However, the inability to take affordable housing contributions from small scale market developments means that the only route open available in many smaller villages is through Rural Exception Sites. Until 2014, it was possible to take contributions from all residential sites, subject to viability and many rural LPAs adopted thresholds of 3 dwellings. Since 2014 Government policy (contained in NPPF/National Planning Practice Guidance (NPPG)) limits taking on-site contribution to sites of 10 dwellings or more. Most sites in smaller rural communities (including windfalls) are smaller, but do not have to make an affordable housing contribution.

The policy was subject to legal challenge and the High Court did leave the door open to LPAs setting lower thresholds where there was evidence of need and it was viable. However, LPAs have been wary of using this because the Planning Inspectorate for England (PINS) has not taken on board the High Court judgement.

A partial rural exemption from this policy exists, which has gradually become more permissive of on-site affordable housing contributions on small sites. This extends to s157 Designated Rural areas – i.e. all National Parks and AONBS and parishes where Local Authorities have sought designation and parishes listed in Statutory Instrument. However, only 30% of parishes with populations of 3k or fewer are covered.

A further limitation on providing affordable housing to meet local housing needs has been the introduction of a national First Homes policy in May 2021. This requires that 25% of any affordable housing contribution on market sites should be First Homes. These are defined as homes for first time buyers, sold at a discount of at least 30% against market value and at

a price capped at £250k outside London. The policy does allow for some local discretion in setting the discount and applying local connection criteria. However, as the findings of a survey undertaken by the Rural Services Network found, three aspects of the design of the First Homes policy will reduce rural affordable housing delivery. Firstly, the inability to set variable discounts to reflect different housing markets within an LPA will mean that they may have to set a low discount that makes it viable to deliver First Homes in lower value areas but makes them unaffordable in higher value rural communities. Secondly, the 25% discount will inevitably reduce the proportion of other affordable tenures, with a particular squeeze on shared ownership housing. As this often helps cross-subsidise affordable rented homes it will potentially reduce further this tenure too. Finally, the lack of price cap discretion means that the size and type of dwelling is not appropriate to first time buyers.

The inability to take affordable housing contributions from small market sites means that Rural Exception sites have become the only route to deliver affordable housing in many smaller rural communities. These sites can be developed by RPs, community-led housing (CLH) organisations and sometimes landowners to develop affordable housing schemes. They are defined in NPPF as small sites [green and brownfield] used for affordable housing in perpetuity where sites would not normally be used for housing. Usually these are within, but more commonly on the edge of settlements. The homes are secured as affordable housing through a combination of measures, significantly discounted land price, and grant support. Perpetuity is enforced by statutory exemptions for developments in smaller rural communities by Registered Providers from Right to Acquire and 100% leasehold exemption. Further enforcement is provided by including perpetuity and local connection requirements in accompanying Section 106 Agreements.

Over the last five years, delivery on rural exception sites has fallen by a third, for four main reasons:

Firstly, anecdotal evidence from RPs and Rural Housing Enablers (RHEs) cites the unwillingness of landowners to release land for rural exception development in the hope that in the near future these sites will be developed as market housing, attracting a much higher land value. This behaviour is incentivised by changes in national planning policy that require Local Planning Authorities to have a rolling Five-Year Housing Land Supply and by a belief that the Presumption in Favour of Sustainable Development may be triggered where land supply, and housing delivery, is insufficient.

Secondly, there has been a reduction in the number of RPs willing to develop small rural schemes with delivery increasingly by specialist rural housing associations. This may in part explain the uneven geographic distribution of rural affordable housing development

evidenced by Homes England.

Thirdly, and related to the first challenge, it is increasingly difficult to secure sites at a price that makes it viable to deliver affordable housing. The conventional rule of thumb is £10,000 a plot, the equivalent of £100,000 per acre. In part, this is a consequence of national policy allowing for a small proportion of market homes on a rural exception site to enable the sites to be delivered without grant funding. Many local authorities try to 'hold the line' on £10,000 a plot, including by stating this as a requirement in policy. In others, where such controls are not in place, landowners have sought to use the market housing to inflate land values which either reduces the amount of affordable housing that can be provided or requires public subsidy to make the scheme viable.

This challenge has been heightened, fourthly, by Government introducing two new exception site types, which offer a narrower range of affordable housing, primarily as affordable sale. These are able to command a higher land value and therefore likely to reduce the supply of traditional rural exception sites. The first of these was the introduction of 'entry level' exceptions in 2018, which would primarily deliver homes for first time buyers. There was very low take up of this policy, which was therefore substituted in May 2021 with First Homes Exception Sites. These form part of the Government's First Homes policy. These sites are expected to be primarily developed as First Homes (for first time buyers, with discount of at least 30% against open market value, which is locked in for initial and future sales). A rural exemption excludes First Homes Exception Sites in areas designated as rural under Section 157 of the Housing Act 1985, which includes National Parks and AONBs. Only traditional Rural Exception Sites will be permitted in these areas. However, nearly two-thirds of smaller rural parishes lack Section 157 designation. In those areas, there is a fear that landowner-led First Homes Exceptions could become the norm, with land prices driven up and the supply of local needs housing driven down. Government has committed to monitoring the impacts of this initiative, but the ideological predilection towards favouring private over community interest seems clear from the unfolding story of Entry-Level and First Homes Exceptions. It presents a major threat to rural affordable housing at a time when community action is demonstrating its worth across rural England.

From the first days of Rural Exception Site policy, delivery has been supported by Rural Housing Enablers whose role is tailored to the sensitivity of these sites and the need for intensive support to build and maintain community engagement. As independent honest brokers they have brought all partners to the table and made a critical contribution to the delivery of rural exception site schemes. However, over the last 12 years their numbers have halved, and their role reduced as a consequence of the loss of national and local grant funding. New models of funding have emerged in some areas with fee income being part of

the funding mix, directly linked to providing specified services and scheme delivery.

With regards to public housing, there has been something of a resurgence of council-led housing development in recent years. This came on the back of legislation allowing authorities to set up local development companies, source credit at sovereign rates from the Public Works Loan Book (PWLB) and build a mix of market and affordable homes on their existing public land banks. The lifting of the Housing Revenue Account (HRA) cap in 2018 has also allowed the building of traditional council housing. But because such housing remains vulnerable to the right to buy (even if councils set up their own RPs), many councils have preferred to partner housing associations and land trusts rather than develop their own homes. Local housing companies have been active in some small towns, with homes built on redundant public land, including on old Highways' facilities, or replacing public buildings that have fallen into disuse with new housing. (This public housing route, however, is only available to the 40% of rural local authorities that own and manage housing stock.)

In addition, because such public assets are generally lacking in villages, council-led building has not been a significant contributor to housing supply in those locations. This was not the case after the Second World War when councils were able to acquire farmland at agricultural value and build traditional council homes. Many villages have small clusters of council homes, which are a legacy of the post-war boom in public housebuilding. The Land Compensation Act 1961 shifted the balance of power away from councils to private landowners and since then councils using Compulsory Purchase Order (CPO) powers have needed to pay intended use value for land (so exceptions are important for villages in part because councils' hands are tied). A revision of the Land Compensation Act, to apply in circumstances of proven need for council homes, could enable a return to council-build in villages.

It needs to be acknowledged, however, that many councils can and do play an active role in supporting the rural affordable housing through planning flexibilities (including proactive use of rural site exception site policies) using commuted sums and their own resources to provide capital grant and, in some cases, providing revenue grants that assist CLH Organisations access technical support.

Community-Led Housing

In rural England, in recent years there has been growing interest in CLH as an option for delivering affordable housing, subject to the availability of revenue funding and technical advice. CLH has a specific definition which was used to direct the Government's Community Housing Fund. In essence it is housing that is the result of meaningful community engagement throughout the development process; ownership or stewardship of the homes by the community; the benefits to the community are clearly defined and legally protected in perpetuity. It takes different forms including, Community Land Trusts (CLTs), Cooperatives, Cohousing and some forms of Custom Build. CLH is not a tenure in itself but can be a vehicle to provide a range of tenures to meet the needs of a community, be that a geographic or a community of interest.

The most common form of CLH bodies in rural England are CLTs, which are legally defined in the 2008 Housing and Regeneration Act. For all CLTs there are six stages to developing homes: group formation and legal registration, needs and site identification, business and feasibility planning, design and gaining planning permission, contracting and managing the build, managing and maintaining the properties. The trust will seek to minimise development costs so as not to jeopardise the affordability of the project, although this does not preclude development of highly energy/resource efficient homes. Their legal Articles will require that the homes benefit a defined community in perpetuity. Planning policy and Development Management practices play significant roles in helping community groups achieve these requirements.

Delivery through CLTs requires considerable input of time and resources by the community. In some cases, this is eased by some of the preparatory work being done through a Neighbourhood Development Plan. The evidence gathered in the drawing up of those plans may clarify the need for additional affordable housing. Local communities may have some reservations about 'external' bodies 'parachuting' affordable homes into their towns and villages and may wish to take a direct lead. They may choose to this alone or work in partnership with a RP. This may be by the RP providing development and/or management services, with the community raising the capital and owning the homes. Alternatively, the CLT may own the freehold and lease the homes to the RP on a 125-year lease in return for a small ground rent. In this scenario the RP will take lead responsibility for building and managing the homes.

Whether the affordable housing is delivered through an RP or directly by a CLT, access to

land at a price that makes it viable to deliver affordable homes is vital. Both approaches would be greatly strengthened if there were alternative means of accessing development land. A new Land Compensation Act might allow local authorities to CPO farmland at current use value for community use. Or a Community Right to Buy (in support of sustainable development) at current use value, of the type that now exists in Scotland, would fundamentally shift the balance of power in development in rural areas from monopoly private owners to communities.

Converting Farm Buildings to Housing Use

The extension of Permitted Development Rights (PDR) has mainly been discussed in urban contexts, with redundant offices made available for housing use. There has also been some focus on farm buildings in rural areas being converted using the same mechanism. Class Q permitted development for agricultural building has been in place since 2015, with exclusions for National Parks and AONBs. Roughly 4000 conversions have happened under this deregulated regime.

It has been claimed that deregulation of the way development is permissioned will increase the supply of new homes and help address housing shortages in England. The removal of 'red tape' reduces the cost of developing more marginal sites. In urban areas, PDR has become associated with poorly located, low quality development. But in rural areas, it may merely facilitate high-end conversions, delivering a cost and time saving for developers looking to convert barns, or similar, to residential use.

Market towns in rural areas may soon feel the impact of PDR with high street uses lumped together (as Use Class E) and then made available for housing re-use without recourse to local planning. That re-use will require only technical consent. PDR presents planning with critical challenges. If local planning teams are unable to scrutinise applications, then they will also be unable to weigh up the benefits and drawbacks of development, taking mitigating actions for potentially deleterious impacts. The essential problem with PDR is that it hands power to private interest and removes it from communities and their representatives.

For that reason – and also because of the high-end nature of Class Q conversions in many instances - PDR in its current form does not present meaningful opportunities to rural communities. It is more likely to facilitate high end market conversions or cause irreparable

damage to the high streets of market towns.

However, cost and slow progress through the planning process is one of the obstacles to rural exception site delivery. Whilst the focus on deregulating private land development in rural areas delivers few obvious benefits, a more streamlined approach to exceptions could reap rewards: 'planning passports' for rural exception sites or CLH developments could offer a presumption in favour of planning permission where key criteria are met: clear evidence that the schemes meets local need; evidence of constructive community engagement; perpetuity arrangements in place; and a clear demonstration of the viability and deliverability of the scheme. Given the housing challenges faced by rural areas, targeted deregulation is needed in support of affordable schemes.

Restricting the Occupancy of New Homes

Affordable homes are retained for local use in perpetuity using occupancy restrictions. This seems perfectly natural: someone, either government or a landowner, contributed a grant or land price subsidy to make them 'affordable' in the first place. It would be a travesty if that subsidy were lost through a private sale, becoming a windfall profit for a private occupant. But local authorities can also apply occupancy conditions on permissions for market housing. They can stipulate, for example, that homes must be lived in by the same individual or family for at least 270 days in a calendar year. This is seen as a way of preventing second home use, although new build homes are seldom put to that use. The buyers of second homes have a clear preference for older housing (see below).

Occupancy restrictions are essential for affordable housing. But if applied generally to market housing, they may have unintended consequences. Shucksmith's (1990) study of such restrictions in the English Lake District revealed their potential impact on development activity. Developers are profit seekers: if profits are curtailed in one area, because restrictions shorten the queue of homebuyers and therefore reduce the gross development value of their projects, they may go and build elsewhere. New build supply is therefore lessened. This means that local buyers need to join the queue for second-hand housing. If that housing is also attractive to 'mobile capital' then the queue of buyers, there will lengthen. Therefore, the net effect of occupancy restriction in an area subject to external market interest will be to push up house prices. Ironically, where there is less external interest in the local market, builders may perceive less effect from the restriction and

therefore continue to build. An added complication is that reductions in gross development value will impact on underlying land prices, making some landowners less inclined to release land for housing, further impacting on supply. And a further added complication is that even when new housing is built, a lower gross development value will mean less capacity to carry planning gain contributions.

If not carefully planned and selectively targeted, occupancy restrictions may cause an elevation of house prices and a reduction in the supply of affordable housing through planning on larger sites. It is often inferred that 'local people' support these restrictions. But the underlying rationale of that support is not clear. Research on the St Ives occupancy restriction, enacted through the town's Neighbourhood Development Plan, suggested a higher level of support from seasonal residents than from the town's full-time residents, with the former perhaps viewing the restriction as a means of slowing development and protecting amenity (Gallent et al, 2020).

Limiting Second Home Use

Second homes are one outcome of the movement of mobile capital into rural areas. Their owners are motivated by investment and access to amenity. The distribution of second homes is largely determined by accessibility and amenity value, whether homes are easy to get to and whether they offer the sort of amenities and opportunities (access to the open countryside or attractive coasts and coastlines) that are absent in the places that purchasers have their primary homes. 'Second homes' are used privately by the owner and by friends and family. They are not let commercially. Homes offered for short-term letting on AirBnB (or similar) or through bookings agencies are 'holiday homes'. There is a further distinction between second and holiday homes that are purpose built (in planned second and holiday home villages and subject to occupancy restriction) and those that are removed from the general housing market and become unavailable to full-time residents. The latter have been the subject of greatest concern for at least the last 40 years and split between those that are 'new build' and those that are 'converted' from existing stock.

Whilst planning can restrict the occupancy of new-build housing, using planning conditions to ensure that homes are lived in full time (e.g., for more than 270 days each year), it cannot dictate the use of existing residential property. There is no distinction between a home occupied full-time or part-time, or a home that is rented out using an 'assured short-hold

tenancy' (AST) or a week-long let, in planning law. A home is a dwelling house irrespective of pattern of use. On many occasions over the last 40 years, the case for setting such a distinction has been made. And on each occasion, governments in power (usually Conservative ones) have rejected the idea, viewing it as an infringement on the free use of private property. But in terms of land use planning, it seems to be the sole means of controlling the growth of second homes. Occupancy restrictions on new housing have little effect as the typical second home buyer is looking for the archetypal traditional rural cottage and not a red-brick new build.

Assuming an amendment to the use classes order, distinguishing between first and second home use, were possible, the burden of enforcement placed on local authorities would be considerable. They would need a significant injection of new resources to keep track of the way homes were being used, and then take enforcement action against non-compliant owners. It might be more practical to use such an amendment to target short-term letting: to specify that the C3 Use Class permits any pattern of private use and long term, AST-based, letting. A separate Use Class could be created for commercial use, including AirBnB-style short lets.

This would not satisfy those calling for a 'ban' on all second homes. But as noted above, second homes are an expression of the inward movement of mobile capital into an area. The effect that movement has on the trajectory of house prices is not 'artificial' but a product of a free market in private property. Affordability ratios – the relationship between in-area workplace earnings and housing costs – are stretched for reasons of supply scarcity, inheritance (giving advantage to households with a family history of property ownership) and the movement of mobile capital. In rural areas, ratios are typically 1:8. In parts of London they hit 1:40. What this means is that earnings (and typical loan advances) are not determining prices. Rather, it is the movement of existing capital into housing (from overseas into London townhouses, or from cities into rural cottages, or from rural areas themselves into additional investment homes) that has the greatest price-setting effect.

It is also the case that those movements scaffold house prices. A great many rural households benefit from rising prices, either directly as vendors, or indirectly as the value of their homes increase. Where equity in housing grows, so too does consumer confidence. House prices drive spending and investment in local economies. They drive job creation in the service sector and, by incentivising development and refurbishment, also in the construction sector. Great care needs to be taken when restricting patterns of housing consumption. It is our view that planning needs to be positive, supporting communities and registered providers that are looking to provide affordable housing outside of the market. Those providers should be offering shared ownership options for households

aspiring to own their own homes.

If there is a wider economic case for calming the flow of mobile capital in housing, this is more easily achieved through higher transaction taxes (SDLT or Land Transaction Tax (LTT)) or through the equalisation of tax rates on work and property: by extending the 2021 social care levy to rental income and levying capital gains tax on property sales at the personal tax rate. Such measures are proven to be effective and do not add to the work burden of already over-stretched local authorities.

Alternative Forms of Low-Impact Development

Different parts of the UK have evolved more permissive or more restrictive approaches to development planning in their rural areas. This is a consequence of significant variation in rural contexts, and also historic patterns of land ownership alongside different experiences of monopoly landlordism and community impact. It also has ideological and political roots, with varying views on the rights of landowners versus the rights of communities. Lowland England, many parts of which are subject to intense development pressure, takes perhaps the most restrictive approach to housing development of any part of the UK. Development outside settlement envelopes is resisted and there are few opportunities to build homes in the open countryside. At the other extreme, the remoter parts of Scotland – the Highlands and Islands – have evolved an approach to land rights and planning which prioritises the rights of communities to live on and benefit from the land. Scottish Land Reform, enacted through a series of legislative changes since devolution, stands in stark contrast to the priority given to private landed interests in England and reflects a significant political rift between English conservatism and the reformist tendencies of a Scottish Parliament run by the Scottish National Party (SNP). The rural histories of the two countries, particularly the history of landlordism and clearances in the Highlands and Islands, go a long way to explaining the more progressive land policies that have today taken root in Scotland. That experience is shared by Ireland, which endured 800 years of colonial rule from London. Ireland and Scotland exemplify permissive approaches to rural planning, with the accent placed on community control of land assets in Scotland and the private right to build rural homes in Ireland. Ireland is often associated with the notion of ‘bungalow bliss’, after Jack Fitzsimons’ 1972 book of the same title.

Wales sits somewhere in the middle. It has its own history of resisting monopoly

landownership, evidenced by the building of 'squatter settlements' in the 19th century, many of which survive to this day - including Bethesda in North Wales. Historic resistances to land enclosures and the denial of common rights remains part of the collective memory in Wales, resulting in a politics that resists the neoliberal leanings of its larger neighbour. However, Welsh and English planning policy developed in tandem for much of the twentieth century. Whenever circulars were issued by the then Department for the Environment in England – in the years leading up to devolution – similar versions were issued by the Welsh Office. However, there has been significant divergence since 1999, not only because of ideological differences but because the Welsh rural context contrasts with that of England (bearing in mind that whatever happens in England is essentially designed for the lowland south-east region).

Whilst Scotland has been able to enact its own land reforms, Wales has rejected the more restrictive planning practices of England and its One Planet Development (OPD) policies supporting LID provide opportunities to live differently in rural areas.

Maxey (2009, p.8) attributes the following characteristics to LID: locally adaptive, diverse and unique; made from natural, local materials; of an appropriate scale; visually unobtrusive; enhancing biodiversity; based on renewable resources; autonomous in terms of energy, water and waste; increasing public access to open space; generating little traffic; linked to sustainable livelihoods; coordinated by a management plan.

The movement appears to have gained particular traction in Wales, building on a long tradition of embracing alternative technologies and lifestyles. Harris (2019, p.32) notes that since devolution the Welsh Government has looked to deviate from English planning practice, developing models of development that are more embedded in Welsh contexts and connect with particular opportunities for living differently in Wales. Many of its one planet developments, supported through the granting of 'exceptions' to standard planning practice, seek different human-nature relationships that protect biodiversity and promote landscape restoration. In the few schemes that have progressed, there has been a focus on new forms of housing development in the open countryside. Indeed, after years of local wrangling, the Welsh Government published a 'One Planet Development' practice guidance note in 2012. General Policy on rural planning is contained in TAN6 – on planning for sustainable rural communities. Planning Policy Wales also complements this guidance, which stipulates that 'development in the countryside should be located within and adjoining settlements and that new building in the open countryside away from existing settlements should be strictly controlled' (Welsh Government, 2012, Para. 3.60). But the One Planet Development guidance, which is a companion to TAN6, deviates from that general approach and is focused on 'One Planet Development in rural locations outside existing settlements' (Land

Use Consultants/Welsh Government, 2012, para 1.2).

Together with TAN6, it defines ‘One Planet Development’ as being both a physical imprint and lifestyle that ensures a much lighter ecological footprint and does not diminish environmental quality. These developments have a 'light touch on the environment', are 'land based' and 'must provide for the minimum needs of residents in terms of food, income, energy and waste assimilation in no more than five years' (Land Use Consultants/Welsh Government, 2012, 2). OPD has a low and prescribed ecological footprint which can be measured through the One Planet Development ecological footprint calculator[6], follow very low-carbon building design principles, are defined and controlled by a binding management plan, and must be the sole residence of proposed occupants. These OPDs look very much like the LID described by Fairlie (1992) and later writers, including Maxey.

Whilst they may be difficult to integrate into all contexts, especially pressured and development-intensive contexts (i.e., many parts of lowland England), the reality is that a combination of Scottish-style Land Reform and Welsh-style LID, may offered an alternative means of reconnecting communities with the land in some rural contexts, including many English ones, contributing to lower impact, reduced carbon lifestyles.

Part 6: National and Geographical Variations

Different nations of the UK encounter different kinds of housing pressure and planning challenges. These relate to extant patterns of planning, intervention and landownership, and also the wide variety of rural circumstances. It is not our intention to attempt full accounts of local difference, but simply provide starting lists of key challenges in different parts of the UK, to seed discussion and elaboration:

6 https://gov.wales/sites/default/files/publications/2020-01/practice-guidance-using-the-one-planet-development-ecological-footprint-calculator_0.pdf

England

1. A combination of restrictive planning and strong housing demand, affecting lowest-tier settlements, driving down affordability, especially in amenity and some coastal villages.
2. Amenity-driven demand inflated by Brexit (e.g., reshoring of second homes) and by the pandemic (driving decentralised housing choices).
3. Replacement of social rent with affordable rent, which may not be affordable to the neediest rural households.
4. Specific threat to the successful 'site exceptions' mechanism in the form of 'first homes exceptions' (in non-designated rural areas) (which support market entry but do not meet full spectrum of need).
5. Ongoing threat to rural economies and communities from market exclusions, which impact on labour supply and service viability.
6. Growing interest in community-led housing solutions that work across sectors, often with local authority housing companies and registered providers.

Scotland

1. Pressure on affordable housing in rural areas due to strong demand for short-term lets (e.g., Airbnb) and second homes. This has the dual effect of raising property values and selling prices (with properties often selling for 10-20% over the asking price), thereby pricing younger locally-based buyers out of the market, and also reducing the availability of long-term stable rentals.
2. A shortage of skilled workers in the construction sector in rural areas, especially on island communities. This results in long lead-in times for new-builds and for maintenance or upgrading of older properties. Anecdotal evidence suggests this shortage of construction workers may be exacerbated by the lack of affordable housing in rural Scotland as outlined above.
3. Long lead-in times, high costs and complicated procedures for applying for subsidies and support for installation of energy-efficient or net-zero technologies. This runs the risk of new technologies such as heat pumps being delivered first and foremost to already affluent and engaged households, and not to lower-income or more vulnerable households who may benefit most from such interventions.
4. Limited availability of housing association/social housing, and complexities associated with self-builds. There is growing interest in and awareness of the

potential for community-led housing initiatives to fill this gap. Rural Housing Scotland, for instance, have worked with communities across Scotland to support community-led housing projects.

5. The Community Empowerment Act (2015) in Scotland gives greater potential for communities to buy land, acquire property, and initiate community planning partnerships. However, it is vital to ensure that – in rural communities in particular – there are people with the skills, time and expertise to be able to realise the potential of community-led planning and housing, and that community organisations are appropriately supported with access to funding and to knowledge and expertise.

Ireland

1. Ireland's rural settlement pattern is highly dispersed with around 70% of rural households located in the open countryside, outside of villages or rural towns (often referred to as one-off rural houses). One-off rural houses account for around 26% of Ireland's entire housing stock but has been a deeply contested aspect of planning in Ireland.
2. Proponents of rural housing often highlight that dispersed settlement patterns are essential to community vitality and to maintaining viable rural communities based on social and family networks. Critics highlight concerns related to the landscape impacts of dispersed rural housing and the environmental costs associated with carbon-intensive car dependency and potential groundwater pollution due to poorly maintained or inappropriate siting of individual septic tanks.
3. The planning system has traditionally been facilitative of house building in rural places. Therefore, rural housing costs have remained relatively affordable (compared to urban contexts) leading to less displacement of 'locals' through housing market pressures.
4. Planning policy in the early 2000s focused on developing user-friendly design guidance as a means to mitigate the visual impact of accommodating rural housing development.
5. The current policy direction emphasises: (1) the need for an evidence-informed (rather than case-by-case) decision-making on rural housing (i.e., related to housing need and demographic trends); and (2) village and small town renewal to enhance the role of villages as critical rural hubs, including as a focal point for new housing growth and for sustaining services.
6. The COVID-19 pandemic has led to a rise in demand for housing in rural (and

particularly rural coastal) locations. Increased working from home trends (now formalised in Government policy) is generally viewed positively amongst rural communities as an opportunity to reduce rural to urban commuting through hybrid working patterns and to attract rural return migrants.

Wales

1. Particular constraints on supply of rural housing given the extent of coverage of three National Parks in Wales.
2. The address of rural housing supply and affordability in some rural areas is intricately interwoven with considerations of support for the Welsh language and predominantly Welsh-speaking communities. Delivery of housing in rural communities can therefore be politically contentious.
3. There are planning policies designed to promote delivery of affordable housing in rural areas, including rural exceptions sites policies, although these tend not to deliver ‘at scale’. These policies are restricted in part by landowners not bringing forward land and a decline in support for RHEs. There has been some experimentation and diversification with other forms of exceptions for rural housing – e.g., for rural enterprises, farm succession, OPD.
4. Significant and acute impacts in certain communities arising from concentrations of holiday and second homes. There has recently been an increased focus on revisiting this issue after a period of limited policy and legislative change on this issue.
5. Some recent concerns about significant increases in house prices in rural communities in Wales, although income to house price ratios still appear lower than in many other parts of the United Kingdom.
6. Some interesting legislative developments, for example a reversal of ‘right to buy’, leading to early signs of renewed investment in local authority housebuilding.
7. More limited use of PD rights in Wales compared to England in terms of enabling conversion of rural properties to residential use without requiring application for planning permission.
8. Limited interest in Wales in approaches to empowering local communities through the statutory planning system (e.g., Neighbourhood Planning in England). Some rural communities are engaged in preparing Place Plans, yet these do not have statutory status and do not come with any significant community powers or rights.

Northern Ireland

1. Of all the devolved nations in the UK, Northern Ireland has the highest percentage of rural dwellers, with an estimated 36% of the population living in rural areas. Furthermore, population growth in rural Northern Ireland is occurring at a faster rate than in urban areas, increasing pressure on housing availability. That said, this is not commonly experienced across the region as demonstrated by geographically fluctuating pressures on service delivery leading in some cases to the closure of schools and other amenities.
2. Rural planning policy in Northern Ireland is currently in a state of transition, as local councils bring forward LDPs. PPS 21 (Sustainable Development in the Countryside) and relevant provisions of 'A Planning Strategy for Rural Northern Ireland' will remain in place until all eleven councils adopt LDPs. Historically, concerns have been voiced about the differentiated interpretation of PPS 21, prior to the transfer of planning powers to local councils in 2015. Planning consultancies have publicly declared the exploitation of 'ambiguities' within the policy as a means for securing planning permission.
3. Government in Northern Ireland has highlighted the availability of affordable housing in rural areas as a key mechanism for sustaining rural communities. From a public opinion perspective, access to rural housing remains a highly emotive issue, with an associated strong sense of place, belonging and attachment to land that is linked to culture and identity. Securing planning permission for a single dwelling on a farm is typically a means to either generating income that is used to sustain an agricultural business, or to provide children with a lower-cost new-build property close to the family unity. Therefore, any real or perceived barriers to rural development are generally met with unified, cross-community rebuke as demonstrated by the recent (October 2021) withdrawal of a Planning Advice Note (PAN) which was intended to ensure consistent interpretation of PPS 21.
4. Strong demand for new dwellings, including one-off housing and residential developments, continues. Whilst there have been some delays caused by supply chain issues impacting on the availability of construction materials; rather than lose a deposit, purchasers have typically absorbed additional building costs within an increased purchase price of the property.
5. Recent property market trends, including evidence from estate agents, indicate a preference for rural and peri-urban housing over urban property; this has been an enduring dynamic of the COVID-19 pandemic (Ulster University, 2021).

6. Other contemporary issues influencing rural housing dynamics include: post-Brexit arrangements and associated impacts on the migrant workforce particularly in the agriculture sector; cross-border commuting and workforce mobility, particularly in the Irish border region; and the development of tourist 'honey pots' in various parts of the region, leading to the purchase of second homes and negatively impacting on housing affordability in locations such as the Causeway / North Coast area and Fermanagh Lakelands.

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Thematic Review: The Ecosystem Services Approach

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Introduction - The Ecosystem Services Approach

Ecosystem services describe the multitude of functions of the system of life on planet Earth. The internationally adopted Common International Classification of Ecosystem Services (CICES) underpin environmental accounting by the European Environment Agency (EEA). There are also other standard classifications of ecosystem services, including the UN-sponsored Millenium Ecosystem Assessment (MA), *T*he Economics of Ecosystems and Biodiversity (TEEB) - an initiative to make nature's value more 'visible' and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). National variations of these classification models, such as the US-EPA Final Ecosystem Goods and Services Classification System (FEGS-CS) add to the mix.

The ecosystem services discourse references the manner in which people and nature are intertwined and function as a dynamic system embedded in the biosphere (Folke et al. 2021). This depicts nature as a complex, interlinked, dynamic entity and highlights the multitude of ways in which humans are dependent on its functions. Following the classification models above, Haines-Young and Potschin (2016) divides ecosystem services into four service types:

- Cultural services: the benefits that nature bestows on humans in the form of improved mental and physical wellbeing, aesthetic pleasure, cultural values and educational impact.

- Provisioning services: the goods and benefits that we derive from nature such as food, minerals, fuel and habitats.
- Regulating services: natural processes underpinning for example climate and flood regulation.
- Supporting services: such as primary production, soil formation and nutrient cycling (though, the CICES classifies these ‘supporting services’ as part of the underlying structures, processes and functions that characterise ecosystems).

The ecosystem services approach has since gained traction in literature and policy and has become robustly institutionalised (Bouwma et al. 2018). An integrated ecosystems-based approach to nature conservation was promoted in the 1992 Convention of Biological Diversity (CBD, 2000), the aim being on one hand to valorise nature in economic terms – to highlight its central role in our economic systems – and on the other, to better articulate, understand and manage instances of societal decision-making where economic values are juxtaposed with environmental ones, often to the detriment of environmental outcomes.

The UN Environment Programme launched the TEEB project in 2007, and 2012 saw the establishment of the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES) (Maes et al. 2016). The UK’s Natural Capital Committee was set up in 2011 to support the government in its endeavour “to be the first generation to leave the natural environment of England in a better state than it inherited.” (NCC 2020: p.1). The NCC set out to do this through developing and championing an integrated systems-based approach and an asset-based framework for understanding environmental change. Ecosystems services play a key role in this nature accountancy framework. DEFRA’s 25 Year Environment Plan was informed by this approach, and it continues to be reflected in the new Environment Act.

