

DEMOS

**SOWING
RESILIENCE**

UNLOCKING THE
POTENTIAL FOR
REGENERATIVE FARMING

DAN GOSS
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SEPTEMBER 2023

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Any errors remain the authors' responsibility.

Dan Goss and Lucy Bush. September 2023.



AN INCLUSIVE ECONOMY

This project is part of Demos's work to help create an *Inclusive Economy*.

A more sustainable, resilient food system is central to this. Food production matters to everyone: consumers in shops, residents in rural communities, visitors to the countryside, farmers working the land, or citizens concerned about the environment. Ensuring that the concerns of all of these groups are represented and reflected in this policy area is a key objective of ours. At Demos we put people at the heart of policy-making. So in this project we have brought citizens, farmers and policy-makers into the conversation about farming policy, and regenerative farming in particular.

FOREWORD

BY RT HON SIR ROBERT GOODWILL



We have all felt the effects of a disrupted food supply chain in recent years. Having been a farmer myself for many decades, I know that there is widespread understanding across industry that the current food system is unsustainable – both for the environment and for farmers’ livelihoods, and the wider public is becoming increasingly aware of the challenges we face. As farmers adapt to the post-Brexit agricultural support system, feel the increasing effects of climate change, and face evermore volatile international supply chains, we must accelerate the adoption of regenerative farming.

As Chair of the Environment, Food and Rural Affairs Select Committee, and as a former Minister of State in the Department for Environment, Food and Rural Affairs, I have heard from farmers, leaders in the industry, the third sector and academia about the challenges facing British agriculture. Our Committee’s work in recent months has covered a number of issues including ensuring the UK’s food security, improving soil health, and supporting nature recovery and biodiversity in rural areas. It is becoming increasingly clear that regenerative farming can be the key to building the resilience that we need to secure our future food system.

McCain Foods, which has sponsored this report, has been an industry-leader on regenerative farming for some time now – both in the UK and across the world – with its landmark commitment to implement regenerative practices across 100% of its potato acreage by 2030. McCain have their head office and a production facility in my constituency of Scarborough and Whitby, so I’ve been following their progress and seen first-hand the impact this is having, not just in the UK but for growers across the world, which includes the work they are doing as a member of the Sustainable Markets Initiative.

Sowing Resilience provides a comprehensive assessment of the barriers to adopting regenerative farming here in the UK. Having consulted with farmers, the report outlines a list of recommendations to Government to renew their ambition for regenerative farming. By empowering farmers to work together and lead the change, supported by the financial security they need, we can make big strides forward. I am excited by the possibilities open to British agriculture in the coming years, and I look forward to seeing the Government and industry take forward these recommendations to ensure a British farming sector that is sustainable for both farmers and our planet.

I welcome this new report, which comes at a crucial time for the farming sector in the UK. It’s today’s farmers, as guardians of our farmland, that will provide the legacy for tomorrow’s. Let’s make sure we provide them with the skills, expertise, and support they need to ensure a resilient food system for generations to come.

Rt Hon Sir Robert Goodwill MP

Member of Parliament for Scarborough and Whitby

Chair of the House of Commons Environment, Food and Rural Affairs Select Committee

EXECUTIVE SUMMARY

“ Really simply, regenerative agriculture is nature-friendly farming. It’s thinking about the health of soil, animals, humans and how they all link together.”

- Hollie Fallick, regenerative farmer, the Isle of Wight¹

UK farming is at a critical juncture. Our food resilience is struggling, as global disruptions have led to rising prices and regular shortages in the shops. Climate change, soil degradation and biodiversity loss will only make this worse. At the same time, agriculture is a significant and underestimated carbon emitter. Agriculture needs ambitious reforms to help the UK meet its food needs and its environmental commitments.

Regenerative farming stands at the intersection of these challenges. It could improve the UK’s food resilience, contribute to our environmental objectives and, at the same time, help overcome delivery challenges within the government’s post-Brexit agricultural reforms.

Based on discussions with farmers and policy experts, a nationally representative survey, and extensive evidence reviews, this report outlines how regenerative farming can play an important role in supporting a long-term resilient and sustainable food system. It outlines the benefits of regenerative farming, the barriers to expanding it, and a set of policy solutions to overcome them.

THE BENEFITS OF REGENERATIVE FARMING

We find key benefits for the environment, farmers, consumers, and communities, including:

1. Protecting soil health and fertility
2. Reducing greenhouse gas emissions and improving biodiversity
3. Increasing long-term farm profitability
4. Increasing farm resilience against extreme weather and supply disruption
5. Enhancing food security and resilience

It is also important that farming policy aligns with public preferences around food and land. Through our survey, we find that:

- The public underestimate the importance of farming for the environment and are unfamiliar with regenerative farming (seven in ten are not very or not at all familiar).
- People support regenerative farming in principle, with two thirds supporting its widespread adoption either broadly or a lot - consistent across all party voters.

¹ Topping A, “This way of farming is really sexy’: the rise of regenerative agriculture’, The Guardian, 14 August 2023. www.theguardian.com/environment/2023/aug/14/this-way-of-farming-is-really-sexy-the-rise-of-regenerative-agriculture

- People think the most important benefits of regenerative farming are the improvements in biodiversity, emissions, and farmer resilience to climate change.
- The public are happy to accept trade-offs if regenerative farming could deliver these benefits. More than half (excluding the 16-23% responding 'don't know') say they would be happy paying more for food if regenerative farming could deliver benefits for the environment and farmer resilience.

THE BARRIERS TO EXPANDING REGENERATIVE FARMING

Despite its widespread benefits, regenerative agriculture has not been expanded across farms in the UK. We identify three key barriers holding that expansion back.

Poor short-term financial incentives: (1) farmers face high transition costs and potentially a long period before margins increase; (2) government support is not sufficiently compelling and could be cut in the long-term; and (3) farmers face low consumer demand, some food businesses without sufficient ambition, and competition with imports produced using lower standards.

Caution about the shift to regenerative: (1) there is a lack of clarity about what regenerative farming means; and (2) there is caution about making significant shifts in farming practices.

Difficulties in implementation: (1) it is hard for farmers to navigate the post-Brexit reforms and government thinking is not sufficiently joined-up, (2) the bureaucracy in government schemes is too burdensome for farmers; and (3) farms find it hard to access relevant advice.

POLICY SOLUTIONS

Based on the barriers we identify to expanding regenerative farming, we suggest that the government works towards three key objectives:

1. Develop a collaborative approach

- Establish a Regenerative Farming Task Force. The government should bring together representatives of farming, consumers, rural communities, environmentalists and government departments around a 'Regenerative Farming Task Force' - to evaluate and deliver policy

solutions on regenerative farming.

- Establish peer-to-peer Regenerative Farming Learning Groups. The government, in partnership with the Task Force, should implement a grant program to support the formation of peer-to-peer networks for knowledge sharing and network building.

2. Ensure financial security

- Provide more support for transition costs. The Department for Environment, Food and Rural Affairs (Defra) should increase the Sustainable Farming Incentive (SFI) 'management payments', extend them to the Local Nature Recovery and Countryside Stewardship schemes, and provide sums to cover capital costs.²
- Ensure long-term funding for Environmental Land Management (ELM) schemes. Defra should engage with the Treasury to maintain the current farming budget up to 2029, supported by increased cost-effectiveness monitoring.
- Run a public awareness campaign. The government should develop a biodiversity strategy to enhance the salience of biodiversity and concern about its relationship to food production, with regenerative methods as a central component. The 'Regenerative Farming Task Force' should consult on other ways to increase consumer awareness of regenerative farming.
- Convene food businesses around commitments to action. The government and Task Force should establish a food industry working group to explore ways to proliferate regenerative farming, and aim towards a regenerative farming pledge in the long-term.
- Develop core minimum standards for food imports, with regenerative principles included. The government should develop core standards that it uses across any future trade deal and align at least one with regenerative farming principles.

3. Bring farmers into the movement and enable the change

- Develop guidance on regenerative farming. The Task Force should develop a high-level guidance framework for regenerative farming, outlining a broad understanding, its benefits, a list of first-steps for different organisations to support the transition, and an outline of further research needed.
- Support civil society and food businesses to

² The Sustainable Farming Incentive and Local Nature Recovery are government payments schemes within the post-Brexit agricultural reforms, and Countryside Stewardship is a scheme that has been continued from prior to Brexit.

publicise the benefits of regenerative farming. Learning Group leaders and food businesses should facilitate knowledge-sharing amongst farmers about the benefits of regenerative methods. Defra should also provide grants for farmers to lead on this.

- Continue the New Entrant Support Scheme and add a regenerative angle.³ Defra should ensure value for money in the scheme to enable it to continue, and encourage entrants to get support on regenerative farming.
- Support farmers to provide advice on how to implement regenerative farming. Through the Learning Groups, Defra should provide grants to farmers to provide peer-to-peer advice on how to implement regenerative methods.
- Publish the promised land use framework, with a coherent vision for regenerative farming. The government should ensure it publishes its promised land use framework and embed regenerative farming objectives and strategies within it.

To unlock the opportunity that regenerative farming offers, the government must empower farmers to make the change. These policy solutions demonstrate how that can be done.

³ The New Entrants Support Scheme is a scheme by Defra that provides advice for potential entrants into the industry

INTRODUCTION

“ Our shared mission, across society, is to reach net zero and strengthen the resilience of our environment so that in turn, re-strengthens the resilience of our businesses and our communities. I find that farmers are the first to insist that these things can and must go hand in hand, if we are to improve the prosperity and food security of every generation to come as well.”

– Rt Hon Thérèse Coffey, Defra Secretary, February 2023⁴

“ Net zero by 2040 across England and Wales is tough, but right. It’s a reaffirmation of farming’s role as custodians of our natural environment, and if I may say so, the sort of leadership we need to drive our country forward.”

– Sir Keir Starmer, February 2023⁵

THE STAKES

UK food resilience is being tested more now than at any time in recent memory. Food prices are rising at the fastest rate in almost 40 years and shortages of essential foods in supermarkets have become commonplace.^{6,7} At the same time, our ability to deliver on our environmental commitments is at a critical juncture, as ambitious targets to halt species loss by 2030 and reach net-zero emissions by 2050 lay ahead.^{8,9}

UK agriculture is at the crux of these challenges. With just under half of food eaten in the UK produced domestically, British farming plays a key role in enhancing our food security.¹⁰

At the same time, British farming is critical to protecting our natural environment, with 71% of UK land being used for agriculture.¹¹

Yet in both regards, the farming sector faces significant challenges. Underlying the current pressures on food resilience are tough challenges for the sector, with global supply disruptions, spillovers from the pandemic, and post-Brexit legal changes causing labour shortages and rising input prices. As a result, nearly half of UK farmers are considering cutting down production in the coming year.¹² In terms of the environmental challenges, the sector currently contributes 11% of

4 Coffey T, ‘Secretary of State Thérèse Coffey’s address at NFU conference’, Gov.uk, 22 February 2023, <https://www.gov.uk/government/speeches/secretary-of-state-therese-coffey-addresses-nfu-conference>

5 Starmer K, ‘“A new relationship with the countryside” – Starmer’s NFU speech’, 21 February 2023, Labour List, <https://labourlist.org/2023/02/a-new-relationship-with-the-countryside-starmer-nfu-speech/>

6 Bruce A and Da Costa A, ‘Soaring food prices push UK inflation back to 40-year high’, Reuters, 19 October 2022, <https://www.reuters.com/world/uk/uk-consumer-price-inflation-101-september-2022-10-19/>

7 Bulbal N and Hasan B, ‘Supermarket food shortages: Roast chicken could disappear from UK shelves’, Evening Standard, 3 May 2023, <https://www.standard.co.uk/news/uk/food-shortages-uk-what-missing-from-shelves-why-supermarkets-b1061854.html>

8 House of Commons, The Environmental Targets (Biodiversity) (England) Regulations 2023, 29 January 2023, <https://www.legislation.gov.uk/ukxi/2023/91/made>

9 Brader C, ‘Mission zero: Independent review of net zero’, House of Lords Library, 20 January 2023, <https://lordslibrary.parliament.uk/mission-zero-independent-review-of-net-zero/>

10 Department for Environment, Food and Rural Affairs, United Kingdom Food Security Report 2021: Theme 2: UK Food Supply Sources, 22 September 2021, <https://www.gov.uk/government/statistics/united-kingdom-food-security-report-2021/united-kingdom-food-security-report-2021-theme-2-uk-food-supply-sources>

11 Department for Environment, Food and Rural Affairs, Agriculture in the UK Evidence Pack, September 2022, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1106562/AUK_Evidence_Pack_2021_Sept22.pdf

12 Case P, ‘Dwindling farmer confidence will dent food production, NFU warns’, Farmers Weekly, 3 May 2023, <https://www.fwi.co.uk/news/farm-policy/dwindling-farmer-confidence-will-dent-food-production-nfu-warns>

the UK's total greenhouse gas emissions - especially significant considering it makes up just 0.5% of the national economy - and is a key driver of falling biodiversity.^{13,14,15,16} There is an awareness across the sector that this must change.¹⁷

All those with a stake in the farming sector - government, farmers, food businesses and civil society - must play their part in helping overcome the challenges. Importantly, the challenges also intersect. The UK government's 2021 Food Security Report found that 'the biggest medium to long term risk to the UK's domestic production comes from climate change and other environmental pressures like soil degradation, water quality and biodiversity'.¹⁸ By delivering better environmental outcomes in farming, the UK can also deliver improved food security.

Regenerative farming could play a key role in that. While there is no one definition of regenerative farming, it most commonly refers to methods that minimise soil disruption, reduce reliance on synthetic inputs, and expand use of non-synthetic inputs (like plants, livestock and non-synthetic fertilisers) to rehabilitate natural ecosystems. In focussing primarily on the rehabilitation of nature and soil health, regenerative farming goes beyond organic farming (which is primarily concerned with stopping use of synthetic fertilisers). Regenerative methods can be used in different combinations and to varying extents, dependent on the farm's land, produce and objectives (see Annex).

Regenerative farming is one part of what it means to farm sustainably - which can incorporate separate shifts like reducing emissions from livestock and rewilding land that is less agriculturally productive.¹⁹ These things are all important if the UK is to achieve its environmental objectives - but rehabilitating natural ecosystems within the food production process is an essential part.^{20,21} It first means lower input costs - increasing long-term profitability and

reducing reliance on unpredictable supply chains. In turn, this improves farmers' resilience to climate change and external market shocks, and can also increase farm yields. This would then benefit UK consumers - by protecting long-term food security (ultimately helping keep food prices down) - and communities - by creating new jobs and allowing a more natural countryside to flourish.

This report lays out these benefits, and explains how policymakers can enable them. First, though, we outline the makeup of the current system and how new policy would fit into it.

THE CURRENT POLICY CONTEXT - AND THE POTENTIAL FOR REGENERATIVE FARMING

We are undergoing the most significant shift in agricultural policy in over half a century. Half of farm profits come from government-provided financial support. The changes that are currently taking place to that system have potentially far-reaching implications for the shape and direction of UK farming. For over 40 years, the EU's Common Agricultural Policy (CAP) was the driving force in farming policy. It mandated that the amount of money given to farmers was proportional to the size of the land they farm. The policies focused on supporting environmental concerns were secondary. With Brexit, the UK left the CAP.

In 2017, the then Defra secretary Michael Gove outlined an ambitious vision of reform for farming in England (as a devolved policy area, each of the UK's four nations are governing their own approach, with England's approach governed by Westminster). Government payments would only be made for certain environmental benefits, under the principle 'public money for public goods'.²² The hope was that these reforms would help deliver government

13 Department for Business, Energy and Industrial Strategy, 2019 UK Greenhouse Gas Emissions, Final Figures, 2 February 2021, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/957887/2019_Final_greenhouse_gas_emissions_statistical_release.pdf

14 Department for Environment, Food and Rural Affairs, Total Income from Farming in the United Kingdom, Second Estimate for 2020, 16 December 2021, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1086587/agricaccounts_tiffenglandstatsnotice_18feb22.pdf

15 F Burns, Eaton MA, Barlow KE, Beckmann BC, Brereton T, Brooks DR, et al, Agricultural Management and Climatic Change Are the Major Drivers of Biodiversity Change in the UK, PLoS ONE, 23 March 2016, <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0151595>

16 Department for Environment, Food and Rural Affairs, Agriculture in the UK Evidence Pack, September 2022, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1106562/AUK_Evidence_Pack_2021_Sept22.pdf

17 National Farmers' Union, 'Achieving net zero - meeting the climate change challenge' NFU Online, 1 January 2020, <https://www.nfonline.com/updates-and-information/achieving-net-zero-meeting-the-climate-change-challenge/>

18 Department for Environment, Food and Rural Affairs, UK Food Security Report 2021, 16 December 2021, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1077015/United_Kingdom_Food_Security_Report_2021_19may2022.pdf

19 Department for Environment, Food and Rural Affairs, Agri-climate report 2022, 27 October 2022, <https://www.gov.uk/government/statistics/agri-climate-report-2022/agri-climate-report-2022>

20 World Wide Fund for Nature, 'Black hole' in government plans to cut GHG emissions from farming - WWF FOI, press release, 11 November 2022, <https://www.wwf.org.uk/press-release/foi-requests-reveals-black-hole-government-plans>

21 Taylor A, Land of Plenty: A Nature-Positive Pathway to Decarbonise UK Agriculture and Land Use, World Wide Fund for Nature, 16 February 2022, https://www.wwf.org.uk/sites/default/files/2022-02/WWF_land_of_plenty.pdf

22 Gove M, 'The Unfrozen Moment - Delivering A Green Brexit', Gov.uk, 21 July 2017, <https://www.gov.uk/government/speeches/the-unfrozen-moment-delivering-a-green-brexite>

commitments to net-zero and biodiversity, while ensuring food security.²³ They are now being delivered over a seven-year transition period from 2021-28, with a gradual reduction in the old payment system. At the forefront of this transition are the ELM schemes, which will run alongside others to aim to improve farming productivity.²⁴

However, this transition has faced significant challenges. Farmers have not joined the schemes at the expected rate. A year and a half since launch, the flagship ELM scheme - the SFI - has had just 1,829 farmers apply to join, which is far less than the 102,000 farmers enrolled in the old scheme.²⁵ Some farmers say the schemes lack clarity, require too much time and bureaucracy, and do not pay enough.²⁶ Meanwhile, environmentalists and others have expressed concern about the schemes not delivering the desired environmental outcomes, due to both low uptake and limited environmental ambition. The National Audit Office has reported that Defra will struggle to reach its environmental ambitions for land in the UK under the current budget. The RSPB and Wildlife Trust are concerned that more ambitious ELM schemes are being overlooked by the government.^{27,28,29} There is space, therefore, for significant improvement of the reforms, both in engaging farmers and ensuring the schemes deliver sufficient environmental outcomes.

