Is regenerative the future of farming?

How corporate commitments can help build food system resilience

Nestlé PROFESSIONAL

FOOTPRINT INTELLIGENCE

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Partner foreword

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The food and beverage industry grew rapidly over the 20th century to meet unprecedented population growth. While achieving the goal of providing affordable food for many, there was also an associated depletion of natural resources. Realising the impact of scope 3 emissions, our industry has begun the urgent action needed to turn back the tide by adopting agricultural systems that sustain and improve resources.

At Nestlé, we want to positively impact ecosystems, farmers, the environment and society, so our aim is to source 20% of key ingredients through regenerative agriculture methods by 2025 and 50% by 2030. Regenerative agriculture has huge potential to improve soil health and fertility, sequestering carbon, protecting water resources and safeguarding biodiversity. This can improve the resilience of farms and yields in the face of extreme weather, making an important contribution to the livelihoods and health of communities, as well as our planet.

Regenerative agriculture sits at the heart of our Net Zero Roadmap, so we're using our size and reach to advance it at scale. To achieve this, we're supporting our global network of farms, including coffee, milk and cocoa to transition to regenerative agriculture through strategies including the Milk Plan, the Nescafé Plan 2030 and the Cocoa Plan.

Our plans are ambitious and to achieve them, we're investing CHF 1.2 billion worldwide by 2025. Adapted to suit different crops or supplies, initiatives include upskilling farmers in regenerative approaches, incentivising adoption, and implementing tree-planting schemes to protect and revive the environment. We're already seeing positive results too, and our latest impact assessment revealed that the Nescafé Plan 2030 has achieved widespread adoption of regenerative techniques, leading to improved yields .

Collaboration will be key to driving initiatives at scale. We'll continue to share our learnings and best practice across the industry as we progress, so we can work together to drastically reduce scope 3 emissions while re-establishing and preserving the planet's biodiversity.

Regenerative agriculture has huge potential to improve soil health and fertility, sequestering carbon, protecting water resources and safeguarding biodiversity.

CHAPTER 1

Regenerative agriculture – why now?

Regenerative agriculture, if not a silver bullet to solving the ills of the food system, can at least provide a key part of the solution as we seek to build long-term resilience and security.

The way we produce and consume our food is in need of a fundamental reset. That was the conclusion reached by Henry Dimbleby following an exhaustive period of research that culminated in the publication of his independent national food strategy for England in the summer in 2021[1].

Dimbleby's core thesis was that the current food system has been successful at producing abundant food at cheap prices but at enormous cost to human and planetary health. He proposed a series of recommendations among which was the development of a framework for how we can optimise our use of the land to support healthy, sustainable diets.

The final report was published a year into the covid-19 pandemic which had layered an unexpected new challenge on top of the deep, structural problems the food system already faced. Subsequently, the war in Ukraine added yet another negative dimension, contributing to a period of rapid food price inflation amid supply shortages and supply chain disruption.

Inflation is expected to retreat over the months ahead yet the fundamental problems with our current food system remain. Since World War II government policy and the market economy have rewarded speciality and scale in agriculture. For the most part, this has kept shelves full and prices low but it has also created a cascading set of environmental and social risks that are currently not accounted for in the price paid for food at the supermarket till or restaurant table.

Policies and subsidies have for the most part incentivised the intensification of agriculture in pursuit of higher yields, which in turn has made farmers increasingly reliant on artificial inputs such as chemical fertilisers and pesticides. Monocropping – whereby farms produce a single commodity rather than a diverse range of crops – has impacted the genetic diversity of the food system as well as the biodiversity of agricultural land. This has come at a high cost: in a 2022 report titled 'Land of plenty', the conservation charity WWF concluded that the UK is one of the most nature depleted countries on Earth, and that our food system is a main driver of this loss[2]. "Ecosystems rich in both carbon and nature, from flower rich meadows to fragile peatlands, have disappeared or been damaged, leading to loss of pollinators, birdlife and mammals," the report read.

A 2022 report from the Nature Friendly Farming Network[3], meanwhile, cited figures estimating that soil degradation in the UK costs an estimated £1.2bn every year, while 40-60% of the nation's soil organic carbon, which plays a vital role in supporting good soil and ecosystem health, has already been lost[4].