Scotland’s third Land use Strategy explicitly recognises the value of ecosystem services and natural capital and states that “natural capital is considered on an equal footing to people, social and economic capital” (Scottish Government 2021: p.10). This is supported by a Natural Capital Asset Index overseen by NatureScot. This is a composite index which tracks changes in the capacity of Scotland's terrestrial ecosystems to provide benefits to people.

The ecosystem services approach has been embedded in policy approaches in Wales for the best part of a decade (Welsh Government, 2012). Legislative changes in Wales in the past five years, including the introduction of the Wellbeing of Future Generations Act 2015, have promoted enhanced connections between ecosystem services and the concept of wellbeing. The approach to ecosystem services in Wales also connects well with the full spectrum of the four categorised elements of ecosystem services. For example, there is a

recognition of some of the contributions that upland habitats can make to cultural inspiration, including art and poetry (Natural Resources Wales, 2016).

In Northern Ireland, there is less reference to ecosystem services within policy, though the 2011 Northern Ireland Ecosystem Synthesis (present as chapter in the UK National Ecosystem Assessment (NEA) Technical Report) was seen as a “first step” in providing a baseline of existing data but recognises there were limited resources to develop this more fully at the time. However, while the NI Environment Link has a page on its website on ecosystem services and there are various suggestions to advance it, there are no associated documents or consultations on the topic, suggesting that ecosystem service-based approaches are underdeveloped in NI. This will be a key area to investigate in the project Roundtables with NI stakeholders to determine where alternative approaches may be used instead, or the reasons why, and indeed if, it is underdeveloped.

The ecosystem services approach underpins Ireland’s *National Biodiversity Strategy 2017-2021* (Government of Ireland, 2017), the third iteration of the country’s biodiversity policy with a new strategy under preparation. The 2017-2021 strategy recognises that the ecosystem services concept provides a critical rationale for nature conservation, based on the social, cultural, and economic value of biodiversity. A key goal within this strategy is to initiate natural capital accounting through sectoral and small-scale pilot studies, including the integration of environmental and economic statistics using the framework of the UN System of Experimental-Ecosystem Accounting (SEEA). This latter element has been undertaken by the national Central Statistics Office (CSO). A pilot project on mapping National Ecosystem and Ecosystem Services was completed in 2016. The strategy also aims to mainstream biodiversity into decision-making across all sectors. There is also a Natural Capital Ireland initiative, a not-for-profit that claims to be “leading the conversation on natural capital”, working with over 1,000 cross-sectoral stakeholders across Ireland and promoting the natural capital approaches through sensitisation and policy integration.

Within Irish planning policy, this has been operationalised via the green infrastructure concept (see later GI sections of this review). For example, the *National Planning Framework* (Government of Ireland, 2018) includes a national policy objective of incorporating green infrastructure and ecosystem services into the preparation of statutory county and city development plans. The current outcomes-based approach Programme for Government (Government of Ireland, 2020) also includes a commitment to preparing Ireland’s first national land-use strategy to provide a multi-sectoral and integrated approach towards land-use management – this is currently at a very early stage of development, with background reports to be completed by early 2022 followed by stakeholder consultation.

Ecosystem services also feature prominently in many EU policies (which will continue to scaffold much of Ireland's environmental policy), although the operationalisation of the term remains weaker (Bouwma et al. 2018). For example, the EU Forest and Biodiversity Strategies make explicit mention of ecosystem services as do the Common Agricultural Policy (CAP) and the Marine Strategy Framework Directive.

But the ecosystem services approach is not without critics. Norgaard (2010) mounts a comprehensive questioning of the ability of such a simplistic concept to represent the complexity of the nature-society relationship and the plural values associated with nature. Due to the complexity of ecosystems, the identification - let alone measurement - of an ecosystem service in situ will always integrate a degree of scientific uncertainty. The relationship between ecosystem services provision, species diversity and resilience of an ecosystem for example is complex and contingent (Loreau et al. 2021).

Defining and valuing ecosystem services

For the concept to remain usable in governance and planning, a balance needs to be found between scientific exactitude and meaningful recognition of nature's functions and meanings in cultures and economies. Many argue that this balancing of scientific and governance perspectives, including the integration of both the economic and cultural value of ecosystem services, should take place in context as close to the operative level of management and use as possible (CBD, 2000).

In an effort to facilitate this, the IPBES community outline 18 categories of nature's goods and services and emphasise that all of these are highly culturally contingent (Diaz et al. 2018). Table 1 displays the 18 categories and their links to the different elements and functions of rural economies and planning considered in this project. The exhortation to consider ecosystem services and benefits always in the given cultural context and the recognition that ecosystem services take both material and non-material forms are crucial takeaways from the IPBES approach and should be integrated into any iteration of ecosystem services in a policy and planning context.

Table 1. Nature's benefits to people and the main relevant element(s) of the rural and sectors of economy (adapted from Diaz et al. 2018)

Nature's benefits to people (Diaz et al 2018)	Provision: relevant rural element and economic function
Habitat creation and maintenance	Land based (agriculture, conservation management, education, tourism)
Pollination and the dispersal of seeds and other propagules	Land based (agriculture, conservation management, forestry, landscape maintenance)
Air quality regulation	Land based, economic
Climate regulation	Land based (agriculture, forestry, landscape management, energy), economic, cultural (landscape management)
Regulation of ocean acidification	Economic
Regulation of freshwater quantity, location and timing	Land based, economic (agriculture, forestry, landscape management)
Regulation of freshwater and coastal water quality	Land based, economic (agriculture, landscape management e.g., peatlands)
Formation, protection and decontamination of soils and sediments	Land based, economic (agriculture)
Regulation of hazards and extreme events	Land based, economic (agriculture, forestry, landscape management), cultural (landscape management)
Regulation of detrimental organisms and biological processes	Land based, economic (agriculture, landscape management)
Energy	Land based, economic (agriculture, forestry, energy), built
Food and feed	Land based, economic, cultural (agriculture, education, tourism)

Materials, companionship and labour	Land based, economic, cultural (agriculture, conservation management, forestry, landscape management, education, tourism, …)
Medicinal, biochemical and genetic resources	Land based, economic, cultural (agriculture, conservation management, education, tourism)
Learning and inspiration	Cultural, built (education, tourism)
Psychological and physical experiences	Economic, cultural (conservation management, landscape management, education, tourism)
Supporting identities	Economic, cultural, built (all)
Maintenance of options	All

While a key benefit of the ES approach is that it helps articulate their role in our economies, assigning an ecosystem service a monetary value – something that is often assumed as central to the ecosystem services approach – further obscures their complexity and cultural plurality. Moreover, monetary valuation introduces economic considerations such as substitutability and opportunity costs which disregard the contingency of ecosystem services and many argue, obscures the plurality of environmental and social values assigned to nature (O'Neill 2019).

This is problematic considering that very little is as yet known, for example, of the role of functional diversity in biosphere integrity and the resilience of the Earth system (Folke et al. 2021; Loreau et al. 2021). Economic values are unlikely to do justice to the breadth and complexity of the science and cultural framings of nature's elements and functions. Though aggregate measures, such as economic value, can aid decision-making regarding alternative management and use options, there is a general agreement in literature that valuation needs to take place in negotiation with the relevant stakeholders (e.g., Corbera et al. 2009). Notions of recognition and procedural justice – what is deemed as useful knowledge and whose voices are heard - are key to good governance when it comes to ecosystems services (Langemayer and Connolly 2021).

Distinct from the economic valuation of ecosystems services, is their so called 'financialisation', as assets in ongoing value extraction activities. Financialisation, which happens on the terms of economic value extraction, carries an even higher risk of selective recognition of value and underpins the much-criticised trend of increasing commodification of nature (O'Neill, 2019). There are some prominent economic 'movements' such as the

green economy and the bioeconomy (Damato and Korhonen, 2021) that stipulate a transition from a fossil fuel-based economy to one that relies on nature-based solutions and ecosystem services instead, thereby engaging more explicitly with ecosystem services as economic assets. These approaches envisage new jobs and source of income in renewable energy, bioengineering and bio-refining, where natural resources and processes form the basis of cleaner and more environmentally-friendly energy and consumer goods and are therefore recognised as valuable assets to be cultivated. These development trajectories envisage the commodification of ecosystem services as a path to ensuring their sustainable management but leave quite a few questions open as to how this would actually happen.

With these caveats in mind, recognising the role of ecosystem services in underpinning many of our economic activities is urgently needed in the context of the ongoing extinction and climate crises and the threats they pose to the planet (Folke et al., 2021). The ecosystem services concept has many benefits, not least in articulating the interdependency of the social and ecological systems and in framing nature as a dynamic entity whose functions have multiple values in our societies. As discussed above, the approach is beginning to be broadly recognised in policy and ecosystem services assessments and can be seen as a good indicator of nature's health and the success of various conservation interventions and initiatives. The ecosystem services-based approach is therefore a valuable insight into this particular dimension of rural planning.

The Dasgupta Review (2021) confirms what is recorded in numerous earlier studies globally, that the state of biodiversity and ecosystems services has been in decline for decades. The 2019 assessment by IPBES, for example, found that 14 of 18 categories of nature's goods and services (Table 1) have deteriorated since 1970. The research on Earth system boundaries (e.g., Steffen 2015; Folke et al. 2021), reveals the key pressures: land-system change, climate change and decline in species and genetic diversity driven by human activities and climate change (driven by human activities). Dasgupta (2021, p.19) observes that "there is a tension between our demand for provisioning services on the one hand and our need for regulating, maintenance, and cultural services on the other."

Key pressures in the UK devolved nations and Ireland

According to Defra in 2011, 74.8% of the land area in the United Kingdom was covered by agricultural uses. This includes much of the high natural value land such as mountain, moor and heathland habitats (Bateman et al., 2013). Rural land and the ecosystems that it supports are therefore key providers of ecosystem services (Posthumus et al. 2010). Bateman et al's. (2013) valuation and modelling-based analysis demonstrates that in order to maximise the benefits of land-based ecosystem services to society, policy needs to focus on both provisioning and supporting, regulating and cultural ecosystems services from rural land.

But the tension between provisioning and other ecosystem services is very evident in both the UK and Irish contexts. The UK undertook a comprehensive NEA that was published in 2011 and Ireland completed a pilot mapping project in 2017. The key message from these assessments is that while many provisioning ecosystems services (such as food and timber production) have seen positive trends in the second half of the past century, others, that underpin broader environmental quality such as those related to air, water and soil quality are in a degraded state or in decline (UK NEA, 2011; Moran, 2021). Agriculture is the dominant rural land-use in the UK nations and Ireland and its central provisioning services have opportunity costs. This is visible in the slow, long-term decline evidenced in other provisioning, regulating and even supporting services such as water provisioning and soil formation (Moran, 2021). This also includes ecosystem services underpinning nature conservation values such as habitat provision and biodiversity, and other provisioning services such as marine fisheries. Broadly speaking, land use change driven by population pressure and climate change were the key drivers of ecosystem decline according to the 2011 UK NEA.

In England, the NCC's latest report (2020) on progress towards the England's 25 Year Environment Plan is perhaps the most recent report providing more detail on the pressures on natural capital and its constituent assets and ecosystems services. According to the report, five out of the seven categories of natural capital (freshwater, marine soils, biota and land), and therefore their constituent ecosystems services, are in decline. Only the atmosphere and minerals and resources are in a steady state. While the report points out that emissions from greenhouse gases and air pollutants have fallen, improving air quality and purification, minerals and raw materials are still going to waste, as recycling rates in

construction and households have plateaued in the last decade. Pollution from sewage discharges and agriculture are still degrading surface water quality and leakages are compounding the impact of wasteful usage on the quantity of freshwater.

Climate change is driving marine water acidification and temperature rises and additional stressors are caused by coastal erosion and run-off with chemicals from agriculture. Soil degradation and intensive cultivation methods in agriculture decrease its quality (soil formation, food production) and ability to sequester carbon and there has been an increase in developed use of land which decreases its function in carbon sequestration, water retention and purification. England's priority habitats (14% of its land area), which support a range of provisioning, supporting and regulating services (flood regulation, carbon sequestration, pollination etc.) are deteriorating due to decline in species that are crucial for the functioning of these ecosystems. Habitat provision and species diversity are interdependent. For example, insects provide natural pest control for plants, including in some cases agricultural crops. Insect decline is largely down to the use of chemicals in agriculture and in domestic gardens and public greenspaces, but light pollution and chemical pollution of air also have an impact.

The 2019 State of Nature Scotland report (Scottish Government, 2019) lists the key pressures on Scottish ecosystems services as agricultural management, climate change, hydrological change, urbanisation, woodland management, pollution, invasive non-native species (INNS), upland management, marine climate change and fisheries. The intensification of agriculture over the past 50 years has seen a decline in soil as well as land-based biodiversity, although in recent years, Scotland has seen some improvements, for example the stabilisation of for example butterfly populations thanks to effective agri-environmental schemes. It appears, therefore, that farmers are beginning to find ways of protecting habitat provision alongside food production. Interest in climate-positive farming, such as the work being undertaken by the James Hutton Institute at Glensaugh Farm, illustrates a growing interest in how agriculture may make a positive contribution to climate change.

Climate change is also driving habitat degradation which correlates negatively with the ability of soil to sequester carbon – an important regulating service. Fires associated with warmer temperatures threaten also the flood and water quality regulation services provided by peatlands. Sea level rise and increasing storm surges threaten ecosystem service rich coastal habitats such as salt marshes and dunes. Scotland's highlands and their species diversity as well as snow cover are particularly vulnerable to the impacts of climate change. Land management and land cover changes are also driving significant hydrological changes and when associated with urbanisation, are particularly detrimental to habitat provision. This

is to an extent addressed by the Scottish Land Use Strategy that integrates an ecosystem service-based approach to urban greenspace (Scottish Government, 2021).

Deforestation and plastic, chemical and nutrient pollution are further pressures, caused by farming, transport and energy industry. Agricultural diffuse pollution is showing signs of abatement but continues to harm water courses while chemical pollution, particularly nitrates degrade land-based nature. The cultivation of non-native species such as timber and grouse entail management practices that degrade habitats that are significant ecosystem services providers. Climate change and commercial fishing exert pressures on marine habitats, causing acidification, release of carbon and loss of fish populations and habitat destruction. Seagrass and kelp habitats that are important blue carbon storages are especially threatened by bottom trawling and in need of conservation.

The Welsh Government, like many others, declared a climate emergency in 2019. Oxfam (2020) in its assessment of an 'environmental ceiling' in Wales identifies very significant negative impacts of both climate change-inducing activities and land use change, as well as biodiversity loss – with a clear picture that these need to be tackled urgently if Wales is to work within its environmental limits. In its assessment of biodiversity, Natural Resources Wales (2021b, p. 7) reports that "the overall trend is one of serious decline, reflecting the global situation and internationally recognised nature emergency". The emphasis then is on biodiversity recovery through more rapid and transformative action, working with the legislative and regulatory framework introduced in the past five years. In the same assessment, concerns are expressed for serious biodiversity loss in Wales, with 1 in 6 species that have been assessed in Wales at risk of extinction.

Land use and soils is defined as one of the eight 'cross-cutting themes' in assessing the state of natural resources in Wales. Natural Resources Wales (2021a) anticipates a very significant reduction in the extent of best and most versatile (BMV) agricultural land from 2050, principally due to changing water availability. The same report also identifies the need for diversification in agricultural practices and calls for further development of "precision farming, agro-ecological systems, agroforestry, low impact regular and irregular silvicultural systems and innovative horticultural systems" (p. 10). Some of the additional headline data and projections related to land use and soils include (Natural Resources Wales, 2021a):

- 'Woodland area in Wales has increased from approximately 303,000 ha in 2010 to approximately 309,000 ha in 2019. This is a positive trend, although it has fallen short of the level of ambition for new woodland creation to tackle the climate emergency during this period'
- 'The area of the best and most versatile land is predicted to change from 22% to 9%

by 2080 in Wales according to the latest climate change high emissions”

Key drivers in Wales of relevance to land, soils and natural resources include: changing land ownership, including transfers between public and private sectors and the capacity this results in for public bodies to ensure progress towards more sustainable management of natural resources; dependency on export markets for some Welsh agricultural products, including lamb, and agricultural produce more generally, with attendant concerns and uncertainties arising from Brexit; an agricultural sector with a high proportion or small and very small farms; challenges of promoting participation in agri-environment schemes for reasons including complexity and limited interest in schemes generally (Natural Resources Wales, 2021a).

The Irish government declared a biodiversity and climate crisis in 2019. In Ireland, land managed for agriculture accounts for around 67% of Ireland’s land cover, primarily pasture, hay, grass silage and rough grazing. Approximately, a third of agricultural land can be classified as high nature farmland, with 50% of these lands coinciding with protected Natura 2000 sites (Moran et al., 2021). The main pressures on Ireland’s ecosystem services are identified (Government of Ireland, 2017) as: agriculture, forestry and fisheries; natural system modification (e.g., land drainage); mining and extraction (including peat extraction); climate change; pollution; and invasive and problematic species. Habitat loss, resulting from more intensive agricultural practices and urbanisation, is also recognised as an ongoing pressure. The most recent national environmental assessment was undertaken by the Environmental Protection Agency in 2020 – *Ireland’s Environment* (EPA, 2020). Its overall assessment of the state of nature is ‘very poor’ with deteriorating trends dominating its assessment. In its review, 85% of EU protected habitats are given unfavourable status, and 15% of protected species are also in decline. The EPA’s assessment of water quality is ‘poor’, with a serious decline in pristine water quality sites and just over 50% of surface water in satisfactory condition.

While agriculture and the wider agri-food sector play a critical role in Ireland’s economy, the recent intensification and specialisation within the agriculture sector, particularly since the publication in 2010 of the Government’s strategy, *Food Harvest 2020*, has implications for Ireland’s environment and ecosystems. In addition, greenhouse gas emissions from the sector negatively impact Ireland's international obligations to reduce emissions. While the agricultural sector relies on natural capital to function, achieving growth in production and productivity without damaging the environment is a significant challenge. These are outlined in detail in the EPA’s *Ireland’s Environment – An Integrated Assessment 2020* (EPA, 2020), and summarised as follows:

- On-farm agriculture practices accounted for 33.3% of national total greenhouse gas emissions in 2019, mainly methane from livestock and nitrous oxide from management of manure and nitrogen fertiliser application to soils. Greenhouse gas emissions are largely determined by the size of the so-called national herd and application rates of nitrogen fertilisers. Emissions have been on an upward trajectory since the removal of milk quotas and the implementation of Food Harvest 2020 and subsequent agri-food policies;
- The agriculture sector is almost exclusively responsible for the largest source of ammonia emissions in Ireland (99% in 2018), with emissions growing in line with the growth in the national herd;
- Changes in and intensification of agricultural practices have impacted on biodiversity, having negative effects on a wide range of habitats and species, such as wetlands, fish, molluscs, terrestrial mammals and vascular plants. Drainage of land, fertiliser application, clear-felling, under-grazing and abandonment of land are known pressures that, although local in extent, may influence a much wider area, especially if they affect groundwater supplies or nearby watercourses.
- Nutrient pollution (caused by too much nitrogen and phosphorus in our waters) is the key water quality issue impacting on our rivers, lakes and estuaries. Agriculture, as the most prevalent land use in Ireland, exerts the most pressure on water quality, impacting on just over half (780) of the 1,452 water bodies that are 'at risk' of not achieving their water quality objectives. Protecting drinking water sources from the pesticide MCPA and slurry spreading are important public health issues in Ireland.

While most of these drivers are universally present, the devolved nations and Ireland have a range of interventions in place to manage them. These will be discussed in later sections.

Impacts on rural economies and communities

The UK NEA and its follow-up work (e.g., NEA, 2014) as well as the NCC's outputs (e.g., NCC 2013; 2015; 2018) focus on understanding and articulating the value of ecosystem services in the national economies. There is an emerging understanding that this is considerable and considerably underestimated, but the economic valuation of ecosystem

services remains a difficult and contentious task and is only just beginning to gain traction in policy.

Nevertheless, the value of ecosystem services for many of the key sectors of rural economies is very evident. Agriculture and forestry, themselves provisioning ecosystem functions, have a direct reciprocal relationship with the rural environment, both depending on and themselves constituting rural landscapes (e.g., van de Ploeg 2006). As per above, intensive agricultural practices drive the decline of those ecosystem services that it is not directly dependent on, but is itself impacted by, for example, the climate change impacts on those ecosystem services that it depends on (IPCC, 2018). Similarly, forestry in the UK and Ireland faces risks from the warming climate, changing growing seasons and the spread of pests and diseases from the south. The coastal areas where fishing and fisheries play a large economic role will feel the impacts of fish stock decline on top of those as yet unclear ones resulting from Brexit, endangering the viability of small family fishing businesses in particular (Stewart et al. 2022).

The indirect economic value of the supporting and regulating ecosystem services from rural land is becoming increasingly recognised with the impacts of climate change. For example, the heightened frequency of surface water flooding in some areas in England has highlighted the potential for hydrological ecosystem services performed by rural land within water catchments. River and catchment management, often to reverse changes that were put in place to accommodate agricultural practices sometimes hundreds of years ago, can be used to ‘rejuvenate’ or recapture the innate flood management services provided by flood plains.

There are several initiatives for example in England, where catchment management is being undertaken in collaboration with land owners, local authorities and other stakeholders such as water companies, to manage flood risk. This is placing some constraints on land management but also offering farmers an alternative form of income through environmental subsidies, a form of payments for ecosystem services. There are already several projects that trial and develop practice in this, known broadly as the umbrella term ‘sustainable land management’ (SLM) (POST, 2021). While there is certain resistance to this within the agricultural profession, many farmers are willingly taking up opportunities offered by ecosystems service management, viewing them as a chance to broaden the role of farming into the provision of public goods. For further details on these, please refer to the thematic reviews on agriculture and nature-based solutions.

Moreover, the evolution to rural communities in the wake of the global COVID-19 pandemic and Brexit may also be a driver of diversification of rural economies and land management

practices. For example, those in-migrants who come to live in the countryside not only add to its home-based workforce with ambiguous economic impact, but also often have an interest in the state of the environment, whether it be visual landscapes and their protection (Paris, 2019) or climate change mitigation and biodiversity conservation. Some of these in-migrants may be new entrepreneurs who look to valorise both the cultural, provisioning and regulating ecosystem services of rural landscapes. While the building of second homes and expansion of rural dwellings to accommodate the needs and preferences can add to pressures on house prices and the rural environment and ecosystem services, in-migrants may also constitute a potential for non-framing oriented environmentally friendly land management, often coupled with aspirations for income from tourism or recreation such as retreats and events[7].

An important economic opportunity in the countryside is constituted by the role that rural territory and its ecosystem services can play in renewable energy provision. The need for growth in wind and solar (as well as hydro) power is evident given the UK's commitment to carbon neutrality by 2050. While solar and wind energy will no doubt have a significant role in the decarbonisation of the national grid, local scale energy sovereignty is also an opportunity that may interest some rural communities and businesses. Anaerobic digestion and small scale solar and wind farming presents opportunities for local energy co-operatives or energy self-sufficient farm businesses.

These opportunities should not be overlooked in the attempts to rekindle lagging rural economies. Marsden and Farioli (2015) see them as harbouring dual potential, on one hand for the likes of 'energy productivism' where a new bioeconomy sees rural land harnessed into intensive energy production either by wind, solar or energy crop production. This could entail opportunities for farm conversion away from food production into lucrative energy farming, and the entry of new businesses, even associated with land grabbing as some claim has been happening in southern Europe where large solar farms are ostensibly taking over from less economically viable family farm businesses (e.g., Silva and Sareen, 2020).

This kind of industrial model of exploitation of the bio-economy potential (for energy production but also beyond bioenergy to bio-refining and biomass production for other purposes) can be tempered by planning and governance, to make sure that it benefits local communities. Marsden and Farioli argue for an alternative, place sensitive, sustainable and

[7] E.g. www.albionnights.co.uk

'just' model that they term the 'eco-economy' which emphasises safeguarding the agency of local actors, the ability of existing small businesses to benefit and a plural recognition of the multifunctional potential of the local resource base rather than a rush for economies of scale (Marsden and Farioli, 2015). Above all, the commodification of the ecosystems service potential of rural territories should be guided by a rationale centring on environmental sustainability, plurality of value and local scale benefits.

Ecosystem services and tourism

Beyond agriculture and forestry, which are considered in more detail in the thematic review of agricultural transitions, rural communities are benefiting economically from an abundance of ecosystem services that can broadly be characterised as cultural – those that underpin tourism and to an increasing extent, the influx of new inhabitants into the countryside. Decline in these services can therefore be seen to potentially endanger rural economies. DEFRA (2021a) suggests that in 2018, tourism contributed 4% of total Gross Value Added (GVA) in predominantly rural regions in England, with 11% of all businesses being tourism related and 15% of the workforce employed in tourism.

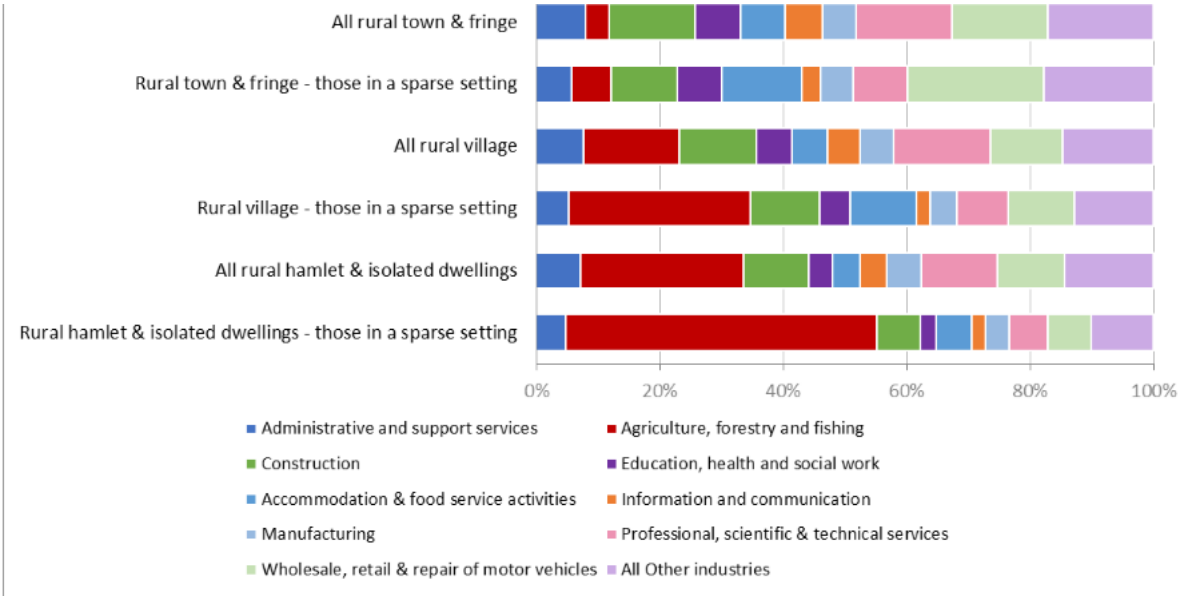

Figure 4 Percentage of registered small and medium enterprises by industry and rural-urban classification, in England, 2019/20 (Source DEFRA 2021b: 64).

Figure 1 from the DEFRA rural statistics report from 2021 demonstrates the increasing role that agriculture and forestry play in moving to sparser rural settings and that the role of tourism (in Figure 1 represented by accommodation and food services which does not capture its full contribution) is biggest in rural towns and fringes, and villages in sparse settings. The economic and community impact of in-migrants moving to rural areas in search of better lifestyles and often continuing to commute to cities or work from home, is less well understood. But they are likely to contribute to the already high frequency of home working in rural areas (Herslund, 2019). For example, the highest rate of home workers was found in rural hamlets and dispersed areas, at 32%, compared with 13% in urban areas.

Overall, rural areas had a higher rate of home working compared with urban areas (22%) (DEFRA, 2021b: 39). There is plenty of anecdotal evidence that reverse migration, from cities to rural areas, has accelerated during the pandemic and that people move to beauty spots and what are seen as idyllic rural areas such as the Lake District, in search of respite from cities (e.g., BBC documentary ‘Lake District with Simon Reeve November 2021). This is by and large thanks to the ecosystem services provided by these regions. The economic and community impacts of this are discussed in more detail in the thematic review on rural housing but it is important to keep in mind that rural ecosystem services act as a driver in these pressures.

The contribution of ecosystem services to rural economies and communities has been considered in Scotland through NatureScot's (2020) work into nature-based jobs and skills in Scotland. NatureScot estimates that jobs in the nature-based sector make a significant contribution to the Scottish economy, amounting to 195,000 jobs or 7.5% of Scotland's workforce in 2019. It is significant to note that whilst jobs directly related to protecting, enhancing and managing ecosystems are included in this figure (e.g., agriculture, forestry, environmental management); a sizeable proportion of these nature-based jobs in Scotland (over 40%) are derived from the tourism, recreation, and hospitality sectors – in order words, jobs that exist as a result of the cultural and provisioning services provided by Scotland's natural environment. NatureScot's data also suggests that 55% of Scotland's nature-based jobs are found in rural or island areas, and that it is rural and island areas that have seen the biggest growth in nature-based jobs. However, as is outlined in more depth in the Housing thematic review, the economic and employment benefits to rural areas associated with ecosystem services are not without their problems.

The cultural ecosystem services provided by rural areas – and associated increase in tourism – has led to an increase in property prices and a lack of affordable housing for either purchase or rent, due to the popularity of short-term lets (The National, 23 October 2021). Rising visitor numbers on tourist routes such as the North Coast 500 have also caused problems with overcrowding, littering and pollution (The Times, 11 July 2021). There is hence a growing concern in Scotland that the cultural and aesthetic benefits provided by the natural landscape, whilst providing significant economic benefit through tourism, may in fact have a number of negative impacts on the livelihood and wellbeing prospects of rural communities.

In Wales, tourism supports 10% of the Welsh tourism economy and is actively promoted through Natural Resources Wales Area Statements as they relate to Ecosystem services and tourism, such as the Reconnecting People and Places Statement in mid-Wales. In Northern Ireland, tourism has taken a hit since the COVID-19 pandemic. There was a consultation in 2021 in the first Rural Policy Framework which has a sustainable tourism pillar, which was welcomed by the RTPI for the government's coordinated approach to address different policy pillars (RTPI, 2021).

Within the Irish context, ecosystem services provided to the agriculture sector in Ireland through nutrient cycling by soil organisms is estimated to be worth €1 billion each year (Government of Ireland, 2017). In a summary of the economic benefits from forestry recreation, COFORD (2018) reports on estimates of 29 million annual visits to state-owned forests, and combining this with the WTP (Willingness to Pay) estimate, gives a value of €179 million for forest recreation. Outside of city breaks to Ireland's urban centres, the

landscape is central to branding Ireland and to the tourist experience. For example, in a 2018 Failte Ireland survey of visitors, 93% of respondents rated ‘beautiful scenery’ as an important factor for considering a visit to Ireland (the highest ranked attribute), with natural attractions at 88% and natural environment 86% (Failte Ireland, 2019a). Expenditure by international tourists visiting Ireland was estimated to be worth €5.6 billion, with €2 billion of expenditure from the domestic market. Tourism accounts for around 3% of GDP. Participation in outdoor activities is also central to Irish tourism, with Failte Ireland reporting 2,679,000 visitors engaged with hiking/country walking, 504,000 visitors engaged with cycling, 221,000 visitors playing golf, 146,000 visitors participating in angling and equestrian engaged with by 126,000 visitors (Failte Ireland, 2019b).

Summarising ecosystem service approaches in the context of the ‘Forces for Change’

The Rural Planning in the 2020s project defines key issues of our time as ‘forces for change’. In addition to the analysis on COVID-19, climate change and adaptation in the latter sections, the following table sets out how these change pressures are impacting ecosystem service approaches in a rural planning context.