The expansion of regenerative methods is an important part of the post-Brexit agricultural transition. It is part of the SFI - which pays for minimising soil disruption, planting 'cover crops' that improve nutrients in the soil, using 'herbal leys' that improve soil health in grazing land, or using 'integrated pest management' to minimise synthetic pesticide use (terms defined in the Annex).³⁰ It features in the Local Nature Recovery scheme (a more ambitious tier of the ELM schemes), which pays farmers to plant trees around farmland. It also features in Countryside Stewardship (a scheme that has been carried over from the CAP system), which pays for use of winter cover crops, organic land management, and species-rich grassland and grazing land. As the current reforms face challenges around

uptake and achieving the necessary environmental objectives, regenerative farming - as a widely supported and relevant movement - could catalyse efforts on both.

Some farmers are adopting these methods, but not enough. A 2019 study found that around 48% of English arable farmland is farmed using minimised tillage (soil disruption), and 7% using no tillage, and a 2016 study found that 66% of UK farmers use winter cover crops. This shows many farmers are adopting some elements of regenerative practices, but they could be expanded significantly. While not a silver bullet for all the challenges facing UK farming and food, an expansion in regenerative farming could provide an essential drive towards a more sustainable, resilient food system within the current policy context.

OUR METHODOLOGY

To develop this report, for each section we began by conducting a comprehensive review of relevant literature. We also ran two nationally representative polls: one in April 2023 with 1,502 participants looking into public perceptions of regenerative farming and its benefits, and one in May 2023 with 1,509 participants looking at specific policy goals.

Informed by the public's favoured policy goals in the latter survey, we ran two workshops with farmers. In these, we tested possible solutions based on the extent to which they would be achievable and effective from the farm perspective. We also ran a roundtable with people working in agricultural policy to test the same features from a policy perspective.

23 Department for Environment, Food and Rural Affairs, *The Path to Sustainable Farming: An Agricultural Transition Plan 2021 to 2024*, November 2020, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/954283/agricultural-transition-plan.pdf

24 Marshall J, Rutter J, Kane J, and Goss D, *Agriculture after Brexit: Replacing the CAP*, 15 March 2022, <https://www.instituteforgovernment.org.uk/sites/default/files/publications/agriculture-after-brexit.pdf>

25 Horton H and Harvey F, 'Just 224 farmers were paid under post-Brexit farming scheme last year', *The Guardian*, 5 January 2023, <https://www.theguardian.com/environment/2023/jan/04/just-224-farmers-paid-under-post-brexit-farming-scheme-last-year>

26 Clarke P, 'Slow uptake of SFI blamed on low payments and lack of detail', *Farmers Weekly*, 8 September 2022, <https://www.fwi.co.uk/business/business-management/agricultural-transition/slow-uptake-of-sfi-blamed-on-low-payments-and-lack-of-detail>

27 National Audit Office, *The Environmental Land Management scheme*, 15 September 2021, <https://www.nao.org.uk/wp-content/uploads/2021/09/The-Environmental-Land-Management-scheme.pdf>

28 Dibley H, *National Food Strategy: The plan*, National Food Strategy, 15 July 2021, www.nationalfoodstrategy.org

29 Groom A, 'Future farming policy: hope or rhetoric over action?', *RSPB*, 6 Jan 2022, <https://community.rspb.org.uk/ourwork/b/nature-s-advocates/posts/is-there-hope-for-future-farming-policy-or-is-this-more-rhetoric-over-action>

30 Department for Environment, Food and Rural Affairs, *SFI Handbook for the SFI 2023 offer*, 21 June 2023, <https://www.gov.uk/government/publications/sfi-handbook-for-the-sfi-2023-offer>

SECTION 1

BENEFITS OF REGENERATIVE FARMING

//

I've seen first-hand how the challenges we've faced in recent years have reminded people up and down the country just how much we all rely on you as farmers. Keeping us fed through thick and thin, playing a vital role in our rural communities and our rural economy and taking care of our landscapes, as farmers have been doing for generations."

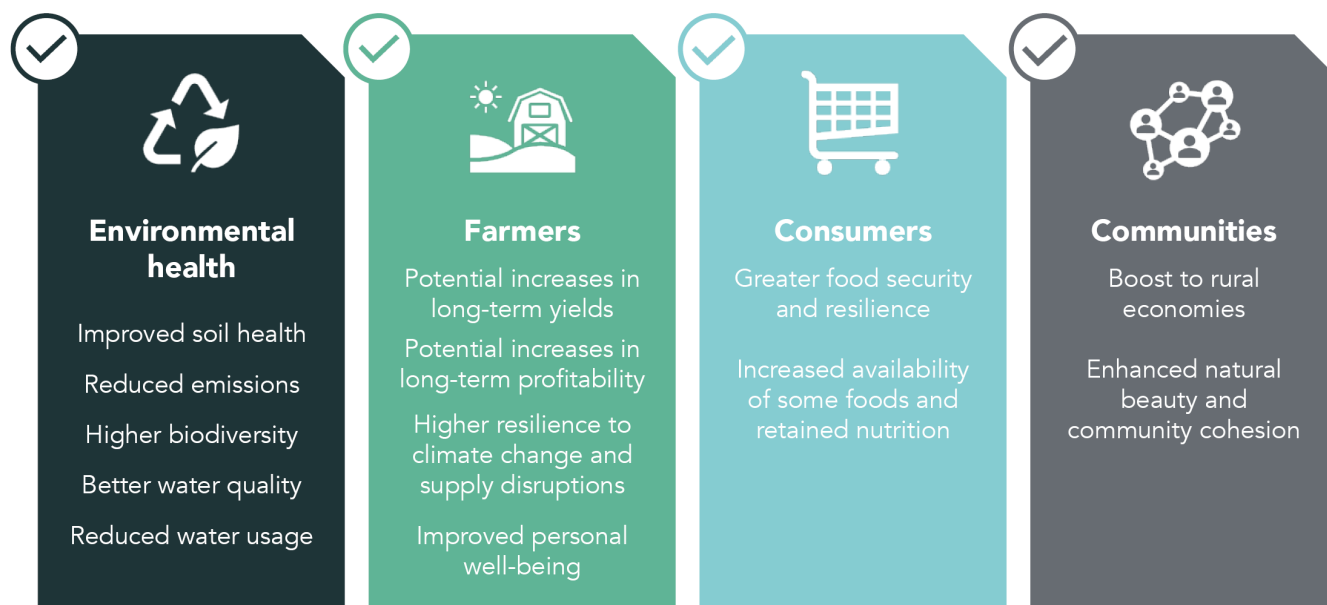
– Rt Hon Mark Spencer, Farming Minister, January 2023

1.1. HOW COULD REGENERATIVE FARMING BENEFIT THE UK?

To develop a policy approach to regenerative farming, we first need to understand what impact it could have for the UK. Regenerative farming is lauded primarily for its environmental benefits. Yet, the benefits extend beyond the environment to many groups across society. There are positive impacts for the farmers who manage the land and produce food, the consumers who buy and enjoy the food, and the communities who live around agricultural land and interact closely with the agricultural sector.

The benefits we identify are summarised in Figure 1.

FIGURE 1
PRIMARY BENEFITS OF REGENERATIVE FARMING



BENEFITS FOR THE ENVIRONMENT

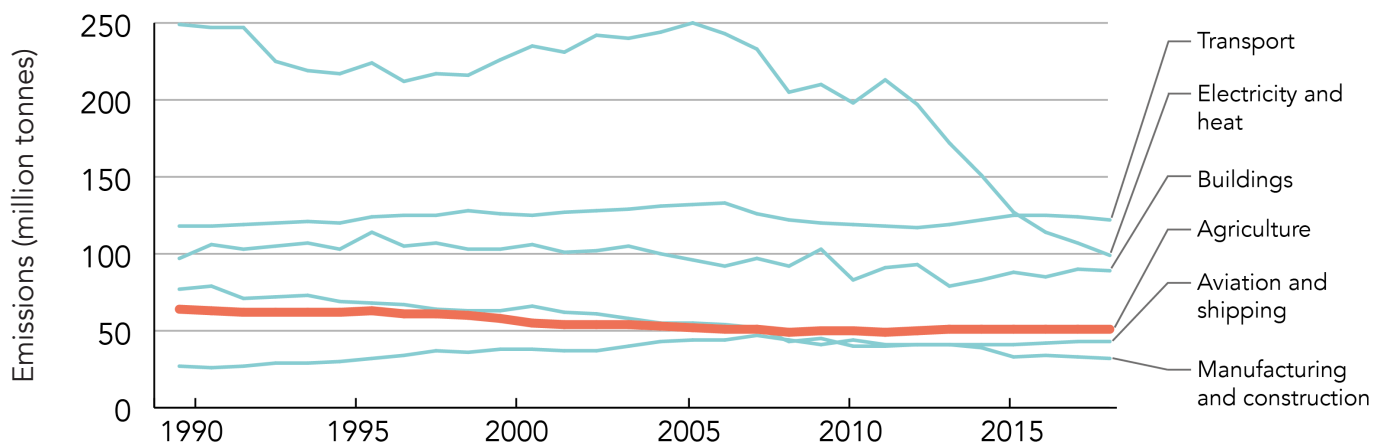
Soil Health

Soils currently store about 10 billion tonnes of carbon in the UK - roughly equal to 80 years of annual UK greenhouse gas emissions. Intensive agriculture has caused arable soils to lose about 40 to 60% of their organic carbon due to soil degradation.³¹ This contributes to emissions, reduces the fertility of the soil, and reduces the ability of the soil to hold water and prevent droughts.³² Regenerative methods - such as cover cropping, minimum-till, and reduced use of synthetic fertilisers and pesticides - can help reverse the decline in soil health by increasing carbon sequestration, enhancing soil organic matter, and reducing compaction.^{33,34,35,36,37,38}

Greenhouse Gas Emissions

Agriculture contributes 11% of UK emissions, and its volume of emissions (as shown in Figure 2) have not dropped at the same rate in recent decades as sectors such as Electricity and Heat or Manufacturing and Construction.

FIGURE 2
UK GREENHOUSE GAS EMISSIONS BY SECTOR,
TONNES CO₂-EQUIVALENT*



*A metric used to compare the emissions from different greenhouse gases on the basis of their potential contribution to global-warming. Lower emitting sectors have been excluded.

Source: Ritchie H and Roser M, 'Emissions by Sector' Our World in Data, accessed 20 July 2023, <https://ourworldindata.org/emissions-by-sector>

31 Environment Agency, Summary of the state of the environment: soil, 26 January 2023, <https://www.gov.uk/government/publications/state-of-the-environment/summary-state-of-the-environment-soil>

32 Ibid.

33 Burgess PJ, Harris J, Graves AR, Deeks LK, Regenerative Agriculture, Identifying the impact; enabling the potential, Cranfield University report for SYSTEMIQ, 17 May 2019, <https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/Regenerative-Agriculture-final.pdf>

34 Brown J, Stobart R, Hallett P, et al, Variable impacts of reduced and zero tillage on soil carbon storage across 4–10 years of UK field experiments, J Soils Sediments, 16 October 2020, <https://link.springer.com/article/10.1007/s11368-020-02799-6>

35 Haddaway NR, Hedlund K, Jackson LE, et al. How does tillage intensity affect soil organic carbon? A systematic review. Environ Evid, 18 December 2017, <https://environmentalevidencejournal.biomedcentral.com/articles/10.1186/s13750-017-0108-9>

36 Poeplau C and Don A, Carbon sequestration in agricultural soils via cultivation of cover crops – A meta-analysis, Agriculture, Ecosystems & Environment, 1 February 2015, <https://www.sciencedirect.com/science/article/abs/pii/S0167880914004873>

37 E Davies, The impact of herbal leys on the health and performance of grazing lambs, Farming Connect, 3 March 2023, <https://businesswales.gov.wales/farmingconnect/news-and-events/technical-articles/impact-herbal-leys-health-and-performance-grazing-lambs>

38 Berdeni et al, Soil quality regeneration by grass-clover leys in arable rotations compared to permanent grassland: Effects on wheat yield and resilience to drought and flooding, Soil and Tillage Research, August 2021, <https://www.sciencedirect.com/science/article/pii/S0167198721001070>

Through their potential to enhance carbon sequestration in soils, various studies find that regenerative methods - such as cover cropping, minimum-till, reduced use of synthetic inputs and agroforestry - led to a reduction in greenhouse gas emissions.^{39,40,41,42,43} The World Wildlife Fund finds that, averaging across various studies, regenerative practices expanded across the UK could reduce annual emissions from farming by 10% by 2030 - equivalent to taking an extra 900,000 cars off the roads.⁴⁴

Biodiversity

Intensive agricultural practices have been one of the main drivers of biodiversity loss in the UK. Britain has lost 50% of its biodiversity since 1970, according to some measures, with many of the worst declines on sites of intensive agriculture.⁴⁵ Enhancing biodiversity, both above and below ground, is inherent to regenerative farming through the use of diversified crop rotation, cover crops, adding legumes and other plants to pastures, planting pollinator habitats or buffer strips, and integrating animals.⁴⁶ Regenerative methods can also support plant regrowth and habitat development to host new species.⁴⁷

Water quality and usage

While current practices are estimated to account

for disruption to the natural chemical balance in UK freshwater sources, regenerative methods can - by improving soil health - reduce agricultural run-off.^{48,49} Equally, while water usage on farms will increase due to global warming, regenerative farming can also reduce the requirements for water usage on farms.^{50,51}

BENEFITS FOR FARMERS

Long-term soil fertility and yields

With soil health declining in the UK, this is also impacting soil fertility and yield. For example, a review of 24 studies in the UK found that, for every 10 cm depth of topsoil loss, yields decreased by 4%.⁵² Some studies suggest regenerative methods can help mitigate these losses in fertility and lead to increased yield. One evidence review looking at the potential of companion cropping for UK farms found that, in comparable contexts, it gives an average 20-30% increase in yield.⁵³ A study of minimum tillage in the UK found it led to increased yields after five years.⁵⁴ Some studies have found increased yield in short periods. A study of arable farms in England measured the effects of removing small parts of agricultural land from production to create wildlife habitat, and found increased yields even by the second year.⁵⁵

39 Mangalassery S, Sjögersten S, Sparkes D et al, To what extent can zero tillage lead to a reduction in greenhouse gas emissions from temperate soils?, *Sci Rep*, 04 April 2014, <https://www.nature.com/articles/srep04586>

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42 Smith L, Kirk G, Jones, P, and Williams A, The greenhouse gas impacts of converting food production in England and Wales to organic methods. *Nature communications*, 22 October 2019, <https://www.nature.com/articles/s41467-019-12622-7>

43 Woodland Trust, Farming for the future: how agroforestry can deliver for nature and climate, 4 Nov 2022, <https://www.woodlandtrust.org.uk/media/51622/farming-for-the-future-how-agroforestry-can-deliver-for-nature-climate.pdf>

44 Taylor A, Land of Plenty: A Nature-Positive Pathway to Decarbonise UK Agriculture and Land Use, World Wide Fund for Nature, 16 February 2022, https://www.wwf.org.uk/sites/default/files/2022-02/WWF_land_of_plenty.pdf

45 Davies J, 'UK has 'led the world' in destroying the natural environment', *Natural History Museum*, 26 September 2020, <https://www.nhm.ac.uk/discover/news/2020/september/uk-has-led-the-world-in-destroying-the-natural-environment.html>

46 Karas S, 'Biodiversity is as Important as Climate Change—How Regenerative Agriculture Can Help', *Center For Regenerative Agriculture And Resilient Systems*, no date, <https://www.csuchico.edu/regenerativeagriculture/blog/biodiversity.shtml>

47 Lamber H, Sanson J, Garcia C et al, The role of regenerative agriculture in sustainable land use, *Climateworks Centre*, March 2023, <https://www.climateworkscentre.org/wp-content/uploads/2023/03/The-role-of-regenerative-agriculture-in-sustainable-land-use-Climateworks-Centre-discussion-paper-March-2023.pdf>

48 Environment Agency, 2021 river basin management plans, October 2019, https://consult.environment-agency.gov.uk/++preview++/environment-and-business/challenges-and-choices/user_uploads/agricultural-and-rural-land-management-challenge-rbmp-2021.pdf

49 Webber J et al, Impacts of land use on water quality and the viability of bivalve shellfish mariculture in the UK: A case study and review for SW England, *Environmental Science & Policy*, December 2021, <https://www.sciencedirect.com/science/article/pii/S1462901121002793#bib120>

50 Clarke A, 'All you need to know about water abstraction licensing reform', *Farmers Weekly*, <https://www.fwi.co.uk/arable/need-know-water-abstraction-licensing-reform>

51 Flint L et al, Increasing soil organic carbon to mitigate greenhouse gases and increase climate resiliency for California, *California Natural Resource Agency*, August 2018, https://www.energy.ca.gov/sites/default/files/2019-11/Agriculture_CCCA4-CNRA-2018-006_ADA.pdf

52 Gregory et al, A review of the impacts of degradation threats on soil properties in the UK, *Soil Use Manag*, October 2015, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5014291/>

53 Howard A, The potential for companion cropping and intercropping on UK arable farms, *Nuffield UK*, July 2016, https://www.nuffieldscholar.org/sites/default/files/reports/2015_UK_Andrew-Howard_The-Potential-For-Companion-Cropping-And-Intercropping-On-Uk-Arable-Farms.pdf

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55 Pywell R et al, Wildlife-friendly farming increases crop yield: evidence for ecological intensification, *Proc Biol Sci*, 7 Oct 2015, <https://pubmed.ncbi.nlm.nih.gov/26423846/>

Profitability

We've seen how, in some studies, regenerative farming can lead to increases in long-term yield. Yet, other studies find that regenerative farming causes a long-term loss in yield. Despite this, however, once long-term cost reductions are accounted for, there is generally an increase in profitability after a number of years. This period before margins increase averages around three to six years - more research on how this varies between farm types could help make this more precise.^{56,57}

For example, analysis from the Groundswell benchmarking group found that, after four harvests using regenerative methods, average yield per hectare was 21% lower, but the net margin remained the same. This was due to variable costs being 18% lower and labour and machinery costs being 32% lower.⁵⁸ On top of this, regenerative farmers can also benefit from increased government payments through the SFI, Local Nature Recovery or Countryside Stewardship.⁵⁹

The positive effects of reducing inputs may be even stronger in the current economic context, given the rapidly increasing costs of synthetic fertilisers.⁶⁰ Farmers in our workshops corroborated this.