Intensification of farming has contributed to other environmental harms such as air and water pollution. New analysis published in July by food and farming charity Sustain found that industrial livestock farming in the UK produces more than 50,000 tonnes of untreated excreta each day that is contributing to acute phosphate pollution of UK rivers such as the Wye[5].

Climate driver

The way we produce food is also inextricably linked with climate

> "The orchards are struggling to cope with some of the extreme weather swings that we're seeing – from severe drought conditions to cold snaps in May – that are making the risk of crop failure greater every year."
>
> **James Smith, Loddington Farm**

change. Agriculture is in the unenviable position of being both a significant source of greenhouse gas emissions and highly vulnerable to the effects of climate change, such as extreme heat and flooding resulting in failed harvests and reduced yields. Yet progress to reduce emissions is slow. The latest report from the UK's Climate Change Committee found that emissions from agriculture and land use are essentially unchanged from a decade ago and currently represent 11% of total UK emissions[6].

More worrying still, analysis from the Energy and Climate Intelligence Unit published in June showed uptake of low carbon farming practices is in reverse, with 53% of farmers taking action to reduce greenhouse gas emissions in 2023, down from 66% in 2020[7].

Food system challenges don't begin and end with the environment: the cost to the NHS of treating obesity and related ill health is estimated at more than £6bn, according to the Department of Health and Social Care[8].

The cost of living crisis is pushing more people into food insecurity. The most deprived fifth of the population would need to spend 50% of their disposable income on food to meet the cost of the government's recommended healthy diet, according to the Food Foundation, which found that healthier foods are over twice as expensive per calorie as less healthy foods[9].

Farmers, meanwhile, are struggling against a perfect storm of low returns, labour shortages, high input costs, increasingly unpredictable weather and an uncertain policy environment as the UK transitions from the EU's common agricultural policy to a new environmental land management regime.

Regenerate or die

If we accept that our food system is in need of review, could the answer lie in a transition to regenerative agriculture?

The view among a significant cohort of farmers and food businesses, alongside academics, scientists and campaigners, is that regenerative agriculture, if not a silver bullet to solving the ills of the food system, can at least provide a key part of the solution as we seek to build long-term resilience and security.

A shift to regenerative agriculture underpins the net-zero plans of many major food and beverage businesses. Nestlé is investing CHF1.2bn (£1bn) in regenerative agriculture across its supply chain and is committed to sourcing 20% of key ingredients from regenerative agriculture methods by 2025 and 50% by 2030. Compass says 70% of its top five food categories will be sourced from regenerative agriculture by 2030. First Milk has committed to paying a premium to farmers who commit to a regenerative farming plan, while brewer Carlsberg Marston's has committed to sourcing 30% of all agricultural raw materials from regenerative practices by 2030, reaching 100% by 2040.

Unlike concepts such as organic and agroecology, regenerative agriculture does not yet have a firm definitional base; some producers say it is more of an ethos than a fixed set of standards. However the outcomes it is designed to deliver – healthy soils, biodiversity, carbon sequestration to name a few – are generally agreed to be intrinsic to the future sustainability of our food system.

Regenerative agriculture is designed to go beyond notions that food production should do no harm to the planet and embrace the idea that farming should actively regenerate natural ecological systems. There is much excitement around the concept but also caution that a movement that began on farms and in communities should not be co-opted for commercial gain.

CHAPTER ONE REGENERATIVE AGRICULTURE – WHY NOW?

As Sustain's head of farming Vicki Hird wrote in a 2021 blog: "The hype is huge and there are new promotions, labels, and high-level support being generated. If done well, regenerative approaches could be a force for good; genuinely supporting farmers to do more for climate, nature and the environment. Done badly, it won't."[10]

Over the course of the next four chapters this report takes a deep dive into why there is growing interest among farmers and food businesses in the concept of regenerative agriculture.

It first considers how we should define regenerative agriculture and what are the key environmental outcomes it should deliver.

We hear from the farmers and businesses leading the shift to regenerative agriculture and the extent to which they, and other experts, believe a transition away from current reductive farming practices can contribute to corporate and national net-zero targets, alongside other environmental ambitions.

And we consider questions around scalability and the need to ensure regenerative agriculture translates into meaningful, long-term regeneration rather than short-term, piecemeal actions that risk locking in harmful practices.