New change drivers

Table 1. Impacts of forces for change on ecosystem services

Forces for change (across) Rural elements (below)	A. Brexit	B. Climate change	C. COVID-19	D. The Countryside as a site of adaptation
1. The built rural	1A – N/A	1B –Increasing frequency of extreme weather events and flooding etc will likely highlight the role of ecosystem services in securing the built rural.	1C – The link between nature's benefits and mental and physical wellbeing is increasingly recognised and likely to factor in growing migration and housing demand in rural areas. This will place pressure on rural ecosystem services whilst also highlighting their value.	1D – Ecosystem services and nature-based solutions can contribute to sustainable construction / climate proof design and the role of ecosystem services is likely to become more prominent in the identification of sites for development.
2. The economic	2A – The shift of farm subsidies to payments for ecosystem services	2B – Climate change impacts will be adverse on some ecosystem	2C – With the newfound link between mental health and	2D – Rural ecosystem services offer an economic opportunity to

rural	is likely to lead to considerable change at farm level. This will likely have income implications. A scramble to identify and nurture ecosystem services on some farms and a focus away from ecosystem services production to competitiveness on others likely.	services such as habitat provision and some forms of agriculture. Some will benefit and can become valorised in monetary terms (see 2A). This will have economic implications.	nature, rural tourism and day visits may increase with attendant economic benefits from land-based ecosystem services. In-migrants may have aspirations for land-based businesses that hinge on ecosystem services provision such as eco-tourism.	farmers and other landowners (as per 2A but potentially beyond). The rural as a carbon sink and a site of renewable energy production to name a few opportunities. Functional ecosystem services-based links with cities or within regions may become more emphasised and can be capitalised on in the form of PES. But presently, at least in the UK, there is no public money or indeed advisory support for non-farmers to cultivate ecosystem services. This is a missed opportunity for the diversification of rural economies and for ecosystem services provision.

3. The land-based rural	3A – As above (2A)	3B – As above (2B) and ecosystem services underpinning some conservation designations may become degraded, some may be improved, and new ones will be emphasised through their role in mitigating climate change. Bioregions such as water catchments may become even more prominent in planning and disaster management	3C – as above (2C)	3D – Land management to provide ecosystem services that support flood risk management, act as carbon sink etc likely to become more prominent and this may change land-use and have landscape impacts (e.g., shift to energy crops). Growing biofuel or bio char crops can have significant landscape impacts.
4. The social and cultural rural	4A – With the shift away from the CAP to ecosystem services-based subsidies (the ELMs), a cultural shift in farming will need to take place. Hobby farming and the environmental stewardship role of farmers (in ecosystem services provision) will likely be more prominent, and farmers will perhaps become either serious and professional or landscape farming.	4B – Landscape values may need to evolve as ecosystem services provision changes. New species and crops will need to be welcomed or fended off. In some areas, the productive function of the landscape will be emphasised which may lead to value conflicts within communities and in others, the cultural change will be away from productive landscapes into nature-value, recreation and leisure provision.	4C – With in-migrants in search of rural ecosystem services (or the quality of life yielded by them) communities will become more polarised and conflicts between long-term and new inhabitants may arise in regard to the value of the productive vs the consumption function of rural landscapes.	4D – Nature may become conceived more strongly as a form of capital, some ecosystem services are more suited to this conceptualisation and may become emphasised whereas other nature values, more difficult to express in the form of ecosystem services or those not as easily monetised / commodified may recede.

The case for intervention

There is a strong case for intervention to support activities that nurture and engage sustainably with the ecosystem services vested in our rural territories. In fact, this can be seen as necessary for many of the current policy agendas in the UK and Ireland, not least the carbon neutrality goal that both countries have signed up to. Similarly, the nurturing of the functions of rural ecosystems that underpin resilience to climate change in food production and communities seems difficult to argue against. The devolved nations and Ireland already have several interventions in place. The three subsections below reflect key challenges and the relevant elements of rural planning outlined in the response to the RTPI call and review existing interventions. Here, we discuss further needs and set out the case for intervention to support an emerging bioeconomy in the countryside.

Ecosystem services and Brexit-related pressures and opportunities – the case for intervention

Much of this issue is related to agriculture and is discussed in detail in the associated *Agricultural Transitions* thematic review. From a nature conservation (ecosystem services) perspective, the UK is in a high-risk era where conservation controls and values upheld by laws and regulations implementing EU policy are in danger of being compromised (Burns et al. 2018). The UK-US trade negotiations alone have pointed to vulnerabilities in standards for pesticide use which could potentially have significant impacts on rural ecosystems and biodiversity. Jordan et al. (2020) point to standards for water quality, environmental assessment, waste and land use planning as those that the UK has performed poorly on when within the EU and now likely to 'let slip'. There is strong evidence that this prediction made in 2020 was correct on water quality, with the recent failure to curb sewage discharges into rivers by water companies (BBC News, October 2021). While the Environment Act (2021) has now been passed, much hinges on its actual implementation into practice which is yet to be seen.

Since 1994 it has been compulsory for every EU Member State, including Ireland, to have agri-environmental schemes in place in an effort to halt the decline in biodiversity. This is the primary way that farmers are rewarded for farming in an environmentally friendly manner. The value of these schemes to biodiversity has, however, been difficult to ascertain and there would be benefits from planning such schemes at a landscape scale. Additionally, there has been limited success in attracting higher value sectors, such as the dairy sector, into these schemes. In the UK, the departure from the CAP offers opportunities for channelling those monies towards payments for ecosystems services which the UK government has embraced in the form of the Environmental Land Management schemes (ELMS, Agriculture Act 2020). Unfortunately, at present those are only available to agricultural land managers/owners.

ES and climate mitigation and adaptation

There is good scope for nature-based solutions that engage ecosystem services to enhance the climate resilience of communities and livelihoods in the countryside. The case for intervention here is covered in the thematic review of *Green Infrastructure and Nature Recovery Networks*.

As for collaborative and place sensitive delivery, on land-based ecosystem services and flood resilience, a recent Office for Science and Technology report (POST, 2021) proposes an integrated approach to land management, which involves collaboration between farmers, other land managers and water companies at catchment scale. This is what the EU Water Framework Directive (2005) has been aiming at through catchment management planning but with few results. The key to this sort of governance integration are shared objectives, compatible modes of operation, trust and sufficient resources and governance interventions (planning) should aim to support that (Cumiskey et al. 2019). As POST argues, “Government must integrate nature restoration with other landscape benefits (food, water, climate, biodiversity), while considering historical and cultural factors that have shaped the land.” (POST 2021).

At present, the planned ELMS schemes seem to have good scope for enabling farmers to do this but there are no alternative governance instruments that would incentivise similar efforts on the part of other land managers. While the ELMS schemes also cover carbon sequestration and biodiversity and habitat provision, the emergence of a sustainable eco-

economy in the countryside would benefit from similar support and incentives for renewable energy production at local scale.

The Welsh Environment Act 2016 requires a periodic assessment of natural resources in Wales. This assessment is conducted by Natural Resources Wales with assessments being conducted in 2016 and 2020. The same Act also places a biodiversity duty on public bodies in Wales.

The sustainable management of natural resources [SMNR] is defined in a Wales context as:

> *"…using natural resources in a way and at a rate that maintains and enhances the resilience of ecosystems and the benefits they provide. In doing so, meeting the needs of current generations without compromising the ability of future generations to meet their needs, and contributing to the achievement of the well-being goals set out in the Wellbeing of Future Generations Act." (Section 3, The Wales Environment Act, 2016).*

The Welsh Government's *National Development Framework*, entitled Future Wales 2040 (Welsh Government, 2021), clearly states its link with the Natural Resources Policy, focusing on addressing the climate emergency and reversing biodiversity decline. This includes the setting out of specific policies that 'safeguard areas for the purposes of improving the resilience of ecological networks and ecosystems services, to identify areas for the provision of green infrastructure and to secure biodiversity enhancement (net benefit)'. The Framework also maps ecological resilience, highlighting some rural areas with relatively low relative resilience values.

The mapping is also designed to try and identify and facilitate nationally important ecological networks across Wales. The National Development Framework sets out a suite of 18 strategic policies with two of these having specific relevance to ecosystem services. The first is a policy in promotion of resilient ecological networks and green infrastructure. This will involve partnership working in identifying and safeguarding ecological networks. National Natural Resources are identified and mapped in the Framework itself, comprising a series of nine national resources. Ecological resilience, ecological networks, and development of green infrastructure are therefore included in statutory development plan policies and at national level. The second policy of particular relevance to ecosystem services is that expressing a commitment to the development of a national forest, with safeguarding of locations for its development. This will support the Welsh Government in achieving its target to increase woodland cover in Wales by at least 2,000 hectares per annum from 2020.

The importance of ecosystem services for climate change adaptation is also gathering interest in Scotland. This is reflected in consideration of nature-based solutions for flood- and heat risk reduction within Glasgow City Region's Climate Change Adaptation Strategy, launched in 2021; and also, in the growing interest of the Scottish Environmental Protection Agency, NatureScot and some local authorities in upstream natural flood management strategies as a way of reducing flood risk to downstream settlements. But a major source of concern relates to the carbon sequestration potential of rural lands, and the danger of this leading to top-down and remote land management in the interest of wealthy and distant landowners rather than local communities. Whilst afforestation has significant potential to act as a carbon sink, there is concern that large-scale afforestation measures, such as the proposed 'Lost Forest' by brewing company Brewdog, are being planned without engagement with adjacent communities or landowners (e.g., MacDonald, 2021). Related to this is the caution that rural lands must not be seen as a blank canvas onto which carbon sequestration measures can be imposed. Rather, the social and cultural significance of these landscapes – and the fact that many lands in the Scottish Highlands were forcibly cleared in the 18th and 19th Centuries – must not be overlooked.

Ecosystem services and well-being

The well-being benefits in terms of active recreational pursuits and access to greenspace and landscapes that are beneficial for mental health are indirectly monetised though tourism. Kitchen and Marsden (2009) suggest that tourism entrepreneurs should be encouraged to 'broaden' and 'deepen' their engagements with the local natural resource base, including ecosystem services, to develop a broader range of locally embedded and sustainable forms of tourism and recreation. To support this, governance and planning interventions should recognise and support ecotourism by establishing clear locally tailored criteria and a system for recognising resorts and providers that engage with local assets in a sustainable manner to bring economic benefits to local communities. Existing landscape designations, such as national parks, serve this purpose to some extent already, with many locally tailored solutions such as the New Forest Marque in the New Forest (Villacampa and Brebbia 2013).

These sorts of private and indirect payments for ecosystems services (Dunn, 2011) need to be complemented by public funding for land managers and owners to ensure that the multiplicity of ecosystem services that provide well-being benefits are recognised, as many do not lend themselves easily to commodification and can therefore become opportunity

costs of more lucrative uses of rural landscapes. There is also a case to be made for a more regulation-based approach here, at present served by the designated area system which should be maintained. However, given that it has to-date provided only weak protection to many ecosystem services related to landscape tranquillity, habitat provision and biodiversity, a broader range of PES is likely needed to maintain their functionality. The ability of local communities to make a living within rural landscape should be safeguarded and carefully designed PES that observe distributional, procedural and recognition justice seem the best way to do that (e.g., Corbera et al. 2007).

The Well-being of Future Generations (Wales) Act 2015 is exemplary in that it has promoted explicit consideration of the linkages between ecosystems and well-being. This was initially recognised and developed in a first State of Natural Resources Report (Natural Resources Wales, 2016). This work has focused especially on how ecosystems can contribute to the promotion of a resilient Wales, particularly in the context of climate change, as well as across the complete range of wellbeing goals. This focus on ecosystems and resilience requires 'building healthy functioning ecosystems which support social, economic and ecological resilience'.

Ecosystem services and new regional bio-economies

Marsden and Farioli (2015, p. 335) advocate a 'post-carbon' bioeconomy, which uses biological resources from the land and the sea, as well as waste, as inputs to food and feed, industrial and energy production, and delivers a wider vector of environmental goods and services in a more sustainable way. This would require a fundamental shift in developmental thinking, planning and governance interventions. The above intervention mechanisms can contribute to this incrementally, but a coherent strategy shifting attention to the bio-economy opportunities and their sustainable iterations would be advisable. Examples of this are available from counties that have embraced this opportunity as significant to their national economies. In the UK context, the national bio-economy strategy of 2018 has been subsumed into the National Innovation Strategy (DBEIS, 2021) which also serves the nation's zero carbon commitment. Oversight for the community and environmental sustainability impact of any bio-economy initiatives would sit with local authorities and their planning decisions.

Land used for renewable energy development has continued to increase to meet the target

of 70% of Wales's electricity consumption from renewable energy sources by 2030 (48% in 2019). (Natural Resources Wales, 2021a). The Welsh Government has also promoted One Planet Living and has also used the planning system to enable One Planet Development in rural areas as a way of promoting land-based enterprises and exemplars of living within environmental limits.

The same concerns that relate to large-scale engagement of rural land for carbon sequestration can be seen in Scotland in relation to debates over conservation and 'rewilding', which are linked more closely to habitat and supporting services. Again, concerns in this area relate to power relations, and to the perception that rural areas in Scotland – especially the Highlands – are a 'blank canvas' onto which species can be reintroduced without consideration of potential impacts on farming practices (see, for instance, concerns over sea eagles killing livestock on the Isle of Mull (The Scotsman, 21 March 2021).

The longer history of an understanding of the embeddedness of humans within Gaelic culture should also be noted. NatureScot (2021) undertook a scoping exercise into Gaelic songs, poetry, literature and place names, finding broad evidence in Gaelic of the multiple benefits nature brings to people. Caution ought to be exercised over 'forcing' an ecosystem service framing onto language and ideas from Gaelic culture. Yet the study nonetheless reminds us that there is a much longer historical context, in the north and west of Scotland in particular, within which contemporary understandings of ecosystem services arise.

Although not unique to Scotland, the limitations of existing approaches to ecosystem services and natural capital in assessing and understanding the contributions to people from marine environments as well as terrestrial environments should be acknowledged. NatureScot's Natural Capital Asset Index, for instance, acknowledges that it does not yet include benefits from the marine environment. As a coastal and island jurisdiction where marine environments and the ecosystem services play a major role in tourism and employment through aquaculture and offshore renewable energy, a fuller understanding of the ecosystem services provided from Scotland's marine *and* terrestrial environments – and the interplay between these – is a crucial remaining research and policy gap.

Conclusions and points for discussion

The ecosystem services-based approach to understanding human-nature interactions in the rural context has strong benefits in terms of articulating the significance of healthy ecosystems for both rural and urban economies and communities. However, the approach is criticised for being reductive, centring attention on the utility value of nature and overlooking complexity in both scientific and cultural terms. The framing of ecosystem functions as services or benefits to humans invites monetary representation, economic valuation and commodification of ecosystems services. This thinking is indeed gaining traction in governance and decision-making particularly in situations where nature conservation is pitted against development that serves economic and community needs. But it is uncertain whether and how either commercialisation or economic valuation would support the need to conserve ecosystems in the long term. One way to support the recognition of the plural value of nature is to bring decision-making, about valuation and management of ecosystems services, close to the context where they are being engaged with, ensuring broad representation and the inclusion of scientific evidence. But this is more easily said than done in land-use planning and management and presently there are disparate approaches and little attention to representation in making these decisions across the UK and Ireland.

Nevertheless, the ecosystems services approach can provide a good understanding of the state of nature and desirable management strategies for enhancing climate resilience and broader ecological values as well as the productive functions of rural landscapes. The findings of this review can be summarised under the following points:

- The scientific basis of defining, identifying and measuring ecosystem services requires more work and the UK nations and Ireland have a disparate range of accounting systems in place – coherence between these merits attention;
- There is a complex relationship between ecosystems services provision, biodiversity, ecosystem productivity and resilience which needs to be understood on a localised scale;
- Ecosystems services, and their benefits to humans, are in decline, and there is a conflict between provisioning services (agriculture and forestry) and regulating, supporting and cultural ones. Intensive agriculture is harming both the so called ‘ecological ecosystems services’ and indirectly, those that underpin productivity. Key additional pressures are caused by land-use change, sewage discharges and waste, including litter. There is a need for diversification of farming practice and measures

such as precision farming.

- So called cultural ecosystems services that underpin tourism and recreational benefits are often also in conflict with ecological integrity and this requires place sensitive management. High demand for cultural ecosystems services is having adverse impacts on communities in the form of house price rises for example.
- Rural ecosystem services hold high promise for climate resilience and mitigation (flood regulation, carbon sink) but there is a lack of coherent, targeted and place sensitive interventions that would encourage and incentivise their provision. This is an opportunity for planning, and useful lessons for good practices could be drawn from the existing SLM practices which bring together a number of stakeholders often at watershed scale. The emerging ELMS and existing agri-environmental schemes play a crucial role in this. Wales points the way with explicit recognition of the wellbeing benefits of rural ecosystems services in policy.
- A broad and innovative approach to engaging place-based ecosystems services for local community benefits is more sustainable than a large scale industrial bio-economy, and planning and governance instruments should ensure that any emerging renewable energy and bio-refinement initiatives do not benefit only far off land-owners and investors, and that they remain open to and engage with local nature in a culturally sensitive and rich manner.

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Thematic Review: Green Infrastructure & Nature Recovery Networks

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Executive Summary

Defining what Green Infrastructure is (hereafter GI), can be complex. It becomes increasingly complicated when, as a largely urban concept, it is discussed in a rural context. The characteristics of urban GI in terms of trees, parks and green space still apply, but when discussed in terms of rural planning they are located in areas where a significant proportion of the environment is either visually “green”, delivering myriad ecological functions, or both. Consequently, the framing of GI within rural areas has to consider the nuance of applying its core principles in locations where everything could be construed as being *GI*.

GI within rural landscapes can therefore be considered as a set of physical spaces, i.e., waterways, Public Rights of Way (PRoW) or woodland that form connective networks of environmental resources, and via its benefits and principles, i.e., the delivery of socio-economic and ecological benefits associated that provide access to nature. This requires a nuanced level of analysis that views GI as more than the sum of its physical parts. There is also a need for the Royal Town Planning Institute (RTPI), planners, land managers, environmental, development, utilities, and community groups to locate *what GI means* in

rural locations, *how* rural communities attribute value of GI, and *what benefits* it can provide within policy and practice.

The diversity of policy structures, as well as the focus of environmental policy in England, Ireland, Northern Ireland, Scotland, and Wales adds a further layer of complexity to these discussions. The alternative approaches to landscape designations, the compliance with EU, UK and Irish policy directives, land management issues, and the variability of policy formation and application mean that our understanding of GI in rural areas, as well as more generally, lacks continuity. Subsequently the appreciation of what GI is in each of these locations is critical to its application and use in future rural planning.

Moreover, the diversity of approach taken across the UK and Ireland provides opportunities for a myriad range of public, private and community stakeholders to become integrated into GI planning. In practice, this provides scope to engage with local knowledge more effectively but potentially also limits the development of consensus as GI planners aim to navigate the complexity of socio-economic and ecologically focussed development opportunities in rural areas. As such the application of GI in rural areas is subject to complex geographical, scalar, and political influences that are not witnessed in urban areas.

Consequently, the framing of GI in rural areas from a thematic perspective provides opportunities for advocates and practitioners within the planning profession to align GI thinking more effectively with prominent policy objectives. These include reflecting on access to rural landscapes and issues of social equity, the protection of diverse ecosystem services associated with historical land management practices, as well as complications associated with finance and land management. We can also see a growing debate focussing on how best to support healthy and active lifestyles that are responsive to socio-economic and climatic change in rural areas.

Framing GI from a thematic perspective is one way to shift the focus of GI planning in rural areas away from a simple elemental approach to land use (and land management) or one that solely responds to the needs of dominant land uses, i.e., farming or forestry. However, taking a such thematic view to the benefits that GI can deliver in rural areas requires an acknowledgement that all areas are different, and that GI needs to be thought of as being inherently contextual. Such a localised perspective does not always sit lightly with national policy mandates but can be used to support localised examinations of GI quality, functionality, and accessibility.

The outcomes of these discussions are therefore not straightforward. GI is proposed, discussed, and planned for in alternative ways depending on the location within the UK and

Ireland. Its inclusion, or lack thereof, in national-level policy illustrates problems with the integration of a relatively new concept into existing policy debates. The diversity of approaches taken by national and devolved governments in the UK and Ireland has subsequently cascaded down into regional and local level policy and practice. This has, in many places, facilitated a more diverse engagement with GI than might have been expected with a more directed top-down policy mandate for GI. In addition, we continue to identify a variety of rural stakeholders and GI advocates working with the planning sector to structure investment, development, and management of GI. Successes, as well as barriers to effective investment in GI are therefore visible across the UK and Ireland. What we can derive from this analysis is that no single approach exists that aids the discussion of GI development of management in each of the administrative regions of the UK and Ireland.

This thematic review highlights these ongoing barriers and their impact on the effective incorporation of GI in rural planning discussions. These are framed by an ongoing variation in stakeholder knowledge, divergent levels of engagement by decision-makers with GI, and uncertainty in their willingness to support investment in GI policy and practice. All of which is framed by the dominant planning discourses of England, Ireland, Northern Ireland, Scotland, and Wales. Consequently, working from a spatial/elemental perspective in conjunction with a focus on the thematic benefits that GI provides may offer a more effective pathway to rural planning for the RTPI and other stakeholders.

In summary, this review proposes that the RTPI and rural stakeholders engage with GI and Nature Recovery Networks (NRN) via the following pathways:

a) More effective linking of current GI thinking in existing policy and practice structures between urban/rural areas within and across each region of the UK and Ireland.
b) Scope exists to make more effective use of contemporary environmental policy, guidance, and standards to support policy dialogues for GI across the UK and Ireland. For example, the 25-Year Environment Plan, Environment Act, National GI Standards, and Nature Recovery Networks in England, the Planning (Scotland) Act 2019, and the growing number of city/city-regional GI strategies being developed in Ireland and Northern Ireland, i.e., County Wicklow, Belfast, or Dublin City Region.
c) Potentially re-examine environmental policy in rural areas to better appreciate where GI can be located within it to align terminological variation, action, and understandings of benefits.
d) Promotion of more effective opportunities exist to debate how access, rights to landscape and understanding GI benefits to different public, private, rural industry and residential communities can be located with rural planning,

development/management, and functionality conversations.

e) Alignment of water, biodiversity, and climate change thinking with housing, socio-economic activities, and transport planning discussions to support socio-economic and ecological thinking in rural areas.
f) Promote greater awareness of regional variations of GI across the UK and Ireland within rural locations (and across diverse landscape mosaics) to identify best practice of management, policy formation and knowledge transfer.

Introduction

The future composition and functionality of environmental resources in rural areas of the UK and Ireland remain open to interpretation. The Environment Act, which was passed into UK law in late 2021 identifies air and water quality, biodiversity, and waste as key components of the transition to a net-zero carbon economy (HM Government, 2021). Any changes to landscape and/or ecological management in rural areas associated with these thematic areas will, as a consequence, have a substantial impact, hopefully positive but potentially negatively, on the ways in which rural environments are managed, protected, and used from the 2020s onwards. The promotion of a net positive effect of development on biodiversity and creation of a “natural resilient” country are equally prominent in the Scottish Planning Act (2019). The approaches taken in England and Scotland suggest that there is a growing understanding of the role that GI can play in supporting sustainable development.

The ways in which planning, natural and built environment professions engage with environmental issues will therefore be critical as the UK moves towards a more resilient form of landscape management. However, we can also identify variation across the UK and Ireland in terms of how rural environments are considered within these discussions. For example, the signing of the All-island Memorandum of Understanding on vernacular heritage between the Irish and Northern Irish executives goes some way to integrating an appreciation of the socio-cultural value of landscape and place within planning policy. The growing discussion Natural Capital in Ireland and England also suggest a move towards a more integrated approach to planning for rural environments is developing (Comhar

Sustainable Development Council (SDC), 2010; Natural Capital Committee, 2015). There is an equally prominent discourse within the academic and professional literature that centres these debates on urban areas with only passing reference to rural landscapes (see for example Mayor of London, 2021; Greater Manchester Combined Authority, 2016). However, the effective planning of ecological and socio-economic change has a political value that transcends the "urban" and must also be considered as critical to the functionality of rural areas.

The groundswell of environmental understanding is reflected in the promotion of specific terminology, i.e., green infrastructure (GI), Nature-Based Solutions or rewilding, or a rejection of it, in some locations, as a mechanism to support more sustainable forms of urban and rural planning. With such diversity comes a corresponding lack of consensus regarding how we integrate this terminology (and associated knowledge) to manage rural landscapes, and illustrates the sometimes-contrasting views of local communities, farmers, foresters, the environment sector and government (nationally in the UK and Ireland and as devolved regions). The ongoing dialogue regarding "landscape", "GI", "NBS" and other terms is, in many ways, academically interesting but places pressure on practitioners to learn (and relearn) what rural means (Schrijnen, 2000; European Commission, 2012; Wang and Banzhaf, 2018; Matsler *et al.*, 2021). This process is mapped onto funding applications and written into planning policy guidance and requires practitioners to navigate evidence, policy, and practice to identify the most appropriate terms for a given location. For many stakeholders in rural environments this remains problematic and adds a level of unnecessary complexity to landscape management. Consequently, there is a need to consider how rural environments are currently framed within planning policy and practice, and where opportunities to integrate research drawn from academic, policy and practitioner organisations into the long-term thinking of environmental management in rural areas are visible.

However, a more contemporary line of argument is visible that aims to integrate these alternative perspectives. Within this discussion, a series of thematic areas can be defined as core signposts that are useful in structuring debate. These look at the complementarity and competing nature of socio-economic, cultural, ecological, and political factors that influence the management of GI (and nature/natural resources) in rural areas. The following sections draw on contemporary discussions to frame these debates: *access, socio-economic and ecological benefits, perceptions and values, landscape designations, GI/Nature Recovery Networks, connectivity, politics of use and user groups, and institutional focus/action*.

The analysis presented in each of the following sections draws on current thinking and practice across the UK and Ireland illustrating where, and if so how, considerations of GI and

Nature Recovery are being made. In addition, the following reflects on issues of scale and geographical context to help identify variation between geographical interpretations of the environment. This will provide the *Rural Planning in the 2020s* project with a robust grounding examining how GI and nature are, and could, be located within policy and practice across the UK and Ireland to secure a more resilient future for rural areas.

The outcome of this scoping process highlights existing good practice within and across the UK and Ireland, where transferable lessons can be learnt, and where gaps in current thinking practice are visible. Through an engagement with these outcomes, it is envisaged that a series of recommendations for the planning, implementation and management of GI and rural nature that are complementary to the other thematic reviews carried out as part of the *Rural Planning in the 2020s* project.

Locating GI planning in a rural context

GI planning has, to date, been predominantly focussed on urban or urban-fringe locations (Sinnett et al., 2015; Countryside Agency & Groundwork, 2005). Exceptions are visible in terms of the planning for water and biodiversity, areas of environmental planning that are inherently considered to work effectively at a landscape scale. Examples from the EU and North America reporting on water management, i.e., the EU Water Framework Directive (Kaika, 2003), as well as the current momentum behind the Northern Forest project in England, show an appreciation of ecological connectivity as a core component of landscape-scale planning. It also helps to align strategic planning mandates between regional, national and international areas into effective management practices. However, research focusing on these issues areas of GI is more limited compared to those with an urban focus within the research literature. The conservation work undertaken by Conservation Fund at the regional/state level in Maryland, as well as the linking of regeneration mandates at a regional scale in the Ruhr in Germany, i.e., in the Landschaftspark Duisburg Nord, are two examples that have successfully aligned GI with landscape-scale thinking (Reimer & Rusche, 2019; Zeff, 2018; Benedict & McMahon, 2006).

Examining the role of GI in a rural context, therefore, requires a reframing of what GI is, what

scale it can work at, what benefits it delivers, and to whom. A “scaling outwards” of GI into rural areas of the UK could be seen as a relatively simple process. The formative development of GI as a concept in the UK drew heavily on the work on the Countryside Agency and English Nature in their *Countryside in and Around Towns Agenda* (Countryside Agency & Groundwork, 2005), which highlighted the functional value of planning across the rural/urban interface. More recently, we can identify comparable policy objectives being presented by Defra (HM Government, 2018) and Natural England (University of Manchester et al., 2020) in England, and by the Scottish and Welsh Governments (Welsh Government, 2021a; The Scottish Government, 2011, 2014). Within this policy work, GI is framed as a form of landscape or environmental resources that connect several interlinking scales to ensure that the multi-functional benefits associated with landscape connectivity, access to nature, and regulating, provisioning, and supporting ecosystem services are met.

What we can identify though is that the terminology (and principles) associated with GI are starting to permeate national level policy across the five administrative areas of the UK and Ireland. Later sections will discuss the inclusion of GI in national policy in more detail but each of the following documents should be used as a baseline for each administrations consideration of GI:

- In England this is via the *National Planning Policy Framework (NPPF)* (Ministry of Housing Communities and Local Government, 2021);
- GI is promoted within the Open Space Strategy sections of the *Planning (Scotland) Bill* (Scottish Parliament, 2019) in Scotland;
- In Wales GI is discussed extensively in Section 6 Distinctive and Natural Places of the *Planning Policy Wales Edition 11* (Welsh Government, 2021);
- The *Project Ireland 2040 National Planning Framework* (Government of Ireland, 2018) discusses GI in the Protecting, Conserving and Enhancing Our Natural Capital section and in National Planning Objective 58
- GI in Northern Ireland is identified as important aspect of their approach to climate management, the promotion of multi-functionality and place-making within the *Strategic Planning Policy Statement for Northern Ireland (SPPS): Planning for Sustainable Development* (Department of the Environment Northern Ireland, 2015).

However, the presentation of GI in each of these strategically important national documents varies in depth and focus. Consequently, the application of GI in each of the five administrations of the UK and Ireland continue to lack consensus. One further issue associated with the consideration of GI in these documents is the lack of prominence, and indeed the consistency of GI as urban, is the lack of a rural focus to discussions.

The alignment of a largely urban-centric GI literature with rural planning, policies and practice therefore needs to consider how we map future growth and management of rural areas around issues of water, biodiversity, access to rural areas and recreation, landscape designations, and rural economic growth. Although potential conflicts arise between these thematic areas of environmental thinking and the responsible authorities for management in England, Ireland, Northern Ireland, Scotland and Wales, there is a growing appreciation that viewing landscape management from a multi-faceted GI perspective allows a more effective form of policy/practice to be developed (Mell, 2018, 2019).

To achieve this, the core principles attributed to GI as presented in the research and academic literature can be used to centre considerations of GI within rural planning debates. These include, but are not limited to, the promotion of access to nature at a number of scales (Natural England & Landuse Consultants, 2009), ecological connectivity and networks of landscape resources (NatureScot, 2021), the promotion of socio-economic and ecological benefits as part of landscape multi-functionality (Lamond & Everett, 2019; Carter et al., 2017), an integrated hierarchy of policy and supportive professions to deliver GI (Lennon et al., 2017), and recognition of variation between locations/geographies, scales, time, and disciplines (Mell & Clement, 2020). Each of these principles can be used to evidence the current consideration of GI in rural planning, identify where opportunities for the exchange of best practice/knowledge exist, and to highlight gaps in the application of GI and environmental management across the UK and Ireland (see GI policy across UK nations and Ireland).

Although there has been a dominance of English evidence supporting these discussions, which is highlight by the number of polices, strategies and “voices” visible in GI debates across the UK and Ireland there is a corresponding set of policies and projects found across all five administrative areas. For example, the innovative GI work coordinated by the Central Scotland Green Network Trust and the Scottish GI Forum in Scotland, the Neath Port Talbot GI work in Wales, the Dublin City Lab work on GI in the greater Dublin area, and by the Irish Green Building Council, are all examples where the principles and stakeholders engaged with GI working to progress its use in urban, peri-urban and rural locations.

Moreover, we can align the core aims of Natural England and Defra’s Nature Recovery Network (NRN) work with considerations of GI by focussing on the role that landscape resources can play in promoting greater resilience in rural areas. The core aims of the NRNs are to protect, enhance and designate a greater proportion of ecologically sensitive land by 2042 via the establishment of more effective landscape management practices (Department for Environment Food & Rural Affairs, 2021a). NRNs also aim to link people with the landscape to encourage a more nuanced appreciation of the cultural and historical values

attached to the environment. NRNs, therefore, compliments GI thinking via their consideration of landscape connectivity, the promotion of multi-functional places, planning for mitigation and adaptation to climate change, and integration of people (and cultural value) in urban and rural planning.