"With fertiliser prices being so high... market conditions dictated [regenerative farming] to us." (Farmer on a small lowland pasture farm)

Resilience to extreme weather

Climate change is a growing threat to farmers' businesses across the world. A 2021 study projects that, as the climate becomes warmer and drier, the probability of crop yield failures for breadbaskets globally will be 4.5 times higher by 2030, and up to 25 times higher by 2050.⁶¹ It expects the probability of a failure of maize crops in Europe by 2050 to be near 100%. Regenerative farming practices can enhance farms' resilience to weather extremes in several ways. For example, one 10-year study of barley crop farms in Spain found that, when using cover crops, the number of very dry events on the farm was reduced by around 20% compared to when cover cropping was not used due to improved soil health.⁶²

Resilience to supply disruptions

Farmers are facing volatility in the costs of fertilisers, pesticides, animal feed and machinery due to global events. For instance, in the UK, the price of ammonia nitrate fertiliser has increased by 152% between May 2021 and May 2022, primarily as a result of the war in Ukraine.⁶³

Yet, regenerative farming methods can enhance the industry's resilience to future shocks by reducing dependence on these inputs. Increasing crop diversity, adding fertility crops, and direct additions of organic matter can all reduce dependency on nitrogen fertiliser.^{64,65,66,67} The same applies to minimising tillage, which helps reduce nutrient losses from the soil, again reducing dependency on external nutrients, which can have high and volatile costs.⁶⁸

56 Petry D et al, Cultivating farmer prosperity: Investing in Regenerative Agriculture, BCG & OP2B, May 2023, <https://www.wbcscd.org/contentwbc/download/16321/233420/1>

57 Teanby A, Marffy G, Is regenerative agriculture financially viable?, Savills, June 2023, https://www.savills.co.uk/research_articles/229130/348021-0

58 Impey L, Regenerative farming data show variable costs cut by 18%, Farmers Weekly, 3 July 2021, <https://www.fwi.co.uk/arable/regenerative-farming-data-show-variable-costs-cut-by-nearly-20>

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60 Eardley F, Rising cost of agricultural fertiliser and feed: Causes, impacts and government policy, House of Commons Library, 22 June 2022, <https://lordslibrary.parliament.uk/rising-cost-of-agricultural-fertiliser-and-feed-causes-impacts-and-government-policy/>

61 Monica Caparas et al, Increasing risks of crop failure and water scarcity in global breadbaskets by 2030, Environ. Res. Lett, 21 September 2021, <https://iopscience.iop.org/article/10.1088/1748-9326/ac22c1>

62 Gabriel JL, Cover crops reduce soil resistance to penetration by preserving soil surface water content, Geoderma, 15 March 2021, <https://www.sciencedirect.com/science/article/abs/pii/S0016706120326665>

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64 Khangura R et al, Regenerative Agriculture—A Literature Review on the Practices and Mechanisms Used to Improve Soil Health, 27 January 2023, Sustainability, <https://www.mdpi.com/2071-1050/15/3/2338>

65 Rodríguez-Espinosa T et al, Nitrogen management in farming systems under the use of agricultural wastes and circular economy, Science of The Total Environment, 10 June 2023, <https://www.sciencedirect.com/science/article/pii/S0048969723012822>

66 E Davies, The impact of herbal leys on the health and performance of grazing lambs, Farming Connect, 3 March 2023, <https://businesswales.gov.wales/farmingconnect/news-and-events/technical-articles/impact-herbal-leys-health-and-performance-grazing-lambs>

67 Berdeni et al, Soil quality regeneration by grass-clover leys in arable rotations compared to permanent grassland: Effects on wheat yield and resilience to drought and flooding, Soil and Tillage Research, August 2021, <https://www.sciencedirect.com/science/article/pii/S0167198721001070>

68 McGregor B, The science behind the Sustainable Farming Incentive, Department for Environment, Food & Rural Affairs, 8 March 2023, <https://defrafarming.blog.gov.uk/2023/03/08/the-science-behind-the-sustainable-farming-incentive/>

Personal well-being

Research has identified the farming sector as suffering high levels of mental health problems due to stress and barriers to support. Shifting to regenerative farming can prove supportive to farmer's personal well-being. This has been corroborated in studies, while farmers and policy experts in our workshops highlighted the sense of pride and security that some farmers can feel by transitioning to regenerative farming.⁶⁹

“Regenerative agriculture can capture the imagination, especially for younger people. Regenerative farming gives people so much more motivation to spend 20-30 years doing it.” (Farmer on a large lowland sheep and beef farm)

“There’s a mental health benefit [from regenerative farming] as well, because there’s their savings in terms of time. But there’s also a large sense of pride in terms of what you’ve done for the land, what you’ve done for biodiversity, what you’ve done for climate.” (Farming policy expert)

BENEFITS FOR CONSUMERS

Food security

The government's 2021 Food Security Report states that 'soil health is perhaps the single most important factor for future domestic food production' - and this risk to production is already driving rising prices.^{70,71} This trend contributes to the wider impact of climate change on food prices, with an expected rise in average global food prices of 20% by 2050 due to its effects.⁷² Based on this, modelling suggests an average family's food bill in the UK would increase by 9% by 2050, or 13% for families in the lowest income decile.⁷³ This would put great pressure on UK

consumers and increase food poverty.

Regenerative farming can help mitigate these concerns in three key ways. Firstly, as noted, it can reduce losses in soil fertility. Modelling shows that, due to disruption to food production, 1.5°C of global warming could mean 80–300 million more people being undernourished by 2050.⁷⁴ Yet, increasing soil carbon sequestration on agricultural land could reduce the impacts on food production, limiting the increase in undernourishment to 20–75 million people.⁷⁵

Secondly, by increasing the resilience of UK land to extreme weather events such as flooding and droughts (as noted earlier), regenerative farming can help protect the stability of UK farm yields, thus protecting food supply.

Thirdly, by helping increase the resilience of UK farms to global supply disruptions by reducing reliance on imported inputs (as noted earlier), regenerative methods can help improve the stability of yields. The NFU have suggested that the current food supply crisis results from soaring costs of fuel, feed and fertiliser.⁷⁶ Regenerative farming would help mitigate exposure to these soaring costs.

Food availability and nutrition

There are concerns that widespread adoption of regenerative farming across the UK could lead to a narrower availability of food types in the UK.⁷⁷ The evidence within modelling suggests that, under a system of widespread regenerative practices and various other environmental reforms, the UK could produce the same amount of food (measured by both volume or calories), but with increases in some food types and decreases in some others.^{78,79}

In terms of nutrition, while studies also show that the minerals and vitamins in food in the UK has been decreasing, by improving soil health,

69 Brown K, Shirmer J and Upton P, Can regenerative agriculture support successful adaptation to climate change and improved landscape health through building farmer self-efficacy and wellbeing?, *Current Research in Environmental Sustainability*, 2022, <https://www.sciencedirect.com/science/article/pii/S2666049022000482#s0070>

70 Department for Environment, Food and Rural Affairs, UK Food Security Report 2021, 16 December 2021, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1077015/United_Kingdom_Food_Security_Report_2021_19may2022.pdf

71 Sartori M et al, A linkage between the biophysical and the economic: Assessing the global market impacts of soil erosion, *Land Use Policy*, July 2019, <https://www.sciencedirect.com/science/article/pii/S0264837718319343>

72 Nelson G et al, Climate change effects on agriculture: Economic responses to biophysical shocks, 16 December 2013, *PNAS*, <https://www.pnas.org/doi/10.1073/pnas.1222465110>

73 Watkiss P, Cimato F, Hunt A, and Morley B, Climate Change Impacts on the Future Cost of Living (SSC/CCC004), Joseph Rowntree Foundation, March 2016, <https://www.climatejust.org.uk/sites/default/files/FINAL%20Watkiss%20report%2030032016.pdf>

74 <https://www.theguardian.com/environment/2017/oct/24/uk-30-40-years-away-eradication-soil-fertility-warns-michael-gove>

75 <https://www.theguardian.com/environment/2017/oct/24/uk-30-40-years-away-eradication-soil-fertility-warns-michael-gove>

76 <https://www.theguardian.com/business/2022/dec/06/uk-food-supply-crisis-farmers-nfu-fuel-fertiliser-feed>

77 Dumbleby H, National Food Strategy: The plan, National Food Strategy, 15 July 2021, www.nationalfoodstrategy.org

78 Barbour R, Holden P and Fredenburgh J, Feeding Britain from the Ground Up, Sustainable Food Trust, June 2022 https://sustainablefoodtrust.org/wp-content/uploads/2022/06/V2SFT_Feeding-Britain-from-the-Ground-Up-single-page-view-compressed-for-web.pdf

79 Poux X., Schiavo M, Aubert PM, Modelling an agroecological UK in 2050 – findings from TYFAREGIO, IDDR, 10 November 2021, https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Idddri/Etude/202111-ST1021-TYFA%20UK_0.pdf

regenerative farming can help mitigate those losses.^{80,81}

BENEFITS TO COMMUNITIES

Support to Rural Economies

Regenerative farming often requires more on-farm labour compared to conventional farming to manage the natural inputs, and in the case of farming with organic inputs, studies have shown that this can result in increased job opportunities in rural areas.^{82,83,84} Equally, as a range of international examples suggest, spillovers into the local economy may occur through the economic activity generated through local trade, the networks people build in discussing regenerative practices, the tourism that nature-rich agricultural land can bring and agro-tourism (visits to work on farms), and the development of new technologies to support regenerative practices.^{85,86,87,88,89,90}

Beauty of the countryside

UK residents made a total of 358 million trips to the countryside in 2019.⁹¹ People in the UK also value wildlife and biodiversity, with reports of three quarters of people in England taking time to notice more everyday nature such as listening to birdsong during the pandemic.⁹² As noted, regenerative farming practices, such as wildflower planting, agroforestry, diverse crop rotations and cover cropping can contribute to thriving habitats, supporting an abundance of different plants or animals. These benefits for communities were echoed by many of the farmers we spoke to.

“The community loves seeing cows in the field and it’s brought people closer to their food.” (Farmer on a large lowland dairy farm)

“When growing cover crops, if it’s next to a public footpath, I’ll make sure that there’s something that flowers and write a piece in the village newsletter and you’ll get questions about what’s going on in the farms, and it opens a dialogue.” (Farmer on a large lowland arable farm)

“If you can increase biodiversity, that sort of thing can benefit the surrounding village. We have a footpath through our farm and get comments saying ‘there’s lots of birds and bees’.” (Farmer on a small lowland cattle farm)

CONCLUSION

The evidence shows that, given the right support and conditions, regenerative farming could play a key role in helping deliver the UK’s objectives for the environment, the farming sector, food security and more. The benefit of regenerative farming to soil health stands at the core of many of these. It can increase carbon sequestration (reducing emission), enhance biodiversity, and reduce water contamination and water demands from agriculture. Simultaneously, by enhancing soil fertility, it can improve yield, help protect domestic food production long-term, and increase resilience to extreme weather. This benefits farmers’ profits and business stability, while reducing food prices for consumers.

80 Montgomery D et al, Soil health and nutrient density: preliminary comparison of regenerative and conventional farming, Environmental Science, 27 January 2022, <https://peerj.com/articles/12848/>

81 Berenic Mayer AM, Trenchard L, Rayns F, Historical changes in the mineral content of fruit and vegetables in the UK from 1940 to 2019: a concern for human nutrition and agriculture, Int J Food Sci Nutr, May 2022, <https://pubmed.ncbi.nlm.nih.gov/34651542/>

82 Pearson C, Regenerative, Semiclosed Systems: A Priority for Twenty-First-Century Agriculture, BioScience, May 2007 <https://academic.oup.com/bioscience/article/57/5/409/221738>

83 Farming For a Better Climate, Regenerative Agriculture: Integrating livestock, no date, <https://www.farmingforabetterclimate.org/resource/integrating-livestock>

84 Lobley M, Butler A, and Reed, M, The contribution of organic farming to rural development: An exploration of the socio-economic linkages of organic and non-organic farms in England. Land Use Policy, <https://www.sciencedirect.com/science/article/abs/pii/S026483770800118X>

85 Shekhar S et al, Intelligent Infrastructure for Smart Agriculture: An Integrated Food, Energy and Water System, Computing Community Consortium, 4 May 2017, <https://arxiv.org/ftp/arxiv/papers/1705/1705.01993.pdf>

86 Baig M and Straquadine G, Sustainable Agriculture Ensures Sustainable Rural Development: A Reality or a Myth, Global Food Insecurity, 1 January 2011, https://link.springer.com/chapter/10.1007/978-94-007-0890-7_3

87 Spychała A and Graja-Zwolińska S, Using biodiversity in creating the tourism offer of rural area, conference paper, May 2015, https://www.researchgate.net/publication/282218894_USING_BIODIVERSITY_IN_CREATING_THE_TOURISM_OFFER_OF_RURAL_AREAS

88 World Travel and Tourism Council, Nature Positive Travel and Tourism: Travelling in harmony with nature, September 2022, <https://wtcc.org/Portals/0/Documents/Reports/2022/Nature-Positive-Travel-And-Tourism.pdf>

89 Borthakur S and Meulensteen T, ‘6 ways digital tech can aid the transition to regenerative agriculture’, idh, 29 June 2022, <https://www.idhsustainabletrade.com/news/6-ways-digital-tech-can-aid-the-transition-to-regenerative-agriculture/>

90 Medhurst J et al, An economic analysis of spillovers from programmes of technological innovation support, ICF GHK, March 2014, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/288110/bis-14-653-economic-analysis-of-spillovers-from-programmes-of-technological-innovation-support.pdf

91 ‘Number of day visits to rural locations in Great Britain from 2011 to 2020 (in millions)’, Statista, 2021, <https://www.statista.com/statistics/629211/number-of-day-visits-rural-location-great-britain-uk/>

92 Natural Resources Wales, Forest Research, Natural England, NatureScot and the Environment Agency, Why society needs nature Lessons from research during Covid-19, May 2021, https://cdn.forestresearch.gov.uk/2021/04/why_society_needs_nature_4fuc2gt.pdf

The effect of regenerative farming on reducing reliance on synthetic inputs also has important knock-on benefits. In particular, it means farmers are more resilient to supply disruptions like those created by the Russia-Ukraine conflict (and can reduce input costs more generally), increasing profit margins.

These many benefits also have wider impacts, including enhancing the beauty of the countryside, creating new opportunities for employment, trade and networking in local and farming-adjacent economies, and improving farmers' personal well-being.

This alone makes a strong case for the expansion of regenerative farming in the UK. We need, however, to also be guided by what the public wants.

1.2. WHAT DO THE PUBLIC THINK OF THE BENEFITS OF REGENERATIVE FARMING?

The public's attitudes matter greatly to land, farming and food policy because they have a huge stake in what it delivers - and policymakers

must ensure their policies align with public preferences. It also matters because significant policy changes require public demand for reform.