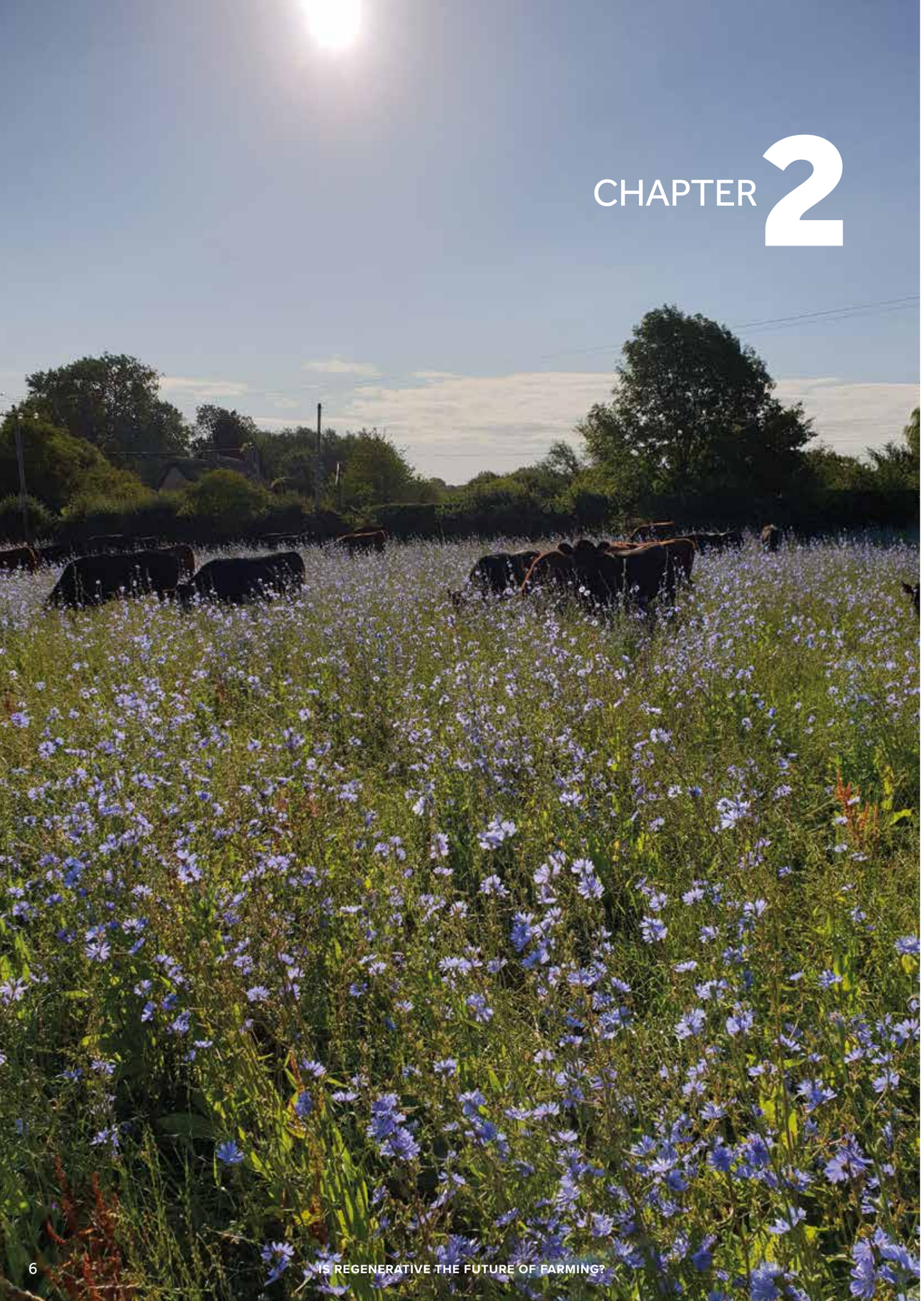
Case Study: Loddington Farm

Loddington Farm, near Maidstone in Kent, exemplifies the systemic challenges farmers currently face in sustaining a viable business and why a transition to regenerative agriculture is seen as an attractive alternative. Traditionally an apple farm employing conventional, intensive growing practices, owner James Smith is in the process of building regenerative principles into the farm, a decision driven by a desire to work with nature rather than against it and de-risk a business model previously reliant on one key commodity.