An additional aspect of the NRN process has been the development of robust partnerships of public, private, environmental (i.e., Wildlife Trusts), and academic partners to lead on investment in innovative landscape management practices (Natural England, 2020a). This has enabled Natural England and Defra to engage with a diverse evidence base and with stakeholders knowledgeable in the actions of effective planning for nature, society, and economic growth in rural areas. The links between people and nature are explicitly outlined in this process and provide clear connections to the wider discussions of GI. As a result, we can identify within NRN and GI planning the need to provide a detailed analysis of governance, development, and management strategies to better understand how practice can deliver the strategic aims of government.

How GI is framed within policy, and specifically the terminology and principles used to support its delivery, are important. Terminology as noted by Hislop, Scott, & Corbett (2019) matter. An examination of how GI fits with rural planning policy one pathway is therefore to understanding where and why different approaches might be taken in practice. Moreover, we can argue that new policy mandates (and terminology) are subject to greater scrutiny as they do have the same tenure of existing policies. The integration of GI principles and language into rural policy should therefore be considered as a longer-term process requiring extensive engagement with stakeholders to gain prominence.

Scale

Locating GI within discussions of scale is a complex process made more difficult in terms of rural planning in the UK and Ireland. The ecosystem and water-based dynamics of GI allow it to be considered and planned for at a landscape scale, and thus work across legal/political boundaries (as seen with stakeholder compliance with the Water Framework Directive (WFD) in the UK and Ireland). However, when this process is broadened to consider biodiversity, health and well-being, economic development, GI can become increasingly difficult to frame in rural contexts. Do planners and GI advocates aim to frame it very narrowly and thus create a very nuanced articulation of the concept or aim to be as inclusive

as possible in terms of its promotion of functions and benefits. The use of environmental network principles that utilise connective ecological elements, i.e., riparian corridors or field margin hedgerows, to promote the terminology of GI is one way to locate it within rural discussions. This can be in the form of mapping GI onto economic development opportunities, for example the tree planting and horticultural activities promoted by the Wales Rural Network Support Unit or by the promotion of spatial connectivity by the Environmental Protection Agency Ireland (Scott *et al.*, 2016).

Furthermore, planning policy must be conversant with the needs of neighbourhood, parish, district, unitary and country structures to enable GI to be planned accordingly. In rural locations these policy scales can vary dramatically in scale, population, responsibility, and leverage within the planning systems of the UK and Ireland. Planning GI across multiple scales in rural areas is a space fraught with political complexity as local government, the development and environment sectors, and communities challenge the focus of policy and practice to locate their vision for GI in a specific location (Roe & Mell, 2013). A further example from Ireland was discussed by Lennon et al. (2017) who's work with LPAs to examine the difficulties in mapping GI principles onto local policy contexts. They identified that GI were, in some cases, seen as the elements of a development or policy at the local level with "landscape" being used as an overarching approach to strategic planning. Furthermore, there is a corresponding need to avoid any ongoing siloed thinking regarding GI planning in rural areas. This requires the key stakeholders in land management, i.e., farmers, foresters, water managers, and other landowners to engage with GI thinking. Unfortunately, the mechanisms needed to achieve this remain variable across. All areas of the UK and Ireland therefore need to be aware of the range of opinions and indeed opportunities available to planners and land managers that support GI within formal planning structures, as well as those informal networks of information/knowledge that can influence local decision-making (Lennon, 2014; Wright, 2011).

One option to address this variation is to take a solely ecological perspective to rural GI. This provides a pathway to incorporate GI in development and management strategies at all scales. As noted above, the connective ecological aspects of GI and their support of networks of green and blue spaces can elevate policy/practice discussions away from a single issue, location, or responsible authority. Such a process allows a range of stakeholders to become engaged in GI policy because it moves away from a siloed mentality. Examples of GI policy work across England and Ireland suggest this has been occurring where a landscape-led systems approach to policy and practice can be identified. The Central Scotland Green Network is one example of this where GI planning integrates a number of LPAs within a strategic approach to investment. However, greater engagement with these discussions does not necessarily mean that multi-scale approaches

to GI development work in all locations. Doubts also remain within local landowner, local government, and the development/utilities sector representatives of the added value of working collaboratively at all scales. GI should therefore not be viewed solely as a landscape-scale process in rural planning but also as a set of resources and investment typologies that can help deliver local and strategic investment.

The Cambridgeshire GI Strategy work has been successful in this regard as it balances discreet projects that deliver benefits at specific locations/points, i.e., Ely Country Park and Wicken Fen projects in East Cambridgeshire, but also feeds into a wider dialogue of landscape scale biodiversity and water management (Cambridgeshire Horizons, 2011). We can identify a comparable process of effective policy-making and practice in the Glasgow and Clyde Valley and Derry and Strabane areas, which uses GI to link urban and urban-fringe with wider landscapes (Derry City & Strabane District Counci, 2018; Hislop and Corbett, 2018).

Potentially the best way to deliver GI in rural areas is to consider it as a continuum of resources that deliver multiple benefits, at different scales, to a variety of user groups. This requires an acknowledgement by local planning and environmental (and other GI) stakeholders of the broad ranging socio-economic and political/planning context that investment is located within, and of the ways in which GI can be embedded within local and strategic thinking. It also raises questions of how effectively GI advocates can navigate the complexities of local, regional and national policy structures to ensure that GI is used effectively to structure rural planning (Horwood, 2020; Lennon et al., 2016).

Regional variation

As discussed in later sections there is a visible variation in how GI is aligned with rural planning across the UK and Ireland. In part, this reflects the development of GI thinking in specific locations, i.e., in urban-fringe areas of North-East England (Davies *et al.*, 2006), and therefore its tenure as a mainstream form of landscape/environmental planning. For example, the discussions of GI policy development at a regional and local level of Horwood (2011, 2020) and Mell (2020) provide deeper dives into the variation of approach seen in England. However, this is not the case in all areas, as GI has been more recently included in policy in Northern Ireland, for example. Practically this means that there is a lack of continuity in how GI is understood, presented, and used across the UK and Ireland, leading

to locally contextual applications. Moreover, there remains a prominent urban focus on GI planning policy and practice in the UK and Ireland with more limited use of GI terminology in rural locations.

Discussions of GI within rural planning debates therefore need to consider the tenure of the concept (and its associated terminology and principles) in each part of the UK and Ireland when it reflects on regional variation. Moreover, the alignment of GI policy with practice must be respective of the individual planning policies, systems, and structures of each devolved nation/region. This influences the ways in which local policy, land ownership, and legal requirements for GI (and environmental planning more broadly) are applied. Consequently, although a level of continuity can be found in terms of the GI benefits are discussed, there is greater fluidity regarding how this terminology and different types of GI are implemented. This can be a strength of GI planning in rural areas but must also be seen as potentially hindering the translating of best practice between locations.

Rural policy and GI

Due to the diversity of local government structures and subsequent practices across the UK and Ireland (Cullingworth et al., 2015), the focus of GI policy in both urban and rural areas has differed. This includes variation in focus, scale, and delivery objectives. Moreover, there is a corresponding divergence in the strength of policy depending on the tenure of GI different locations (as noted above). For example, GI has a longer policy history in the North-West of England, Cambridgeshire and the Clyde Valley area compared to other areas of England and Scotland. However, we can identify a growing engagement with the concept in Ireland using GI to inform regional planning in Dublin and the *Blue Green City* documentation of the Southern Regional Assembly, and within the Placemaking Wales Charter, which link GI with well-being and high-quality public realm development. Consequently, policy in these locations is more nuanced in terms of the presentation of GI principles and delivery programmes.

We can also identify a breadth of understandings of GI in policy across the devolved regions of the UK and in Ireland. This is reflective of the dominant planning policy mandates, delivery structure and available evidence bases in each region which have been used to shape GI

thinking. Where GI is embedded in policy across England, Ireland, Northern Ireland, Scotland, and Wales, it suggests that GI has gained political support although this is presented in alternative ways depending on its perceived value by those same political stakeholders. It is therefore important to assess policy at a devolved level to locate where GI sits with development discussions - if indeed it is used how it relates to rural planning and development issues.

GI policy across UK nations and Ireland

England

Central government support for GI in England is located within the National Planning Policy Framework (Ministry of Housing Communities and Local Government, 2021). The document makes mention of GI and situates it in discussions of urban and environmental improvements but does not outline an explicit link to GI in rural areas (except in its definition of the concept). The NPPF has a more direct discussion of environmental management and the need to protect the quality of urban and rural areas to support ecological functionality, as well as promote strong rural economies. Defra's 25-Year Environment Plan (HM Government, 2018), and the subsequent Environment Act (HM Government, 2021), offer a more direct approach to GI in rural areas compared to the NPPF. The 25-Year Environment Plan brought forward Biodiversity Net Gain (BNG) which is proposed as being a useful tool in the development management process in all urban and rural areas. Moreover, the proposals to plant 1 million trees across England is a further target that looks to invest in GI in all locations (with a significant proportion being located in urban-fringe and rural areas).

The 25 Year Environment Plan also sets out a case for investment in GI to deliver high quality places and ecological systems linking these to economic development. When considered with the breadth of GI policy at a sub-national level, the Environment Plan provides a set of options, via the provision of GI corridors, water management, habitat creation, and more effective landscape management to situate GI in rural development debates more effectively. It also cross-references the Natural Environment and Rural

Communities Act (2006) to ensure that issues including biodiversity protection and management are integrated into planning practices. The signing of the Environment Act (HM Government, 2021) is an additional and progressive step to ensuring that these issues are considered within all areas of GI planning. Furthermore, given the ecosystem functions associated with the provision of GI in rural areas this offers significant opportunities for policy/practice to engage more effectively with the principles and benefits associated with GI (see the Thematic Review on Ecosystem Services for a more detailed analysis of this process).

Ireland

The policy environment discussing GI in Ireland is comparable to that of Northern Ireland with a directed commentary being embedded within national policy. The National Planning Framework of Ireland presents GI planning as a mechanism for “Protecting, Conserving and Enhancing Our Natural Capital” that includes the management of important and vulnerable habitats, landscapes, natural heritage, and green spaces. Within the document the National Policy Objective 58: Integrated planning for Green Infrastructure and ecosystem services will be incorporated into the preparation of statutory land use plans (pg. 125; 166). They go on and argue that this should be achieved via an integration of policy mandates at the national, regional, and local level which should inform the strategic investment and management of urban and rural environments. To achieve this, the Government of Ireland proposes that GI – utilising ecosystem services thinking - needs to be integrated into statutory land-use plans. They also state that the planning of GI needs to move beyond urban areas to better appreciate the inherent socio-economic and ecological values of the environment in rural Ireland. This, they argue, will create stronger bonds between GI advocates and local stakeholders and increase the viability of rural communities and allow them to become effective custodians of GI via alternative land management practices (Ireland, 2018).

Scott et al's (2016) work for the Irish Environmental Protection Agency supports this view, arguing for a collaborative approach to policy and practice that aligns EU and Irish policy to manage water, biodiversity, forestry, and agricultural land more effectively. They call for an increased coordination between partners to better understand local context and opportunities for investment in GI, which is directly relevant to the development of GI in rural areas. Lennon et al's. (2017; 2014) examination of GI in Ireland examines some of these issues looking at the role of stakeholders and location as core aspects of effective planning.

Consideration of GI as part of the National Adaptation Plan and National Biodiversity Plans should also situate GI thinking in rural as well as urban contexts. Integrating GI with national and local policy mandates will help to ensure the breadth of knowledge of Ireland's ecological and planning professionals are included in the process. In addition, the Comhar Sustainable Development Council (SDC) (2010) proposed that the Department of the Environment, Heritage and Local Government (DOEHLG) should take a leadership role in this process, as it would enable them to work with rural stakeholders to consider local environmental context and how this can be aligned/enhanced with investment and/or management using GI principles.

Northern Ireland

GI policy in Northern Ireland is predominantly focussed on urban areas, i.e., Belfast, rather than being discussed in terms of rural or wider landscape planning. This is witnessed by the lack of debate examining the added economic, socio-cultural and ecological value of GI and environmental resources in rural areas more broadly (Department of Agriculture Environment and Rural Affairs, 2019). Strategic planning policy published in the 1990s does argue for the development and management of GI, especially in "A Planning Strategy for Rural Northern Ireland" (Department of the Environment Northern Ireland, 2015; Department of the Environment Northern Ireland & Planning Service - Department of Environment Northern Ireland, 1993). However, these discussions are not extensive or explicitly linked to GI or its principles. Where GI is discussed in terms of policy it is aligned with delivering a green recovery for Northern Ireland or linked to the promotion of a net zero economy.

The Northern Ireland Housing Executive (2021) do discuss the need to consider environmental quality, functionality, and amenity within their reporting. This does not address issues of GI development or management but is linked to wider climate change issues more widely. A greater level of discussion of environmental change (and its subsequent management) is focussed on coastal areas and agricultural land in terms of land use reform/change rather than on the process of delivering multi-functional GI. At the local level we can identify areas including Belfast and Derry and Strabane where LPAs have produced more specific GI guidance. This, however, is predominantly focussed on urban areas but does refer to the connective principles of GI and draws on aspects of linking resources into GI networks that can be located across Northern Ireland. Within these documents though the positive role of multiple stakeholders in shaping GI thinking is noted. This suggests that

policy-makers value the process of knowledge exchange between environmental and development stakeholders, and are using this experience to promote more effective land management.

Scotland

In Scotland, the passing of the Planning Act (2019) (Scottish Parliament, 2019) set out provision to develop GI via the creation of open space strategies and forest and woodland strategies, it also proposed that GI and blue infrastructure (BI) should be supported via the implementation of an Infrastructure Levy placed on development. Analysis of the Act outlines a view that GI is a critical form of infrastructure that can be used to support investment, development, and management of locations across all of Scotland's landscapes. This includes upland and remote areas, as well as coastal and urban areas.

This is supported by the Scottish Government (2011) in their GI Design and Placemaking policy which aims to improve the environmental and socio-economic quality of urban and rural areas via investment in GI. Although this document does not make explicit references to GI in rural areas, it does focus on the delivery of socio-economic and environmental benefits at several scales including the landscape/strategic. It is in this space that the delivery of GI can be aligned with forestry, biodiversity, and water management practices to manage Scotland's landscape more effectively. In addition, the Planning for Scotland National Planning Framework 4 document presents GI as a significant policy area that can be used to support development of urban locations, as well as the protection of environmental resources across Scotland's diverse landscape mosaic.

A further example of Scotland's alignment of GI with rural development and planning is via the Scottish Government's Green Infrastructure Strategic Intervention (GISI) project (2016-2023). This project has seen the Scottish Government, NatureScot, and the European Regional Development Fund (ERDF) work collaboratively to:

- Improve the quality, accessibility and quantity of green infrastructure in major towns and cities.
- Provide increased and better opportunities for people to improve their health and well-being.
- Address inequalities through the creation and improvement of greenspace for

communities in areas of multiple deprivation and/or for communities living in proximity to vacant and derelict land.
- Provide increased opportunities for people to experience and value nature and promote greater use of greenspace by local communities.
- Contribute to economic regeneration, providing benefits to people and businesses by investing in green infrastructure.

Again, the focus of project work and policy may not explicitly be on GI in rural areas, however, a line of argument can be made that links landscape and environmental management processes with GI and planning policy structures across Scotland. Moreover, the proposals to better understand landscape value, and the ways in which alternative management practices can influence quality helps to situate GI within a broader landscape context in Scotland. This, in turn, provides scope to apply the principles of GI within rural areas to ensure that economic development is aligned more effectively with environmental and social needs.

Wales

There is a more direct inclusion of GI in planning policy in Wales. This includes its integration into the Future Wales: The National Plan 2040 (Welsh Government, 2021b) and the Planning Policy Wales Edition 11 documentation (Welsh Government, 2021a). The latter present a visible set of discussions linking GI and rural planning, especially in *Chapter 6 – Distinctive and Natural Places*. Within the document GI is linked to the national objective of placemaking in urban and rural areas and promotes an appreciation of GI in terms of location, type, amenities, aesthetics, and functionality to support investment. Moreover, there is a clear link between GI policy and the Welsh Government's proposals to address climate change, water management and ecosystem service functionality. These objectives are linked to local planning structures within rural areas, for example Biodiversity Action Plans (BAPs) and local planning strategies to ensure that environmental quality is maintained.

Overall, the Planning Policy Wales documentation calls for a nature-based approach to planning in urban and rural areas that support multi-functional GI to deliver socio-economic and ecological services. The Future Wales: The National Plan 2040 (Welsh Government, 2021b) documentation does not engage with GI in the same depth. However, it provides a

more detailed discussion of rural landscapes/environments and their value to the Welsh economy. This includes reflections of the breadth of landscapes in Wales including the management of ecological/GI assets within the country's National Parks, AONBs, and coastal areas. The National Plan 2040 also outlines a need to consider GI within the urban-rural fringe via its discussion of protecting Green Belt areas in north and south Wales. This is examined as a process of managing urban growth versus a shift towards development and the management of rural landscapes. Therefore, although there is a predominance of economic arguments in the National Plan 2040, it does highlight the need to consider environmental management, in part as GI, across the breadth of landscape types and characters of Wales. As such, the plan is a useful counterpoint to the Planning Policy Wales documentation which provides a more direct analysis of *what* and *how* GI can enhance the landscape functionality of the country.

Key Stakeholders

Discussions of GI are inherently reflective of the stakeholders engaged with wider landscape management practices. This applies to urban areas, as well to those in rural locations. What is common across both is the interaction of local and national government (and associated planning authorities), with the environment sector, members of the rural economy, as well as utilities/infrastructure providers. In addition, there is potentially a greater visibility of local communities and lobbying groups in rural areas debating the value of GI compared to urban areas. The result of which is a complex stakeholder arena which questions the process of planning for rural environments, as well as what development or change can (or should) be afforded.

Breaking down the most prominent advocates and/or stakeholders engaged in the planning of GI in rural areas identifies four distinct groups who hold significant influence (see Table 1). These relate to policy (national, regional, and local government), the implementation of management (Environment sector), those with legal ownership and rights to manage land including the Crown Estate, Ministry of Defence, and utilities companies, and finally local communities and campaign groups. The latter could be considered to have a disproportionate influence on rural policy and management practices, especially in areas with a dominance of environmental designations and/or agricultural practice or where “contentious” development of resources may change the physical and socio-cultural composition of a GI resource.

The influence of each stakeholder group varies depending on location. Defra, for example, has set ambitious targets for biodiversity, conservation and a transition to net-zero carbon via the 25-Year Environment Plan (and the subsequent Environment Bill) (HM Government, 2018). Their thinking has been framed to strategically consider the long-term sustainability of rural landscapes via a series of protection and enhancement measures linking to Biodiversity Net Gain (BNG), and the emerging National GI Standard. However, these proposals still require engagement from other government, environmental and landowner/private stakeholders. Moreover, an understanding of the potential conflicts between the top-down imposition of new/alternative landscape management techniques, i.e., EU regulation or Defra/Natural England’s Nature Recovery Networks or rewilding needs to be examined in conjunction and not in opposition to locally-led (or socio-economically driven) form of management for such specific activities. If this can be achieved, then a more effective dialogue may be possible between rural stakeholders.

Table 1. Stakeholders engaged with GI in rural areas

Government	Environment	Landowners / Private sector / Utilities	Communities / Campaign groups
- National Government (Defra) - Environment and Forestry Directorate (Scotland) - Department for Agriculture, Environment and Rural Affairs (Northern Ireland) - Natural Resources Wales (Wales) - Department of Culture, Heritage and the Gaeltacht (Ireland) - Local Planning Authorities (LPAs) - National Park Planning Authorities (NPPA)	- Natural England - Environment Agency - Forestry Commission - Historic Scotland - Wales Biodiversity Partnership - Environmental Protection Agency (Ireland) - Office of Public Works (Ireland) - Scottish Green Infrastructure Forum - NatureScot (Scotland) - Glasgow Clyde Valley Green Network	- Ministry of Defence (MoD) - Forestry Commission - The Crown Estate = Regional Utilities companies = Network Rail / ScotRail	- Campaign for the Protection of Rural England (CPRE) - Friends of Groups - Local communities - Schools, education and health organisations

By way of comparison, in Scotland proposals can be identified within the Fourth National Planning Framework (NPF4) for the creation of sustainable, liveable, productive and distinctive places as central mandates of national policy (The Scottish Government, 2020).

Within this broader scope, GI planning is noted as a core approach to deliver improved landscape management in urban and rural areas. The framework also looks at how GI, and landscape management more widely, can be aligned with rural prosperity and raises questions regarding the provision of housing, energy and digital infrastructure whilst maintaining the quality of rural landscapes. The policy also makes an explicit case for managing Scotland's landscape as a whole rather than focussing on the *rural*, the *urban* or *coastal* areas. This provides scope for the policy to have a greater applicability due to its potential to integrate alternative land management techniques, as it is not focussed solely on rural/urban dichotomies.

How LPAs engage with central government policy mandates, as well as deliver locally needed socio-economic and ecological infrastructure is also an important aspect of planning for GI in rural areas. Where GI strategies focus on rural as well as urban landscapes, i.e., the sub-regional strategy for Greater Nottingham (Broxtowe Borough Council et al., 2020), or to a lesser extent the Derry City & Strabane GI Strategy (Derry City & Strabane District Council, 2018), we can identify an engagement with the core landscape principles of GI. LPAs in these locations are therefore tasked with aligning the complexities of land management practices focussed on people and/or economic growth with sustainable environmental resource management. In some locations, i.e., Cambridgeshire, this has been difficult due to contrasting agendas focussed on conservation or farming (Roe & Mell, 2013; Cambridgeshire Horizons, 2011). As a consequence, LPAs hold a key role in facilitating discussions of the added value that GI can deliver in rural areas in order to moderate the perceptions of negative impacts that may occur through development in policy/practice. This is clear in the discussions centred on housing and transport provision where it impacts upon the quantity of GI in rural areas, i.e., in parts of central and north Wales (Welsh Government, 2021b). The strategic approach taken in County Wicklow provides further evidence that successful collaboration is important in setting effective policy for GI. In their discussion Wicklow County Council/Comhairle Contae Chill Mhantáin (2016) develop a strategic approach to management ensures that local land managers, communities, environmental and development organisations can work with the LPA to support appropriate GI investment.

The role of the environment sector is also critical here, as in many cases they are the delivery agents of policy within rural areas. NatureScot and Natural England and the Environment Agency are well placed to act as advocates of GI policy and practice in Scotland and England respectively. However, each area of the UK and Ireland is represented by a different set of environmental stakeholders drawn from across the water, biodiversity, energy, development, forestry and agricultural sectors, who all need to be engaged to effectively manage GI provision in rural areas. This can be mapped onto EU

Directives and policy, i.e., the Habitats Directives or Water Framework Directive, or local planning and environmental policy. Moreover, the environmental sector must work with statutory bodies tasked with managing specific landscapes, i.e., Heritage Coasts or National Parks, to ensure that the socio-cultural, cultural, and economic benefits of these locations are mapped effectively onto ecological objectives. As such, there is also a need to consider the influence the environmental sector has on planning policy and practice. Questions therefore need to be raised regarding how both engage with GI policy, and what objectives they are promoting.

Thematic issues associated with GI

All discussions of GI in rural contexts, as with those in urban areas, need to take an additional thematic approach to examine and analyse GI policy and practice for two main reasons. First, it provides scope to consider how the benefits of GI, barriers to its use, and opportunities for future investment can be framed in different locations, and second it provides a set of policy hooks through which planners and GI advocates can support or direct thinking towards a more inclusive and refined appreciation of how GI fits with rural planning debates. This is especially prescient when or where agriculture, forestry, water management and utilities/service provision, military use or transport infrastructure are considered as core land uses. The following sections outline a series of key areas currently being discussed in policy, practice and the academic literature to shape how GI can be used to meet socio-economic and ecological needs in different locations across the UK and Ireland.

Access

Access to GI in rural areas is subject to a number of constraints related to location, mobility and perceived quality or amenity value. Unlike in urban areas where GI is perceived to be

local, i.e., within a 15-minute walking distance, access to GI in rural areas is not as easily identifiable. Can we classify all rural landscapes as GI or does the functionality, connective or network aspects of a resource make it GI? Whilst we could argue that all rural landscapes can potentially be classified as GI it would be difficult to state that (a) they are all easy to access to all members of society and (b) to identify that there is a provision of high-quality GI (or indeed its principles or benefits) in all locations. The principle of multi-functionality (and the activities/amenities a space provides) inherent to GI thinking thus needs to be a key consideration in any discussion of access (European Commission, 2012; Madureira and Andresen, 2014). Therefore, a more considered approach is needed to assess how quality, quantity and functionality alter perceptions of accessibility

Furthermore, planning in rural areas needs to ask whether we consider large formal landscapes, i.e., Forestry Commission sites in Scotland or the six National Parks in Ireland as GI, or is GI only those landscapes that are walkable from rural settlements? The scale and location of a site raises significant questions regarding accessibility with those more remote locations, i.e., Exmoor in England or the Snowdonia in Wales being less accessible to people with lower personal mobility. The location of GI in rural areas can therefore be considered to both promote conservation and biodiversity mandates by being located away from settlements but also limits engagement and use because of the travel time and distances needed to access them. This is an issue seen in rural areas of other countries, i.e., Germany and Sri Lanka, where access to National Parks have been limited due to the costs associated with travel and time (Mayer and Woltering, 2018; Prakash *et al.*, 2019).

The distribution of GI in rural areas also raises questions regarding their functionality to all parts of society and leads to further considerations of its amenity value within these debates. This relates to both the provision of amenities that support socio-economic activities but also ecological functionality – issues that have historically le to conflicts between users, planners and landowners (cf. Roe & Mell, 2013). Planning for GI in rural areas thus needs to balance the provision of ecosystem services (provisioning, regulating, servicing and cultural) with more people-oriented focussed activities. Landowners, including the Forestry Commission, are well versed in this process but this is not the case across all rural landscapes as tensions can arise between the promotion of economic activity (particularly in areas with environmental designations associate with them) and landscape preservation or conservation management (Flood, Mahon and McDonagh, 2021). There is also a need to evaluate how, and whether, people are able to move freely around rural areas and if so how. This supports a further review of the spatial extent of the Public Right of Way (PRoW) network in the UK and access to rights on way in Ireland. Where an awareness of these resources is known a greater level of mobility may be afforded to people, however, an awareness that knowledge does not necessarily lead to action needs to be considered as

well.

However, restrictions exist in terms of the knowledge and perceived rights to use the resources, as illustrated by the growing visibility of groups, including Black Girls Hike and Muslim Hikers (Black Girls Hike UK, 2021; Parveen, 2020). Black Girls Hike aims to demystify the perceptions of exclusion felt by Black, Asian and Minority Ethnic (BAME) communities from visiting and walking in the countryside via guided engagement. The process of rural “othering” was brought to the fore on Christmas Day 2021 when the Muslim Hikers took a group of walkers to Mam Tor in Derbyshire to experience the Peak District. The backlash against the group was significant and highlighted an ongoing issue regarding who the countryside is for and whether we should view GI as being equitable for all members of society. The awareness of access routes, PRoW and permissive and public access rights are therefore being challenged and remain a key issue in generating value of rural GI. The Campaign for the Protection of Rural England’s (2021) report on access to nature for Black, Asian & Minority Ethnic (BAME) communities goes further identifying costs, location, cultural variation in knowledge of access rights and feeling of othering as being drivers of rural GI not being used to its fullest potential.

For those who live in rural areas the perceptions of access to GI may also vary compared to urban residents. With proximity comes a potential narrowing of appreciation or understanding of the socio-economic and ecological values of GI (or even the understanding that rural landscapes are GI). This has implications for how people access GI, how they engage with it, and what value they place on it. Moreover, these limitations could be exacerbated in areas where environmental designations dominate a locale. In such places the added value placed on natural or historical beauty may be undermined if other socio-economic services are not delivered. As a consequence, local residents, especially younger people, may not wish to engage with GI in the same way.

Consequently, in rural areas GI should not be classified as being accessible in the same way as in urban areas, and therefore needs to be planned carefully to ensure that the widest range of people are able to engage with these landscapes (both local residents and visitors). This requires consideration of mobility, transport, time, and costs, in addition to reflections on the demographic and cultural understandings of access from wider communities. In one sense this relates primarily to the accessibility of GI in rural areas for urban populations but also need to be cognisant of the lack of mobility afforded to many who live in rural areas, i.e., children, young people and the elderly.

Economic benefits of a high-quality and functional environment utilising GI

Establishing the economic benefits of GI remains difficult due to the variability of approaches taken to valorising environmental resources, functions, and benefits. The development of myriad techniques to value ecosystem services (Schäffler & Swilling, 2012) and the development of Natural Capital approaches in the UK and Ireland have been prominent aspects of this process (Natural Capital Committee, 2013). Moreover, we can identify a growing evidence base that looks at the broad socio-economic, cultural and ecological benefits of GI associated with specific types of GI, i.e., trees, woodlands/forests or parks (Vivid Economics & Barton Willmore, 2020). Within these debates there is a dominance of valuing GI within urban areas, however, it remains prudent to think beyond city boundaries when debating economic values.

The structure of GI as a series of links, hubs and nodes connected into a landscape-scale network providing habitats, connective migration corridors, water management and flood protection functions, i.e. as set out in the 2017-2021 National Biodiversity Plan in Ireland (Department for Housing Local Government and Heritage, 2017), as well as a recreation destination (see for example discussion of tourism and economic growth in UK National Parks) is critical to understanding its economic value in rural areas. Extensive case study material exists within the GI literature which value GI as a set of connected landscape scale resources. These include the linking of urban parks with wider rural landscapes in Paris (Laruelle & Leganne, 2008) and Milan (Mell, 2016), and landscape conservation efforts in Maryland (Weber et al., 2006; Benedict & McMahon, 2006). What each of these case studies highlights is a significant link between connectivity, functionality, and the subsequent added value to the overall quality of the landscape. This includes promoting recreational and tourist uses of rural spaces that are accessible by walking/cycling from urban areas. It also supports the view that rural areas do not need to be spatially isolated from urban locations, and as such economic spend and prosperity can be better aligned between urban and rural.

Moreover, there is a need to consider in the UK and Ireland how to achieve more effective environmental management that promotes biodiversity and habitat creation and management to deliver ecological resilience. Planning for sustainable environmental management is one mechanism to ensure that cultural, provisioning, regulating and supporting ecosystem services continue to support the UK and Irish economy. The Environmental Stewardship Schemes (ESS) embedded within the Common Agricultural

Policy (CAP) may have gone some way to promoting this historically; post-Brexit there are tensions between the ongoing valuing of environmental stewardship if payments are not forthcoming to support these practices.

Reflecting on the breadth of approaches associated with such schemes linked to EU policy the Joint Nature Conservation Committee (JNCC) highlighting the following as being significant to planning GI/environmental management in rural areas:

- Environmentally Sensitive Areas (ESA) in the UK
- Countryside Stewardship Scheme (CSS) in England
- Tir Cymen (which became Tir Gofal) in Wales
- Countryside Premium Scheme in Scotland (CPS) (becoming the Rural Stewardship Scheme (RSS) in 2001)
- Countryside Management Scheme in Northern Ireland

The range of schemes available has aided the transition of a significant proportion of land into targeted environmental-centred management programmes. Each scheme has been designed to provide guidance for land managers to maximise the economic benefits of ecologically sensitive land use and thus support a shift away from increased yields per hectare thus promoting a greater consideration of environmental sensitive management (House of Commons, 2021). Consequently, we can identify a growing awareness of the added economic value of ecologically sensitive practices in farming, water management, upland management, and forestry that could be considered to deliver the ecological benefits of habitat creation and management embedded within GI thinking (cf. Hurley et al., 2022; Okumah et al., 2021; Ellis, Anderson, & Brazier, 2021). The uptake of environmentally sensitive management has the benefits of working with the landscape to maintain functionality, diversify its composition, and allows land managers to think long-term about its productivity.