Through our survey, we find that:

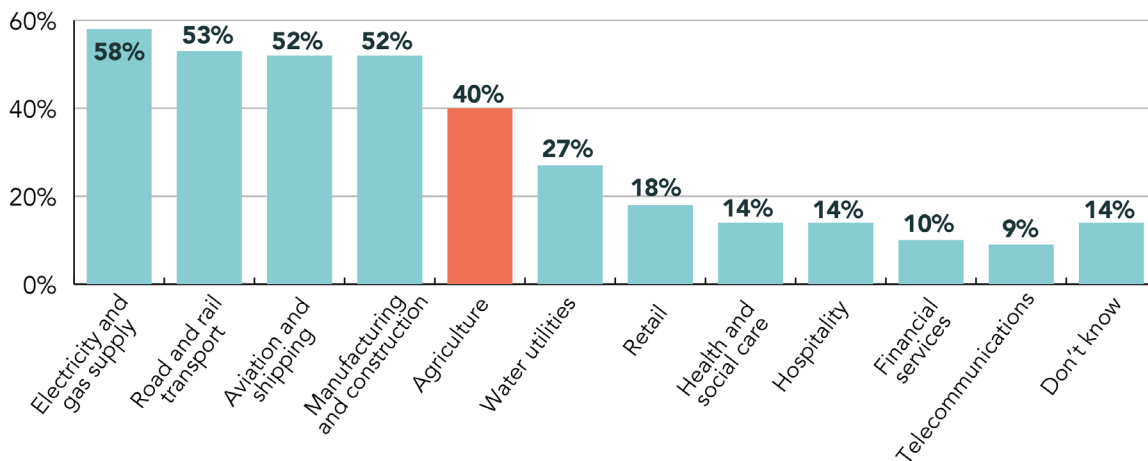
1. Awareness of regenerative farming and its importance is low

The public underestimate the extent to which the farming sector is important for the environment. The agricultural sector creates 11% of greenhouse gas emissions in the UK. It is therefore one of the highest emitting sectors in the UK. In the list of sectors in Figure 3, it is the fourth biggest emitter.^{93,94,95,96,97} We asked people to select up to five of the most emitting sectors, meaning that selecting agriculture would have been a correct answer.

However, while over half the respondents identify aviation and shipping as a top emitting sector, just 40% identify agriculture (which emits more than aviation and shipping). Six in ten people don't identify agriculture as being one of the five most important sectors for reducing emissions.

FIGURE 3

VIEWS ON WHICH SECTORS ARE MOST IMPORTANT FOR THE UK IN REDUCING GREENHOUSE GAS EMISSIONS



Q1: To a greater or lesser extent, every sector in the UK has an impact on our greenhouse emissions. If, as a country, we wish to make changes to reduce emissions, which of the following sectors do you think are most important for achieving this? You may select up to five sectors. Base, all respondents (n=1,502)

93 Agriculture, in 2018, emitted 54.6 MtCO₂e. This is less than road and rail transport (113 MtCO₂e), electricity and gas supply (98 MtCO₂e), and Manufacturing and Construction (66 MtCO₂e). It is, however, more than Aviation and Shipping (54 MtCO₂e), water utilities (between 1.3 and 4 MtCO₂e) for 2018 data, and less than retail, health and social care, hospitality, financial services, and telecommunications (all less than 3 MtCO₂e) for 2019 data.

94 Climate Change Committee, The Sixth Carbon Budget: Surface Transport, December 2020, <https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Surface-transport.pdf>

95 Climate Change Committee, The Sixth Carbon Budget: Shipping, December 2020, <https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Shipping.pdf>

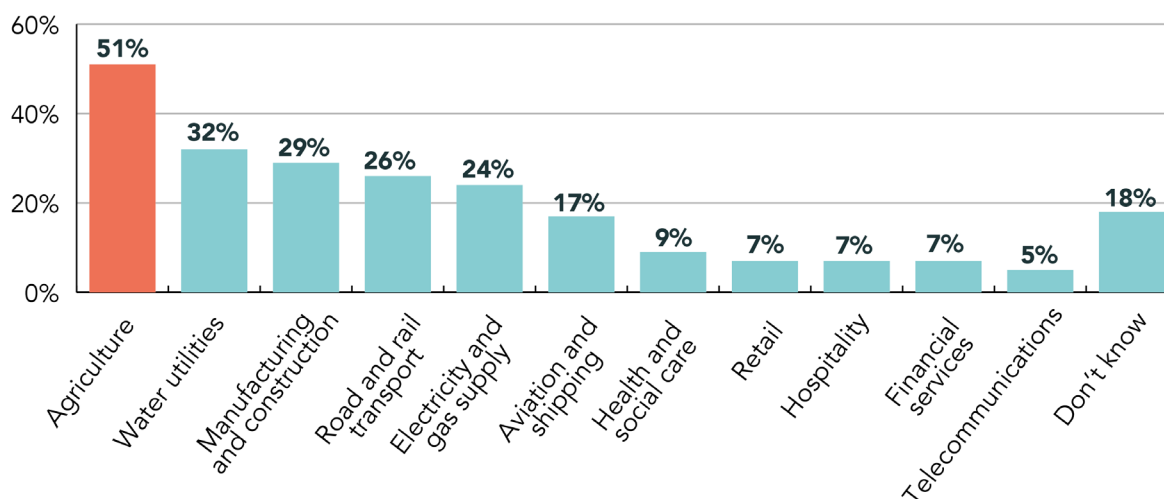
96 Climate Change Committee, The Sixth Carbon Budget: Aviation, December 2020, <https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Aviation.pdf>

97 Allas T et al, 'Opportunities for UK businesses in the net-zero transition', McKinsey, 21 October 2021, <https://www.mckinsey.com/capabilities/sustainability/our-insights/opportunities-for-uk-businesses-in-the-net-zero-transition>

Also, while research suggests agriculture is the leading cause of biodiversity loss in the UK - just over half of people correctly identified agriculture as one of the three most important sectors for this (see Figure 4), and just a third of people aged 18-24 did.⁹⁸

The public were also generally unfamiliar with regenerative farming (seven in ten people are either not very or not at all familiar).

FIGURE 4
VIEWS ON WHICH SECTORS ARE MOST IMPORTANT FOR THE UK IN INCREASING BIODIVERSITY



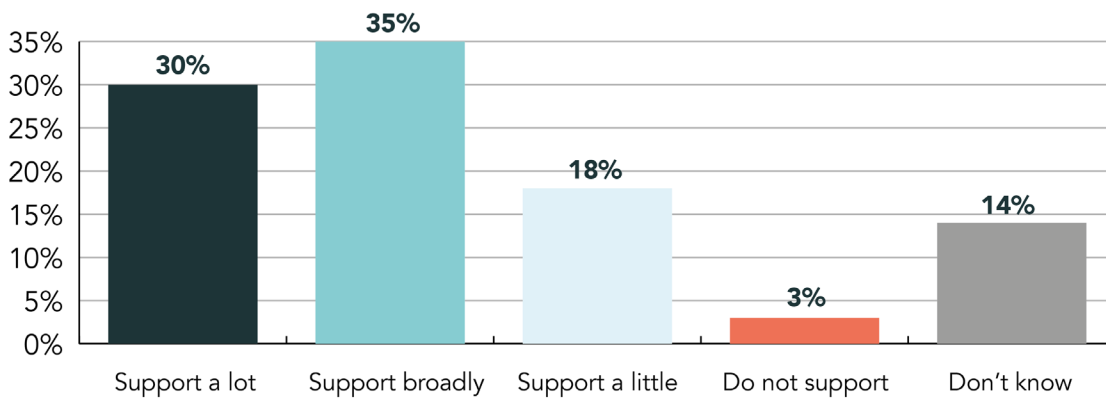
Q2: To a greater or lesser extent, many sectors in the UK have an impact on biodiversity (meaning the amount of plants and animals that exist in nature). If, as a country, we wish to make changes to increase biodiversity, which of the following sectors do you think are most important for achieving this? You may select up to three sectors. Base, all respondents (n=1,502)

2. Support for regenerative farming in principle is high.

When defined, the public are highly supportive of regenerative farming, with two thirds supporting its widespread adoption either broadly or a lot (see Figure 5). This is consistent across voters of the main political parties, with 69% and 68% of those who voted Conservative and Labour in 2019 respectively saying the same.

⁹⁸ Davies J, 'UK has 'led the world' in destroying the natural environment', Natural History Museum, 26 September 2020, <https://www.nhm.ac.uk/discover/news/2020/september/uk-has-led-the-world-in-destroying-the-natural-environment.html>

FIGURE 5
EXTENT OF SUPPORT FOR WIDESPREAD ADOPTION OF REGENERATIVE FARMING
IN THE UK

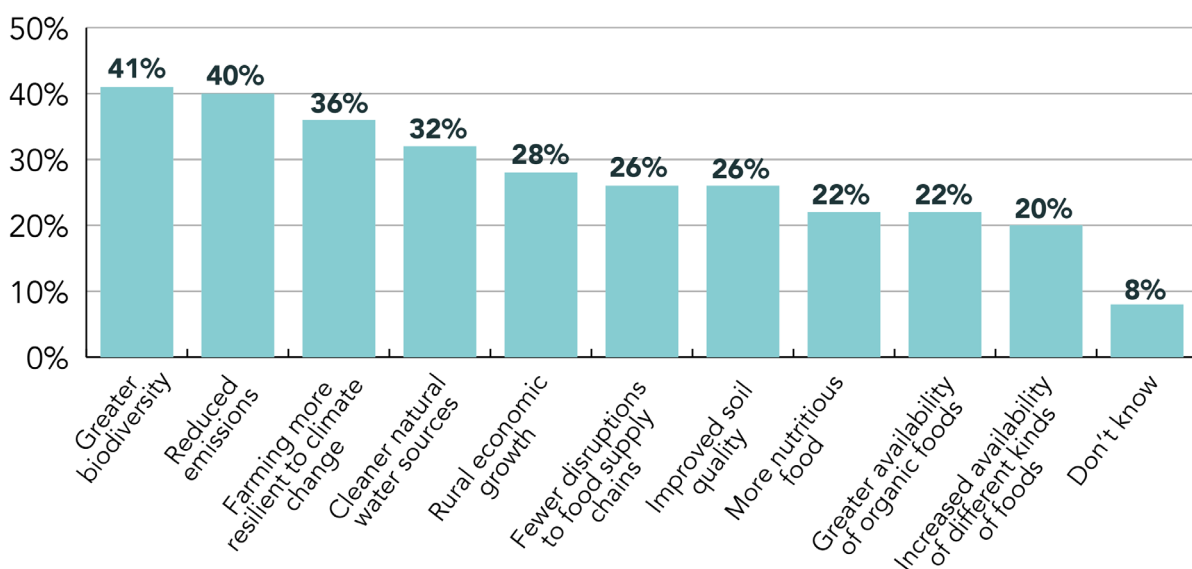


Q4: 'Regenerative farming' is a way of farming that aims to be more environmentally friendly. It does this by using methods and techniques that reduce greenhouse gas emissions, and protect and restore the health of soils and plants. Based on this understanding, to what extent would you support widespread adoption of regenerative farming? Base, all respondents (n=1,502)

3. People would accept trade-offs to see regenerative farming deliver key benefits

People think the most important benefits of regenerative farming are the broad environmental effects and enhanced farmer resilience to climate change (see Figure 6).

FIGURE 6
VIEWS ON TOP THREE MOST IMPORTANT BENEFITS OF REGENERATIVE FARMING



Q5. Below are some of the benefits of regenerative farming. Rank up to three benefits that you feel are most important, in order of importance (1 being the most important, 3 the least important). Rank 1, 2 and 3. Base, all respondents (n=1,502)

As Figure 7 shows, the public are also happy to make trade-offs to deliver these benefits. While there is no clear evidence that regenerative farming would push up food prices, whether consumers would accept higher prices is indicative of the extent to which they value certain other aspects of that food. We find that more than half (excluding the 16-23% responding 'don't know') say they would be happy to pay more for food if regenerative farming could deliver reduced emissions, greater biodiversity, enhanced farmers' resilience, more organic food, and clear natural water sources. For example, if regenerative farming helped increase farmers' resilience to climate change, a 12% majority would be happy to pay more for food. If regenerative farming helped reduce emissions or increased biodiversity, an 11% and 6% majority respectively would be happy to pay more.

Regenerative farming, which could help achieve these objectives, is also widely unknown.

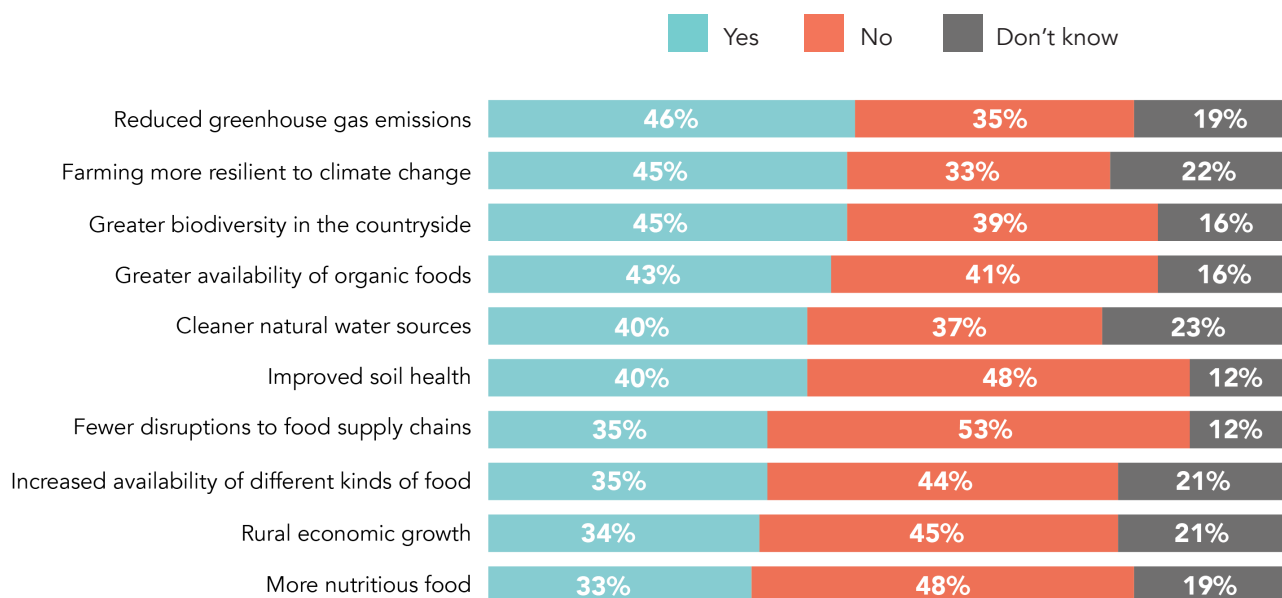
Encouragingly, once regenerative farming is explained to the public, they are highly supportive and happy to accept important trade-offs. People tend to say they would be happy paying more for food if regenerative farming could deliver benefits for the environment and farmer resilience. This shows that increasing public recognition of regenerative farming and enabling it to deliver its key benefits could be an effective approach for policymakers, delivering the key benefits of regenerative farming while garnering public support. In the next section, we look at why regenerative farming has not therefore been expanded.

IN SUMMARY

For the public, agriculture seems to be the 'forgotten sector' when identifying opportunities to bring down our greenhouse emissions, and overlooked by many when identifying opportunities to improve biodiversity.

FIGURE 7

WOULD THE PUBLIC BE HAPPY TO PAY MORE FOR FOOD PRODUCED USING REGENERATIVE METHODS IF IT COULD DELIVER SPECIFIC BENEFITS?



Q6.1 Imagine regenerative farming could deliver [Insert benefit] for the UK. For [Insert benefit], would you be willing to: Pay more for food grown using regenerative methods? Base, all respondents excluding those answering 'don't know' to Q5 (n=1,382). For each benefit listed, respondents were only asked about it if they selected it as important in Q5.

SECTION 2

BARRIERS TO EXPANDING REGENERATIVE FARMING

“ I know bad news is boring, but we’re at a tipping point where we could make really good, profoundly countryside-changing decisions, and we’re not making them.”

– James Rebanks, July 2021⁹⁹

We have seen that regenerative farming could have significant benefits for the UK. We have seen how the public are broadly supportive of a move to more regenerative farming, and would accept significant trade-offs if required to make it happen. Why, therefore, hasn’t this happened? Here we outline the three barriers to that development, as summarised below.

“ From speaking to the farming community about the horrific costs of fertiliser at the moment, created by the Ukrainian war, people who had been very resistant to regenerative farming are beginning to get quite interested in people who are using 30% less fertiliser than them to generate the same yield. You might see more of a drift towards that in the absence of government targets because people have seen a future and we have had a short—hope—glimpse of what the future might look like. It does not look great if you are reliant on industrial fertilisers.”

– Henry Dimbleby, June 2022¹⁰⁰



Poor short-term financial incentives

- High transition costs and time requirements
- Uncertainty about impact
- Insufficient government payments
- Concern about government delivery and payment volatility
- Low consumer demand
- Insufficient ambition among some businesses
- Competition with imports produced using lower standards



Caution about the shift to regenerative

- Lack of clarity about what regenerative farming means
- Caution about change



Difficulties in implementation

- Insufficient access to relevant knowledge and advice
- Current system too complex to navigate
- Excessive and invasive bureaucracy

99 Lewis T, “Sustainable isn’t a thing’: why regenerative agriculture is food’s latest buzzword’, The Guardian, 18 Jul 2021, <https://www.theguardian.com/food/2021/jul/18/sustainable-isnt-a-thing-why-regenerative-agriculture-is-foods-latest-buzzword>

100 Land Use in England Committee, Corrected oral evidence: Land use in England, House of Lords Library, 27 June 2022, <https://committees.parliament.uk/oralevidence/10508/pdf>

We take as our starting point the perspective of farmers and land managers, because they make the final decisions about how land is used, but analyse barriers both that farmers engage with directly and parts of the wider system creating indirect barriers for farmers who might otherwise expand regenerative methods.