"The orchards are struggling to cope with some of the extreme weather swings that we're seeing – from severe drought conditions to cold snaps in May – that are making the risk of crop failure greater every year," he explains. "When it comes to harvesting we can't access labour so we don't know if we can pick the crop and then if we do manage to pick it I'm not sure I can afford the electricity to store the crop. And at the end of that I'm not confident the retailer will pay us a profitable price to have taken all of that risk."

Smith has taken a decision to remove all but the most productive orchards and is now looking to diversify the crops he's producing. That includes reintegrating livestock onto the farm, including a flock of laying hens, to help with nutrient cycling as well as 'pick-your-own' pumpkins. Smith and his team have also planted a small vineyard, designed to allow sheep to graze underneath.

"We, like so many food producers, had been on a journey of intensification and specialisation," he says. "We've had to look at how we retrofit more natural ways of farming. The regenerative approach brings a functional diversity to the business which is fundamental to our plans going forward."



CHAPTER 2

Defining regenerative agriculture

> Outcomes are more important than definitions. By trying to codify regen we are already missing the point! It is about farming with nature and allowing natural ecosystems to flourish.
>
> **Lee Truelove, responsible sourcing manager, First Milk**

What do we mean by regenerative agriculture? This remains a hard question to answer; regenerative agriculture means different things to different people and is not easily pigeonholed but its philosophical essence is the mirror opposite of extractive farming; rather than creating external costs you put more back in – both to the land and society – than you take out.

If you were to draw a line from conventional, intensive farming on the one side to agroecological farming on the other, some (albeit not all) would have regenerative farming sit somewhere in the middle. Its principles are broad enough to permit the use of some conventional practices like the application of artificial fertilisers or pesticides (whilst acknowledging the need to reduce their use over time) but it also embraces the idea, as in agroecology, that farming should optimise the interactions between plants, animals, humans and the environment.

"There are a range of terms that are used in relation to sustainable agriculture: agroecology, conservation farming, regenerative agriculture, organic farming," explains Rebecca Geraghty, CCO of data marketplace Agrimetrics. She says regenerative agriculture has similar objectives to many of the other approaches: maintaining agricultural productivity, improving soil health, increasing biodiversity and enhancing carbon capture and storage. But in contrast to these other terms, regenerative agriculture does not have a given set of rules and practices. "Instead, the goals that should be achieved are set and then practices and new technologies are adopted over time which contribute to achieve these goals," says Geraghty.

In a recent briefing paper on regenerative agriculture, Table, the global platform for knowledge synthesis on food, suggested that definitions of regenerative agriculture can be clustered into three, overlapping groups[11]. There are those that place emphasis on a particular set of practices; those that focus on its desired or promised outcomes; and those that primarily see regenerative agriculture as an ethos characterised by a fundamentally different way of thinking about humanity's relationship with the natural world and producers' relationships with consumers.

Farming principles

At a farm level, Leaf UK, the sustainable farming organisation and certification scheme, has identified five core principles of regenerative agriculture. These are:

- **Minimise soil disturbance**, for example through the adoption of no-or minimum tillage.
- Create **diversity** through practices such as rotational leys, companion cropping, and cover cropping which can improve nitrogen and phosphorous flows by increasing soil organic matter and reducing the need for synthetic fertilisers.
- **Protect soil surface** by covering the soil with living plants or crop residues that protect the soil itself and the organisms living within it.
- **Maintain living roots** by leaving plants in place for longer to enable them to grow deeper roots which in turn encourages the build-up of organic matter and reduces the risk of soil erosion.
- **Livestock integration** whereby animals are allowed to graze the land to spread organic matter and increase nutrient cycling and plant growth as part of mixed farming systems. This is often through rotational or 'mob' grazing whereby animals are frequently moved between small areas of pasture to help stimulate plant growth and build soil organic matter.

Those interviewed for this report were in broad agreement that producers did not need to tick all of these boxes in order to claim a regenerative approach, yet neither do single, piecemeal actions constitute regenerative farming – it has to be built on a holistic view of what is needed to regenerate land and landscapes.