The economic value of GI in rural areas also needs to be considered in relation to the delivery of the Water Framework Directive (WFD). To effectively comply with the WFD multi-stakeholder partnerships are required to work across legal and landscape boundaries to deliver effective quality and quantity management (Hering et al., 2010). In practice this means managing water at a catchment scale, which ensures that GI in the form of Blue Infrastructure (BI and its associated water and terrestrial habitats) are considered at a regional scale. The EU propose within their broader GI and ecosystem guidance that planning for water at this scale is an intrinsic part of landscape management in urban and

rural areas. In Northern Ireland national oversight for this process is undertaken by the Department of Agriculture, Environment and Rural Affairs, in Ireland this role is performed by the Department of Housing, Local Government and Heritage, the Department of Agriculture, Food and Rural Affairs in England and Wales and by NatureScot in Scotland. Consequently, although each administration works to comply with the legal requirements of the WFD they do so in different ways reflective of policy/delivery structures in each location.

One example where an alignment of the principles of the WFD with GI is made is in the 'Guiding Principles for Devon" in South-West England. In their guidance they note that effective water management:

- Recognise, protect and manage Devon's natural green (and blue) infrastructure assets and processes that provide important water and flood risk management functions, and take opportunities to improve, extend or restore these where compatible with other land uses and functions.
- Take into account strategic needs expressed in relevant Catchment Flood Management Plans and the South West River Basin Management Plans when managing green infrastructure assets and planning new projects.
- Integrate components of Sustainable Drainage Schemes (SUDs) into development as part of the green infrastructure network to assist flood management and provide multiple functions.
- Design and manage green infrastructure assets in a way that reduces rates and volume of water runoff, erosion and sediment transport, and improves water quality where needed.

Devon County Council make clear links between effective management, functionality, water quality and supply, and economic sustainability. The management of water resources in conjunction with GI can also limit the impacts of flooding, as well as poor-quality provision in urban and rural areas, and is embedded within this WFD management processes. This goes some way to illustrating the links between rural GI, water management and securing economic stability via an increased level of joined-up thinking that explicitly promotes sustainable land management. Comparable examples can be identified within Ireland via the central government's consultation on effective water management and the linking of GI and Natural Capital with more sustainable practices, which use the WFD to deliver best practice and economic resilience. Linking the economic value of rural water management and GI systems is thus imperative to locating an ecological perspective into policy. The integration of Biodiversity Net Gain (BNG) approaches within the UK Environment Act is a further example of the growing alignment of ecological processes with sustainable land management.

We can also identify large-scale forested landscapes as potentially core GI resources supporting diverse habitat mosaics and economic development opportunities. Forestry Commission sites in England, Scotland and Wales can be viewed as examples of this process and have been considered by the Forestry Commission to act as landscape scale GI resources (Forest Research, 2010). Such sites have been shown to support the develop and management of priority habitat and priority species, conserve ancient and native woodlands, and act as facilitators of peat restoration. These are benefits that can transcend a single location, as they support ecological functionality at a regional and even a national scale. In addition, the UK government and Forestry Commission have noted that effective forest management has significant economic benefits including:

> *"Utilisation of timber ensures a financial underpinning to woodland management. Forestry and timber support over 80,000 green jobs and every £1 private profit generated through the management of forests for timber delivers £18 public benefit."*

Furthermore, the Office of National Statistics (ONS) reported that woodland and forest areas provide key ecological, climatic and economic benefits to the UK. These statements were drawn from amalgamated figures of the 2020 and 2021 Woodland Natural Capital Accounts (Office of National Statistics, 2020a, 2021a) and highlight the ongoing value of forestry as a working land use that supports ecological and socio-economic benefits for the UK. These included:

- The removal of air pollution by woodland in the UK equated to a saving of £938.0 million in health costs in 2017.
- Woodland in the UK removed 18.1 million tonnes of carbon dioxide equivalent in 2017, equating to a value of £1.2 billion; this is equivalent to 4% of total UK greenhouse gas emissions in 2017 (Total greenhouse gas emissions in 2017 were 460 $MtCO_2e$).
- Pollution removal by woodland in Wales is estimated to have an ecosystem services value of £100 million in 2017, representing 31% of the annual value of Welsh woodlands.
- Carbon sequestration by woodland in Northern Ireland is estimated to have an ecosystem services value of £42 million in 2017, representing 42% of the annual value of Northern Irish woodland.

The ONS also calculated that the ecological values of forests and woodlands via the provision of the following economic benefits to the UK economy:

- There were an estimated 475 million visits to woodlands in 2017, on which the public spent £515.5 million collectively.
- The non-market benefits of woodland exceed the market benefits of timber by approximately 12 times; timber represents £275.4 million out of £3.3 billion total annual value of woodland in 2017.
- The asset value of UK woodlands was estimated as £129.7 billion in 2017, with timber representing £8.9 billion (6.9%).
- The annual value of woodland ecosystem services in England is estimated to be £1.6 billion in 2017, representing 50% of the annual value for UK woodlands as a whole.

In addition to the economic value associated with ecological management of rural areas it is important to consider its value as a location of tourism and recreation. Statista (2021) proposed that there were over 358-million-day visits to rural areas in Great Britain in 2019 (down from 395 million in 2012). Moreover, in 2014 Visit England reported that tourist spending on overnight stays in rural areas was approximately £3.1 billion and on day trips £8.4 billion. Although it is not possible to argue that all spend was related to GI, we can suggest that the quality, functionality and amenity value of rural landscapes act as a significant contributing factor in this spend

Evidence also suggests that the three National Parks in Wales receive over 12 million visitors a year with a corresponding £1 billion spend (and an approximate contribution of £557 million to the Welsh economy). Scotland's National Parks also support part of the £4 billion spending per annum in these locations (Barrow, Scottish Campaign for National Parks (SCNP) and Association for the Protection of Rural Scotland (APRS), 2016), whilst in Ireland the economic spend associated with rural tourism is approximately €8 billion (€6.6 in spending and €1.4 billion in the domestic market development/spend) (Teagasc, 2016). This spend has been linked to the "holiday experience" of Ireland that links quality amenities with landscape diversity (and quality) to promote tourism.

As noted above, making direct links between the economic value of GI and rural landscapes regarding socio-economic and ecological benefits is a complicated process. However, via a review of the WFD, tourist spends and links to agricultural and environmental stewardship schemes we can identify that GI provides a location where economic value can be calculated. This can focus on the delivery of provisioning, regulating and supporting ecosystem services associated with farming, forestry or water management, as well as the spend from recreation and tourism associated with landscape designations, i.e., National Parks, or cultural ecosystem services. What is apparent is that although the language of GI may not be used as extensively to discuss economic returns in rural areas as it is in urban locations, the promotion of connected, attractive, accessible and multi-functional spaces

remain directly relevant to rural planning. Ensuring that rural landscapes are managed effectively should therefore be a core principle of policy to ensure that the ecological and economic functionality of rural places is maintained.

Perceptions and values

As with discussions of access there is a breadth of understanding regarding how and what values people place on rural areas. The variation in perceptions is loaded with socio-economic, cultural and experiential meaning, and differs between communities throughout the UK and Ireland. Moreover, the diverse landscapes of the UK and Ireland provide scope to view the values placed on rural locations as a continuum that relates to landscape type. This would allow landscapes such as the west coast of Ireland (Kerr, 2019; O'Rourke, 2005), which have very specific history of immigration/emigration, settlements and engagement with politics to be seen on a continuum with the remoter areas of Scotland and Wales to promote the relationships local people have with the landscape, land ownership, and rights to the land (Vergunst, 2013). The perceptive nature of such a continuum would allow historical activities which occurred hundreds of years ago to be considered alongside more contemporary issues in shaping the value of rural landscapes locally for communities and within the wider consciousness of a country (see for example Stobbelaar and Pedroli (2011) and Millican *et al.* (2017) work on Scottish identity and landscape). However, in the case of the west of Ireland the remnants of forced migration, famine, the enclosure and economic ruin remain visible in the landscapes (and the cultural memories of local communities) across these locations and should be discussed in terms of their value as landscapes of memory and memoriam (Nassauer, 1995; Matless, 1998).

Managing expectations of what the landscape can offer and what is means culturally for alternative groups of users, residents and businesses is difficult and requires extensive reflection on local needs. It also requires an appreciation of the value of the rural environment to other people outside of these communities, and therefore what makes a place an attractive destination to visit, live in or invest in. As noted above the west ad northern coastlines of Ireland and Northern Ireland are subject to this process, as both as complex amalgams of physical/scenic and cultural meanings (or social imaginaries) that manifest themselves in alternative ways for different local and visitor audiences (Mannheimer, Reijnders and Brandellero, 2022). The diversity of GI form in such areas, i.e.,

as mountains, coasts, lakes and forests are part of this discussion. This process can be exacerbated due to visible differences in socio-cultural or demographic belonging and/or the reception of this by local communities (Moore, 2021, see also reception of Blacks Girls Hike and Muslim Hikers discussed previously). Whilst rural areas remain popular with a wide range of people in the UK there are existing (and there remain) invisible barriers for some visiting and others who are residents in these areas that limit the value they feel they can attribute to rural landscapes (Ware, 2015). An understanding of “othering” in rural areas as discussed in the section on access is meaningful here, as whether all societal groups feel welcome in rural areas will impact directly on the value they associate with it. How planners in each of the central administrations (and local level administrations) of the UK and Ireland address this issue remains open to discussion.

One area where perceptions of different stakeholders are integrated into the planning and/or management of GI in rural areas is via the use of protected designations. These offer insights into how perceptions of quality, access and functionality differ between local users/residents and those travelling to use a resource. Throughout 2020, for example, COVID-19 restrictions led to a greater number of people travelling to National Parks (and other designations) across the UK to experience a better quality of landscape. In itself this is not an issue, however, the scale of movement (as noted in other thematic reports, i.e., housing), placed significant pressures on local capacity, especially car parking, leading to a perception of damage or rural GI by local communities. Whilst National Parks and AONBs themselves remain high-quality spaces the pressures placed upon them by visitors attempting to engage with that quality can lead to problems of overuse. The outcomes of which have been abuse towards local people, other visitors, and National Park staff, as well as increased damage to resources and wildlife (BBC Online, 2021). There was also the issue of containing COVID-19 spreading raised with some people choosing to ignore calls to not travel between England and Wales to access National Parks (Morris, 2020).

We can also reflect on the perceived “natural quality” of GI in National Parks in the UK. National Parks in England and Wales for example were established following the 1949 National Parks and Access to the Countryside Act to:

- Conserve and enhance the natural beauty, wildlife and cultural heritage.
- Promote opportunities for the understanding and enjoyment of the special qualities of national parks by the public.

To carry out these purposes in the UK there are National Park Planning Authorities (NPPA) who are required to foster the economic and social well-being of local communities in the National Park (National Parks UK, 2021). In addition, National Parks in Scotland are

required to:

- To conserve and enhance the natural and cultural heritage of the area.
- To promote sustainable use of the natural resources of the area.
- To promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public.
- To promote sustainable economic and social development of the area's communities.

Irish National Parks have been in existence since Kilarney National Park was designated in 1932. A further five parks have been designated since them with Wild Nephin in County Mayo the most recent in 1998. The aim of the six National Parks is:

- To protect and conserve habitat for wildlife, whilst enabling the public to benefit from and appreciate the natural heritage of Ireland.

To deliver on each of these objectives requires each NPPA, local government, businesses and local communities need to work collectively to maintain the quality of GI in each area and ensure that they can develop to meet the socio-economic needs of local communities. This can lead to divergent perceptions of land use being identified in rural areas, as locations attempt to deliver transport, energy, housing and commercial/service infrastructure. The management of "GI" within these locations is therefore subject to socio-economic and ecological challenges, which are locally specific.

Landscape designations and everyday rural landscapes

Any discussion of GI must take into account the mosaic of environmental designations across the UK and Ireland, as noted above with National Parks, to fully appreciate how the environment can be managed to ensure quality is maintained. The creation of National Parks facilitated an expansion of environmental designations aimed at protecting the ecological, socio-economic and cultural value of landscapes across the UK (Dwyer, 2011). These cover marine and terrestrial spaces that transcend a single landscape, location or administrative authority, thus upland and moorland, as well as chalk grassland, areas of forestry and heritage coastlines are all subject to management practices.

Common to all designations is an assumption based on scientific and culturally generated evidence that these locations are examples of high quality or rare landscape features. This can be linked to GI thinking via the analysis of access to nature (linked to the core principles of National Parks in the UK), protection of habitat and support for ecological conservation efforts (linked to Natura 2000 and Habitat Directive targets), and the promotion of multiple attractive and amenity-based locations, i.e., those linked to country park or heritage coast designations. The difference between traditional GI thinking and these designations is the additional level of policy and/or management protection afforded to them in both national and local level policy. National Parks in England, Scotland and Wales are protected by National Park Authorities with local government development and landscape management powers. Additionally, Special Protection Areas (SPCA), Special Areas of Conservation (SACs), and Natural Heritage Areas (NHAs) are all afforded protection by EU legislation in Ireland and are managed by National Parks & Wildlife Service (NPWS) thus providing a framework to manage high-quality ecological GI.

The rarity or uniqueness of these landscapes can be directly linked to the level of protection given to each designation, although the effectiveness of protective policy/management varies (Cunningham et al., 2021). This is not common to all GI, and therefore needs to be taken into consideration when the development, management and/or protection of GI in rural areas is discussed. Moreover, each of these designations is grounded in a set of principles that highlights a specific (or set of specific) benefits, species or circumstances that require management. Again, this level of protection is not prominent in all GI discussions in rural areas, and raises questions as to how a mosaic of GI can be managed that effectively protects designated and everyday spaces (Roe, 2013; Scott, 2011).

Where there is a lack of specific protection attached to discussions of GI in rural areas, we can reflect on the role of the European Landscape Convention (ELC) (Sarlöv Herlin, 2016) and its promotion of “everyday places”, as being central to our understanding of place. This moves the conversation on from only focussing on the value of protected areas and/or designations as being the primary focus of rural GI discourse. Whilst, the ecological, economic and socio-cultural value of National Parks, AONBs, National and Local Nature Reserves (NNR and LNR) and the plethora of EU designations associated with Natura 2000 (Hermoso et al., 2020) provide a framing of value for rural landscapes, they do not engage directly with the majority of spaces. It is therefore important to identify the role played by local woodlands, green spaces, waterways and PRoW in any assessment of rural GI. These are the spaces used more frequently and potentially for far more mundane activities, i.e., walking the dog or taking children to school, but they provide valuable spaces that facilitate rural functionality. The value of parks, playground, and sports pitches therefore need to be examined in rural places as key GI resources to ensure their role in supporting local

community life is retained. This is often overlooked when practitioners are focussed on assessing the value of designated areas via an ecological quality perspective.

Although it may be more difficult to identify a specific reason why these local and quotidian spaces are valuable, they provide key resources that offer opportunities for social interaction, economic development, and habitat protection and/or creation. Any future GI policy recommendations thus needs to take a more nuanced appreciation of these local spaces as well as examining how best to manage more “valuable” locations.

GI and Nature Recovery as innovative forms of land management

The development of Natural England’s Nature Recovery Network (NRN) pilots along with the Local Nature Recovery Strategies (LNRS) are aiming to reframe biodiversity planning in rural areas to better align strategic and local management, as well as understanding of ecological connectivity and networks. Although solely focussed on England that are supported by a cross-government and environmental sector management group suggesting that if successful they could be applied in other parts of the UK and Ireland. Through a more direct engagement with existing water and biodiversity policy NRN and LNRS can be used to plan for the long-term management of an ecological resource base. In addition, they are key aspects of the 25-Year Environment Plan and the Environment Act, thus providing legal support for more effective management of GI in rural areas. When aligned with considerations of the EU WFD and Natura 2000 mandates and the ELC these emerging policy areas will provide greater clarity to which rural environments should be protected and why.

Specifically, LNRS (Department for Environment Food & Rural Affairs, 2021b) focus on:

- Agreeing priorities for nature’s recovery
- Mapping the most valuable existing areas for nature
- Mapping specific proposals for creating or improving habitat for nature and wider environmental goals

These principles map onto the broader aims of the NRN network process which aims to develop partnership between rural stakeholders in government, agriculture, forestry and nature conservation to better align expertise, capacity, funding and implementation.

Moreover, a variety of ecological resources such as road verges, public and private gardens, wildflower meadow and grasslands, and farmland could all be used to support the ambitious targets of NRNs. The delivery of NRN will be supported though an allocation of £80 million via the “Our Green Recovery Challenge Fund”, that will work with partners to delivery NBS that restore nature, tackle climate change, and connect people with the natural environment (Department for Environment Food & Rural Affairs, 2021c)

NRN and LNRS potentially offer one of the most meaningful mechanisms to support GI in rural areas. Due to the focus on landscape connectivity, networks and functionality they provide an environmental structure that maps effectively onto existing rural resources, as well as promoting the core principles of GI. Moreover, the mapping of functionality against socio-economic and ecological goals/indicators offers scope to examine the use and value of rural places more effectively. Although this builds on current policy, the legal support afforded by the Environment Act (HM Government, 2021) will potentially make ecological management in rural areas stronger. To date there is a level of uncertainty regarding the effectiveness of NRN and LNRS as they are being piloted by Natural England. A detailed breakdown of these successes and barriers to implementation will be published in due course.

COVID-19, GI and nature

The impacts of COVID-19 on GI, and engagement with nature more broadly, has been significant. Due to lockdown restrictions imposed by the UK government in 2020, there has been an extensive increase in the number of people visiting/using GI, be it in urban or rural areas. Moreover, there has been a corresponding discussion within practice (and academia) of the added-value of engaging with GI to address mental and physical health issues exacerbated by COVID-19. The number of people reporting improvements (or maintenance of) good health via interaction with GI during the pandemic has, consequently, been significant (Public Health England, 2020). The additional use of GI during 2020-21 may potentially lead to a wholesale change in engagement post COVID-19, however, it is currently too early to understand if changing user behaviour will be maintained.

The COVID-19 pandemic also provided people with the opportunity to use a wider variety of GI resources due to a decrease in some of the limitations associated with use, i.e., having

sufficient time to visit places which may have been addressed via home working or furlough. People across the UK and Ireland therefore used a wider range of rural spaces on a more regular basis because of the lack of opportunity to engage with other socio-cultural or economic activities (see Guzman *et al.* (2020) and Hubbard *et al.* (2021) for discussions of Ireland and Scotland respectively). However, additional use comes with specific equity caveats when the demographic profiles, types and locations of spaces visited as analysed in more detail (Natural England, 2020b). The Monitor of Engagement with the Natural Environment (MENE) survey undertaken annually by Natural England illustrates significant differences in how communities of Black, Asian and Minority Ethnic (BAME) and low-income engage with GI, and moreover rural GI, compared to those communities with greater affluence and considered predominately white-British.

Research also showed that people engaged in a wider range of activities located in GI during the pandemic compared to other times. The Office of National Statistics (2021a) reported people using GI for walking but also as a place of more diverse exercise, a play of relaxation, and as a place of restorative health amongst other activities/benefits. Consequently, those rural locations that provide a wider range of GI “experiences” compared to urban parks were used with greater frequency than prior to COVID-19.

These map onto the benefits discussed by Natural England who examined the links between health and well-being and access to and the use of GI (Natural England, 2020b; Lovell et al., 2014). The diversity of landscape features, functions/activities and aesthetic quality offered by rural places, i.e., in the form of National Parks, country parks or other designated landscapes, were a significant draw for people during the pandemic. Unfortunately, as noted above this has not been equitable, with Natural England and ONS reporting that communities with higher ethnic diversity and lower incomes were (a) less likely to spend time in GI compared to communities classified as white and of greater affluence and (b) had more limited opportunities to travel to rural GI due to transport and cost implications (Office of National Statistics, 2020b; Natural England & Office of National Statistics, 2019). The use of high-quality in rural areas during COVID-19 this highlighted disparities in accessibility for many communities across the UK and Ireland. The value of rural GI to all members of society during the pandemic may therefore be questioned, raising concerns regarding whether rural landscapes are delivering socio-cultural, economic, and ecological benefits to a specific stratum of society or to it as a whole.

A further note of caution is also needed. Although user preferences and engagement changed due to COVID-19 this also led to conflict between users, and between visitors and local communities. Some GI locations, i.e., National Parks, became hotspots for use, leading to the normal/everyday capacity being exceeded. Consequently, the health and well-being

benefits of nature could have been compromised due to the additional stresses associated with too many people. This was noted as an issue in a number of UK news outlets during 2020-21. In addition, we can also identify further concerns related to changing demographics of rural areas, access to natural/GI resources, and the ability to pay to use GI in rural areas. As discussed by Nick Gallent, amongst other trends, rural home ownership was skewed during COVID-19, as urban residents started to move into rural locations to “escape” COVID. However, rural communities remain subject to economic limitations leading to poverty in some areas, and COVID-19 potentially extended the hardships felt by some due to changes in use and demographic profiles (Butler, 2020). Thus, engagement with GI may have fallen in some places if or where communities were dealing with low incomes, a more tenuous economic status due to furlough or unemployment, and changes to the structure of rural communities. People with relative affluence moving to or using rural areas may have made this situation more acute (Maclaren & Philip, 2021).

The long-term impacts of COVID-19 on the UK and Ireland are unknown, this is also the case for GI (and GI in rural areas). However, we can identify within policy at the devolved level, i.e., Northern Ireland, that access to nature has grown in prominence as an indicator of quality of life in both urban, and importantly, rural areas (Department of Agriculture Environment and Rural Affairs, 2021). Moreover, the consultation of the Landscape Review undertaken by the UK government in 2022 provides further evidence that those in power are starting to acknowledge the value of rural landscapes as cultural and productive places that provide access to nature and require more effective management. COVID-19 has thus brought many of the issues related to the future of rural GI to the fore. However, whether a sustained engagement with nature is forthcoming is open to debate, but it would be advisable to consider rural areas as key GI resources due to their variety, and as they provide functions/amenities that meet the needs of a broad range of communities.

Analysis of GI and nature recovery in the context of the ‘forces for change’

The Rural Planning in the 2020s project defines key issues of our time as ‘forces for change’. In addition to the analysis on COVID-19, climate change and adaptation in the latter sections, the following table sets out how these change pressures are impacting on GI and nature recovery in a rural planning context.

Table 2. Impacts of forces for change on Green Infrastructure and Nature Recovery

Forces for change	A. Brexit	B. Climate change	C. COVID-19	D. The Countryside as a site of adaptation
1. The built rural	1A – With changes in funding for landscape management via EU strategic funding, changes in CAP, and the decreased availability of funding for strategic investment in GI in rural areas there is an expectation that a decreased level of investment and innovation in the type, scale and focus of GI and Nature Recovery projects. This will have subsequent impacts on the security of rural communities against climate change but also in terms of supporting local employment in farming, forestry or nature conservation.	1B – Climate change will continue to impact on rural infrastructure most noticeably via issues of flooding and landscape functionality. More extensive and effective planning for GI, nature recovery and ecosystem services are needed to mitigate the long-term impacts of climatic variation. Strategic planning in rural areas needs to be considerate of how GI/habitat networks, upland restoration projects, tree planting, and natural flood management can be used to decrease the long-term impacts of climate change. Localised responses to housing, transport and flood infrastructure are also needed to ready places in the short-term for changes in climate.	1C – COVID-19 has led to an increased use of rural areas by specific demographic groups (but not all, especially those in BAME classifications) increasing the pressures of the built infrastructure of rural areas. The increased level of use, tourism and home ownership in rural areas and the associated number of visits/permanent residents potentially places pressures on rural GI/environmental resources to function is the focus of land use (and management) diversifies to meet the needs of new populations.	1D -

2. The economic rural	2A – See 1A. However, changes to the application or legal requirements to enforce EU regulation on environmental protection, quality and management may impact rural economies if landscapes become degraded/over exploited. Additional considerations of the impacts of decreased funding for landscape management linked to multi-scale/country EU projects may also impact directly on the ways in which GI is managed, developed and protected. Comparable considerations are also needed to ensure biodiversity/habitat, woodlands/forests, waterways and socio-cultural landscape remain protected (and functional).	2B – As the climate of the UK and Ireland continue to diversify with wetter, windier and warmer conditions the role of GI as a form of habitat and landscape moderation/management will become increasingly important. Traditional forms of landscape management may lack a level of adaptability to climatic variation whilst GI and specifically Nature Recovery Networks are focussed on delivering long-term resilience to environmental and socio-economic protection. Investing in ecological networks, promoting habitat and climate corridors and supporting ecological diversification will provide scope for land managers and planners to work with a suite of innovative and complimentary options to support more sustainable landscape management.	2C – The increased use of rural areas during COVID-19 has placed GI and landscape value at the forefront of political debates (especially when related to health and well-being). Increased use though has the potential to damage all rural landscapes via overconsumption and damage to ecological infrastructure. This is magnified in areas protected/identified as high-quality environmental designations, i.e., NPs, RAMSAR Sites, or SSSIs/LNRs in rural areas. Care is needed to ensure that spaces remain accessible without undermining their ecological or socio-economic functionality. Capacity, accessibility, functionality, and timings of use need to be taken into consideration when planning for increased or managed use in the future.	2D – Diversification of tourism based around GI resources is an option for the UK and Ireland's rural areas. Existing designations, i.e., NPs or Forestry Commission sites, are already engaged in GI/environmental based activity, which could be developed further as people spend more time locally. Carve is needed to ensure that places do not overextend such opportunities to the detriment of ecological functionality or the socio-cultural value of specific landscapes, i.e., heritage coastlines.

3. The land-based rural	3A – Changes in UK legislation or adherence to EU environmental policy/legislation have the potential to decrease the level of protection afforded to rural landscapes. The growing number of GI projects, policies and strategies may go some way to limiting any impacts, however, there is a need to consider how biodiversity, water, and habitats directives specifically (but located within the wider family of environmental/GI policies) are mapped onto UK practice.	3B – The impacts of climate change and ecological composition of rural landscapes could lead to fundamental changes in land management practices and a decreased level of functionality across the UK. Questions also need to be asked regarding how we integrate new forms of land management, i.e., nature recovery, rewilding or landscape scale water catchment planning.	3C – COVID-19 has placed pressures on rural landscapes to provide greater recreational spaces and amenities for urban and rural communities. Consideration of the impacts of exceeding environmental thresholds in terms of managing designations landscapes, as well as quotidian rural spaces is needed to minimise overuse and environmental degradation.	4C – The countryside of the UK and Ireland will continue to provide locations for innovations in landscape management, i.e., rewilding, natural flood management (NFM) and/or nature recovery, as well as adapting to the diversifying needs (and expectations of functions/amenities) of rural and urban populations. The value of rural areas as a socio-economic and ecological set of assets will require repeated reflection to ensure it maintains its value to all.
4. The social and cultural rural	4A – see 3A	4B – If the structure of rural communities continues to diversify there may be subsequent impacts on land use and land management practices, which in turn may limit the effective functionality of ecological networks, disturb habitats, and make rural areas increasingly prone to	4C – COVID-19 has increased the visibility and prominence of rural landscapes as places for recreation and the promotion of health/well-being. The latter being important in 2020-21. This has led to increased use, in some cases beyond existing capacity,	4D – The protection and/or enhancement of GI and areas of natural or socio-economic value in rural areas is seen as desirable. However, the added value of such work via the promotion of nature as a socio-cultural asset needs to be moderated by a requirement to

		climatic variation/extremes. Issues of ecological functionality associated with waterways (and flood/natural flood management), biodiversity corridors/habitat fragmentation, and wider ecosystem services functions could be compromised as rural landscape management change. The promotion of Nature Recovery Network, catchment management and innovative upland/landscape restoration works could assist in limiting the extremes of climate change.	i.e., parking and maintenance, leading to conflicts between users/local communities. A consideration of long-term patterns of migration/home ownership also needs to be taken into account, as increases in small populations could place additional stresses on local environmental quality and capacity.	maintain spaces that are ecologically strong. Rural communities are adept as understanding landscape value and working with rural places to manage change. The integration of local knowledge with expert opinion (NE/Defra, or Department of Environment in NI for example), is needed to ensure that new management strategies do not undermine existing landscape practices unnecessarily.

Policy recommendations

To ensure that GI is located effectively within rural policy discussions requires an appreciation of the structures, stakeholders, and needs of rural places, as well as the ways in which the core principles of GI, i.e., connectivity, access to nature and multi-functionality can be integrated into planning and management. However, there is currently no single approach to successful plan for GI in rural locations in the UK and Ireland thus leading to variation in how we use GI terminology, and the resources allocated to it in policy and practice. To facilitate a more effective approach to GI across the UK and Ireland requires both an acknowledgement that all locations have specific policy and practice drivers that need to be recognised. However, there is scope to consider the translation of best practice between England, Ireland, Northern Ireland, Scotland, and Wales in terms of GI terminology, policy, and practice. Potential ways in which rural policy and practice can approach this process include:

a) A more effective linking of the current GI thinking evident in existing policy and practice structures between urban/rural areas within and across each region of the UK and Ireland.

b) Scope to make more effective use of contemporary environmental policy, guidance, and standards, for example the 25-Year Environment Plan in England, the Environment Bill and Planning Bill in Scotland, Planning Policy Wales Edition 11, the National GI Standard and Nature Recovery Networks in England, to support policy dialogues for GI across the UK and Ireland.

c) The potential to remap the environmental policy landscape to better appreciate where GI can be located within it and to better align terminology, actions, and understandings of benefits.

d) Opportunities for a better appreciation of how access, rights to landscape and an understanding of GI benefits can be located with rural planning, development, management, and functionality conversations.

e) Alignment of water, biodiversity, and climate change thinking with housing, socio-economic activities, and transport planning discussions to support socio-economic

and ecological thinking in rural areas.

f) Promotion of a greater awareness of regional variations of GI within rural locations (and across diverse landscape mosaics) to identify best practice of management, policy formation and knowledge transfer.

g) The promotion of a greater awareness of terrestrial, water and coastal variation, as well as GI value in remote rural and urban fringe.

Summary / conclusion

Planning for GI is a complex process, one that is made more difficult by a lack of consistent evidence concerning best practice for the planning, delivery and implementation of GI in rural areas. Consequently, the language and use of GI to structure environmental management practices is more diverse than we see in urban areas. However, a policy and evidence base does exist across the UK and Ireland, although this is somewhat compartmentalised geographically, whereby GI has been located within praxis to support biodiversity, climate change, and water management actions, as well as deliver socio-economic benefits in rural areas. Although alternative terminology might be used to support this work, GI principles are located within rural policy. Moreover, the use of a variety of landscape designations has been a prominent feature of rural GI discussions, as National Parks and AONBs are discussed within policy as delivering several core GI benefits. What is absent in these discussions is a more directed examination of the links between planning for GI and rural policy in the UK and Ireland. A greater level of engagement with the language, principles and benefits of GI would facilitate more effective discussions of environmental management in rural areas in many instances. To facilitate this, we need to make the most effective use of existing GI advocates and their voice within planning policy and practice. Regional or local stakeholders therefore hold a key role in ensuring that national and sub-national policy delivers GI to meet strategic and local needs.

To achieve a more integrated form of rural planning that highlights the value of GI requires planners and practitioners to continue their promotion of its added value. In some locations, i.e., Bath and North-East Somerset (BANES) in England or Derry & Strabane in Northern

Ireland, this is being achieved but this is not universally the case across the UK and Ireland. A more nuanced appreciation of the principles and benefits of GI within rural contexts is therefore needed to examine how and where GI can offer policy hooks and subsequent enhancements to delivery. This is a long-term process and requires a willingness on all sides, especially in central government, to work with specialists in rural areas to consider where GI can aid local development and management priorities. The development of Nature Recovery Networks, BNG and the National GI Standard may go some way to establishing a level of continuity between stakeholders at all scales. If such an alignment of GI and Nature Recovery principles can be embedded in rural policy and practice, then a more directed approach to environmental development and management may be achievable.

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Thematic Review: Agricultural Transitions and the relationship between rural planning and changes to agricultural practices

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Introduction

The term ‘agricultural transitions’ means a shift towards more sustainable farming through alterations to the overall agri-food ‘regime’ or existing sets of practices. ‘Agricultural practices’ includes what is produced as well as methods of production, across the different sub-sectors: cereals, general cropping, horticulture, dairy, grazing livestock, pigs and poultry etc. (DEFRA, 2021). Experts and, increasingly, producers themselves have recognised the environmental consequences of prevailing existing practices across the sector. A recent report by the Sustainable Food Trust (Fitzpatrick et al, 2019:12) notes that ‘[i]n order to make a living, most producers are forced to exploit the natural capital upon which food production depends in ways that degrade it for future generations’, and priced the wider externalities of food production on the natural environment as 96.7p for each £1 spent on production.