2.1. POOR SHORT-TERM FINANCIAL INCENTIVES

High transition costs and time requirements

As our evidence review shows, while transitioning to regenerative methods can increase long-term profitability, it often also reduces profitability in the short-term. There are costs in terms of the time needed to transition (to learn about, plan, and implement the changes), as well as financial costs (to invest in new non-synthetic inputs and the equipment needed to manage these). As a policy expert we spoke to noted, “As you reduce your outputs, you’re still paying for your costs in the old system.”

Some farmers may not be able to sustain the transition costs, or feel they are too burdensome given the time it will take to see returns. The Sustainable Markets Initiative (SMI), Agriculture and Horticulture Development Board (AHDB), and World Wildlife Fund for Nature (WWF) all highlight this as a key barrier for farmers^{101,102,103}. Farmers and policy experts in our workshop echoed these concerns:

“[My neighbour,] their main customer is asking them to go down a more environmental route, but they’re looking at the cost of a £100 grand drill.” (Farmer on a large lowland arable farm)

“A bee farmer I know who has adopted regen practices. And she said, it’s taken about ten years from start to finish. And the benefits weren’t immediate, and she felt quite resigned to the fact that there are probably a lot of older farmers who will never make that switch because of the time and the effort that it takes.” (Farming policy expert in our workshops)

Uncertainty about impact

Farms plan for the future, like any other business, based on forecasted costs and revenues. Yet, as we’ve shown, a transition to regenerative farming creates various uncertainties for those forecasts around the impact on input costs and yield, leading to risks and feelings of uncertainty. Many farmers are not willing to take that on. Farmers in our workshops expressed this.

“[A key barrier to regenerative farming is] the risk and hope, the what ifs, the what if nots. The unknown is a serious problem.” (Farmer on a large lowland arable farm)

“[A key barrier to regenerative farming is] the trialling of things, there’s no workbook for this. The key for us is doing small bits. It’s the risk.” (Farmer on a large lowland dairy farm)

Many farmers also feel that the risk will not pay off, with scepticism about the likelihood of a long-term increase in profitability and the potential for maintaining short-term productivity. An AHDB study found that many farmers viewed regenerative farming as less commercially viable.¹⁰⁴ Farmers in our workshops expressed similar doubts. Some felt regenerative farming means a fall in production, and others felt it means a fall in long-term profits.

“Some people end up as a smaller business, they’ve cut the staff, cut the machinery, and they’re producing less. They spend less within the community and spend less within agriculture.” (Farmer on a large mixed lowland farm)

“I think there’s long-term benefits way down the line. I don’t think there’s many short-term benefits as it can lead to a loss in production or ease of doing things.” (Farmer on a small upland sheep farm)

“It’s just going to add costs and we’re not going to get any return for those costs.” (Farmer on a small lowland beef and combinable crop)

As our evidence review shows, regenerative methods tend to reduce long-term costs and

101 The Sustainable Markets Initiative Agribusiness Task Force, Scaling Regenerative Farming: An Action Plan, 3 Nov 2022, <https://a.storyblok.com/f/109506/x/7b102e6831/agribusiness-task-force-white-paper.pdf>

102 The Sustainable Markets Initiative Agribusiness Task Force, Scaling Regenerative Farming: An Action Plan, 3 Nov 2022, <https://a.storyblok.com/f/109506/x/7b102e6831/agribusiness-task-force-white-paper.pdf>

103 Taylor A, Land of Plenty: A Nature-Positive Pathway to Decarbonise UK Agriculture and Land Use, World Wide Fund for Nature, 16 February 2022, https://www.wwf.org.uk/sites/default/files/2022-02/WWF_land_of_plenty.pdf

104 Magistrali A, Cooper J, Franks J, George D, and Standen J, Identifying and implementing regenerative agriculture practices in challenging environments: experiences of farmers in the north of England, Agriculture and Horticulture Development Board and Biotechnology and Biological Sciences Research Council, June 2022, [https://projectblue.blob.core.windows.net/media/Default/Research%20Papers/AHDB/2022/PR640-09%20Final%20report%20AHDB-BBSRC%20Farm%20Sustainability%20Fund%20\(Cooper\).pdf](https://projectblue.blob.core.windows.net/media/Default/Research%20Papers/AHDB/2022/PR640-09%20Final%20report%20AHDB-BBSRC%20Farm%20Sustainability%20Fund%20(Cooper).pdf)

improve farms' long-term profitability and business resilience. The concern among farmers demonstrates that these benefits have not been sufficiently communicated.

Insufficient government payments

A survey by AMTEC (an agricultural machinery dealer) found that 27% of farmers cited a lack of funding as their main barrier to starting with regenerative techniques. The main way farmers would get such funding would be through the government payment schemes, particularly the SFI, but also Local Nature Recovery and Countryside Stewardship. But while 95% of surveyed farmers are aware of these schemes, many farmers feel the payments are not enough.¹⁰⁵ Surveys asking farmers why they did not enter into the SFI in 2022 have found that half say 'payment rates are not attractive enough given the costs of delivery'.¹⁰⁶

This sentiment has been echoed by the National Farmers' Union (NFU), who have said 'the payment rates [for SFI] do not offer sufficient incentive to secure high levels of engagement'.¹⁰⁷ This barrier is compounded by the difficulties in accessing government payments (for example due to extensive bureaucracy), as we expand on later. This could also lead some farmers to disengage with government payments and seek other ways to cover those costs; as the Institute for Government (IfG) note, this could involve farming more intensively, which would be counterproductive to regenerative farming. The farmers we spoke to expressed these various concerns.

"With the way the subsidy system is going, farmers aren't going to be able to take on the costs of [a transition to regenerative farming]." (Farmer on a small lowland beef and combinable crop farm)

"In theory, SFI is a good thing... but the payments are paltry and hardly worth the paperwork." (Farmer on a large lowland

arable farm)

"SFI is worse in the uplands, it's not even worth the actual bit of paper it's written on in the uplands... If SFI doesn't fit with your farm, it will probably alienate you further and push you to focus on yield." (Farmer on a large lowland arable sheep and beef farm)

There is also concern about low payment rates for the higher (more ambitious) tiers of Countryside Stewardship, which could be essential for delivering regenerative farming and the more ambitious environmental objectives that Defra is working towards, especially if uptake in ELM schemes is low.¹⁰⁸ Prior to the agricultural transition, the government processed up to 2,500 farms into the higher tier of Countryside Stewardship each year. In the new system, however, the higher tier is only available to 300-500 farms each year.

Concern about government delivery and payment volatility

As we have heard, farmers require a degree of long-term certainty for their planning.¹⁰⁹ Yet, the current agricultural reform programme is creating significant uncertainty. When Liz Truss was prime minister, for example, she suggested the government would strip back on the reforms.¹¹⁰ Farmers expressed frustration that the government was creating volatility around their finances.¹¹¹

There are also concerns that the Treasury could request a reduction in payments to farmers.¹¹² While the agricultural transition is occurring until 2028, the government has only committed to maintain the current level of spending of farm support until the end of this parliament (expected to be 2024). The Treasury could pressure a cut in spending after this point, particularly if uptake of the ELM schemes is low and objectives are not achieved.¹¹³ This risk decreases the incentive for farmers to make long-term investments in

105 Swire J, '75% of farmers say regenerative farming is important for the future, survey finds', AA Farmers, 13 April 2022, <https://www.aafarmer.co.uk/regenerative-agriculture/75-of-farmers-say-regenerative-farming-is-important-for-the-future-survey-finds.html>

106 Clarke P, 'Slow uptake of SFI blamed on low payments and lack of detail', Farmers Weekly, 8 September 2022, <https://www.fwi.co.uk/business/business-management/agricultural-transition/slow-uptake-of-sfi-blamed-on-low-payments-and-lack-of-detail>

107 NFU, 'AHDB report says SFI will not offset direct payment losses', NFU Online, 14 April 2022, <https://www.nfonline.com/updates-and-information/ahdb-report-says-sfi-will-not-offset-direct-payment-losses/>

108 Groom A, 'Lack of ELMS payment strategy risks poor outcomes for nature and farmers', RSPB, 23 May 2023, <https://community.rspb.org.uk/ourwork/b/rspb-england/posts/payment>

109 Department for Environment, Food & Rural Affairs, 'A fresh start for new entrants', 1 June 2022, <https://defrafarming.blog.gov.uk/2022/06/01/a-fresh-start-for-new-entrants/>

110 Cockburn H, 'Hundreds of farmers warn MPs 'fragile food system at critical turning point'', The Independent, 20 October 2022, <https://www.independent.co.uk/climate-change/news/farmers-food-system-elms-liz-truss-b2206833.html>

111 Ibid.

112 Marshall J, Rutter J, Kane J, and Goss D, Agriculture after Brexit: Replacing the CAP, 15 March 2022, <https://www.instituteforgovernment.org.uk/sites/default/files/publications/agriculture-after-brexite.pdf>

113 Ibid.

regenerative farming. The concern was echoed by the farmers and policy experts we spoke to.

“One party can’t even keep one minister for agriculture in for longer than 6 months, one political party will be in for four years then another will come in and it’ll all change.” (Farmer on a small lowland beef and combinable crop farm)

“We can’t have plans for agriculture and farming in this country that are based on political cycles, it just won’t work.” (Farming policy expert)

Farmers also express a general lack of confidence in the ability of the government to deliver the reforms. Previous research has detailed how, due to past government errors such as late payments and poor communications, many farmers lack trust in Defra and the Rural Payments Agency.¹¹⁴ Farmers in our workshops also expressed scepticism about government interventions - which could have a negative effect on engagement.

“The schemes are dreamt up by people who sit in offices that haven’t got a clue... they can’t even tell us how they think it’s meant to work.” (Farmer on a small lowland beef and combinable crop farm)

“The vast majority of the people who make up the legislation have never set foot in a farm... they don’t have the time, they don’t have the expertise. The pilot farms are saying they haven’t even heard from the people they’re meant to be working with for months.” (Farmer on a small upland sheep farm)

Low consumer demand

Low consumer demand for regenerative products limits the market incentives for growers to produce regeneratively. The organic market is a useful contrast, whereby rising consumer demand (for organic food alongside clothing, cosmetics and other products) has led to expanding sales, with a 13% increase between 2019 and 2023.¹¹⁵ Regenerative produce is not seeing

the same consumer drive, despite our survey finding that people were willing to pay more for regeneratively produced food. There are several reasons why.

One reason is the inability for consumers to know which food is produced regeneratively. As is expanded upon later, while organic food has a clear definition and can be easily labelled, there is no agreed upon measurement of regenerative production. This creates barriers to informing consumers about which food is produced regeneratively.

Another reason is the lack of awareness of regenerative farming. Our survey shows that less than three in ten people are somewhat or very familiar with the term ‘regenerative agriculture’. It is clearly not, therefore, a salient consideration in most people’s spending habits. As noted, we also found that the UK public underestimate the impact of the agricultural sector on greenhouse gas emissions and biodiversity, which may diminish the extent that people see regenerative farming as important.

Beyond this, even if consumer awareness was much higher, there is a problem around the ‘value-action gap’, whereby consumers often state their concern for features of food like ethics and environmentalism, but in reality will only buy food for this reason if other needs - such as price, availability and quality - are satisfied.¹¹⁶ This has been widely recorded in previous literature, and could likely be compounded currently by the rising cost of living.^{117,118} The AHDB study, for example, found factors such as environmental credentials and animal welfare are seen as ‘nice to have’ in food consumption, but still lose out to cheaper products.¹¹⁹ While this is not an urgent problem now, given the lack of consumer knowledge about food produced using regenerative methods, it is a risk to future consumer demand. Farmers in our workshop also echoed the sentiment.

“Consumers like the idea [of regeneratively farmed products], they like the ethos, but their pockets aren’t deep enough to afford it.” (Farmer on a small lowland cattle farm)

114 Ibid.

115 Harvey F, ‘Steep rise in UK’s consumption of organic food’, The Guardian, 10 February 2021, <https://www.theguardian.com/environment/2021/feb/10/steep-rise-in-uks-consumption-of-organic-food>

116 d’Angelo et al, Food consumption in the UK: Trends, attitudes and drivers, RAND Corporation, 2020, https://www.rand.org/content/dam/rand/pubs/research_reports/RR4300/RR4379/RAND_RR4379.pdf

117 Essiz O et al, Exploring the Value-Action Gap in Green Consumption: Roles of Risk Aversion, Subjective Knowledge, and Gender Differences, Journal of Global Marketing, 25 August 2022, <https://www.tandfonline.com/doi/full/10.1080/08911762.2022.2116376>

118 Department for Environment, Food and Rural Affairs, Attitudes and Behaviours around Sustainable Food Purchasing, April 2011, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/137733/defra-stats-foodfarm-food-attitudes-report-110406-mainreport.pdf

119 Consumer awareness of regenerative agriculture, Agriculture and Horticulture Development Board, 13 July 2021, <https://ahdb.org.uk/news/consumer-insight-consumer-awareness-of-regenerative-agriculture>

Insufficient ambition among some businesses

Regenerative or other environmentally friendly production practices have been embraced to various levels across the food sector. The Sustainable Soils Alliance found that, of the 25 businesses they found to have the largest impact on UK agriculture practices, 20 mentioned sustainable or regenerative agricultural practices on their website or ESG reports.¹²⁰ Many companies are taking active steps to accelerate the implementation of regenerative practices. Several are members of the SMI's Agribusiness Task Force, which aims to identify how the private sector can better support farmers to transition to regenerative practices, and have made ambitious commitments to source regeneratively produced food.¹²¹

However, there is a risk that efforts among some food businesses are not outcome-oriented enough or ambitious enough. The businesses surveyed by the Sustainable Soils Alliance acknowledged that some sustainable farming initiatives are designed more for marketing outputs over long-term results.¹²² This risk has also been identified by the Soil Association, who note that - because regenerative farming is not currently codified - it could be interpreted in various, possibly less outcome-oriented ways.¹²³ Problems have also been recorded with food businesses not being sufficiently ambitious with environmental targets; The World Benchmarking Alliance found that, while 65% of the food businesses they evaluate have targets to cut emissions, just 7% have targets in line with the Paris Agreement's 1.5C pathway.¹²⁴ Moreover, over half do not publicly report on their indirect emissions, which are 5.5 times higher than direct emissions on average. If regenerative farming is to deliver sufficiently for the environment, it will need to be guided by ambitious outcome-focused targets that consider the full environmental impacts.

Similarly, some farmers in our workshops also felt that food businesses are insufficiently concerned about regeneratively produced food, suggesting prices are more important.

"Your average top four supermarket just wants as much as possible as cheap as possible." (Farmer on a large lowland arable farm)

Competition with imports produced using lower standards

In most countries, including the UK, environmental standards applied to domestic agricultural produce are not applied to food imports.¹²⁵ This means international trade can open markets up to agricultural products produced to lower environmental standards. The Institute for Development Studies argues that this can undermine policies encouraging sustainable practices domestically, as farmers have to compete with imports produced to lower environmental standards.¹²⁶ The National Farmers' Union has suggested that 'trade policy could ultimately be more significant than environmental policy' in developing a sustainable farming sector.¹²⁷ Policy expert in our workshops corroborated this:

"There is absolutely no way that the farms in the UK on the scale they operate can compete with the massive prairie farms in the US and Asia. So if we're not providing some kind of trade barrier to support domestic production, we're just not going to have any investment." (Farming policy expert)

There is also particular concern around upcoming trade deals with Brazil and the US, and the UK joining the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP).¹²⁸ For regenerative farming specifically, given the lack of an internationally recognised

120 Sustainable Soils Alliance, Soil in the UK Supply Chain: How the food and drink industry can support the transition to sustainable, regenerative agriculture and Net Zero, December 2021, https://sustainablesoils.org/images/pdf/Soil_in_the_UK_Supply_Chain_Report_Dec_2021.pdf

121 The Sustainable Markets Initiative Agribusiness Task Force, Scaling Regenerative Farming: An Action Plan, 3 Nov 2022, <https://a.storyblok.com/f/109506/x/7b102e6831/agribusiness-task-force-white-paper.pdf>

122 Sustainable Soils Alliance, Soil in the UK Supply Chain: How the food and drink industry can support the transition to sustainable, regenerative agriculture and Net Zero, December 2021, https://sustainablesoils.org/images/pdf/Soil_in_the_UK_Supply_Chain_Report_Dec_2021.pdf

123 'Regenerative Agriculture position statement', Soil Association, no date. <https://www.soilassociation.org/causes-campaigns/a-ten-year-transition-to-agroecology/regenerative-agriculture-position-statement/>

124 World Benchmarking Alliance, Assessing the world's 350 most influential food and agriculture companies, September 2021, <https://www.worldbenchmarkingalliance.org/publication/food-agriculture/>

125 Institute of Development Studies, Trade Policy for Sustainable and Inclusive Agriculture, 7 February 2023, <https://www.ids.ac.uk/publications/trade-policy-for-sustainable-and-inclusive-agriculture-accessible-version/>

126 Ibid.

127 House of Commons Environment, Food and Rural Affairs Committee, Oral Evidence: Environmental land management and the agricultural transition, HC 78, 11 May 2021, <https://committees.parliament.uk/oralevidence/2228/default>

128 'UK joins Indo-Pacific trade bloc, raising concerns about food, farming and environment standards', Sustain, 31 March 2023, <https://www.sustainweb.org/news/mar23-uk-joins-indo-pacific-trade-bloc-cptpp/>

framework, it is difficult to ensure standards are consistent across countries.

If not protecting against imports produced using lower standards, the government also misses an opportunity to signal to farmers that they care about UK farming.