These five principles see regenerative farming overlap with concepts such as silvopasture and agroforestry whereby trees are integrated into pasture or cropland to the benefit of the environment and productivity. In a new report published in June titled 'The agricultural transition: Building a sustainable future', consultancy McKinsey found that agroforestry can provide 45% to 65% more benefits for biodiversity than standard agricultural landscapes, while silvopasture sequesters five to ten times as much carbon as standard pastures[12]. In addition, trees can make farms more resilient by protecting crops and livestock from the elements such as sun, wind and rain.

Context is key

In a blog published in June this year, Leaf's technical officer Daisy Wood explained how a sixth principle for regenerative agriculture has recently been proposed – context – which speaks to the importance of site specificity and individuality[13]. "Understanding the context of your farm means regenerative agriculture can be implemented in line with individual farm operations," Wood wrote. "No two farms are alike, they all have differing climates, soil types, crop/livestock types, funding availability, skills and goals that will influence them and their operations."

This chimes with the view of many experts who believe a key strength of regenerative agriculture is how it is rooted in the farm-specific context and does not seek to prescribe a set of practices farmers must follow. Although "there is a long list of practices associated with regenerative agriculture it is widely accepted (among researchers, farmers, and farming and food NGOs) that there is not one clear formula that works for every farm", according to Catherine Chong, ESG advisor and engagement lead for Clear (Consortium for labelling for the environment, animal welfare, and regenerative farming). In practice, Chong says it is about working with the individual farm's biological, chemical, and physical ecological limits. "Those stakeholders who do try to reduce it to a set of specific practices and outcomes sadly include those whose sole intention is to profit from its promised climate mitigation benefits by exaggerating the soil carbon sequestration potential," Chong adds.

Lee Truelove, responsible sourcing manager at dairy cooperative First Milk, says the risk of having fixed standards for regenerative agriculture is that it is "dumbed down". "Outcomes are more important than definitions. By trying to codify regen we are already missing the point! It is about farming with nature and allowing natural ecosystems to flourish," he adds.

The notion that those employing regenerative approaches should be more concerned with the 'what' than the 'how' begs the question, what outcomes should it deliver? Academics Tara Garnett and George Cusworth, who authored the Table paper, wrote that although the precise list of environmental metrics that might be used as a proxy for ecosystem and soil health is somewhat open-ended, "it is likely to include reference to soil carbon levels, invertebrate numbers, soil drainage, friability, moisture penetration, soil depth, soil nutrient content, fungal/bacteria ratios, greenhouse gas emissions, pollinator abundance, antibiotic usage, and biodiversity measures".

> "In terms of outcomes, we are focused on sequestering carbon in soil and perennials, improving downstream water quality, enabling farmers to trial and develop new practices, and building generational security in farm families."
>
> **Shaunagh Duncan, head of sustainability, Oatly (International & European markets)**

As we shall see in later chapters, these indicators are not easy to measure and there remains little consistency in the way they are currently captured and reported. But many believe that shouldn't be a barrier to pressing ahead with adoption of regenerative approaches and supporting them throughout the value chain. "The best situation would be a definition that we could all agree on so we are working with farmers to do similar things and measuring consistently," says Laurence Cox, sustainability manager at Carlsberg Marston's Brewing Company. "But we can't wait for that perfect situation, which is why various companies have started on this journey."

Oatly is among the companies that has begun the process of defining the environmental outcomes it believes regenerative agriculture should deliver. Through its future agriculture renovation movement (FARM) programme, the plant-based alternative to dairy has defined a regenerative standard that it says seeks to support farm viability and resilience, while reducing net greenhouse gas emissions, and enhancing biodiversity and ecosystem health. "In terms of outcomes, we are focused on sequestering carbon in soil and perennials, improving downstream water quality, enabling farmers to trial and develop new practices, and building generational security in farm families," says Shaunagh Duncan, head of sustainability for Oatly, International & European markets.

Welfare matters

One element of regenerative agriculture that tends to be overlooked, but some argue is critical to its success especially where livestock is integrated into the farm ecosystem, is animal welfare. "We need to place animal welfare at the heart of regenerative farming but currently we feel it's a missing component," says Tracey Jones, director of food business at Compassion in World Farming. "Regenerative farming has the potential to give animals their best quality of life but it's not a given."