At the present time, systemic changes to the overall agri-food regime are likely to occur because of changes to the environmental, economic and social changes relating to the four identified pressures of Brexit, COVID-19, Climate Change and Countryside Adaptation to prevailing changes. Furthermore, the growth of existing ‘niches’ (Elzan et al, 2012) such as local community-supported agriculture (CSA) projects, ‘alternative’ production methods and the adoption of new technologies are continuing to exert influences on agricultural practices, particularly in well-connected ‘close rural’ and lowland areas; whereas in remote upland areas, the prospect of significant landscape change due to economically-driven abandonment of farming continues to linger in the background (Pate, 2018; Manzoor et al, 2021). Significant changes to existing practices may challenge existing levels of self-sufficiency in food production, which are currently estimated to be approximately 60% across the sector in the UK (Statista, 2021). Ireland produces large meat and dairy surpluses, with 37% of meat products exported to the UK in 2016 (Bord Bia, 2016).

The agri-food sector in the UK and Ireland is multi-layered, with a prevailing regime focussed on industrial national and international food production and distribution systems underlaid by a thin, but growing, lower layer of local food networks structured around CSA projects and other specialist niche producers; and, finally, very local or domestic food production through neighbourhood initiatives, allotments and private gardens that currently accounts for an estimated 3% of fruit and vegetable production in the UK (Smithers, 2020). Producers are required to have a certain level of expediency and pragmatism in order to respond to changing economic and environmental conditions, policy shifts, and to be able to make the most of technological and scientific advances. As a result, many farms have redundant infrastructure and buildings created by rapid production shifts. However, this dynamism within the sector can generate significant volumes of ‘noise’ that can sometimes be misinterpreted and misreported as signifying an underlying shift. Specifically, reporting around the specific disruptions caused by COVID-19 and Brexit warrant a degree of caution as producers are adept at dealing with short-term issues, provided that the longer-term outlook remains positive.

That said, the sector has undergone some significant structural changes in recent decades and, against the backdrop of the four pressures, agriculture is likely to be in something of a turning point at this juncture. Since the mid-twentieth century, farms have been declining in number and growing in size, although the average UK farm is 87 ha / 209 acres (MHA, 2019) and approximately 75% of farms are below 100 ha / 240 acres (DEFRA, 2021a) reflecting the diverse farming systems found in UK agriculture (DEFRA, 2021a:98). In Ireland, average farm sizes are smaller, at 32.4 ha / 78 acres in 2018 (CSO, 2018), with a greater focus on the livestock sector. Large farms and farming estates account for approximately 25% of land holdings in the UK (DEFRA, 2021a) while, at the other end of the

spectrum, approximately one third of farms in England and Wales were managed by tenant farmers in 2010, the majority being smaller, livestock holdings (TFA, 2010). Approximately 10% of UK farms, amounting to 200,000 acres in total, are owned by Local Authorities as 'County Farms' that have provided an entry-level route into farming. However, Graham et al (2019) report that the number of county farm landholdings have halved since the 1980s, with 7% disposed-of between 2010-18 (the majority in the two years from 2016-18) with a strong association with austerity measures implemented from 2010.

The long-term trend of farm consolidation and contractual tie-ups with large food retailers has also driven a consolidation of the wider agri-food infrastructure, including slaughterhouses and livestock markets. Large food retailers tend to favour the use of direct contracting for the supply of livestock that are subsequently processed though larger, high-volume abattoirs, contributing in-turn to the demise of smaller, local slaughterhouses. Ryan (2018) reports the closure of one in three abattoirs in the decade between 2008-18, leaving sizeable areas of the UK – including the county of Dorset - without any local provision (Thomas, 2019), in-turn requiring livestock to be transported for longer distances and at greater cost and travel time. This can cause disruption to other activities including additional part-time employment held by a farmer (Per Consulting, 2018).

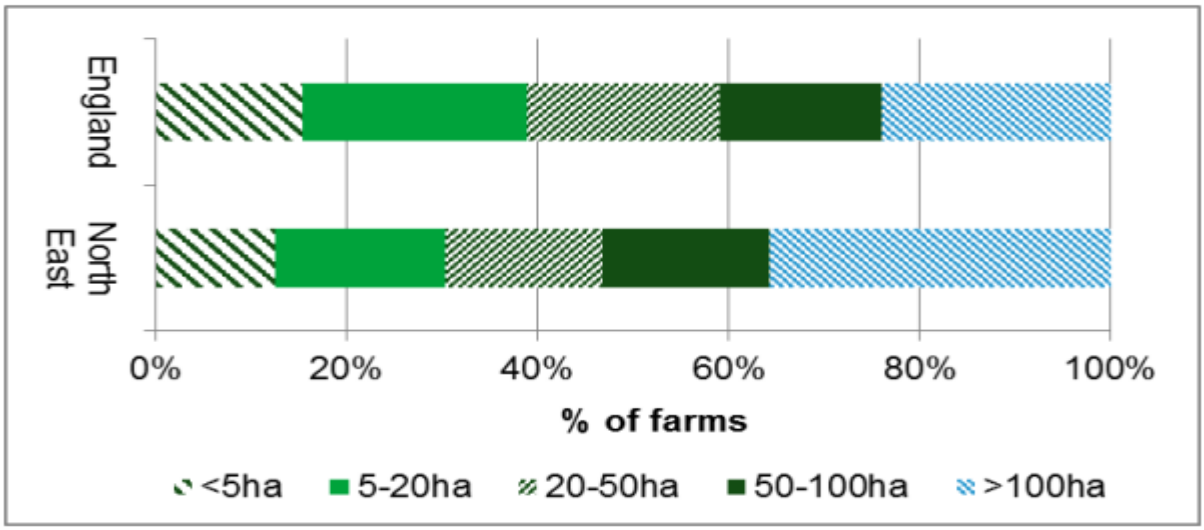

Figure 5 Distribution of farms by size, percentage of farms (DEFRA, 2021a)

The relevance of changing agricultural practices on planning are sometimes difficult to evaluate both because of the freedom and flexibility that the planning systems of the UK and Ireland afford agriculture, and because of the indirect relationship that land use changes have with planning systems. For example, switches in production practices and products usually don't require planning permission per se, but the radical alteration or provision of new buildings and fixed infrastructure often does. Furthermore, significant alterations in practices may, in-turn, have population and workforce impacts that can lead to changes in the demand for rural services and community infrastructure, including schools and healthcare and the availability of buildings and land for repurposing.

Pressures (faced) and essential dynamics

The agricultural sector is tasked with improving its economic, environmental, and social sustainability. This means producing food and agricultural products more cost-effectively, improving economic resilience in the face of disruptive effects of Brexit and climate change, while reducing its environmental footprint and contributing positively to natural and social capital. As Ingram (2017:3) observes, the shift towards a more sustainable agri-food system requires:

> *"A shift from a system characterised as having the goal of increasing productivity, to one built around the wider principles of sustainable production and rural development and resilience; social justice and food security."*

In relation to economic sustainability, the sector has long been subject to pressures to improve production efficiencies, resulting in the consolidation of the sector and a 30%

reduction of the number of UK farms since 1990. Ireland shows similar trends, although farm reduction and consolidation has been less pronounced than in the UK (Farming Times, 2018). Trading conditions remain uncertain while the UK redefines its post-Brexit relationships, including with Ireland, although the governments of the UK are committed to continuing the financial support for agriculture through the Environmental Land Management scheme (ELMs) in England from 2024 (DEFRA, 2021c), Sustainable Farming Scheme in Wales (Welsh Government, 2021) and similar plans being development in Scotland and in Northern Ireland. Climatic instability has also added to existing economic pressures, by affecting cereal crop and horticultural yields, livestock stress and flood damage. For example, 2015 saw the wettest December ever recorded in the UK, with a succession of storm events leading to the flooding of 45,000 ha of farmland in the North of England at an immediate cost £1.7m to livestock and infrastructure, but with much more extensive long-term and indirect impacts (NFU, 2016). The current average annual cost of flood damage in the UK, which is estimated at £1.9bn, is predicted to rise to £3.3bn by the 2050s under a pessimistic 3˚C warming scenario (NFU, 2016).

Economic diversification has been widely embraced across the sector. In the UK, the National Farmers Union (NFU, 2019) notes that 66% of farm businesses have adopted diversification in some form, such as through the development of retail including farm shops, storage facilities, the hosting of other businesses on farm premises, and 6% of farms now offer accommodation. The NFU also notes that the English National Planning Policy Framework requires planning policies to support a ‘prosperous rural economy’ (NFU, 2019). Energy production has become an increasingly important component of farm diversification, with 40% of UK farms hosting energy production of some form to generate a total of 10% of the UK’s electricity (Countryside Online, 2019). Solar PV panels and anaerobic digestion (AD) of biomass are currently the leading production methods, with 70% of all solar production situated on farms (ibid).

Environmental sustainability has become a leading policy priority for the sector in recent years and an area that presents a huge challenge to agriculture, which produces 10% of overall greenhouse gas (GHG) emissions (DEFRA, 2019). Within this overall headline figure, agriculture was responsible for producing the following GHG emissions:

- 70% of total nitrous oxide emissions
- 50% of total methane emissions
- 1% of total carbon dioxide emissions.

The greater proportion of N_2O emissions are in arable farming, from the application of inorganic fertilisers or spreading of manure to the soil or disturbance of organic soils

(histosols), whereas most methane emissions derive from livestock and specific from the enteric fermentation of manure from grazing livestock through anaerobic processes. Thus, the bulk of methane is derived from the decomposition of wet slurry, typically from cattle, held in lagoons, ponds and tanks (DEFRA, 2019), whereas 'dry' manure that is allowed to ferment aerobically as a solid or spread on pastures emits almost no methane. The greater proportion of CO_2 emissions are produced by the combustion of fuel through the operation of vehicles, machinery or buildings.

The UK Department for the Environment Food and Rural Affairs (DEFRA, 2019:86) notes some of the positive outcomes of action undertaken in the sector, but also the displacement of GHG emissions overseas through the replacement of domestic production of imports:

"While production in the UK has fallen overall for some commodities since 1990, which may result in lower total emissions, in the main, domestic production (in particular meat) has been replaced with imports. Therefore, any reduction of emissions in the UK will have been at the expense of increases overseas. There is insufficient evidence to say with any certainty that this displacement will have been of a significantly different level of GHG intensity". Further GHG displacement or 'leakage' is a distinct possibility for the UK because of the potential impact of post-Brexit trade deals.

Regarding social sustainability, in common with global trends, UK and Irish farming is also facing a problem of ageing, with the average farmer in the UK now 59 years old and 40% of farmers now over the age of 65 (Harabin, 2021), while in Ireland 55% of farmers are over the age of 55 years of age (Farming Independent, 2018). In an attempt to bring 'new blood' into the sector, the UK government has recently announced plans for a Lump Sum Exit Scheme for farmers in England (DEFRA, 2021b), which is expected to be complemented by similar schemes in the other UK regions. A further key social sensitivity is the strong continuing connection between culture and agriculture (Berry, 1996) that is particularly prevalent in deep rural areas, where hamlets and small villages retain a farming base. For example, the prevalence of the Welsh language is higher among the Welsh farming community (Welsh Government, 2019) and language is an important social connector in remote farming-based communities. Livestock markets form important nodes in rural social networks in rural areas generally (Per consulting, 2018), and particularly in more remote and upland areas where isolation and loneliness can be particularly problematic. Though, as in the case of the Shaftesbury (Dorset) livestock market, these are also under threat of closure in some areas.

New change drivers and consequences

The four drivers of change (Brexit, Climate Change, COVID-19, and Countryside Adaptation) have added an overall burden of pressure to all sectors of agriculture to a greater or lesser extent and both positively (new opportunities) and negatively (uncertainty and forced changes). Some drivers, such as climate change and adaptation, have already created pronounced structural changes, while others, such as COVID-19 and Brexit have been disruptive with a significant level of uncertainty remaining over the long-term fallout. Lowland mixed and diversified farms already find themselves in a more secure position against the continuing uncertainty of future disruptions and changes, while more specialist farms, including upland livestock farming, generally face greater uncertainty.

Although support for agriculture through the Common Agricultural Policy (CAP) has broadened its focus in recent years to overall 'stewardship' of the countryside, the post-Brexit Agriculture Act 2020 introduces a new Environmental Land Management subsidy (ELMs) for farmers across the UK, in return for the creation of 'public goods' ranging from flood risk mitigation to ESS and nature restoration schemes, as reflected in the three option themes of the ELM schemes available to farmers as follows:

- Sustainable Farming Incentive (SFI), launched in October 2021 with three payment levels – basic, intermediate and advanced levels of ambition – to assist the adoption of progressively advanced environmentally friendly agricultural practices in part or all of a landholding
- Local Nature Recovery (LNR), to be piloted from 2022 and to be available for multiple landowners to participate in a recovery project in a given area
- Landscape Recovery (LR), also to be piloted from 2022 to assist with large-scale environmental projects

Although broadly welcomed, some commentators (e.g., Evans, 2021) hold the view that ELMs could lead to the bifurcation of agriculture between farms primarily focussed on agri-food production and those with environmental stewardship at the fore. A significant loss of agricultural production runs a risk of creating 'carbon leakage', as well as the potential for undermining high production standards, if offset by greater food imports. Although there are opportunities for UK producers to expand exports of food and agricultural products under the

post-Brexit trade deals currently being negotiated by the UK, the current climate seems to be one of uncertainty bordering-on pessimism particularly among the specialist arable and upland livestock farmers most vulnerable to external competition. ELMs may safeguard the future of rural landowners as ‘countryside stewards’, but at the potential cost of the community, social practices and cultural landscapes formed around agriculture.

Climate change continues to make a pronounced impact on the agri-food sector. This can be seen in terms of the sector’s commitment to reduce its GHG footprint as part of the UK’s overall commitment to achieving net-zero by 2050. For instance, in responding to new demand for more sustainable foods and other products, including construction materials derived from agricultural by-products, the alteration of production practices and products to suit a changing climate, and changing agricultural practices and use of farmland for climate change mitigation. In relation to altering practices to reduce emissions, the many synergies between monetary efficiency and emissions reductions have meant that a reported 61% of UK farmers were taking actions to reduce their emissions (DEFRA, 2019), although it has been reported that larger farms are more likely to be taking action, with small farms generally less inclined to view their actions as being significant. Environmental concerns have also driven new food trends including an increase in veganism and a move towards more energy efficient and ‘cleaner’ practices such as organic and biodynamic practices and community supported agriculture (CSA), and to a recent revival in the use of local agricultural by-products for construction such as straw bale.

Climate change has, of course, also provided the impetus to the roll-out of renewable energy in the form of wind, solar, hydro and biomass energy on farmland, often with significant impacts on landscape and to farming practices. In responding to climate change, as already experienced, arable and horticultural growers are sensitive to long-term change as well as short-term disruption. Longer-term responses to climate change include the rapid growth of viticulture, attracting investment from French wine producers, with potential impacts to the built countryside – production / bottling facilities, visitor centres, improved access roads (Gallent et al, 2018). Lastly, the alteration of agricultural practices to mitigate some of the effects of climate change have been spurred-on by recent extreme weather events linked to climate instability, including extreme flooding in the North-west and South-west of England during 2015 and 2016. The role of agriculture in catchment management has been significantly strengthened, such as through schemes to more effectively manage stormwater and the use of agricultural land for flood management, often through the use of wilding and nature restoration approaches.

The COVID-19 pandemic has undoubtedly exacerbated labour shortages experienced as a result of Brexit because of the reduced movement of migrant seasonal workers, but these

movement restrictions have also led to increases in domestic tourism including ‘staycations’. It is still unclear how lasting the disruptive effects of COVID-19 will be. Labour shortages have caused some producers to shift to less labour-intensive products in the short term and, in some instances, to make a structural pivot towards automated or robotic production practices. The recent surge in domestic tourism has meant more visitors to the countryside, staying in farm-based accommodation and enjoying local landscapes, including the farmed ‘cultural landscapes’ of the UK and Ireland. In response, the UK government relaxed the 28-day limit on temporary campsites to 56 days without the requirement for planning permission, allowing some farms to generate significant additional income (Young, 2021). Although there has presumably been a certain amount of discovery and rediscovery, it is difficult to foresee whether the growth in domestic tourism will be maintained in the future. Furthermore, the use of grazing pasture as temporary camping grounds has not been universally successful and the investment into visitor facilities has not always paid off, meaning that a proportion of farmers will choose not to offer accommodation in future years, regardless of visitor numbers.

Finally, the farmed countryside has continued to operate as a site of adaptation in relation to the changing nature and demands of society, including cultural diversity and specific needs of different consumer groups. For example, some livestock farmers have also altered practices to embrace a growing domestic and export market for religious slaughter. Approximately 20% of UK lamb is now produced by halal slaughter (AHDB, 2021) with its focal points, such as Craven Arms in Shropshire, embracing a new ethnic diversity, as manifested by the construction of a mosque in the village (Economist, 2019). Reflecting on the new opportunities of religious slaughter for Lake District farmers, Rebanks (2020:227) observes, ‘The old farmers in our valleys know exactly when the festival of Eid starts and ends because they time their sheep-selling to coincide with the feasting’.

Table 1: Impacts of forces for change on Agriculture Practices

Forces for change (A-D) Rural Area Elements (1-4)	A. Brexit	B. Climate change	C. COVID-19	D. The Countryside as a site of adaptation
1. The built rural	1A – Switches in production and the reshaping and potential rescaling (consolidation) of agri businesses (UK), caused by long-term restructuring of the labour force, market conditions, agri-environmental schemes and new opportunities rewilding and regenerative agriculture assisted by ELMs.	1B – Climatically-driven switches to existing growing (arable, fruit & veg) + changes in consumption patterns leading to the restructuring of agri-businesses and agricultural premises to embrace new opportunities e.g., in food, visitor and energy sectors.	1C – Potential for short term disruption to the labour trigger lasting impact through changes in type (crops) and mode (use of tech) of production. The potential to capture lasting growth of the visitor economy prompted by COVID (accommodation, visitor facilities)	1D - The 1947 Acts have given the built rural considerable flexibility to adapt to changing circumstances, enhanced by NPPF, 2016 Housing & Planning Act.

2. The economic rural	2A – Greater sectoral diversity – with multiple income streams for farm-based households; continued shift from 'raw' productivist farming farming practices towards value added production (manufacturing) and consumption-based activities of the visitor economy.	2B – New growing and consumption patterns bring new opportunities (food, visitors, energy) with the loss of older activities (upland livestock).	2C - A switch to less labour-intensive modes of production could mean changes to the employment patterns of the agricultural workforce as well. But also, an expanded visitor economy.	2D – Financialisation has meant new investment opportunities.
3. The land-based rural	3A – In the UK, post-CAP ELMs will require farmers to alter practices to produce wider public 'goods' (ESS, catchment management, etc. in return for subsidies and labour shortage leading to some switch in production (fruit/arable-pickers/packers) and uncertainty of future trade deals (especially upland livestock). Uncertainties on cross-border trade UK and Ireland.	3B – Greater use of farmland to address climate change issues either adaptation or mitigation e.g. carbon storage, flood resilience, green energy production etc.	3C – Potentially different growing practices and a greater number of visitors accessing the land.	4C – Pressure to rationalise and follow narrow market logic has consequences for landscapes, local communities and societies at large

4. The social and cultural rural	4A – Potentially fewer seasonal workers generally and from outside of the UK, leading to changes in the use of rural community infrastructure (pubs, shops etc.).	4B – Maintenance of environmental and welfare standards in production.	4C – Possibility of a reduced agricultural workforce, but higher visitor numbers?	4D – Pressure to rationalise and follow narrow market logic has consequences for landscapes, local communities and societies at large.

Why intervene (in the existing dynamics)

The central question is whether it is necessary for planning to intervene in the current dynamics of change, and if so, why? A key concern across the UK and Ireland are the competing claims on the land resource, and the continuing pressure to take rural land out of productive agricultural use, for less efficient and sustainable use for other purposes. Perhaps equally concerning, from a farming perspective, are the comparative weakness of the voice for agri-food production in such discussions. In the UK, the rural 'voice' in government was briefly enhanced through the non-departmental Commission for Rural Communities from 2005-2013 that was established to provide a rural perspective on policy discussions and forthcoming legislation across all government departments. It was abolished under the Coalition Government's reform of public bodies. A smaller Rural Communities Policy Unit was subsequently established within DEFRA, which has now been replaced by a Rural Policy Team.

Concerns over the erosion and 'squandering' of the land resource are, of course, long-standing and have been central to the development of planning, stimulating the early arguments for green belts as articulated by Patrick Abercrombie and others, the Barlow Commission's focus on the efficient spatial organisation of land use, and the 1947 Acts, for example. Yet, simplistic and short-term counterarguments that are readily articulated to justify the conversion of rural land to low-density housing development, warehouses and other 'space hungry' land uses appear to have been gaining traction once again in recent years. For example, Worrall (2012) notes that in November 2012 the UK Housing Minister, Nick Boles declared that:

> *"In the UK and England at the moment we've got about 9 per cent of land developed. All we need to do is build on another 2-3 per cent of land and we'll have solved a housing problem."*

Similar arguments were recently put forward by the UK government in support of a Planning White Paper that would have significantly weakened the protection of rural land against

conversion from agricultural use.

Against the backdrop of the various pressures to relax safeguards on the conversion of agricultural land, we identify the following four main reasons to intervene to safeguard existing agricultural land from over-development: food self-sufficiency, biodiversity, climate change mitigation and the sector's contribution to the rural economy.

Food Self-Sufficiency

The UK overall self-sufficiency in food production has declined from a high point of 70% in the early 1990s. Arguments for safeguarding or enhancing the current position include (but are not limited to) food security in the face of known and unknown threats to global logistics chains, food miles and shortening the distances from 'farm to fork', and control of food production standards and methods including (hard fought) welfare, biosecurity and hygiene standards in the livestock sectors, and the environmental standards in arable and horticulture sectors. DEFRA (2019:5) It would not make sense to drive down emissions from UK agriculture by relying more on the import of products that are at least as GHG intensive: this would effectively export the emissions resulting from food consumption, causing "carbon leakage".

Agriculture is socially and culturally embedded in important and diverse ways. Consumer choices have profound impacts on agriculture practices, prized rural landscapes are derived from agricultural practices (and the social and economic value of these) and agriculture remains integral to the rural social fabric and networks associated with food production, trading and consumption.

Biodiversity

Agricultural practices have evolved in recent decades, driven by our improved knowledge of the impacts of post-war intensification of farming on the natural environment, which have been extensively documented. As the 2016 State of Nature Report observes:

“The intensification of agriculture has had the biggest impact on wildlife, and this has been overwhelmingly negative. Over the period of our study (around 40 years), farming has changed dramatically, with new technologies boosting yields often at the expense of nature”.

Yet, although agricultural intensification has been identified as a root cause of biodiversity loss, improved farming practices is also being seen as key to sustaining a recovery of biodiversity. The UK’s various farm support programmes and the EU CAP programmes recognise the need for ‘rebalanced’ rural farming landscapes that retain a strong food contribution if less intensive production components work alongside biodiversity enhancement and rewilding initiatives, as illustrated by the Knepp Estate in West Sussex (Tree, 2018).

Climate change mitigation

Many of the direct connections between agriculture and climate change mitigation are covered in the accompanying thematic review on *Green Infrastructure and Nature Recovery Networks* and *Ecosystem Service Approaches.* However, it should be noted that there are a range of indirect connections, including the use of agricultural by-products such as compacted straw as a carbon-negative construction material and sheep wool as an abundant, natural and breathable building insulator. Miles (2021) notes the marked increase in the use of compacted straw in construction worldwide over the past decade, particularly in North America and France, for increasingly ambitious building projects. In the UK, although there is currently understandable nervousness about the use of such materials in the wake of the Grenfell Tower disaster, compacted straw bale panels have been used in the commercial construction of a range of high-profile schemes by Bristol-based straw bale constructor Modcell, whose projects have included the LILAC low impact cohousing project in Leeds, Hayesfield School in Bath and a development scheme of seven new houses on the edge of Bristol.

Unlike compacted straw, sheep's wool requires treatment to make it safe to use in buildings as an insulator. Yet, the financial costs and other inputs into preparation and production need to be weighed against the abundance of this low-cost raw material across the UK and Ireland, and the low level of energy efficiency across the existing building stock of both countries. The price of wool has been depressed over recent decades because of fierce competition from synthetic fabrics, and the 'wool cheque' received by farmers often does not cover the cost of shearing (BBC, 13th August 2021). Manufacturing of sheep wool insulation is already undertaken at a modest scale by Ty Mawr in Brecon, South Wales and Eden Renewable Innovations in Penrith, Cumbria.

Rural Economy

Food production directly contributes an estimated £120bn annually to the UK economy, through the various stages of growing, processing and distribution. Tourism contributes an estimated £11.5bn in GVA annually to the economy of predominantly areas (DEFRA, 2021d), with 15% of the rural workforce employed in the sector in over 66,000 registered

businesses. In many scenic areas, for example, the Lake District and Brecon Beacons, tourism is based on a landscape largely produced and maintained by agricultural practices, and where visitors provide an important market for local and celebrated farming products, from Welsh lamb to Herdwick wool upholstery and Harris tweed garments, supporting local value-added manufacturing activities, crafts and cultural practices.

Diversity has long been regarded as being key to a solid economic base. In the context of agriculture, diversification refers to the planting or livestock mix, other farm-based business activities, as well as other revenue streams such as income from elsewhere, such as through other employment on or off the farm. It would be unusual for a farm not to be diversified to some extent. A significant switch away from agri-food production may have implications on the diversity of farm incomes and on the secureness of the rural economy in turn.

What interventions are needed

Rural agriculture is sometimes eclipsed by the spotlight on global food supply chains and modern production methods. However, as the analysis in this review has shown, rural agri-food production continues to be foundational to the rural communities, economies and landscapes of the UK and Ireland. Small- to medium-sized farms continue to play a critical role, despite the changes in production regime and growing methods that have occurred in recent decades. The 2020s will undoubtedly see new changes in rural land uses and pressures on the rural land resource for new development. This review identifies four overlapping interventions that are necessary to support high levels of agri-food self-sufficiency, and the rich culture of rural life in turn.

Protection of rural land for agriculture

Agriculture has traditionally enjoyed considerable freedom and flexibility to adapt to changing circumstances, whilst the 1947 Acts and subsequent legislation in the UK have also protected the rural land resource from urban encroachment and blight from unscrupulous development. The recent Planning White Paper for England raised the prospect of a considerable relaxation of these protections. Although subsequently withdrawn, the prospect of blight from new development received considerable attention while the specific impacts on agriculture in near-rural areas received significantly less coverage. In a similar vein, the conversion of agricultural land to woodland, wetlands and other landscapes can often inspire the public imagination and deliver a range of substantial ‘goods’. At a local level, the implications on food production are usually limited in the context of contemporary supply chains. However, agricultural impacts of land conversion would inevitably alter with large-scale projects being mooted for delivery under the Landscape Recovery strand of the UK’s ELM scheme. It is not yet entirely clear how large-scale land conversion projects would be managed through the planning systems of the UK nations, but it is important that food production is given fair consideration.

Maintenance of food production in ‘rebalanced’ landscapes

Research undertaken by DEFRA and presented earlier in this review indicated that a majority of farmers are now aware of agriculture’s role in contributing to climate change and the loss of biodiversity because of intensive farming practices. Many are sympathetic to the idea of rebalanced landscapes, provided that a reasonable income and way of life can be maintained. Therefore, rewilding ought to be inclusive of agriculture, in order to maintain high levels of food self-sufficiency and therefore carbon integrity and food standards, to help keep a diverse rural economy, protect rural communities and culture and nationally and globally important cultural landscapes. Planning should, in turn, continue to support agriculture and rural communities in adapting to changing markets and economic circumstances through the repurposing and adaptation of farm and community infrastructure, to help rural farms and rural communities to stay connected physically and virtually, and to maintain access to social and economic opportunities. Integral to this is the exploitation of opportunities, such as the development of markets for agricultural by-products

such as for construction, creation of value-added processing and manufacturing of products, adaptation to the altered growing conditions of a changing climate and opportunities to capture more of the visitor market.

Local growing and community-supported agriculture

Small-scale growing and CSA schemes have been on the rise in recent years, and Brexit, Climate Change and the renewal of community relations during the COVID-19 pandemic appear to have provided an impetus for new projects. These tend to be focused on the market garden production of fruit and vegetables on or near the urban fringe, for the creation of veg boxes for collection or local delivery – increasingly through sustainable modes of transport such as cargo bikes – or for sale at a local market or retail outlet. Such schemes reduce food miles and help strengthen community relations. However, such schemes usually require polytunnels, sheds, car parks and other permanent infrastructure that require planning permission.

Climate change adaptation activities

Climate change has already seen the introduction of new production regimes to parts of the UK and Ireland, perhaps illustrated readily by the substantial growth in viticulture and the visitor economy associated with wine production in parts of southern England. Investments into new growing regimes such as viticulture can be both significant, and the risks can also be considerable, but the local economic uplift of value-added production activities and tourism can make these endeavours worthwhile. These projects typically require new facilities to accommodate production, manufacturing and distribution of products, as well as road and building infrastructure to accommodate visitor and logistics traffic.

Safeguarding livestock infrastructure

The livestock sector has lost much of its market and slaughterhouse infrastructure in recent decades, largely in response to a transition to a regime of direct contracting and high-volume processing brought in by the major food retailers, leaving large areas of the UK and Ireland without a market or abattoir. This has had profound economic, community and animal welfare implications, as noted earlier. However, market data indicates that the sector has achieved a state of equilibrium in recent years (Per consulting, 2018), while there has also been a greater degree of innovation applied to re-imagining livestock markets and abattoirs as multi-purpose 'hubs'. Nevertheless, many sites make commercially attractive redevelopment opportunities, and once lost are almost never regained.

Reflections of regional and national variations

Aside from the different policy and trade impacts and responses to Brexit across the United

Kingdom and in Ireland, the contamination of water courses from pollutants such as phosphates and ammonia have become matters of increasing concern. For example, across southern Wales high phosphate levels in the Wye and Usk rivers have led to the introduction of stringent restrictions on development in the catchments of these rivers (Natural Resources Wales, 2021). Farming has been identified as one of the major sources of phosphates and is therefore regarded as one of the areas of activity needed to resolve the issue, for example through the storage and management of slurry or phosphate stripping – such as to chicken manure (Midland Farmer, 2021). In Northern Ireland, ammonia emissions have emerged as a threat to sensitive natural habitats including peat bogs. The dairy industry has been identified as a major source of ammonia that has responded through the

identification and implementation of practices to help reduce ammonia gas (CAFRE, 2022).

The purchase of farmland for carbon offsetting has also emerged recently as a threat to farming in areas of rural Wales, with farmers reportedly being unable to compete with the purchasing power of major corporations (UK Parliament, 2022). Once purchased for off-setting, farm holdings are often broken-up, the farmhouse and ancillary buildings re-sold and the land planted for forestry, leading to the permanent loss of the farm as a live-work entity as well as the erosion of the local Welsh-speaking farming community.

The case above highlights the importance of being aware of the local social sustainability impacts of well-intended environmental sustainability measures applied to rural farming economies.

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Thematic Review: Rural Transport (mobility), Connectivity and Energy

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Introduction

Recently, many local authorities have declared either a climate or ecological emergency. The issue of climate change and biodiversity loss have become forefront of the minds of both the public and the planner. New climate governance such as citizens assemblies are discussing how these issues can feed into a bottom-up and participatory process of climate action. In addition, many Local Authorities have developed supplementary planning guidance on climate change and climate and ecological emergencies that involve LPA-specific checklists requiring developers to consider how their proposals address issues relating to energy, sustainable transport and building fabric, which complement national (planning policies).

This scoping review focuses on the issue of rural mobility, connectivity and energy - all three of which are inextricably tied to being able to deliver the right infrastructure to achieve low-carbon or net-zero targets set out by Government and how these approaches differ within the UK and Ireland.