*"It must be the aspiration for every farmer to see their government assuring that the food coming into this country is at a minimum at the standards required within the UK... it would provide a bit of assurance to farmers, you'd think yeah we're being backed as an industry."
(Farmer on a large lowland beef, sheep and poultry farm)*

2.2. CAUTION ABOUT THE SHIFT TO REGENERATIVE

Lack of clarity around what regenerative farming means

An asset of the term 'regenerative farming' is that many farmers are familiar with it and supportive in theory. All those we spoke to were familiar with it, and almost all felt it was good practice. Previous research has found that two thirds of farmers think regenerative farming is important now, and three quarters think it is important for the future.¹²⁹

However, regenerative farming doesn't have a clear definition. A report by the Sustainable Soil Alliance notes that there are multiple definitions of 'regenerative' within the agricultural community. Whilst some flexibility to suit individual farm requirements is important, surveyed businesses highlight that the lack of a consistent definition can be a barrier to engagement.¹³⁰ This point was echoed by several of the policy experts we spoke to.

*"It's a huge challenge how on earth we define regenerative farming... and I really don't know how government are going to define it."
(Farmer on a large lowland beef, sheep and poultry farm)*

"It's quite difficult to define one type of

*farming as regenerative. Some things are regenerative that farms do naturally... but that doesn't make you a regenerative farmer."
(Farmer on a large upland beef and sheep farm)*

Some we spoke to felt like it was failing as a term to build a movement because it felt divisive, and others felt excluded by the term because it is too rigid. The AHDB found similar feelings among farmers.¹³¹

*"You have to be really careful when labelling different types of farmers... when you start putting different labels, people become disinterested... For me, the whole regenerative title is a really divisive statement."
(Farmer on a large upland beef and sheep farm)*

*"We're intensive but our carbon footprint is really low. You can be sustainable without being regenerative... It all depends on your farming system. There's not one system that fits all sizes, and terminology can be criminal."
(Farmer on a small lowland cattle farm)*

At the same time, very few farmers defined regenerative farming in terms of specific practices or outcomes. Some felt that regenerative farming is "leaving your land in a better situation than it was" or just synonymous with good farming, such that we "need to get rid of the tagline because actually I just think it's really good farming practice". Others did explain regenerative farming in terms of a specific set of practices, but rarely highlighted the wide variety that come under the term 'regenerative'. Herbal leys and cover cropping were often mentioned, but other practices were rarely mentioned. One farmer noted that "I don't really know the difference [between regenerative and organic] anymore". The vague understanding of what regenerative farming involves, both in terms of outcomes and practices, can make it hard for farmers to understand how it could apply to their farm.

The term 'organic' - defined as agricultural production which avoids use of human-made fertilisers, pesticides, growth regulators and

129 AMTEC, Regenerative farming in the UK 2022, no date, <https://amtec-group.com/future-of-farming/regenerative-farming-survey-results-2022>

130 Sustainable Soils Alliance, Soil in the UK Supply Chain: How the food and drink industry can support the transition to sustainable, regenerative agriculture and Net Zero, December 2021, https://sustainablesoils.org/images/pdf/Soil_in_the_UK_Supply_Chain_Report_Dec_2021.pdf

131 Magistrali A, Cooper J, Franks J, George D, and Standen J, Identifying and implementing regenerative agriculture practices in challenging environments: experiences of farmers in the north of England, Agriculture and Horticulture Development Board and Biotechnology and Biological Sciences Research Council, June 2022, [https://projectblue.blob.core.windows.net/media/Default/Research%20Papers/AHDB/2022/PR640-09%20Final%20report%20AHDB-BBSRC%20Farm%20Sustainability%20Fund%20\(Cooper\).pdf](https://projectblue.blob.core.windows.net/media/Default/Research%20Papers/AHDB/2022/PR640-09%20Final%20report%20AHDB-BBSRC%20Farm%20Sustainability%20Fund%20(Cooper).pdf)

livestock feed additives - is a useful contrast.¹³² This term was very successful in building a movement both among farms (as many of the farmers we spoke to highlighted) and consumers (as reflected in the huge proliferation of organic food sales in the UK).¹³³ It also provided very clear guidance for producers to change. There is government guidance on what constitutes organic food, with legal protections (e.g. that 'at least 95% of the agricultural ingredients are organic').¹³⁴ While not completely analogous with regenerative farming (which is inherently more complex and multifaceted), this illustrates the structures that 'regenerative farming' lacks. While there have been regenerative farming frameworks developed by specific food businesses, there is no government guidance, and as noted earlier, consumer awareness is low.^{135,136,137,138,139}

Caution about change

We have shown that most farmers support regenerative farming practices. Despite support, however, some farmers may be satisfied with current methods or wary about implementing the changes on their farm. A study of the uptake of reduced tillage in the UK similarly found that satisfaction with current production was the most commonly cited reason by farmers for not adopting reduced tillage on their farms.¹⁴⁰ In our workshops, some farmers told us that the farming sector can be traditionalist, and reformed practices are often only taken on if taught by family or peer groups.

*"Being set in your way as a farmer is a main barrier [to regenerative farming]."
(Farmer on a large lowland dairy farm)*

*"There's a core group, which is a big core group, that just do it the way dad's always done it, or do it the way they've done it for the last 50 years."
(Farmer on a small upland sheep farm)*

2.3. DIFFICULTIES IN IMPLEMENTATION

Insufficient access to relevant knowledge and advice

Lack of knowledge of regenerative farming practices among farmers is a significant barrier to implementation - as the AMTEC survey and AHDB study have found.^{141,142} This was also echoed in our workshops, where one farmer cited lack of knowledge as a barrier and almost all others enthusiastically agreed. This problem also feeds into farmers' concerns about lack of time, with the learning, planning, and administration taking more time when knowledge and advice is hard to access, or not fully relevant when found.

*"It takes... a period of rethinking, and it's the thinking space that's the hardest thing to have time to do."
(Farming policy expert)*

Defra has committed - through its Future Farming and Resilience Fund - to providing business support to help farmers understand how the changes work, how they relate to their farm, and how they can adapt to that.¹⁴³ This is welcome, but farmers in our workshops still felt they could not easily access relevant knowledge, suggesting these schemes are not sufficiently supporting farmers. Policy experts we spoke to also suggested that the current external advice available hasn't sufficiently reached farmers.

*"There's a question of do we have advisers and enough advisers to give advice in the first place...and we need support for those advisers to reach farmers, which we haven't had so far, and it's ended up really fragmented."
(Farming policy expert)*

There are also concerns around the relevance of advice and knowledge to different farm types. The AHDB's research found that there is a need for more locally applicable knowledge and

132 What is organic food?, Erudus, 22 Sep 2022, <https://erudus.com/editorial/the-food-agenda/what-is-organic-food>

133 Bedford E, 'Sales revenue of organic food and drink in the United Kingdom from 1999 to 2021', Statista, 11 June 2023, <https://www.statista.com/statistics/282379/organic-food-and-drink-sales-in-the-united-kingdom-uk-since-1999/>

134 Department for Environment, Food & Rural Affairs, Organic food: labelling and advertising rules, 29 April 2016, <https://www.gov.uk/guidance/organic-food-labelling-rules>

135 McCain, Regenerative Agriculture Framework, 2022, <https://www.mccain.com/media/4036/mccain-foods-regenag-framework.pdf>

136 Savills, Regenerative Agriculture, February 2021, <https://pdf.euro.savills.co.uk/uk/rural---other/spotlight---regenerative-agriculture-2021.pdf>

137 Nestle, The Nestle Agriculture Framework, no date, <https://www.nestle.com/sites/default/files/2022-07/nestle-agriculture-framework.pdf>

138 'Agriculture', Pepsico, no date, <https://www.pepsico.com/our-impact/esg-topics-a-z/agriculture>

139 'Agriculture', John Lewis & Partners, no date, <https://www.johnlewispartnership.co.uk/csr/our-strategy/agriculture.html>

140 Alskaf K et al, The uptake of different tillage practices in England, Soil Use and Management, August 2019, https://www.researchgate.net/publication/335069898_The_uptake_of_different_tillage_practices_in_England

141 Swire, John. "75% of Farmers Say Regenerative Farming Is Important for the Future, Survey Finds." *Agronomist Arable Farmer*, April 13, 2022. <https://www.aafarmer.co.uk/regenerative-agriculture/75-of-farmers-say-regenerative-farming-is-important-for-the-future-survey-finds.html>.

142 Magistrali A et al. "Identifying and implementing regenerative agriculture practices in challenging environments: experiences of farmers in the north of England". 21 June, 2022. [https://projectblue.blob.core.windows.net/media/Default/Research%20Papers/AHDB/2022/PR640-09%20Final%20report%20AHDB-BBSRC%20Farm%20Sustainability%20Fund%20\(Cooper\).pdf](https://projectblue.blob.core.windows.net/media/Default/Research%20Papers/AHDB/2022/PR640-09%20Final%20report%20AHDB-BBSRC%20Farm%20Sustainability%20Fund%20(Cooper).pdf)

143 Powley, Andrew. "The Future Farming Resilience Fund: Access Free Support." Department of Environment, Food and Rural Affairs. July 13, 2021. <https://defrafarming.blog.gov.uk/2021/07/13/the-future-farming-resilience-fund-providers-named/>

regional data.¹⁴⁴ Many tenant farmers are also concerned about whether they can implement regenerative methods in accordance with government schemes - a significant problem given that 30% of UK farmland is tenanted.^{145,146} To join the SFI and some other schemes, Defra makes clear that tenant farmers do not need landlord consent. It is also making welcome efforts to improve access for them - including by making Countryside Stewardship more flexible for tenant farmers.^{147,148} These efforts should help overcome some barriers. Yet, to further alleviate concerns and drive uptake among tenant farmers, they must come with tenant-specific advisory support.

It's important to note that the government is not the only source of information for farmers. The AHDB's study found that peer-to-peer learning was particularly useful, and farmers in our workshops expressed the same, but noted there was currently insufficient incentive to enable this.¹⁴⁹

"There's a lot of guys here doing farm walks and discussion groups, but no one gets paid to run that, but if it takes 2-3 hours to show people round your farm. Can't someone just pay someone a small amount in recognition of your time."
(Farmer on a large lowland arable, sheep and beef farm)

Defra already offers something similar to this for Countryside Stewardship through its Facilitation Fund, but this pays for more extensive coordination by farmers to build longer-term networks.¹⁵⁰ This may not be so appealing for farmers who simply wish to host a farm tour, for example, and it is also not currently extended to the ELM schemes. There may also be missed

opportunities to use social media to facilitate this, as farmers in our workshops noted.

"We should be trying to make the most of existing knowledge, supporting peer-to-peer and farming demonstrations.. This kind of learning also matches the values of the movement." (Farming policy expert)

"Everyone has a different network of friends. It's that diversity of voices and approaches that gets everyone moving." (Farming policy expert)

"I watch a lot of video on youtube... maybe if you get the money to host the farmers, you make it available online for people who couldn't be there." (Farmer on a large lowland arable sheep and beef farm)

Current system too complex to navigate

The plan for the post-Brexit agricultural transition was highly ambitious and highly complex. Alongside the three ELM schemes, there are a range of productivity schemes, other environmental initiatives, reforms around older schemes such as Countryside Stewardship, and a regulatory reform programme.¹⁵¹ Details on these have been released in iterations over several years. Many farmers therefore lack a clear sense of what the reforms are collectively trying to achieve - which dampens support.

Individual schemes are also complex. The SFI offer for 2023 - which comes after Defra made efforts to simplify it - includes 23 separate actions outlined in a 156-page handbook.¹⁵² Countryside Stewardship contains three different tiers, which

144 Magistrali A et al, Identifying and implementing regenerative agriculture practices in challenging environments: experiences of farmers in the north of England, Agriculture and Horticulture Development Board and Biotechnology and Biological Sciences Research Council, June 2022, [https://projectblue.blob.core.windows.net/media/Default/Research%20Papers/AHDB/2022/PR640-09%20Final%20report%20AHDB-BBSRC%20Farm%20Sustainability%20Fund%20\(Cooper\).pdf](https://projectblue.blob.core.windows.net/media/Default/Research%20Papers/AHDB/2022/PR640-09%20Final%20report%20AHDB-BBSRC%20Farm%20Sustainability%20Fund%20(Cooper).pdf)

145 Savills, 'Regenerative Systems', February 8 2021. <https://www.savills.co.uk/insight-and-opinion/research.aspx?currentSitePagelD=229130&sitePagelD=310687-0>

146 Barclay C. 'Tenant Farmers', House of Commons Library. 19 May 2010 <https://researchbriefings.files.parliament.uk/documents/SN01337/SN01337.pdf>

147 Hughes J, 'Environmental land management schemes: details of actions and payments', Department for Environment, Food and Rural Affairs, 26 January 2023, <https://defrafarming.blog.gov.uk/2023/01/26/environmental-land-management-schemes-details-of-actions-and-payments/>

148 Spencer M, 'Government sets out further support for tenant farmers', Department for Environment, Food and Rural Affairs, 24 May 2023, <https://www.gov.uk/government/news/government-sets-out-further-support-for-tenant-farmers>

149 Magistrali A, Cooper J, Franks J, George D, and Standen J, Identifying and implementing regenerative agriculture practices in challenging environments: experiences of farmers in the north of England, Agriculture and Horticulture Development Board and Biotechnology and Biological Sciences Research Council, June 2022, [https://projectblue.blob.core.windows.net/media/Default/Research%20Papers/AHDB/2022/PR640-09%20Final%20report%20AHDB-BBSRC%20Farm%20Sustainability%20Fund%20\(Cooper\).pdf](https://projectblue.blob.core.windows.net/media/Default/Research%20Papers/AHDB/2022/PR640-09%20Final%20report%20AHDB-BBSRC%20Farm%20Sustainability%20Fund%20(Cooper).pdf)

150 Rural Payments Agency, Facilitation Fund 2023: Countryside Stewardship, 7 November 2022, <https://www.gov.uk/government/publications/facilitation-fund-2023-countryside-stewardship>

151 Marshall J, Rutter J, Kane J, and Goss D, Agriculture after Brexit: Replacing the CAP, 15 March 2022, <https://www.instituteforgovernment.org.uk/sites/default/files/publications/agriculture-after-brexit.pdf>

152 Department for Environment, Food and Rural Affairs, SFI Handbook for the SFI 2023 offer, 21 June 2023, <https://www.gov.uk/government/publications/sfi-handbook-for-the-sfi-2023-offer>

collectively pay for 280 different options.¹⁵³ To deliver the environmental outcomes that the government wants to achieve while remaining inclusive of all farms, a degree of complexity is inevitable. Defra has taken steps to help simplify the process for farmers - by developing an integrated online service for farmers, for example.¹⁵⁴ However, the schemes can still be highly burdensome for farmers.

This concern has been raised by many stakeholders, from Sustain, the IfG and the CLA - and farmers also expressed these difficulties in our workshops.^{155,156,157} Given these complexities, farmers felt that they needed advisers to join the schemes, which discouraged them from doing so. Defra have made efforts to mitigate these concerns by paying for advice for certain actions.¹⁵⁸ Yet, the need for external advisers still feels burdensome for farmers.

"I don't think anyone really knows what the SFI is, including the people doing the SFI. They bring out new things and get rid of things almost on the monthly." (Farmer on a small upland beef and sheep farm)

"There's a lack of joined up thinking between stewardship and legislation." (Farmer on a large lowland arable farm)

"The countryside stewardship, SFI, and landscape recovery, the whole thing's so complicated. That's probably the biggest barrier, and how reliant it is on having an adviser." (Farmer on a large lowland dairy farm)

The level of complexity also means activity

across government departments can become confused. The Environmental Audit Committee note that management of the UK food system is often disjointed, with no single person or department wholly accountable.^{159,160} There is not currently a framework for managing land use in the UK, which - according to the FFCC - creates inefficiencies (e.g. missing opportunities for data sharing on land use and climate change).¹⁶¹ The government has promised publication of such a framework in 2023.¹⁶²

Excessive and invasive bureaucracy

Bureaucracy and inspections around the government payment schemes pose a challenge, preventing some farmers from engaging. The CLA survey found that, when asked why they did not enter the SFI in 2022, 27% of farmers said that the process is too bureaucratic.¹⁶³ The NFU also described Countryside Stewardship as 'bureaucratic by nature requiring onerous record keeping and evidence gathering'.¹⁶⁴ This is a risk in particular for smaller farmers, who may not have the capacity to manage extensive bureaucracy.¹⁶⁵

"We're a small farm and we're getting inspected on a regular basis and it's really depressing.... when the inspection comes, that's your day gone, or maybe longer than that." (Farmer on a small uplands sheep and beef farm)

Similarly, farmers in our workshops felt that the inspections are too invasive and can create anxiety, particularly because the tone can feel more disciplinary than collaborative.