Jones argues that regenerative farming cannot take place within the context of indoor production systems for animals like chickens and pigs, regardless of the welfare standards they meet. "It has to be based on the land. You can't move from an indoor chicken farm to a regenerative farm without moving out onto the land, reducing flock or herd sizes and using more traditional breeds. It's a complete system shift with true integration of animals in the ecosystem."

Social dimension

More contested is the extent to which regenerative agriculture must also engender a social or people dimension. This version of regenerative agriculture incorporates notions of paying producers a fair price for the food they create, allowing farmers to innovate freely, facilitating the sharing of knowledge between producers and buyers and sellers, and ensuring that the food produced from regenerative agriculture is nutritious, affordable and accessible. "Anything we do cannot make the farmers worse off," says First Milk's Truelove.

It also seeks to reset power relations within food supply chains, shifting from a state of top-down control where buyers dictate to growers the terms of production, to a more collaborative, bottom-up approach. The Table paper notes how growing interest in regenerative agriculture from large multinational agri-businesses is potentially changing what it means to practice regenerative agriculture "with greater emphasis being placed on measurement, accreditation and marketing, and less on its credentials as a farmer-led movement organised around the redistribution of power in the food system".

It begs the question of whether regenerative agriculture can exist within the framework of current farming systems and food value chains, and how they function, or whether it requires a complete overhaul of our approach to food and farming.

Some farmers are sceptical of whether that transformative agenda is on the table. In a blog posted following the Downing Street food summit this spring, Martin Lines, an arable farmer from South Cambridgeshire and CEO of the Nature Friendly Farming Network, suggested that "corporate versions of regenerative agriculture tend to offer a relatively status quo political vision for the future of food, with the dynamics between consumer, producer, distributor and processor largely unchanged"[14].

"What we're talking about here is a rethink the industry needs to do on the relationship that exists between price and value; what should the price be for the consumer, and what does the market structure need to look like to facilitate it, in a way that's cognisant of externalities like health and environment," says Carolyn Ball, director of net-zero delivery, Compass UK & Ireland.

CHAPTER TWO DEFINING REGENERATIVE AGRICULTURE

> "High yielding agriculture can of course be good, giving us space for biodiversity for example, but there are elements of industrial practice that need addressing; including how we factor externalities into prices."
>
> **Carolyn Ball, director of net-zero deliver, Compass UK&I**

"High yielding agriculture can of course be good, giving us space for biodiversity for example, but there are elements of industrial practice that need addressing; including how we factor externalities into prices. A food market that better serves private and societal goals will better support farmers too – we have to work hard on what that requires of us in practice. We want to be part of the dialogue around regenerative agriculture and to help bridge the gap between concept, perception and reality."

FAI Farms & McDonald's

As the role of meat in a sustainable diet comes under ever-growing scrutiny, businesses that sell large volumes of animal protein are exploring ways to integrate regenerative principles into production practices.

McDonald's has partnered with consultancy FAI Farms to explore what adaptive multi-paddock (AMP) grazing looks like on a commercial UK beef system. Unlike other forms of rotational grazing, AMP grazing is adaptive, requiring the farmer to read the conditions of the land and forage, assess the needs of the livestock, and plan the grazing appropriately. It aims to replicate how large groups of herbivores would move across the plains, only taking the most nutritious top portion of the plants while leaving the roots undisturbed and allowing the plants to continue to grow. Cattle move paddocks regularly (approximately every 1-4 days) with the action of the herd trampling the manure into the soil stimulating plant growth and building soil carbon.

In 2020, FAI transitioned its beef enterprise to AMP grazing and is now extending the learnings to 10 farms within the McDonald's beef supply chain. The plan is to collect data to measure the economic, ethical and environmental benefits of transitioning to AMP grazing with metrics including data on soil health, carbon footprint and sequestration, biodiversity, and farm economic performance. Learnings will be shared with the wider pool of McDonald's beef farmers to help encourage a wider shift to regenerative agriculture.

CHAPTER 3

Regenerative agriculture and business

"My toughest job internally is to remind everyone to be patient. Businesses tend to want an ROI of three years or less but we can't do that with regenerative agriculture. On some farms emissions may go up before they go down, too."