Key issues relating to Mobility, Connectivity and Energy

Mobility relates to being able to access essential services and the meeting of basic needs, such as access to local shops, healthcare and schools. Mobility also covers sustainable transport patterns that enable access to the countryside by way of footpaths and cycleways, which can also be a key driver for nature tourism in some areas, particularly in Areas of Outstanding Natural Beauty (AONBs). *Connectivity* refers to the connection, or lack of, of associated infrastructure to enable mobility and connection within and between places, including appropriate infrastructure (e.g., energy, transport, digital technologies). *Energy* refers to the mode of electrification and heating, such as the extent to which energy mixes are dependent upon fossil fuels and renewables and contribute to a low-carbon, net-zero or carbon negative society.

Whether the wider infrastructure of low- or zero-carbon energy solutions are reaching rural areas is a key issue to promote a circular renewables solution with regard to transportation through the expanded provision of renewable energy infrastructure, and other energy infrastructure more generally. Indeed, recent trends in technology are affecting the traditional logistical networks underpinning both transportation and other infrastructure, such as energy, through increasing electrification, automation and real-time data analysis (DfT, 2021b). The UK's Transport Vision 2050: investing in the future of mobility (Innovate UK, 2021) identifies six key areas to deliver its vision to achieve a 2050 vision: i) travel and transport demand, ii) connectivity, iii) energy vectors, iv) autonomy, v) business models, vi) infrastructure. Innovate UK suggests these will lead to smarter, greener, and integration of transport infrastructure with other services. Due to the extent to which these three elements interact they are considered to be integrated issues within this thematic review, often overlapping in the way they are planned for.

The UK's government's Levelling Up agenda aims to deliver the required investment for infrastructure to enable a more distributed and net-zero growth, which includes enabling rural and semi-rural locations to benefit from improved service delivery. However, there has also been a significant under-investment in rural areas since the 1960s, leading to increased car ownership and dependence, congestion, air and noise pollution and road accidents. Yet, there is a dearth of policy that effectively integrates transport and spatial planning. For instance, the Better Transport, Better Planning, Better Places report (CIHT, 2019, p.5) states that "sustainable approaches to transport are largely non-existent" and that development outcomes are at odds with healthy lifestyles and responding to climate change. Housing developments still contribute to car-centric transportation behaviours and increasing road

traffic and congestion in a context of already constrained transport capacity, which affects health and environmental wellbeing (CIHT, 2019).

In addition, rural areas are often blighted by an urban-centric focus by policy-makers in terms of what is appropriate to rural communities or can be an afterthought (IFT, 2021). Many rural areas struggle to access investment for connected or digitalised mobility services that would facilitate greater access to integrated, low-carbon transport modes (Connected Catapult, 2020). Meanwhile, pollutants caused by fossil fuel-based modes of transport exacerbate public health risks and contribute to climate change (Mueller et al., 2017). In the UK, the transport sector is the largest contributor of greenhouse gases, contributing to 28% of emissions in 2018 (BEIS, 2018; DFT, 2020). These continue to rise, despite gains made in the efficiency of manufacturing of cars (see CCC, 2021).

More recently, there has been greater attention to the role of the 20, or even 15-minute neighbourhood where essential needs and services are accessible within this period of time - particularly in urban areas and cities. Where these have been successfully introduced, they have been found to promote community cohesion (Morris et al., 2020). However, they can also run counter to trends of consolidating local services and the way planners currently plan. In addition, 15- or 20-minute neighbourhoods work best in older housing stock, but much of England's housing stock is post-war (RTPI, 2021). In addition, the visibility of rural communities is not as clear as urban areas and are less easily mapped (Lord Dillington, 2015). A lack of spatial data on the location of new homes affects the planning systems' role to determine how they meet wider sustainability objectives (RTPI, 2018). How these can be translated into effective and sustainable lifestyles in a rural context where settlements are more dispersed, and services are not always located in the immediate area is a key issue in terms of promoting environmentally-sensitive and resilient communities in the future.

Mobility

Access to transport in rural areas

The Scottish Transport Strategy (Scottish Government, 2020) estimates that, in optimal conditions, one double decker bus could replace 75 private cars. Urban residents tend to have a lower carbon footprint than rural areas (Centre for Cities report Net zero: decarbonising the city; Catapult, 2020). In the UK, 95% of households in rural areas (outside of towns) have access to a car, compared to 66% in urban areas. 75% of trips in rural areas are made by car, compared to 52% in urban conurbations (2018 National Travel Survey, DfT 2018). Car traffic in the UK decreased by 24.7% between 2019 and 2020 due to the effect of lockdowns, but rebounded and is expected to grow even more, with car traffic increases estimated to rise between 11%-43% by 2050 from 2015 levels (Innovate UK, 2021). In Ireland, public transportation rates were already in decline before the pandemic where trips by bus and coach fell between 2009-2018, from an average of 234.1m between 2005-2009 to an average of 226.7m in 2018 (CSO, 2019).

Yet, overall, there much there is still little in the way of research or policy on transport outside cities. Rural communities also take more trips per person and travel further, compared to urban areas (DEFRA, 2018, cited in CILT, 2021) and trips revolve around an 'urban halo' of urban-based services (CILT, 2021). For instance, rural Scotland accounts for 98% of the land mass but only 17% of the population live there, meaning that rural households have to drive further to local services (Scottish Government, 2020). As such, rural areas are on average nearly twice as far from their nearest services as urban areas (CILT, 2021), such as town centres and hospitals, though different regions and extent of rurality affect these distances (RTPI, 2021). In Ireland, CSO data (CSO, 2019) revealed that the most rural areas are often over 40km from some essential services, such as hospitals and train stations. They found that the average distance to a public bus stop in the most remote areas is 17 times longer than in cities, or 14 times longer distance to a train station.

Those without access to public transport in rural areas also experience constraints in access to employment opportunities (DfT, 2021). The higher rate of ownership among rural households also brings with it an additional cost to maintain multiple cars (CILT, 2021). However, CSO's Household Environmental Behaviours - Energy Use data (CSO, 2021 - see

below) indicates that those living in rural areas are less likely than urban areas to consider purchasing an electric vehicle when they next change their car. This is also an embedded issue within urban development too; RTPI research highlights that, in the English context, access to amenities in new residential developments was twice as fast by car than public transport, and three times quicker than walking (RTPI, 2021). Even Garden Villages and Garden Towns are at a high risk of becoming car-dependent as 'commuter estates' due to the current configuration of the (English) planning system.

Finding public transport services to match the flexibility and freedom of having a car is hard to replicate (Catapult, 2020). Safety concerns, such as lane width, potholes and increased delivery vans affect potential increased uptake of cycling (Catapult, 2020). Public transport information is often hard to access, services have been cut or are not integrated and cost-efficient; meanwhile, trials are short-lived and fail to change habits (Catapult, 2020). Cuts to bus services in England have been particularly hard hit, with the devolved administrations in Scotland and Wales maintaining a higher number of services (CILT, 2021). The lack of accessibility targets and a regional approach is one of the key challenges of effective rural transport solutions.

Pilot projects underestimate the time to set up a service and the speed of behaviour change and knowledge dissemination; short-term funding is constrained by a competitive funding environment that is more focused on high-tech, urban-based innovations (ITF, 2021). If few people use a service - sometimes less than 1% of a population - it becomes hard to draw meaningful conclusions. Meanwhile, innovations are often copied from the urban areas and are not always viable or practical in an urban context (IFT, 2021). Pilots are often disconnected from the wider transport network, and funding is not long-term to accommodate this. Meanwhile, filling the gaps through community transport is considered unsustainable if reliant solely on volunteers to keep costs down (CILT, 2021). Indeed, it is imperative that carbon emissions and transport equity are tackled together.

Mobility-as-a-service (MaaS) would require higher coordination of transportation modes to provide different services (CILT, 2021). There have been some examples of innovation in local service provision, such as where community services are paid for by the beneficiary, e.g., the National Trust and the Dales Bus in the Yorkshire Dales National Park which have reduced tourism-related traffic in some areas (CILT, 2021). In Cornwall, the One Public Transport System includes 102 new green buses which aims to connect more communities, while the CoastHopper links villages along the coast of north Norfolk. In Sevenoaks, England, villages can now use their smartphone to access on-demand public transport through the G02 network and similarly, the ArrivaClick on-demand minibus scheme in Leicestershire (Graham, 2021). Additional suggestions have been to increase the use of

drone delivery to more remote areas (DfT, 2021a). In Scotland, for instance, tourists and residents in rural areas can access shared bike schemes. VeloCity is proposing to convert disused bridleways and footpaths into “cycling and walking networks” so that villages can access each other’s services more easily.

The planning system and its capacity to cultivate mobility

There is a need to better understand existing and potential users of different transport modes, whereby needs and transport provision should match latent demand of how people would like to move around, rather than doing what is available to them to render such schemes viable and able to guarantee independence (Catapult, 2020). These issues are all essential aspects of the planning process and its role to provide suitable and sustainable housing, infrastructure for employment opportunities and other essential services. CIHT’s report suggests that a more “efficient and integrated planning and transport system is required” (CIHT, 2019, p.5). Yet, in an English context, this is currently hampered through the lack of targets set in Local Plans relating to accessibility (e.g. quantifying the planning system’s contribution to sustainable transport from the more general aims set out in policies such as the NPPF through measurable targets), a risk-averse or reactive culture amongst planners due to a lack of innovation and sharing of best practice and ineffective coordination between planners and transport bodies (CIHT, 2019, p.5).

Various solutions have been proposed to explicitly link transport and planning. Transport for New Homes has developed a checklist for new housing developments (Transport for New Homes, 2019) designed for local authorities, developers and neighbourhood groups. The checklist includes measures to encourage greater integration of transport and development which can be rated as either red, amber or green for how well it reduces car-dependency. Catapult suggests that local authority district-level data can be enhanced by data relating to accessibility in terms of physical (road and rail) networks and digital connectivity, while public transport data and frequency can help determine the extent a community is “rural” (Catapult, 2020). As part of the AsSeTS Project (Assessing Alternative Mobility Solutions for Rural Areas in the UK), the DfT worked with Catapult Connected Places to improve data for on-demand new mobility services, including in rural contexts, to generate a demand model so that commercial approaches can be tailored to variables such as population density and travel demand and patterns, leading to workable on-demand New Mobility Services (NMS).

The State of the Nations 2020 report (TPS, 2020) reviewed UK travel trends and behaviours, current government policy, regional transport planning, spending and investment and transport taxes and charges. It found that transport planning will be pivotal in how decarbonisation is managed and will require additional spending and taxation to meet the challenge, with clear objectives set out in transport strategies aligned to such public investment. The report suggested that transport planners need improved tools, data and flexibility and, where possible, local authorities should be allowed to raise revenues to complement national government funding, as in the case of Transport for London (TfL). The IFT suggests governance reform is required to restructure rural planning to become more integrative and coordinated so that transport networks can become more self-sufficient, with reliable funding streams to support rural transport innovation. Regulatory sandboxes to test roll out initiatives in other contexts are also required while co-developing solutions with communities on the ground is vital so services and demand are synchronised (ITF, 2021).

The RTPI has also suggested that making the case for the accessibility of new residential developments to key amenities is a key means to do this. As such, the planning system should be encouraged to be more outcome-orientated towards the delivery of wider societal goals (RTPI, 2020). CIHT's report further suggests that Local Plans ought to "commit to a compelling and clearly expressed place-based vision" of fully integrated and mutually reinforcing elements of sustainable development tied to an Infrastructure Delivery Plan (IDP). This should include transport and mobility, as well as promoting more effective partnerships and integrating a degree of flexibility within the implementation of Local Plans to achieve appropriate outcomes. This could include ensuring that developments are located in areas that can be serviced through an expanded transportation network through the use of modernised and flexible transportation hubs, particularly those that can be provided by integrated community providers, see Public Transport).

Connectivity

Planning policy has a role in encouraging active travel and reducing dependence on the car, and for making transport infrastructure accessible; as we have seen, there is scope for much greater integration of planning and transportation solutions (see DfT, 2021b; RTPI, 2021).

The location of housing developments is often not tied to existing employment opportunities (based on a 'predict and provide' model of demographic data, which does not afford an integrated vision of linked environmental and social issues). This further increase traffic and pollution in other areas, encourage out-commuting and possibly associated levels of inactivity (and obesity - nearly a third of children and 60% of adults are overweight or obese, resulting in £6bn of costs to the NHS and £27bn of wider associated costs, DfT, 2021b). These outcomes can dampen the potential cohesiveness of communities if there are few services and opportunities available locally, particularly for older or more vulnerable residents.

Railways and connectivity

As the Museum of English Rural Life (n.d) suggests "Railways transformed the relationship between town and countryside, enabling people and goods to be moved much more efficiently and quickly between the two". The importance of railways to rural communities is expressed by Stephen Joseph (in Salveson et al., 1998, p.5), whereby "[t]hey provide access to employment, education, shops and leisure, as well as to friends and relatives, of a far higher quality than any bus service can. At the same time, they help relieve rural roads from the increasing traffic which is smothering local communities." With proper investment, Joseph suggests railways could become "the spines for economic development in rural areas" (Stephen Joseph in Salveson et al., 1998, p.5). Railways could help to bridge more entrenched connectivity issues between rural towns and cities, such as rural towns like Skibbereen and nearby cities Cork or Dublin in Ireland.

However, rural areas are still living with the impact of the cuts to their railway infrastructure in the 1960s under the Beeching reforms which saw the loss of a significant amount of connective infrastructure from urban to rural areas. These cuts were predicated on the financial loss railway companies were facing as a result of the increased use of the private car. The cuts were notably worse in Cornwall where 55 stations were closed under the Beeching cuts (Trewhela, 2019).

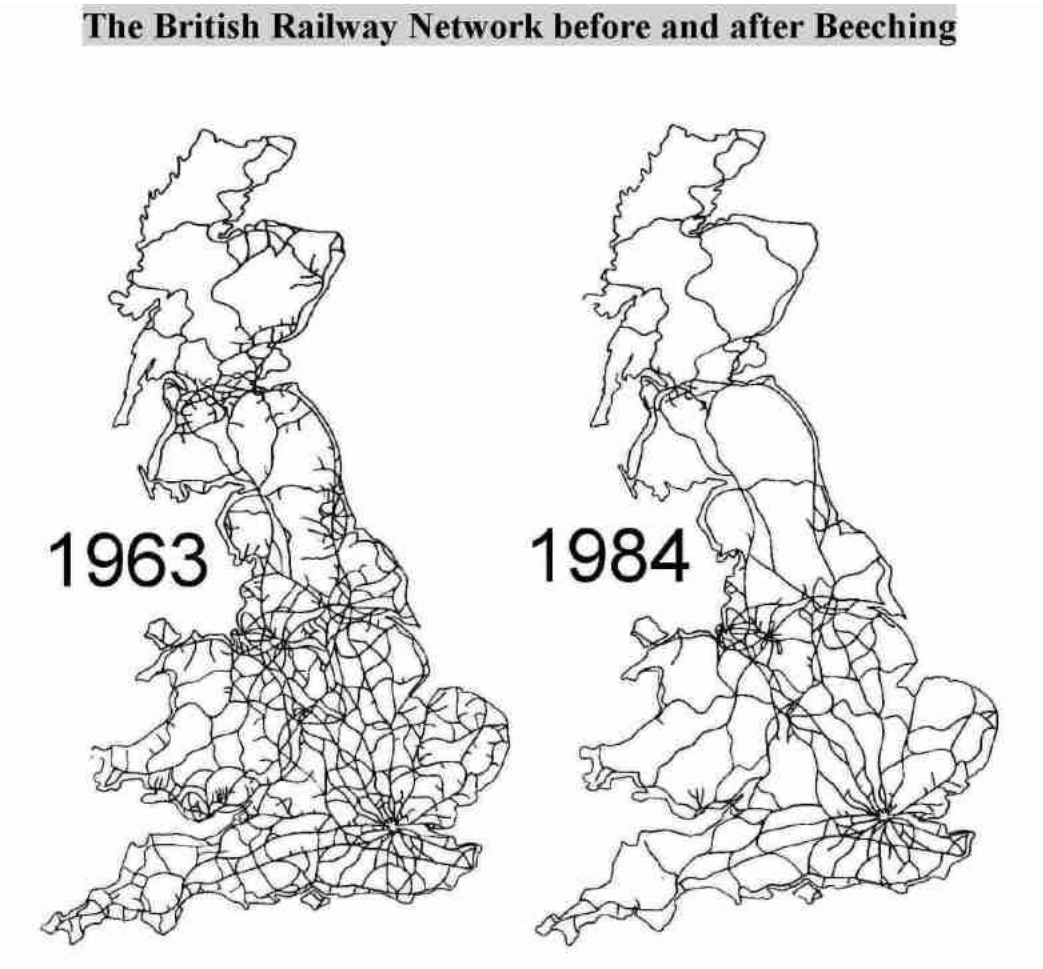

Figure 6 The British Railway Network before and after Beeching (Williams, 2011)

Development of railway infrastructure is typically a strategic matter, often of national importance. Transport in Scotland and Wales is devolved, yet Network Rail owns their rail assets. Northern Ireland has an independent rail network. As of May 2021, passenger levels were only 39% of pre-pandemic levels and there has been a £1bn cut to Network Rail, resulting in a £2.9bn shortfall in revenue (Topsham, 2021b). There are now railway reforms underway to create and reopen railway lines in England which the government intends to deliver a simpler, more accountable rail network that would reduce financial inefficiency. These proposals will still mean a largely privatised rail network, though rail infrastructure and services will be under the control of a public body that will subsume Network Rail. Some critics believe that this delivery model fails to offer a transformative

railway infrastructure - such as a more locally-focused approach - and is “a missed opportunity to make a clean break” where private companies will still benefit in profit at the expense of “a truly integrated national rail network” (RMT General Secretary, Mike Lynch cited in Topsham, 2021b). ScotRail has declared that it was not consulted over the reforms, despite its franchise being nationalised under the new proposals. Wales has yet to agree to the proposals (Topham, 2021a).

There are encouraging signs of greater connectivity of rural areas that reverses the Beeching Cuts. For instance, there are plans to reopen the 14-mile line between Exeter and Okehampton in Devon which closed almost 50 years ago. In Scotland and the North of England, the Borders railway reopened in 2015 which connects the Scottish Borders, Midlothian and Edinburgh.

Indeed, there are some calls for community-led innovation in the servicing of rural railway networks as a result of the increasing value of railway networks for rural communities that may once again face the threat of cuts to their infrastructure if pre-pandemic passenger numbers do not recover at a financially viable rate (Salveson, 2020). In 2020, The Rail Reform Group - a thinktank for railway professionals - published articles that examined how the railway network could be run for ‘the common good’. Enterprising Railway mirrors the experience of European railways running as independently owned and managed rural networks. In such a model, profits would be reinvested back into the railway, rather than as dividends for shareholders, with board members drawn from passengers, employees, local government and the business community. As Salveson argues “what could work is a combination of greater local management, empowered to do much more than just run trains, with the security of being part of a much bigger network”. For instance, community-led transport schemes using independent, community hospitality services (such as the Settle-Carlisle Railway Development Company) (Salveson, 2020). Under the model suggested by Salveson, a community-led approach to rural rail networks would have even closer links to the planning process, such as siting affordable housing near to railway stations, facilitating complementary transport and other services to support community-led local economic regeneration.

Digital connectivity

Many rural areas are experiencing ‘digital poverty and technological barriers’ that affect how they access mobility services (Catapult, 2020, p.13). Many rural areas have poor 4G coverage and no public Wi-fi access and most rural telephone exchanges use older and slower technology. In Ireland, some rural areas (such as the Border region) have much less access to the internet at 84%, with the lowest level of access being 67.8% in ‘Highly rural/remote areas’ (CSO, 2019b).

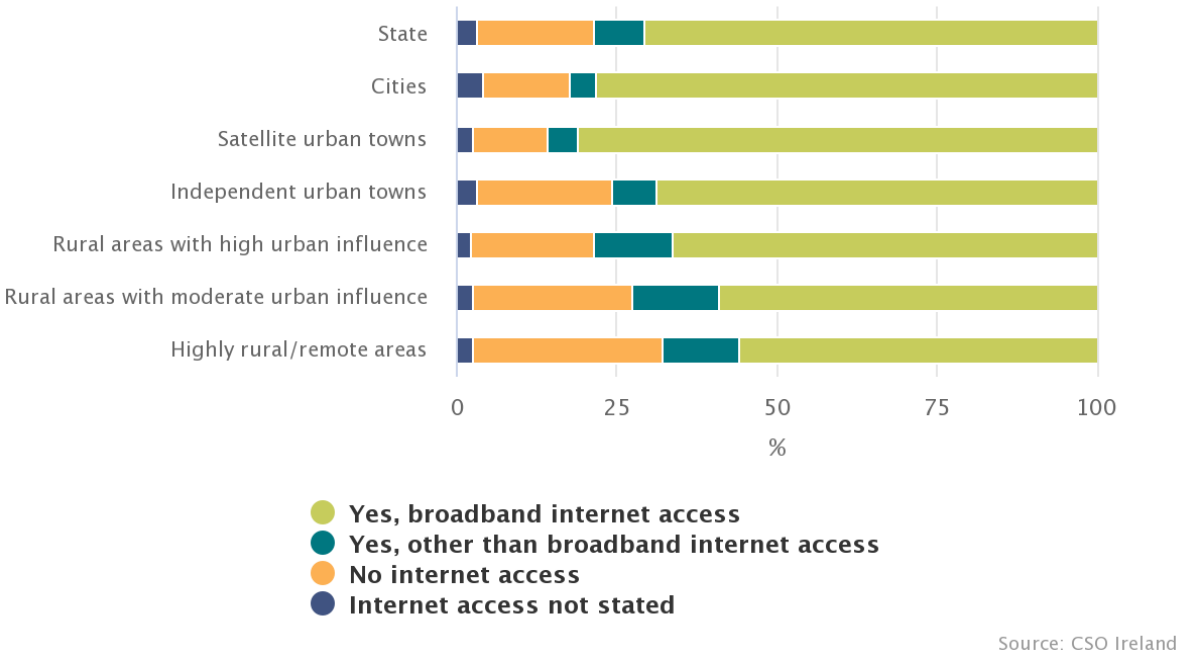

Figure 7 Levels of internet access in Ireland (CSO, 2019b)

The UK telecommunications regulator Ofcom aims to roll out 95% of UK 4G coverage by 2025 (Ofgem, 2019, cited in CILT, 2021). Openreach (which maintains the UK’s exchanges and street cabinets) has upgraded most of the network to Asymmetrical Digital Subscriber Line 2+ (ADSL2+) standard with speeds of up to 17Mb, but rural areas are typically on older

ADSL Max systems, where speeds reach up to 7.5Mb, or even as low as 2Mb. While fibre has been rolled out to 90% of UK households, the remaining properties are in rural areas. Even when fibre is installed into an exchange, if the wires taking the signal to the property are copper then the full effect of fibre is much reduced.

In addition, many rural areas have 'not-spots' - areas where mobile phone coverage is 3G (which is due for removal in UK networks) or which have no mobile signal at all. In July 2018, the Government published The Future Telecoms Infrastructure Review that set targets for the availability of full fibre and 5G networks. The Government has committed to a £5bn 'Project Gigabit' upgrade to half a million rural properties and businesses under its levelling up agenda, in addition to a £500k plan to improve mobile services in rural Scotland, Wales and North East England. While broadband is often not considered 'a planning issue' by some LPAs, planning policy guidance is clear on the role of planning in enabling the roll out of such infrastructure and enhancing connectivity, particularly in rural areas. There are also collaborative schemes between providers to support rural areas, such as the Shared Rural Network. In Ireland, the government is rolling out its National Broadband Plan while private operators such as Eir and Elon Musk's Starlink are also rolling out or piloting high-speed internet in rural locations (Keane, 2021). Overall, digital innovation is bridging previous remoteness that prevented rural regeneration, particularly in Ireland.

There are also wider questions of the connectivity of natural with social infrastructure. For instance, the *Green Infrastructure (GI) and Nature Recovery* thematic review carried out for this project asked whether GI should carry an additional weighting if these natural assets are walkable from rural settlements, or whether a lack of access undermines their wider contribution to well-being and social value. The review also suggested a need to evaluate how and whether people - and indeed who - can move freely around rural areas via Public Rights of Way (PRoW) networks. For instance, while natural spaces grew in popularity in the main during the COVID-19 pandemic, people from lower-income households or ethnic minorities accessed natural areas less or experienced discrimination in some areas when doing so. Greater understanding of access to natural infrastructure will therefore affect how it is planned for in rural areas.

Local-level GIS software, such as Parish Online (see case study), are incredibly helpful to map community assets and the software has been used by several neighbourhood planning groups in England to create specific maps relating to development and green spaces. Parish Online has various national data layers such as Ancient Woodland, Flood Risk, Listed Buildings etc and communities can map their own layers onto it for plan-related issues, such as development sites or local green spaces. For instance, the Ordnance Survey Mastermap is updated every 6 weeks to show new housing, changing woodland etc. However, when

exported as a Jpeg or a PDF, such maps become static and mean that the data and the plans themselves can become outdated. Meanwhile, some capacity issues with local users can mean the creation of the maps is outsourced to consultants and communities lose the potential for GIS-informed development and resilience planning. There is thus great potential to leverage these tools to rural areas to encourage them to map local assets, thus bridging a data divide between rural and urban areas, while also using them as an instrument to link to wider LPA systems, such as nature recovery mapping and locally-identified projects for biodiversity net gain, flood management planning and monitoring of community issues on-the-ground.

There is also a need to consider changes in the (rural) economy due to pressures from climate change and opportunities under the net-zero agenda. For instance, PWC's Green Jobs Barometer takes a UK-wide, devolved nation or regional assessment on which are the best and worst performing areas across different pillars, such as green job creation, wider benefits from green jobs, sunset jobs (jobs lost to the green transition), carbon intensity of employment and green workplaces on a comparative index. Tools such as this could help to improve the co-location of green infrastructure in rural areas, if such a tool could be scaled out to be applicable at the Local Authority area to enable planners to assess data on the green economy with wider rural mobility and infrastructure needs. Graham has also suggested that villages could set up village co-working hubs so that freelancers and start-ups can create a localised, shared centre for enterprise that could help stimulate rural productivity and connectivity (Graham, 2021). While in Ireland, some are calling for Irish ex-pats that left in the recession to come back and carry out jobs in remote areas and rural enterprise hubs are gaining traction (Keane, 2021).

Catapult's report suggests that rural mobility needs to be considered within a data-driven solution that cuts across administrative boundaries, such as an LPA, with more focus required on door-to-door travel patterns that can be integrated with scheduled public transport (Catapult, 2020). This might require a mobility hub where they can access on-demand services through digital technologies, including electric vehicles and bikes (for instance through car clubs), while the use of lockers could reduce the mileage of door-to-door delivery vehicles in some of the most remote areas (see Catapult, 2020).

Mobility in the context of COVID-19

The COVID-pandemic and the widely accredited move towards a “new normal” has affected rural connectivity in different ways. For instance, lockdowns acted as a catalyst for accelerating digital connectivity, with more people using apps to access services, such as council services (Catapult, 2020). Many people during lockdown saw them as a way to change lifestyle habits, by supporting local high streets and making fewer car journeys. These changes in the public mood towards an appreciation of the local offers the potential to underpin innovations in rural community mobility modes and patterns (Catapult, 2020). Though, while the COVID-19 pandemic may stimulate an increase in the demand for tourism in rural areas it may reinforce the preference for individual transportation modes, and in particular the private cars. However, if service delivery is not radically altered, there is a risk that this potential momentum for lasting change may be missed.

A Rural England (2022) report the *State of Rural Services 2021: the impact of the pandemic* suggests that many rural market towns showed themselves to be more resilient than may have been expected amidst an increase in online services. Though, diminished public transport footfall is yet to recover; most respondents to an associated survey carried out for the report indicated they would visit town centres less often (53%), would use local shops more often (47%) and would use public transport less often (20%). Such a focus on the local environment as a result of COVID saw an increase in cycling and walking but the fall in public transport has led to cuts in these areas (DfT, 2021).

Figure 8 UK Transport usage by selected modes since March 2020 (DfT, 2021b, p.20).

To promote more staycations and improve the experience of them, innovations in mobility can also promote sustainable tourism development. In Germany, for instance, a tourism tax for hotel users is partly invested in shared mobility transport schemes where tourists can use these modes of transport for free (if they have paid the tax).

Energy

Overall, energy consumption in the UK fell by 13% between 1990 and 2019 and the share of renewable energy in overall energy consumption in the UK increased by almost 12 percentage points between 1990 and 2019. The contribution of renewable energy to the UK's energy infrastructure has led to a 10% reduction in $C0_2$ since 2009. However, carbon leakage from imported goods and services and Scope 3 emissions are not always sufficiently captured in such figures.

Energy mixes across the UK and Ireland

In Scotland, energy consumption fell from 170,000GWh in 2010 to 155,000GWh in 2020. Such consumption is dominated by heat (51.5%) followed by transport (24.5%) and electricity (21%). Renewable energy capacity in Scotland has increased by an average of 700MW per annum since 2009 (with a total capacity of 12 GW) but has plateaued since 2019. Onshore wind is the single most installed renewable technology, with 71% of installed capacity (or 8,670 MW). Comparatively, overall, energy consumption of NI was 47,039 GWh in 2017, or 3.3% of the UK's total energy consumption.

Overall, renewables account for 97% of Scotland's gross electricity consumption (from 24% in 2010). Hydroelectricity is the next highest electricity technology in Scotland, with 19% of total output (6,187 GWh). While the highest mix of renewable heat in 2020 was biomass (81% or 1,730 MW), followed by heat pumps (13%, 270 MW). However, this only accounts for 6.4% of Scotland's non-electrical heat demand in 2020, meaning the 2020 target of 11% heat generation by renewable technologies has not been met. In total, the renewable sector employs 22,660 equivalent FTE employees directly and indirectly across a range of services, with the greatest in onshore and offshore wind.