153 Groom A, 'Lack of ELMS payment strategy risks poor outcomes for nature and farmers', RSPB, 23 May 2023, <https://community.rspb.org.uk/ourwork/b/rspb-england/posts/payment>

154 National Farmers Union, 'Everything you need to know about the ELMs 2023 prospectus', NFU Online, 21 June 2023, <https://www.nfuonline.com/updates-and-information/everything-you-need-to-know-about-the-elms-2023-prospectus/#AdviceProvision>

155 'Farm policy drama and what really happened' Sustain, 3 Oct 2022, <https://www.sustainweb.org/blogs/oct22-elms-and-nature-in-peril/>

156 Marshall J, Rutter J, Kane J, and Goss D, Agriculture after Brexit: Replacing the CAP, 15 March 2022, <https://www.instituteforgovernment.org.uk/sites/default/files/publications/agriculture-after-brexif.pdf>

157 Environment, Food and Rural Affairs Committee, Oral evidence: Environmental land management and the agricultural transition, House of Commons Library, 11 May 2021, <https://committees.parliament.uk/oralevidence/2228/default/>

158 National Farmers Union, 'Everything you need to know about the ELMs 2023 prospectus', NFU Online, 21 June 2023, <https://www.nfuonline.com/updates-and-information/everything-you-need-to-know-about-the-elms-2023-prospectus/#AdviceProvision>

159 Environmental Audit Committee, Oral evidence: Environmental change and food security, House of Commons Library, 22 March 2023, <https://committees.parliament.uk/oralevidence/12927/pdf/>

160 Environmental Audit Committee, Oral evidence: Environmental change and food security, House of Commons Library, 25 January 2023, <https://committees.parliament.uk/oralevidence/12601/pdf/>

161 Food, Farming, and Countryside Commission, A Land Use Framework for England: Briefing for policymakers, February 2023, <https://cdn2.assets-servd.host/ffcc-uk/production/assets/downloads/A-Land-Use-Framework-for-England-Briefing-for-Policymakers-February-2023.pdf>

162 Department for Environment, Food & Rural Affairs, Government food strategy, 13 June 2022, <https://www.gov.uk/government/publications/government-food-strategy>

163 Clarke P, 'Slow uptake of SFI blamed on low payments and lack of detail', Farmers Weekly, 8 September 2022, <https://www.fwi.co.uk/business/business-management/agricultural-transition/slow-uptake-of-sfi-blamed-on-low-payments-and-lack-of-detail>

164 Written evidence submitted by the NFU (ELM0012), House of Commons Library, no date, <https://committees.parliament.uk/writtenevidence/21852/pdf/>

165 House of Commons Committee of Public Accounts, Environmental Land Management Scheme, 13 December 2021, <https://committees.parliament.uk/publications/8357/documents/85142/default/>

*"It would be good if they were less trying to catch you out, because there's a lot of anxiety when an inspection is coming."
(Farmer on a small lowland dairy farm)*

"[Inspections would be better if tones like] 'we're just checking that we're doing what you're saying you're doing to make sure everyone on the scheme is treated fairly', more than 'we're going to turn up and tell you what you're doing is wrong and waste your whole day'." (Farmer on a small upland sheep farm)

SECTION 3

POLICY SOLUTIONS

“ We have to be proactive in encouraging regenerative agriculture, with a diversity of plants and of grazing livestock, replacing lost organic matter through the use of legumes, cover crops, residues and mulches... The alternative is too grim to contemplate.”

– King Charles III, August 2022

We have seen that, despite its benefits, a range of barriers hold back the expansion of regenerative farming in the UK. In this section, we propose a range of policy solutions to tackle these barriers.

These recommendations are based on evidence we have gathered from previous research, our discussions with farmers and agricultural policy experts, and our understanding of public preferences through our polling. We have also ensured that our recommendations align with and support the current reforms to agricultural policy.

The policies we recommend are primarily targeted at government departments, in particular: Defra; HM Treasury (HMT); Department for Business & Trade (DBT); Department for Energy Security & Net Zero (DEBNZ); and the Cabinet Office. Alongside this, food businesses, farming groups, environmentalists and other civil society groups have a key role to play.

We recommend the following policies:



Developing a collaborative approach

Establish a Regenerative Farming Task Force to build a network and coordinate action

Establish peer-to-peer 'Regenerative Farming Learning Groups'



Ensuring financial security

Provide more financial support to cover transition costs

Ensure long-term funding for ELM schemes

Run public awareness campaign

Convene food businesses around action to expand regenerative farming

Develop core standards for food imports, with regenerative principles embedded



Bringing farmers into the movement and enabling change

Develop a framework for regenerative farming

Support Learning Groups and food businesses to publicise the benefits

Continue the New Entrant Support Scheme with a regenerative angle

Support farmers to advise on implementation

Incorporate regenerate farming into the upcoming land use framework

3.1. DEVELOPING A COLLABORATIVE APPROACH

Establish a government-led 'Regenerative Farming Task Force' consisting of farmers and other stakeholders.

We have seen how the barriers to regenerative farming are wide-ranging and complex, and addressing them will require financing, training, communications, re-organisation etc. To do this, a range of stakeholders - including the government, farmers, civil society, and food businesses - need to work collaboratively. We have also seen how, despite there being significant momentum around regenerative farming among these groups, they often lack an overarching direction and cohesion. Meanwhile the current vision and guidance from the government is often overlooked due to lack of confidence in the government and too much complexity in government communications.

The government should therefore convene various stakeholders - farmers, farming groups, consumer groups, rural community groups, environmentalists and key government departments and agencies such as the Cabinet Office, Defra, DBT, HMT, DESNZ, the Rural Payments Agency, and Natural England - around a 'Regenerative Farming Task Force'. This group would be key to evaluating, refining, and delivering the policy solutions to expand regenerative farming in the UK, and provide a permanent base within government for advocacy for regenerative farming. At the same time, it would signal to these stakeholders that there is a vision for regenerative farming, helping to empower a grassroots push.

This task force should be led by Defra with the support of key departments including HMT and DBT, in recognition of the need for a cross-departmental approach and policy mix, but work with a participatory co-design approach. It should meet regularly, over a period of at least a year, with a clear set of aims and objectives - some of which we set out in our subsequent recommendations. These objectives should be aligned with Defra's current plans in the agricultural transition, particularly strengthening uptake for the SFI and Countryside Stewardship. It should also align with the current cross-sector pilot initiatives such as the SMI Agribusiness Task Force.

Establish peer-to-peer 'Regenerative Farming Learning Groups'

In designing communications policies to promote

regenerative farming, policymakers must be careful about how messaging is conveyed. In our workshops, farmers expressed scepticism about top-down guidance (for example, from government authorities) and preferred knowledge sharing through peer-to-peer networks. Peer-to-peer learning networks have been proven to be highly effective in facilitating such knowledge transfer, promoting the sharing of practical experiences, and enabling farmers to learn from one another's successes and failures.

Policymakers should follow this lead. Drawing upon insights from existing peer-to-peer networks and pilot programs, we recommend the government, in partnership with the Regenerative Farming Task Force, develop a grant program for farmers to form and lead peer-to-peer 'Regenerative Farming Learning Groups'. These groups should be hosted on social media like WhatsApp, but with meetings, workshops, and farm tours organised as part of them. Some of these events should be in-person in different regions across the UK; farmers we spoke to emphasised that these were an important opportunity to observe and ask questions first-hand, and could support a sense of community and collaboration. These groups will be instrumental to subsequent recommendations around knowledge-sharing among farmers.

"[Regenerative farming is] a mindset, an ethos, it's about storytelling, people saying we've done this and we've achieved this. You've got to have other farmers you can gently learn from."
(Farmer on a large upland beef and sheep farm.)

The groups should be differentiated and tailored to address the unique needs and contexts of each farm type, considering aspects such as type of produce, farm size, land ownership (owned vs rented) and geographical location (upland vs. lowland). As noted, tenant farmers face specific barriers and building networks of advice and support for this group is key.

3.2. ENSURING FINANCIAL SECURITY

Provide more financial support to cover transition costs

Policymakers need to support farmers to be able to sustain the short-term costs associated with a shift to regenerative farming and communicate this support to them effectively. Our review of the barriers showed that the current government payments are not seen as high enough to cover

these costs, and are not well-known enough.

The government has recently recognised the need to support planning and management costs as they have begun providing 'management payments' as part of SFI to cover the administrative costs of transitioning. However, these are only payments of £20 per hectare, for up to 50 hectares of land entered in the scheme.^{166,167} When announced, this was criticised as 'too little, too late' by the NFU.¹⁶⁸ Also, many of the farmers we spoke to highlighted the extensive transition costs and low incentive from current SFI payment rates - and none mentioned the existence of the management payments. Equally, there is currently no support for the transition costs of Local Nature Recovery, despite this involving even more significant costs, or Countryside Stewardship agreements.

The government also recognises the need to support farmers with capital investment. They currently do this through the Future Farming Resilience Fund (which provides free business planning advice to farmers), the Farming Innovation Programme (which supports farmers to adopt new innovations), and the Farming Investment Fund (which provides grants for new equipment and technology).¹⁶⁹ However, these are not linked directly to the schemes, and farmers may find it hard to navigate and engage with both the payment schemes and the many productivity schemes.

Defra should significantly increase the SFI 'management payments' to improve the incentives and provide a new signal to farmers of the support available for transition costs. They should extend this also for the Local Nature Recovery and Countryside Stewardship schemes. Alongside the per hectare payments, they should include within it the option for additional sums to cover specific capital investment costs involved in the transition. The payment rates should be set so as to sufficiently enable farmers to avoid any drop in profitability during transition. This scheme should be guaranteed for at least seven years, given the time that regenerative farming takes to restore profits without government payments. This policy would prove popular with farmers

and the public. Farmers across our workshops highlighted the need for increased payments, while our survey found that 72% feel this goal is an essential, high or moderate priority. As expanded in subsequent recommendations, it must also come alongside improvements in access to the schemes.

Defra should also explore ways to bring in private finance to help share transition costs. While such cost-sharing programmes do exist (e.g. preferential loan terms), they typically involve just one or two manufacturers contributing to the funding. Enabling a wider range of actors to contribute and benefit from the transition funding would help scale regenerative practices. Defra could also learn from the Eden model - as proposed by Green Alliance - which provides a framework for this.¹⁷⁰

Ensure long-term funding for the Environmental Land Management schemes

The government needs to give farmers long-term certainty about payments so that they can plan long-term and with security. This would allow farmers to confidently make long-term investments in a transition to regenerative methods.

This has been called for by the National Food Strategy, Institute for Government, and the EFRA select committee. The National Food Strategy and EFRA committee both suggested the current level of spending on farm support should be maintained in real terms until at least 2029. The IfG also notes how this should be accompanied by Defra carrying out robust monitoring and evaluation of the new schemes, to ensure that they are on track to deliver the public goods intended. We echo these previous calls, and recommend that Defra engage with HMT and agree to maintain the current farming budget until 2029, supported by increased cost-effectiveness monitoring.

Campaign to increase salience of biodiversity and its relationship to farming

To help generate consumer demand for regenerative products, we need to increase interest in buying sustainable food. This should

166 Baker J, 'Introducing SFI Management Payments and changes to Countryside Stewardship rates', Department for Environment, Food & Rural Affairs, 5 January 2023, <https://defrafarming.blog.gov.uk/2023/01/05/introducing-sfi-management-payments-and-changes-to-countryside-stewardship-rates/>

167 1 hectare is around 2.5 acres

168 Horton H and Harvey F, 'Post-Brexit £1,000 farming payments 'too little, too late', says NFU', The Guardian, 5 January 2023, <https://www.theguardian.com/environment/2023/jan/05/elms-payments-of-up-to-1000-may-be-too-little-too-late-says-nfu-farmers-environment>

169 Marshall J, Rutter J, Kane J, and Goss D, Agriculture after Brexit: Replacing the CAP, 15 March 2022, <https://www.instituteforgovernment.org.uk/sites/default/files/publications/agriculture-after-brexit.pdf>

170 Elliot J, Building local markets for sustainable land management with the Eden Model, Green Alliance, 30 March 2021, <https://greenalliance.org.uk/publication/building-local-markets-for-sustainable-land-management/>

start with increased communication efforts to convey the importance of food choices, and food produced regeneratively, for the environment. Previous research from the IFIC has found that 85% of people express interest in knowing more about the link between food production and regenerative practices.¹⁷¹

Our survey showed that there is a significant proportion of the population who are not aware of the relationship between agriculture and biodiversity, particularly younger people. We also saw that a widespread proportion of the public see biodiversity as one of the top reasons why regenerative farming is important. But in current discourse around a green transition, increasing biodiversity is not spoken about as often as 'reaching net zero'. There is therefore an opportunity to increase the salience of UK biodiversity targets (e.g. halting species decline by 2030), utilise public support for that mission, and to further explain the impact of agriculture on biodiversity.¹⁷²

While the government does have an 'Environmental Improvement Plan 2023', this focuses on much more than biodiversity.¹⁷³ They previously had a plan looking specifically at biodiversity (Biodiversity 2020) which was published in 2011, focussed primarily on actions up to 2020.¹⁷⁴ Having a renewed biodiversity strategy within the Environmental Improvement Plan would be a useful addition to lay out a clear vision for the future.

We recommend that the government develop a biodiversity strategy which, like their net-zero strategy and previous biodiversity strategy, communicates to the public the importance of biodiversity. Given the relevance of regenerative farming to biodiversity in the UK, regenerative farming methods should form a key part of the strategy - and the Regenerative Farming Task Force should lead on this section. Alongside other stakeholders, the task force should publicise it widely and encourage coverage from media and civil society, particularly among younger people.

There is also an opportunity to link the impact of biodiversity specifically to the food that consumers can buy. The Regenerative Farming

Task Force should consider how to boost this over the medium- to long-term so as to establish widespread familiarity with the term, in a similar way to 'organic' currently. This could include:

- **Advertising.** Supermarkets or food manufacturers could incorporate messaging around regenerative farming and biodiversity-positive food into their advertising campaigns - highlighting the importance of farming practices for the environment.
- **Brand-specific statements.** These could be statements developed by individual food manufacturers noting the regenerative practices of their suppliers. Some manufacturers already have targets to grow their food regeneratively and so have assessments in place. Statements could be made on packaging highlighting this.
- **Cross-brand labelling.** This could be a label similar to the Soil Association's 'Organic' label on food currently, certifying that the food is produced using certain biodiversity-positive methods. The Regenerative Organic Alliance, for example, is working towards this kind of labelling.¹⁷⁵ A mainstream option in the UK is a longer-term prospect, given that regenerative farming would first have to be better defined and a set of specific measures would have to be decided on, if this is deemed effective.

Convene food businesses around action to expand regenerative farming

The transition to regenerative farming requires enhanced efforts from food businesses. Our survey found that the public strongly supports food businesses that take active steps to source food produced using regenerative methods - across all policies, an average of 45% said supermarkets should take an active role to deliver them, and 44% said food manufacturers should (both more than any other option). In taking an active role, food businesses could therefore potentially enhance their brand reputation.

To facilitate this transition, as a sub-group to its Regenerative Farming Task Force, the government - particularly DBT - should establish

171 International Food Information Council, Consumer Perspectives on Regenerative Agriculture, February 2022, <https://foodinsight.org/wp-content/uploads/2022/02/IFIC-Regenerative-Ag-Consumer-Survey.pdf>

172 House of Commons, The Environmental Targets (Biodiversity) (England) Regulations 2023, 29 January 2023, <https://www.legislation.gov.uk/uksi/2023/91/made>

173 Department for Environment Food & Rural Affairs, Environmental Improvement Plan 2023: Executive summary, 7 February 2023, <https://www.gov.uk/government/publications/environmental-improvement-plan/environmental-improvement-plan-2023-executive-summary>

174 Department for Environment Food & Rural Affairs, Biodiversity 2020: A strategy for England's wildlife and ecosystem services, 19 August 2011, <https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services>

175 'Why Regenerative Organic?', Regenerative Organic Alliance, no date, <https://regenorganic.org/why-regenerative-organic/#regen-organic-certified>

and lead an industry working group consisting of representatives from food manufacturers, supermarkets, and the food service industry. Meeting on a quarterly basis, and feeding out from the findings of the wider working group, this group will explore and develop strategies for collectively proliferating regenerative farming methods among growers. They should critically evaluate - with a holistic, outcome-based view - current frameworks that seek to increase sustainable production, and industry contracts with criteria around sustainability. Based on this, they should establish model frameworks or contracts that expand regenerative methods and proliferate these across the group and among wider networks.

In the long-term, the task force should also work to develop a pledge among multiple food businesses to procure a certain proportion of their food from regenerative farms. This will signal a commitment to sustainable agriculture, drive demand for regeneratively grown produce, and inspire other businesses to follow suit. This pledge should be widely marketed to generate awareness among the public and businesses.

Develop core minimum standards for food imports, with regenerative principles embedded

The government needs to protect farmers using regenerative methods from being undercut by food imports produced using low environmental standards and give a signal to farmers that they care about the sector. Policies to achieve this goal were widely supported by the farmers we spoke to, and among the public it was the most popular goal of all those we asked about (eight in ten people felt it was an essential, high or moderate priority). The WWF highlights how this could also support a global shift to more regenerative practices.¹⁷⁶

This has some international precedence. In 2019, for example, Thailand introduced a minimum standard on all fruits and vegetables imports, requiring that they have a GAP (Good Agricultural Practices) certificate, which ensures minimum standards of food safety, environmental sustainability, workers' well-being, animal health and welfare, and traceability.^{177,178} The government should learn from these examples.

The National Food Strategy suggests that

“the Government must draw up a set of “core standards” [for food imports] that it can use for all future trade deals. It should then explain how it intends to enforce them”.¹⁷⁹ Equally, the Trade and Agriculture Commission recommends that “if trading partners could not demonstrate equivalence with core standards, then they would not be considered for zero tariff, zero quota access for those products”.¹⁸⁰ We support these recommendations, and suggest DBT aligns at least one of the core standards for food imports with regenerative farming principles. The WWF is currently commissioning research on such core standards for food imports, and the government should utilise this.