Robin Sundaram, responsible sourcing manager, Nestlé UK&I

"Regenerative agriculture is poised to move into the mainstream faster than many people expect," wrote global futurist and author Jack Uldrich recently[15]. It is, he said, the "classic triple-win situation" offering security to farmers, protecting the planet and bringing more nutritious foods to consumers. It is an appealing and appetising vision.

Chapter Four discusses some of the environmental and social benefits of this transformation. Here, we discuss the role of businesses. Are they committed to the cause, how are they supporting progress, and what (more) can they do to accelerate change?

The promised land

Research by Rabobank shows that just some of the public and private sector commitments toward regenerative practices and soil health add up to more than 40 million hectares by 2030 (or 4% of the total crop and pasture acreage of the US, Canada, the EU, Australia and New Zealand)[16]. It is "the topic of the moment" notes Fairr, the global network of investors focused on ESG.

With media coverage of the food system dominated by stories of environmental degradation, biodiversity loss and food's carbon footprint, the prospect of food coming from a system that is healing and restorative is something people really want to buy into. But it's easier said than done. There are currently more questions than answers, more assumptions than outcomes, and more theory than practice. This has led to criticism and accusations of corporate greenwashing.

Trailblazing trials

There is no doubt uncertainty about the benefits of some regenerative agriculture projects and ambiguity around the environmental benefits and potential to scale such approaches (see Chapter Five). But things are moving quickly: what was seemingly a new corporate 'buzzword' just months ago has evolved into what Charlotte Bande, global food and beverage sector lead at consultancy Quantis, calls "pragmatic pilots" of regenerative approaches.

Heineken and Pernod Ricard's subsidiary Irish Distillers has launched a project in Ireland to help 15 malting barley farmers transition to more regenerative agricultural practices. The three-year pilot study is part of a global initiative to build resilience into the production of agricultural raw materials.

Carlsberg Marston's Brewing Company's (CMBC) regenerative farming project is also underway in the UK, Finland and France. The brewer is currently working with 45 farmers in France and has pledged to use barley sourced from regenerative farming practices for all beer sold under its 1664 Blonde brand by the year 2026[17].

Compass, meanwhile, is partnering with the Soil Association Exchange programme to undertake a detailed baseline of the ecological health of five of its supplying farms. The results will be benchmarked against hundreds of farms across the UK to share knowledge, with

> "Farmers are now an integral part of our team – as they always should have been. You've got to give the farmer peace of mind."
>
> **Tom Barton, co-founder, Honest Burgers**

each of the five pilot farms receiving an action plan to decrease their ecological footprint based on regenerative agriculture.

"Companies cannot massively invest in any transition unless they have a good indication that it's going to be successful," Bande explains. "So I feel like this stage of pilots is relevant because once you start transitioning the agricultural supply chain, there's no way back."

Trialling new techniques, mining data and developing new commercial partnerships with farmers are all important stage posts on a journey to regenerative agriculture. There is flexibility in the approaches. As McCain Foods notes in its framework for regenerative agriculture principles, this is a journey rather than a fixed set of goals and there is no "one size fits all".

Diversity not dictation

That journey could take a long time, not least given the lack of silver bullets and off-the-shelf certification schemes (as yet). What's more, there is no real certainty of success. Robin Sundaram, responsible sourcing manager at Nestlé UK&I, admits that his "toughest job" internally is to remind everyone to be patient. The financial and environmental benefits will come but it takes time, he explains. "Businesses tend to want an ROI of three years or less but we can't do that with regenerative agriculture. On some farms emissions may go up before they go down, too."

The malaise affecting the food system, however, means companies need to move fast. "While there might be strong positions held for or against certain types of solutions, the challenges of sustainability in general and agri-food systems sustainability in particular are so complex and urgent that all types of solutions with real potential for post-growth transformation are needed," noted researchers in a paper for *Nature Sustainability* in 2022[18]. Bande puts it more succinctly: "We cannot afford to spend the next five to 10 years in pilot stage."

Clearer definitions of regenerative agriculture would certainly help. It is an area in which businesses would welcome greater clarity and agreement: some form of common understanding or shared standards would benefit the entire supply chain (and potentially consumers, too). It could, for example, enable farmers to make the changes required to deliver regenerative outcomes by ensuring there is a guaranteed market for the outputs they produce.