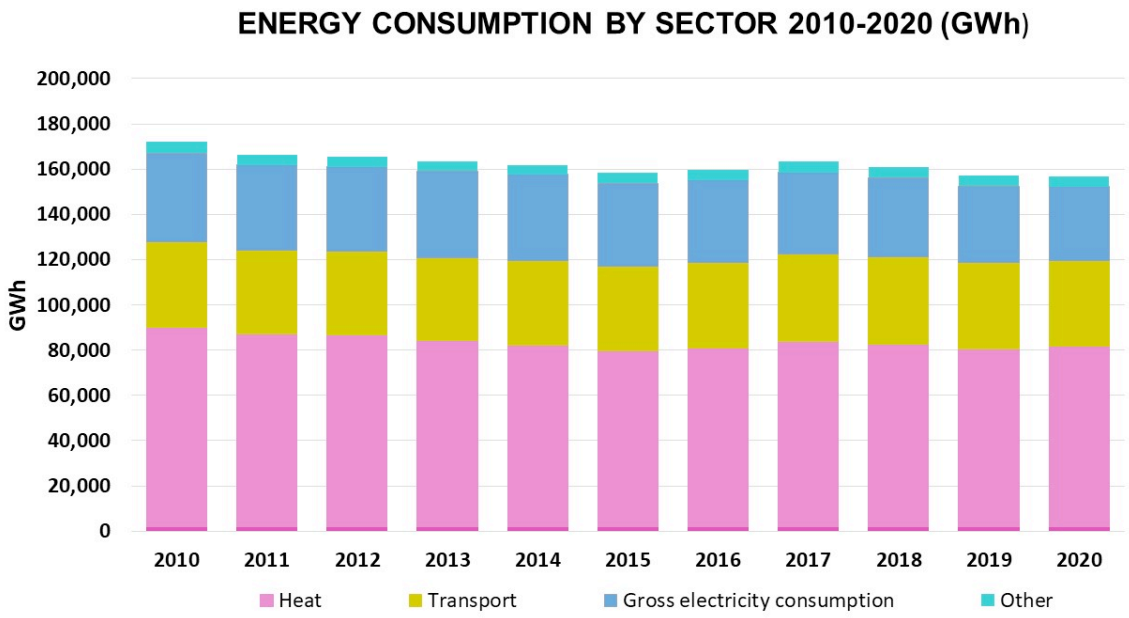

Figure 9 Energy consumption by Sector 2010-2020 in Scotland (Scottish Renewables with data from Scottish Energy Statistics Hub)

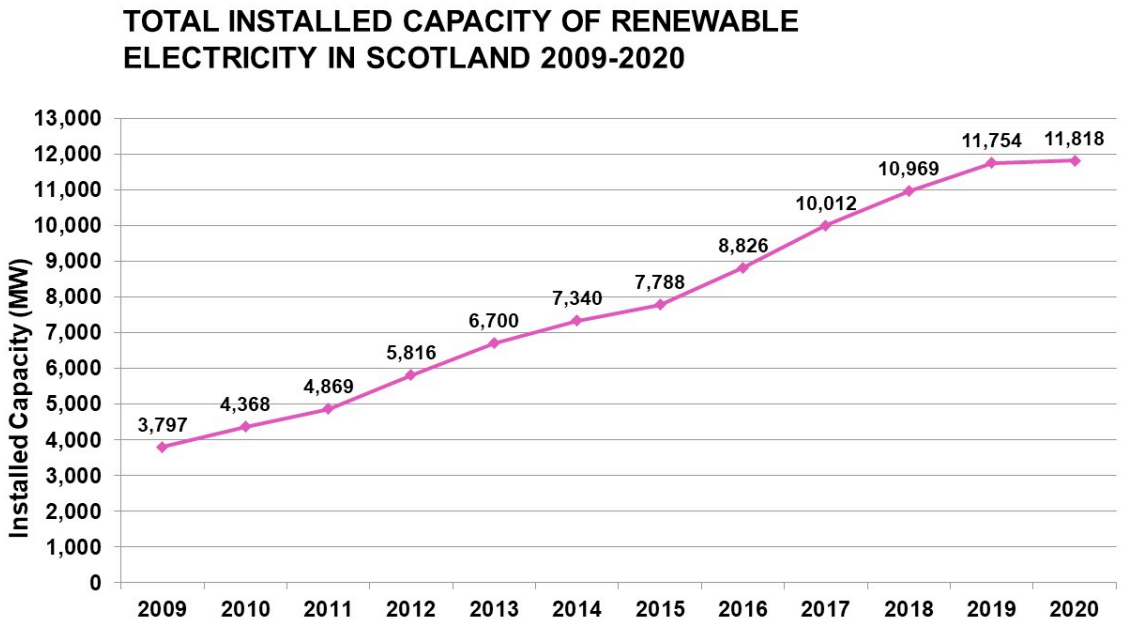

Figure 10 Total installed capacity of renewable electricity in Scotland 2009-2020 (Scottish Renewables with data

from Scottish Energy Statistics Hub)

In Northern Ireland, petroleum-based fuels constitute 58% of the country's energy consumption; oil is used in 68% of homes, far higher than the rest of the UK (Lowes and Mitchell, 2021). Northern Ireland imports nearly all its oil and gas from abroad.

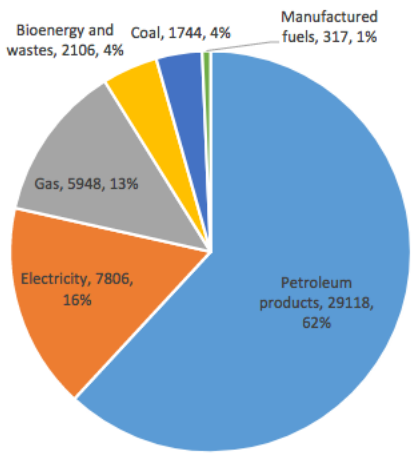

Figure 6 - Northern Ireland final energy consumption split by fuel for 2017 (GWh/%). Based on Energy in Northern Ireland 2020 (Lowes and Mitchell, 2021, p.12)

In Wales, renewables accounted for 27% of the country's total electricity generation in 2019, with coal, nuclear and gas consumption falling from 2016 onwards (Welsh Government, 2019).

Table 3 Electricty generation projects in Wales (as of 2019) (Welsh Government, 2019, p.4)

Technologies	Number of projects	Electrical capacity (MW)	Estimated electricity generation (GWh)
Fossil fuels	102	7,419	20,461
Coal	1	1,586	631
Diesel	13	184	643
Gas	88	5,650	19,187
Storage	209	2,088	-
Battery storage	207	29	-
Pumped hydro	2	2,088	-
Renewables	56,860	3,372	7,470

On-shore and off-shore wind accounted for a significant proportion of the total renewable electricity generation mix, while biomass heat accounts for the largest proportion of renewable heat in Wales (Figure 11).

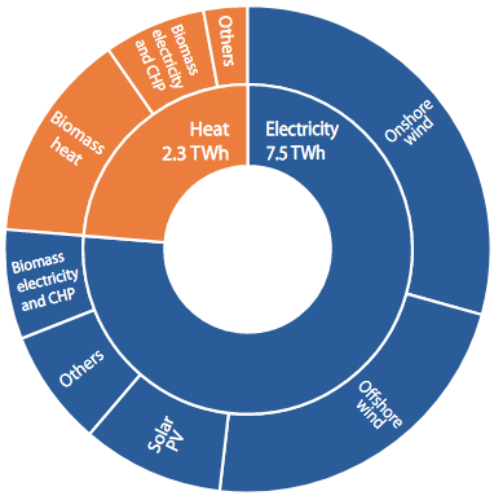

Figure 11 Wales' renewable electricity and heat generation as a share of total capacity (Welsh Government, 2019, p.5)

In Ireland, as of 2017 renewable energy accounted for 30.1% of Ireland's electricity generation (CSO, 2019). Only 4% of rural households use natural gas as their mean heating source and three counties (Donegal, Leitrim and Sligo) are not connected to the gas

network and Longford has no residential connections (CSO, 2019). Rural counties are more likely to use heating oil as their main heating fuel, with 66% of households in the Border region and 58% in the West, compared to only 8% of households in Dublin using oil as their main heating source. Solid fuel (such as wood logs and pellets, coal, peat) used as the primary source of heating was highest in the Midland region (31% households), compared to Dublin (2% of households). Though there has been a 31% reduction in the proportion of dwellings built using heating oil since 2000 (CSO, 2021c) there is still a tendency to use kerosene as a heating fuel for rural properties.

% of weighted households

	Natural gas	Heating oil[1]	Electricity	Solid fuel[2]	Other
Border	4%	66%	7%	20%	2%
Dublin	69%	8%	18%	2%	1%
Mid-East	45%	36%	8%	6%	2%
Mid-West	27%	43%	13%	13%	3%
Midland	16%	44%	6%	31%	2%
South-East	20%	52%	11%	14%	1%
South-West	33%	44%	11%	8%	2%
West	6%	58%	13%	17%	3%
State	37%	37%	12%	11%	2%

[1]Kerosene, diesel/gas oil and LPG

[2]Wood logs, coal, peat and wood pellets

Figure 12 Main Heating Fuel by Region, Quarter 3 2021 (CSO, 2021)

Trends towards community energy and a move towards Distribution System Operators (DSOs), or entities responsibility for distributing and managing energy from renewable sources to consumers, brings a more decentralised energy framework and the potential for community energy groups to bring in community-led and owned energy infrastructure within the energy supply chain (IRENA, 2019). This is anticipated to lead to a more democratic energy system given that generally motivations to engage in community energy initiatives tend to be centred around concerns relating to social justice, fuel poverty and community resilience in the face of climate change.

However, as RegenSW points out, community groups are still held back by network and grid constraints, lacking in-house capacity and a general dominance of established energy companies. Though, initiatives such as the industry-led Open Networks Project are seeking a more inclusive approach to energy transitions. While Local Area Energy Planning (LEAP) offers the potential to broaden engagement in the wider benefits of community-energy owned assets and tools. For instance, planners and communities could consider how they plan for co-benefits from energy infrastructure, such as employment and community benefits (complementing, for instance, England's Community Infrastructure Levy which is generated from new development). Steps such as these would reflect a transfer from a 'local ecosystem' - local social and environmental benefits and accruing value to an area - to a more systemic 'energy ecosystem' approach - where energy operators take an integrated and collaborative approach to secure a mix of community and privately owned solutions.

Households were the highest user of fossil fuels in the UK in 2019, compared to the energy, manufacturing and transport sectors. Many rural areas are locked into fossil fuel energy infrastructure, such as oil tanks to heat their homes and are not connected to the national grid. There are thus huge potential challenges and opportunities to address this and explore locally-generated renewable energy solutions, including those developed through community energy and microgrids (self-sufficient energy systems that serve a discrete geographic footprint - see the Bridport Cohousing Microgrid, Hazlemead, Dorset case study in Technical Report 5).

Net-zero and the built environment

There have been steady increases in the energy efficiency of buildings in recent years. For instance, in Ireland dwellings built in 2015-2021 were considerably more energy-efficient than those built in earlier periods with 97% given an "A" rating compared with 34% in 2010-2014 and 1% in 2005-2009" (CSO, 2021c). There are several innovations that are promoting net-zero or circular approaches to the built environment. For instance, the UK Green Building Council (UKGBC) launched a Net Zero Whole Life Carbon Roadmap at COP26 in Glasgow as a common vision and set out key actions for achieving net zero carbon in the construction, operation and demolition of buildings and infrastructure. These measures include a carbon footprint for the UK built environment, a Net Zero Carbon trajectory to 2050, and policy recommendations with industry action plans to deliver the 2050 scenario. However, a previous RTPI-funded project involving RegenSW found that requiring

a particular smart energy solution can often mean these become obsolete by the time a housing development is built. Though, there is great potential for LPAs to share best practice and involve District Network Operators (DNOs) in site selection during Local Plan development. Research by the RTPI has suggested a need for place-based approaches to the net-zero challenge which sets out a strategy for modelling different typologies of place (though mainly urban-centric) to deliver on net-zero, specifically relating to transport.

Energy and transport

The UK's Department for Transport estimates that poor air quality may cost health and social care services in England £5.3 billion by 2035 (DfT, 2021b). Switching to zero-emission vehicles is also expected to save the UK Government £7-10bn in costs thought to be caused by the negative impacts from noise pollution exceedance (DfT, 2021b). Below, the assumed mix between 'energy vectors' in the UK is illustrated as they relate to road transport up to 2050; this shows a fully decarbonised road sector towards 2040 and 2050, but a relatively poor state of decarbonisation at the present time:

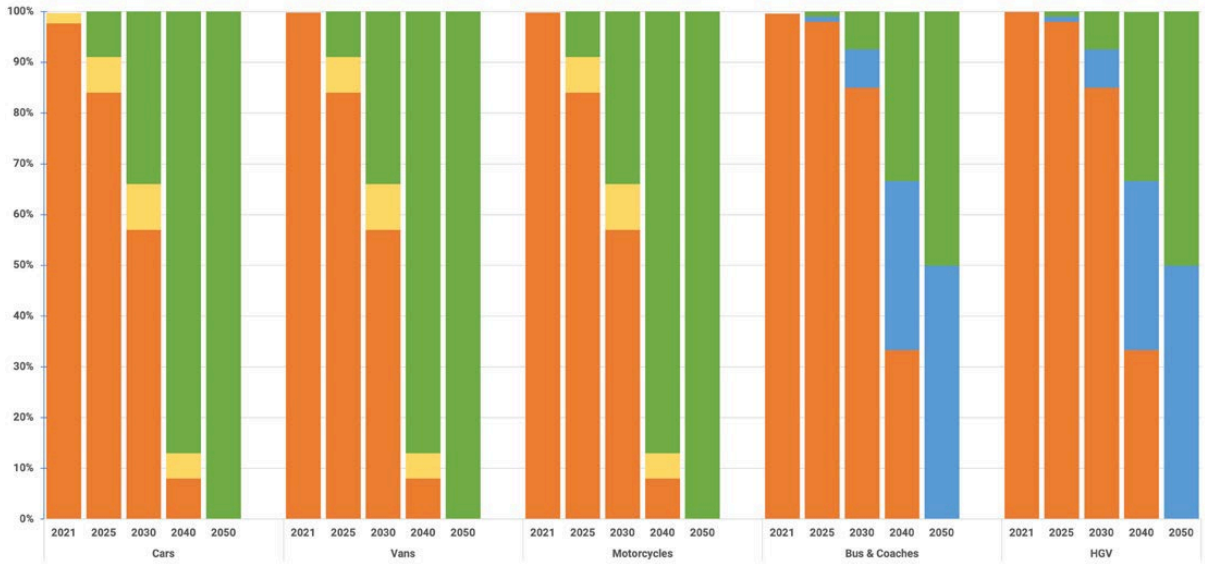

Figure 13 Energy Vectors for road transport sector to 2050 (Innovate UK, 2021, p.19)

The UK government has committed to the UK government ending sales of combustion engine cars by 2030, as well as encouraging EV-related infrastructure through the planning process and incentives to encourage their uptake. EVs accounted for over 10% of UK passenger car registrations in 2020, up from 3% in 2016 (Watson and Luppa, 2020) and there are now over 175,000 zero-emission vehicles in the UK (with registrations increasing threefold in 2020 on 2019) and 198,000 plug-in hybrid vehicles (DfT, 2021). In Scotland for instance, the number of electric vehicles charging points has increased from 702 in 2017 to 1592 in 2020. Wider availability of data has become part of the scalability of EVs, for instance Zap-Map which allows (potential and existing) EV users to assess the level of network coverage in areas they may drive in. Moreover, moves toward electrification are estimated to require 280,000 charge points on UK roads by 2030, with an estimated 155TWh of electricity to fuel transport by 2050 (Innovate UK, 2021). The scalability of these initiatives to rural areas may require differentiated strategies (for instance, many rural households might charge their car on their domestic electricity supply rather than car charging points).

Energy and farm diversification

The agricultural sector produces 10% of overall greenhouse gas (GHG) emissions - composed of 70% of total nitrous oxide emissions, 50% of total methane emissions and 1% of total carbon dioxide emissions (DEFRA, 2019). In England, the National Farmers Union (NFU) notes that the English National Planning Policy Framework requires planning policies to support a ‘prosperous rural economy’ (NFU, 2019). Energy production has become an increasingly important component of farm diversification, with 40% of UK farms hosting energy production of some form to generate a total of 10% of the UK’s electricity (Countryside Online, 2019). Solar PV panels and anaerobic digestion (AD) of biomass are currently the leading production methods, with 70% of all solar production situated on farms (ibid).

As discussed in the Agricultural Transitions Thematic Review (in Technical Report 1), environmental concerns have also driven new food trends including an increase in veganism and a move towards more energy efficient and ‘cleaner’ practices. For instance, organic and biodynamic practices, community supported agriculture (CSA), and a recent revival in the

use of local agricultural by-products for construction such as straw bale. The synergies between monetary efficiency and emissions reductions have meant that a reported 61% of UK farmers were taking actions to reduce their emissions (DEFRA, 2019), although it has been reported that larger farms are more likely to be taking action, with small farms generally less inclined to view their actions as being significant. There are associated risks relating to the carbon footprint of agricultural imports relating to Brexit, which might result in 'carbon leakage'. Energy production and agricultural practices can also support what Marsden and Farioli (2015) term 'energy productivism', though this should not affect the overall productive potential of existing agricultural land and that any carbon, wildlife and agricultural land use benefits can be appropriately 'stacked' to ensure they remain complementary to one another.

Differences between UK nations and Ireland in relation to mobility, connectivity and energy policy

There are regional differences in how transport and spatial planning is linked, notably because in England transport planning is more dispersed, in contrast to the expectation in the UK's devolved regions to develop a national plan (although so far, Wales is the only nation to do so). In Wales, Scotland and Ireland the government has made an explicit link between planning and transport and there is greater alignment between strategic planning (through Strategic Development Plans) and Local Development Plans.

The UK's move towards clean energy is mandated within the Climate Change Act 2008 and the associated Climate Budgets. The collapse of dozens of energy suppliers in 2021 highlights the challenge of providing viable commercial solutions in an increasingly volatile market and reliance on overseas nations. At a UK policy level, the Net Zero Strategy: Build Back Greener (October 2021 - see pp. s 152-168) outlines quantifiable carbon reductions as a fundamental part of local transport planning and funding. This strategy sets out Local Transport Plans (LTPs) as a statutory requirement for place-based strategies to improve transport networks and their investment. It also sets out how to deliver carbon reduction targets towards net-zero (para 47), a legal duty within the Climate Change Act 2008 (as amended) 2019.

Meanwhile, the UK Government's Future of Transport programme "aims to secure the UK's position as a world-leading innovator, creating a greener and more inclusive future transport system for us all" (DfT, 2021b). Though, the DfT's Road to Zero: Next steps towards cleaner road transport and delivering our industrial strategy (DfT, 2018) was criticised for lacking a focus on rural areas, and only mentioned 'rural' six times in the whole document (CILT, 2021). A Chartered Institute of Logistics and Transport (CILT) report states there are challenges with meeting the government's plans to meet net-zero targets. Moreover, there needs to be 'rural-proofing' of decarbonisation in the rural environment, such as the electrification in delivery vehicles or enabling farms to support the supply of greener transport fuel (CILT, 2021). In response to some of these challenges, the UK Government launched the Future of Transport: Rural Strategy Call for Evidence. The aim of this call was to "to seek views on our assessment of the emerging trends that will shape rural mobility and how industry, government and rural communities could work together to help harness the opportunities" (DfT, 2021, p.5). The UK Climate Change Committee argues that UK policy could go further through a Net Zero Test is required, which would ensure that all

Government policy, including planning decisions, is compatible with UK climate targets.

In England, the NPFF in particular highlights the role of mobility, connectivity and energy in relation to sustainable development (paras 7-14), promoting sustainable transport (paras 104-113), supporting communications infrastructure (paras 114-118), the effective use of land (paras 119-125) and meeting the challenge of climate change, flooding and coastal change (paras 152 -173). Though the NPPF, while recognising wind turbines as essential renewable infrastructure (Annex 3, food risk vulnerability classification), it is generally unsupportive of wind turbines which "should not be considered acceptable" unless identified within a Local Plan and is evidenced as fully supported by the local community (footnote 54), accounting for the comparably low levels on on-shore wind installation than Scotland, which has a more favourable policy landscape for on-shore wind.

Specifically, the government aims to 'embed transport decarbonisation principles in spatial planning and across transport policy making', including integrating the measures set out in the National Model Design Code (DLUHC, 2020). This would encourage local planning authorities to include issues relating to environmentally-responsive and sustainable places within design codes to 'ensure developments respond to the impacts of climate change, are energy efficient, embed circular economy principles and reduce carbon emissions' (Para 48). There is less of a regional focus (in the absence of Strategic Development Plans as in the devolved nations). The government aims to revive Local Transport Plans, based on decarbonisation, and "to embed transport decarbonisation principles in spatial planning".

The cycling and walking investment strategy (DfT, 2017) sets out the government's ambition for cycling and walking while Decarbonising Transport: Setting the Challenge (DfT, 2020) sets out six strategic priorities: accelerating modal shift to public and active transport, decarbonisation of road vehicles, decarbonising logistic networks, place-based solutions, the UK as a hub for green transport technology and innovation and reducing carbon in a global economy (DfT, 2020, p.7). Decarbonising Transport: A better, greener Britain (DfT, 2021b) sets out a vision and thematic delivery on net-zero transport on all forms of transport and sets out key enablers of decarbonisation in the transport sector, including unlocking green finance. The government has also funded schemes such as Cycle Ambition Cities, Bikeability and the Access Fund to encourage walking and cycling. While Gear Change White Paper (DfT, 2020b) has a more urban focus in how it sets out a "vision for a travel revolution" in England's streets, towns and communities. Though the document states that in rural areas the government will work with bus operators to allow bikes on board its "main focus" is medium-sized, larger towns and cities (p.33).

In Wales, the government is using a value-based approach to systematise an integrated and

collaborative approach across policy frameworks. Planning policy is set out in Future Wales: National Plan 2040 - which replaces the former Wales Spatial Plan (which did not have plan status) - as a 20-year national development plan for the nation, its national development framework (NDF). The NDF is part of the national strategy, Prosperity for All, within the country's strategy to address climate emergencies and contribute to sustainable development and is informed by the pioneering Well-being of Future Generations Act 2015. This Plan divides Wales into four regions - North Wales, Mid Wales, South West Wales and South East Wales - and each region is expected to create Strategic Development Plans (SDPs) which feed into Local Development Frameworks (LDFs). The National Plan also sets out a framework for national large scale infrastructure projects through the Developments of National Significance (DNS) process and identifies National Growth Areas and Regional Growth Areas which will offer greater, connected services (SW, Mid and North Wales). The Plan also aims to promote connected, inclusive and healthy places, which enable "vibrant rural places" with access to homes, jobs and services, promote sustainable travel, and create decarbonised and climate-resilient places with reduced pollution.

Wales also has a series of thematic Plans which fed into the National Plan 2040, including a Transport Strategy (Welsh Government, 2021) and its Low Carbon Wales plan. The National Plan 2040 also lists key challenges in line with the Rural Planning in the 2020s project: Climate Change, COVID 19 and a Low-carbon economy. In relation to energy, the National Plan is explicit about the need to meet international climate change targets and to "combat the climate emergency" (Policy 17). Unlike the English NPPF, it is also supportive of large-scale, onshore wind.

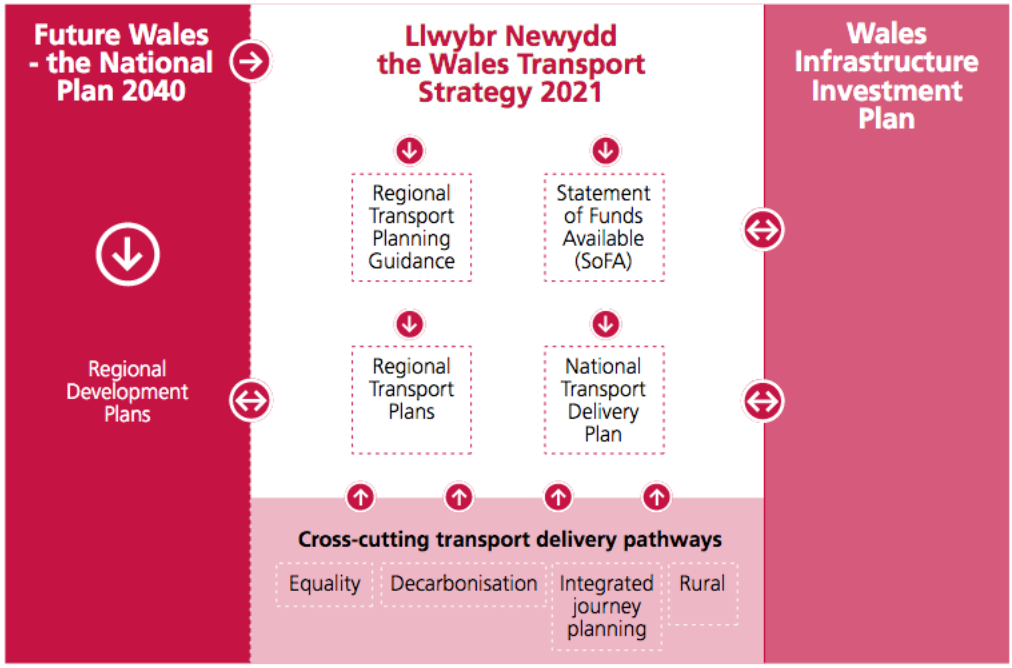

Figure 14 Policy framework for Transport Planning and Delivery in Wales (Wales Transport Strategy, 2021, p.44)

The Natural Resources Policy also sets out how to promote a circular economy and the decarbonisation of the economy through energy and transport choices. The government is actively pursuing Integrated Active Travel Networks, which it will keep under review (see Wales Transport Strategy, 2021a, p.57); it has also produced extensive and detailed guidance relating to the design of sustainable transport user needs in related guidance to accompany the Active Travel (Wales) Act (2013). The Welsh Government further intends to set out how it will deliver enhanced EV provision through its Electric Vehicle Charging Strategy. Wales has a target of 70% of Wales's electricity consumption from renewable energy sources by 2030 (compared to 48% in 2019). (Natural Resources Wales, 2021a). However, some national entities such as the Institute for Welsh Affairs (IWA) are calling for Welsh Government to go even further, to deliver 100% energy from renewable sources by 2035 (see Re-energising Wales, IWA) - including a strengthened community energy sector - amid a stalling renewables sector whereby value is not always accruing to local communities, businesses and the public sector.

Fundamentally, the presence of the Ways of Working associated with the Well-being of Future Generations Act 2015 is having a synergistic effect which sews these values through different plans and strategies. The Government is also using the Wellbeing Goals (related to

the Well-being of Future Generations Act 2015) to shape how to effectively monitor and evaluate the impacts of transport planning in society (see Wales Transport Strategy, Welsh Government, 2021a, p.49). As illustrated in the figure below, these values are reproduced across the Welsh policy landscape, and specifically across 'mini-plans' within the Transport Plan for different transport modes as well as the third sector. The Active Travel Act Guidance (Welsh Government, 2021a).

Figure 15 Example of value-based integration within 'mini-plans' (Bus network, Wales Transport Strategy, 2021, p. 63)

In Scotland, the approach to policy-making is becoming increasingly participatory with an emphasis on co-production and partnership, thus helping to break down traditional policy and hierarchies in terms of evidence and evaluation (Carneigie UK Trust, 2021). For instance, its 20-year Transport Strategy (Scottish Government, 2020) was created with collaboration from stakeholders in both rural and urban areas. It is also noted that rather than term those with reduced mobility as "disabled", the Transport Strategy refers to this group of people as those who engage in "wheeling" (travel by wheelchair). This in itself is a discursive shift from discriminatory discourse to a more inclusive approach to recognise this mode of travel as simply another mode of transport and is an example of how its value-

based approach to transport planning is challenging discursive barriers to a more inclusive society. The strategy also ties sustainable transport to gender equality and women's safety, discrimination against older people, fairer pay through more accessible economic opportunities, and childrens' rights. This kind of approach makes the Scottish Transport Strategy stand out in terms of its innovative approach to using transport as a mechanism to transform societal issues, in ways that extend beyond the normal brief of planning-related policy documents and strategies. In Scotland, the idea of 20-minute neighbourhoods has been included in the Programme for Government 2020-21 and the National Planning Framework 4 Position Statement.

Under the Climate Change Act 2019, the Scottish Government has made "one of the most ambitious climate commitments in the world" (Scottish Government, 2020, p.2) in declaring a goal to achieve net-zero by 2045 (in contrast to the UK government's target of net-zero by 2050) and a 75% reduction from 1990 levels by 2030. The Scottish government's approach in Scottish Planning Policy sets out more detailed measures on energy infrastructure integration, such as the mapping of the co-location of development with heat supply and identifying areas weakly/unconnected to the grid. There is also an explicit statement on how the planning system can help to achieve the Scottish Zero Waste Policy, such as encouraging the circularity of materials and considering optimising energy, heat and waste infrastructure to provide co-benefits and maximising impact. The Scottish Government plans to phase out the need for new petrol and diesel cars and vans by 2032 and plans to decarbonise the country's passenger railways by 2035 and decarbonise scheduled flights within Scotland by 2040. In addition, the word 'rural' appears 40 times in the Transport Strategy, often in the context of 'remote' and 'island communities' and there is a section dedicated to outlining the needs of these communities (pp.17-19).

Scottish Planning Policy also encourages energy development to follow the Government's Good Practice Principles for Community Benefits from Onshore Renewable Energy Developments. However, Scottish LINK has suggested that the 10-year National Planning Framework 4 (NPF4) "is a missed opportunity to futureproof our natural environment in the face of the climate and nature", with the main criticism relating to a lack of a comprehensive strategy on nature recovery. At a more general level they suggest the NPF4 lacks "crucial detail on how nature-positive and low emissions developments will be supported by Scotland's planning system". As such it fails to "embolden… decision-makers to make net-zero and nature positive decisions" crisis (Scottish Link, 2021).

Under the Governance of the Energy Union and Climate Action Regulation, Ireland's draft National Energy & Climate Plan (NECP) 2021-2030 was submitted to the European Commission in December 2018 which looks at the country's energy and climate policies in

detail for the period from 2021 to 2030 and reflects on ambitions to 2050. Under the Programme for Government, Our Shared Future, Ireland is committed to achieving a 7% annual average reduction in greenhouse gas emissions between 2021 and 2030 - the latter commits to a 30% reduction by 2030 in non-ETS greenhouse gas emissions (from 2005 levels). Though, the NECP was written before the more ambitious target was set and is therefore not included. Ireland has a specific target for private electric car ownership with a target of 1 million vehicles by 2030. However, there is no such target for shared mobility. As stated in the Irish national policy assessment, self-build development is being used to support low-carbon building standards. There are various policies that are advancing low-carbon and renewables in Ireland, such as the Climate Action Plan 2021, the National Adaptation Framework 2018 and the National Mitigation Plan 2017, together with draft wind energy development guidelines (2019).

In Northern Ireland, Transport policy is the responsibility of the Department for Infrastructure (DfI) but is impacted upon by UK legislation, such as the provision of incentives for low-emission vehicles. Many issues within the remit of heat and building issues are set within complex governance arrangements, often outside the DfI, which is split between the Department for Communities and The Department of Finance (Lowes and Mitchell, 2021). DAERA leads on carbon and climate-related issues but lacks authority to take action (ibid), Additionally, the NI government has limited tax-raising powers to support domestic energy-related policies. A cross-departmental ‘Energy Strategy Government Stakeholders Group’, led by DfE, was established but there are still issues relating to responsibility, accountability and energy goals (ibid). Indeed, Lowes and Mitchell map out existing energy governance and propose new, streamlined forms of governance within the context of the UK government and the Northern Irish government entities and wider stakeholders.

Conclusion

- Rural mobility, connectivity and energy are inextricably tied to being able to deliver the right infrastructure to achieve low-carbon or net-zero targets set out by Government. The COVID-pandemic and the widely accredited move towards a “new normal” has affected rural connectivity in different ways.
- Development outcomes are often at odds with healthy lifestyles and responding to climate change, e.g. access to amenities in new residential developments is quicker by car than by walking.
- A lack of targets in e.g. Local Plans, relating to accessibility hamper effective sustainable transport solutions.
- 15 or 20-minute neighbourhoods are complex to apply in a rural context where settlements are more dispersed and services are not always located in the immediate area.
- Funding for rural transport innovation is constrained by a competitive funding environment that is more focused on high-tech, urban-based innovations.
- These outcomes can dampen the potential cohesiveness of communities if there are few services and opportunities available locally, particularly for older or more vulnerable residents.
- Though, there are promising signs of a reversal of the Beaching Cuts in some areas, including through community-led integrated transport provision linked to localised economic regeneration.
- Digital innovation is bridging previous remoteness that prevented rural regeneration, particularly in Ireland.
- Online GIS mapping tools can help to bridge the digital divide and bring local councils into the 21st Century. For instance, mapping local assets, bridging a data divide between rural and urban areas, and linking to wider LPA systems (such as nature recovery mapping and locally-identified projects for biodiversity net gain, flood management planning and monitoring of community issues on-the-ground).
- Tools that map the transition to green economy at a local level could be used by planners to assess data on the green economy with wider rural mobility and infrastructure needs.
- Tourism taxes and other forms of progressive localised taxes could help to encourage green transportation e.g. a tourism tax that is partly invested in shared mobility transport schemes where tourists can use these modes of transport for free (if they have paid the tax).

- Overall, substantial progress has been made in sourcing electricity and heat from renewable sources across the UK and Ireland, though progress has been more limited in Northern Ireland and Ireland which still have a substantial amount petroleum-based heating (e.g. oil), particularly in some areas.
- Trends towards decentralised energy systems (e.g. DSOs, microgrids and community energy) may lead to a more democratic energy system given that generally motivations to engage in community energy initiatives tend to be centred around concerns relating to social justice, fuel poverty and community resilience in the face of climate change. These are key opportunities to encourage adaptation in the countryside.
- The energy efficiency of homes continues to increase from baseline figures and LPAs are developing Climate Emergency-related Supplementary Planning Documents (SPDs). Though, planning across the board needs to more effectively link to new climate governance, such as citizen assemblies and other community-led/multi-partnership energy governance.
- Carbon, wildlife and agricultural land use benefits should be appropriately ‘stacked’ to ensure they remain complementary to one another.
- Brexit could affect the relationship between EU and UK environmental policy targets and renewables supply chains.

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