3.3. BRINGING FARMERS INTO THE MOVEMENT AND ENABLING CHANGE

Develop a framework for regenerative farming

We need to advance the understanding of ‘regenerative farming’ among the government, farmers and environmentalists to better support an expansion in regenerative methods. This first requires a wider consensus around what it is, why it’s important, and how to make the change needed. Given the challenges that farmers have experienced accessing Government guidance, the Regenerative Farming Task Force should develop the document. It should outline:

- A broad understanding of regenerative farming, recognising how it varies between farms and can be delivered to very different extents while highlighting its core benefits, with emphasis on the benefits for farm profit margins.
- The benefits to the environment and farmers in the long-term, and to consumers and communities also.
- A list of first-steps to how different organisations can take action to support the transition - linking to sources of more relevant and detailed information.
- A plan of action on the research required on regenerative farming.

This document should be careful to be broad enough to be inclusive of a wide array of farm types, but specific enough to relate to the real experience of farmers. This would complement Defra’s current guidance publications - such as

176 WWF, Core Environmental Standards, January 2022, https://www.wwf.org.uk/sites/default/files/2022-02/Core_standards_2022.pdf

177 WWF, Core Environmental Standards, January 2022, https://www.wwf.org.uk/sites/default/files/2022-02/Core_standards_2022.pdf

178 ‘Our Impact’, Global G.A.P, no date, https://www.globalgap.org/uk_en/what-we-do/our-impact/

179 Dimpleby H, National Food Strategy: The plan, National Food Strategy, 15 July 2021, www.nationalfoodstrategy.org

180 Trade and Agriculture Commission, Final Report, March 2021, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1116669/trade-and-agriculture-commission-final-report-march-2021.pdf

the SFI handbook - which are more technical. The government should learn from Groundswell (who provide a handful of easy-to-understand regenerative principles), the Sustainable Agriculture Initiative Platform (who are developing a globally recognised regenerative agriculture measurement framework), business-specific frameworks outlining regenerative principles, and other groups working in this area (such as the SMI and the World Business Council for Sustainable Development).^{181,182,183,184,185,186} The task force should collectively promote the framework, encourage their networks to do the same, and present it at the Groundswell conference.

Support Regenerative Farming Learning Groups and food businesses to publicise the benefits of regenerative farming

It is important to increase awareness among farmers of the benefits for them of farming regeneratively - in particular, for long-term soil fertility, reduced inputs, long-term profitability, and resilience to climate change and supply disruption. The government should use the Regenerative Farming Learning Groups to do this.

Learning group leaders should, as part of their agenda and grant, encourage knowledge-sharing about the benefits of regenerative farming. To further enable that, the government should provide further grants to regenerative farmers to create video content on social media and host in-person farm tours illustrating the benefits. Government grants should come with guidance around how to do this effectively. The Learning Groups should advertise this opportunity within their channels of communication.

The government, through the Regenerative Farming Task Force, should also encourage businesses and organisations to highlight these benefits in the same ways as the Learning Groups (social media and farm tours), particularly those already advocating for increased adoption of regenerative farming methods, including the Nature Friendly Farming Network, the

Groundswell conference and various food businesses.

Continue the New Entrant Support Scheme and introduce new entrants to the benefits of regenerative farming

We need to open the space for new farmers to enter the industry and help them develop knowledge about regenerative farming, while enabling farmers who may want to sell-up to exit farming stably and securely. The government already recognises the need for this within the current reform programme via its Lump Sum Exit Scheme and New Entrant Support Scheme.

The former makes it easier for farmers who want to leave the industry to do so by giving them a lump sum amount. Those who want to leave the industry but are hesitant to do so are less likely to invest in a long-term shift in practices, as regenerative farming requires. Helping these people leave the industry securely is therefore important. The latter aims 'to encourage new entrants to the industry, with all the new ideas and new business models they can bring'.¹⁸⁷ It does this by providing tailored business advice on how to join the sector, with advice on management, finance, and innovation. The government completed the pilot on this in early 2023, with staff saying 'participants are developing their skills, deepening their networks and inspiring each other to greater innovation'.¹⁸⁸ Such personal developments are key for farmers adopting regenerative methods. The government should ensure value for money within these schemes so they continue after the pilots.

The government should also direct those skills, networks and innovations to support uptake of regenerative farming. Defra also noted the importance of in-person events within the New Entrant Support Scheme for building relationships and increasing future online interaction. Defra should run talks at these events on regenerative farming - in collaboration with pre-existing networks such as the Nature Friendly Farming Network - and encourage farmers to join the Regenerative Farming Learning Groups.¹⁸⁹

181 '5 Principles of Regenerative Agriculture', Groundswell, no date, <https://groundswellag.com/principles-of-regenerative-agriculture/>

182 McCain, Regenerative Agriculture Framework, 2022, <https://www.mccain.com/media/4036/mccain-foods-regenag-framework.pdf>

183 Savills, Regenerative Agriculture, February 2021, <https://pdf.euro.savills.co.uk/uk/rural---other/spotlight---regenerative-agriculture-2021.pdf>

184 Nestle, The Nestle Agriculture Framework, no date, <https://www.nestle.com/sites/default/files/2022-07/nestle-agriculture-framework.pdf>

185 'Agriculture', Pepsico, no date, <https://www.pepsico.com/our-impact/esg-topics-a-z/agriculture>

186 'Agriculture', John Lewis & Partners, no date, <https://www.johnlewispartnership.co.uk/csr/our-strategy/agriculture.html>

187 'A fresh start for new entrants', Department for Environment, Food & Rural Affairs, Posted on: 1 June 2022, <https://defrafarming.blog.gov.uk/2022/06/01/a-fresh-start-for-new-entrants/>

188 Leveson-Gower H, New Entrant Support Scheme: an update on our pilots, Department for Environment, Food & Rural Affairs, 29 March 2023, <https://defrafarming.blog.gov.uk/2023/03/29/new-entrant-support-scheme-an-update-on-our-pilots/>

189 'Home page', Nature Friendly Farming Network, no date, <https://www.nffn.org.uk/>

Defra should also direct new entrants to the support available from external partners and local government.¹⁹⁰

Support farmers to provide advice on how to implement regenerative farming

We need farmers to feel like they can easily access trustworthy and relevant advice on how to implement regenerative methods on their farm. The Regenerative Farming Learning Groups should coordinate this. Alongside grants supporting farmers to publicise the benefits of regenerative farming, Defra should provide grants for farmers to provide tailored advice on how to implement the methods. This could involve farm tours of those currently using regenerative methods (both virtual and in-person), or visits to farms considering using regenerative methods to advise on how they would apply.

The private sector should also play a role here. The SMI's Agribusiness Task Force recommends that manufacturers, retailers and suppliers support peer-to-peer farmer networks and farmer ambassadors as a way to fill the regenerative farming knowledge gap many farmers have.¹⁹¹ Some businesses are already doing this (McCain and Waitrose & Partners, for example, have demonstration farms which they use to showcase regenerative farming) - and others should follow suit.^{192,193}

Publish the promised land use framework, with a coherent vision for regenerative farming within it

The Government needs to give farmers a clear and coherent narrative of what the post-Brexit agricultural transition will look like for farming, the trade-offs involved and the role that regenerative methods will play in that. The government said - in its 2022 Government Food Strategy - that it will publish a land use framework in 2023.¹⁹⁴ This has not yet been delivered, and the government should ensure it is published promptly. Our public attitudes research also found that this was a high priority among the public - the second highest among all policy goals we asked about. 77% see such a framework

as an essential, high or moderate priority, and 48% see it as an essential or high priority.

With regenerative farming embedded into such a framework, it would also signal to farmers that the government is supportive of a regenerative transition and would illuminate the opportunities and risks involved, increasing business confidence. The government should outline SMART objectives for farming policy, with regenerative farming outcomes such as soil health and biodiversity indicators included within that. They should also outline how the current reform programme fits within that. In the design of this framework, the government should learn from the FFCC and Geospatial Commission's pilots on land use frameworks.¹⁹⁵

190 'Devon County Council and the Apricot Centre: Future of Farming – Training the next generation of Regenerative Farmers' Local Government Association, 23 Jun 2022, <https://www.local.gov.uk/case-studies/devon-county-council-and-apricot-centre-future-farming-training-next-generation>

191 The Sustainable Markets Initiative Agribusiness Task Force, Scaling Regenerative Farming: An Action Plan, 3 Nov 2022, <https://a.storyblok.com/f/109506/x/7b102e6831/agribusiness-task-force-white-paper.pdf>

192 'Farming at Leckford', Waitrose & Partners, no date, <https://leckfordestate.co.uk/farming>

193 'Farming at Leckford', Waitrose & Partners, no date, <https://leckfordestate.co.uk/farming>

194 Department for Environment, Food & Rural Affairs, Government food strategy, 13 June 2022, <https://www.gov.uk/government/publications/government-food-strategy>

195 Geospatial Commission, National Land Data Programme: Pilots and projects overview, 23 May 2023, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1158133/NLDP_Pilots_and_projects_overview-gov.uk.pdf

CONCLUSION

“ *Regenerative agriculture can capture the imagination, especially for younger people. Regenerative agriculture gives people so much more motivation to spend 20-30 years doing it.”*

– Farmer in our workshops from a large lowland sheep and beef farm.

It is evident that regenerative farming represents a key opportunity for the UK farming sector and our environmental objectives, and in turn also for consumers and communities. It has the potential to reduce greenhouse gas emissions, enhance biodiversity, protect and stabilise our domestic food production long-term, and enhance our food security and price stability. Collectively, this also makes for a more natural countryside, improved farmer well-being and potential benefits for the nutrition of our food.

Regenerative farming also represents a favourable political opportunity. As a movement, it has the potential to be a catalyst for the government’s post-Brexit agricultural transition, by both boosting uptake and reaffirming the environmental ambition. We also find that the public are highly supportive of regenerative farming and its benefits for the environment and agricultural sector - and are happy to make trade-offs to see those delivered. This shows the movement could gain widespread momentum. If policymakers unlock the potential of regenerative farming, they could also see a political payoff.

It is clear, however, that policymakers must navigate around certain roadblocks to unlock the potential of regenerative farming to deliver these goals. This report identifies three principal barriers to this shift, namely, poor short-term financial incentives, caution among farmers about the shift to regenerative, and practical difficulties

in implementing regenerative methods. Addressing these hurdles forms the core of our policy recommendations.

To start with, the government needs to develop a collaborative approach to deliver the reforms. In the coordination of policy, frameworks, and activities among industry and civil society, the government should bring a wide range of stakeholders together under a Regenerative Farming Task Force. For knowledge-sharing and movement-building among farmers, the government should empower the pre-existing networks among farmers that are trusted and proven effective. To do so, they should establish and facilitate Regenerative Farming Learning Groups with both in-person and virtual presence.

The financial concerns among farmers then require attention. Substantial support is needed to offset the high costs of transition and mitigate the risk of lower profitability, and assuring long-term funding for the ELM schemes will also be key for providing long-term certainty. It is also important to expand market incentives to produce regeneratively. To do so, it is important to boost consumer demand through a renewed biodiversity strategy and review of awareness-raising methods (like advertising and labelling), and boost demand among food businesses by coordinating a review of frameworks and contracts, while a holistic outcome-focussed approach should also make up part. At the same time, developing core standards for food imports with a regenerative angle would help level the playing field for farmers in a global market.

There is also a pressing need to address concerns and build up enthusiasm for the regenerative farming movement and enable farmers to make the change. This can be facilitated by developing clear guidelines on regenerative farming practices, encouraging peer-to-peer promotion of the benefits, continuing and empowering the New Entrant Support Scheme with a regenerative angle, supporting farmers to advise

on the implementation of regenerative farming, and bringing all the plans together within the promised land-use framework.

Collectively, this approach would take UK farming towards a more prosperous, resilient, and sustainable future.

ANNEX

REGENERATIVE FARMING OVERVIEW

Some of the most common regenerative practices include:¹⁹⁶

- Minimising till: reducing or completely stopping the practice of disrupting soil in crop preparation by digging, stirring, overturning etc.
 - Cover cropping: growing certain crops during periods where the main crop isn't growing, to ensure soil is covered year-round.¹⁹⁷
 - Intercropping: growing several species of crop in the same field for a proportion of their growing periods.¹⁹⁸ This includes companion cropping, which is growing crops alongside the main crops to support pest control, pollination or soil nutrients.¹⁹⁹
 - Crop-livestock integration: combining the cultivation of crops with that of livestock, with crops providing feed for the animals and animal manure providing nutrients for crops.²⁰⁰
 - Integrated pest management (IPM): protecting plants from harmful organisms using a variety of methods beyond pesticides - such as crop rotation, certain crop cultivation techniques, and hygiene measures
- such as cleaning machinery - and only using pesticides where necessary.²⁰¹
- Agroforestry: planting trees, shrubs, and hedges on agricultural lands alongside produce.²⁰² This is distinct from rewilding, which is the practice of returning an area of land to a wholly natural space, which would imply ending agricultural production entirely.
 - Optimising water usage: upgrading water irrigation systems to minimise water usage and utilising more rainwater in those systems.²⁰³
 - Multispecies pasture rotation (MSPR) system: combining multiple species of livestock (i.e., chickens, cattle, sheep, and pigs) in one landscape.²⁰⁴
 - Mob grazing: bringing many animals to graze together in high density for a short-period of time, before moving them on. This allows livestock to eat some of the top of the plants - and beneficial trampling - before allowing plants time to regrow.²⁰⁵
 - Herbal leys: using different grasses, legumes and herbs that are designed to protect the soil in pastures (land with crops used for animal grazing).²⁰⁶

196 Savills, Regenerative Agriculture, February 2021, <https://pdf.euro.savills.co.uk/uk/rural---other/spotlight---regenerative-agriculture-2021.pdf>

197 Woolford AR and Jarvis PE, Cover, Catch and Companion Crops Benefits, Challenges and Economics for UK Growers, January 2017, https://www.agricology.co.uk/sites/default/files/Cover%20Crops-%20Final_1.pdf

198 Stomph T et al, Designing intercrops for high yield, yield stability and efficient use of resources: Are there principles?, *Advances in Agronomy*, 2020, <https://www.sciencedirect.com/science/article/abs/pii/S0065211319301075>

199 Woolford AR and Jarvis PE, Cover, Catch and Companion Crops Benefits, Challenges and Economics for UK Growers, January 2017, https://www.agricology.co.uk/sites/default/files/Cover%20Crops-%20Final_1.pdf

200 'Crop-livestock integration', *Table Debates*, no date, <https://www.tabledebates.org/glossary/crop-livestock-integration>

201 'Integrated Pest Management (IPM)', European Commission, no date, https://food.ec.europa.eu/plants/pesticides/sustainable-use-pesticides/integrated-pest-management-ipm_en

202 'What is agroforestry?', Soil Association, no date, <https://www.soilassociation.org/causes-campaigns/agroforestry/what-is-agroforestry/>

203 Sharma A, 'How Regenerative Agriculture Can Mitigate Drought', NRDC, 22 March 2022, <https://www.nrdc.org/bio/aro-hi-sharma/how-regenerative-agriculture-can-mitigate-drought>

204 Rowntree J et al, Ecosystem Impacts and Productive Capacity of a Multi-Species Pastured Livestock System, *Front. Sustain. Food Syst.*, 4 December 2020, <https://www.frontiersin.org/articles/10.3389/fsufs.2020.544984/full>

205 'How regenerative mob grazing can improve pasture health', *Farmbrite*, 13 October 2022, <https://www.farmbrite.com/post/mob-grazing-101>

206 'Herbal Leys', *TerraFarmer*, no date, <https://terrafarmer.co.uk/consultancy-services/regenerative-agriculture/herbal-leys/>

- Using organic fertilisers: using fertilisers made from plant or animal sources, rather than human-made chemicals.²⁰⁷

incorporates not only food production, but also energy, water, and waste management.

There are various closely related concepts, which often appear in conjunction with regenerative farming in the literature. These concepts, which are separate from regenerative farming, include:

- Sustainable farming: farming that maintains the long-term viability of the farming system and/or farming that minimises negative environmental impacts.²⁰⁸ Regenerative farming moves the focus beyond just harm reduction towards actively improving the health of the ecosystem. It also focuses more on specific regenerative practices, whereas sustainable farming is primarily outcome-based.
- Agroecology: an academic discipline around creating an ecologically positive agricultural system.²⁰⁹ It is therefore broader than the processes of regenerative farming, and speaks also to the demand-side of the food supply chain, such as the diet changes required for improved ecological outcomes.
- Rewilding: the restoration of nature on a large scale by rebuilding ecosystems, to the point when it becomes self-sustaining (continually supports itself without human intervention). Unlike regenerative farming, rewilded land is not being farmed. Land can be rewilded alongside land that is farmed regeneratively, however, particularly if that land is not cultivated or less cultivable.
- Organic farming: the practice of farming while reducing or completely stopping human-made inputs, particularly human-made fertilisers and pesticides.²¹⁰ This is often considered a regenerative practice, but does not encapsulate the broad range of practices that regenerative farming does.
- Permaculture: a holistic approach to design based around building self-sustaining ecosystems that mimic the natural world.²¹¹ Unlike regenerative farming, permaculture

207 'Fertilisers', Royal Horticultural Society, no date, <https://www.rhs.org.uk/garden-jobs/fertilisers>

208 'What is Sustainable Agriculture?', Sustainable Agriculture Research & Education Program, no date, <https://sarep.ucdavis.edu/sustainable-ag>

209 Teal N and Moss D, 'Exploring the connections between Agroecology and Regenerative Agriculture', One Earth, 25 August 2022, <https://www.oneearth.org/exploring-the-connections-between-agroecology-and-regenerative-agriculture/>

210 'Organics at a glance', European Commission, no date, https://agriculture.ec.europa.eu/farming/organic-farming/organics-glance_en

211 'What is permaculture?', Permaculture Research Institute, <https://www.permaculturenews.org/what-is-permaculture/>

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