Consider crop rotation, a central pillar of regenerative agriculture which requires each field to produce different crops from one season to the next that may go to different buyers. Some firms are already buying a broader range of crops from farmers to incentivise such changes on farms.

Companies supporting regenerative approaches are maintaining a greater presence on farms, engaging producers, encouraging them and collaborating. "We have to remember this is people's livelihoods," says Nestlé's Sundaram. "We are asking them to fundamentally change their business and that's a big ask." He says 10% of farmers already "get it" and are early adopters of new lower carbon techniques, while 10% will probably stop supplying Nestlé or leave farming altogether. The other 80% are open to change.

This is not about dictating to farmers or asking them to do something differently in return for a premium; it's more than that. "We want to create a collection of growers that have shared interests with us," explains Laurence Cox, sustainability manager at CMBC, "which can create greater momentum with other companies and growers, and that

CHAPTER THREE REGENERATIVE AGRICULTURE AND BUSINESS

the government can be part of by incentivising regenerative practices. Together we create a system that's better," he adds.

Transition time

Speak to farmers and some are excited by the swell of interest in regenerative agriculture; others are anxious; nearly all are still trying to understand what it means for them.

Producers are concerned in particular about the transition period when yields and financial returns can potentially drop. Using data from Canadian arable farms, consultants at Bain showed yield loss was typical in the first two seasons of transforming to regenerative agriculture[19]. Producers may then break even by the third or fourth seasons but it's only in years five and six that they begin to see greater profitability (which early studies suggest could be as much as 30%). The experts noted that "helping farmers through their transitions to regenerative agriculture is a limited-period investment that becomes self-sustaining after a few years".

Research recently published by Boston Consulting Group (BCG) in Germany showed how regenerative farming offers "huge benefits" in the medium and long-term[20]. Improvements in soil structure as a result of no-till farming, for instance, would increase an arable (cereal/oilseeds) farm's profits by €97 (£84) per hectare, including a gain of €69 (£59) per hectare in net cost savings from avoided tillage operations and €28 (£24) per hectare in revenue from increased yields.

Farmers will, however, need help financing the shift so that the risk of transitioning from conventional to regenerative farming is shared. "Undoubtedly some farmers lack the capital needed to cover the cost of adopting certain regenerative practices or may simply be unwilling to risk abandoning their customary approach to farming," the BCG consultants wrote. "To overcome these fears, Germany's government and its food companies must support farmers in their transformation toward regenerative agriculture and convince them that they can achieve positive economic effects even in the first year of the transition."

This applies the world over but it can't be taken for granted. Some point to the decades-long concentration of the agri-food industry that has created large agri-industrial clusters whose business models drive short-term, unsustainable practices. Shifting that structure so that it supports

> "If companies want to speak to the consumer, I think they should really focus on communicating the outcomes [and tell them]: what is better and what has improved?"
>
> **Charlotte Bande, global food and beverage sector lead, Quantis**

a long-term transition to mixed, agroecological approaches that enhance biodiversity, maintain fertile soils, and improve the system's resilience to social and ecological shocks is no mean feat – practically, financially or culturally.

Banks' risk-return models, for example, tend to favour short-term profitability and liquidity over long-term value and collateral. Investors too need convincing of the long-term benefits of regenerative agriculture, as well as the risks of maintaining the status quo. "Impacts on yields and productivity under different intensity levels of regenerative practices need to be better understood," noted Elizabeth Lunik, senior F&A climate analyst at Rabobank, in her May 2023 paper 'Regenerative agriculture's many shades of green'[16].

"I think food businesses are alert to this potential 'gap' but they've not fully comprehended what it means for their business," says Adele Jones, executive director at the Sustainable Food Trust (SFT). "We can feed the world with food grown regeneratively but it's a really fundamental change of the whole system that needs to happen. It's not tweaks around the edges. And that's the bit food companies still need to work through."

An estimated US$350bn (£278bn) per year until 2030[21] will be needed to ensure that food systems meet climate mitigation and adaptation targets as well as other sustainable development goals. That sum exceeds public financial resources by some distance so private finance is essential.

"This must include a just transition for farmers," says Duncan from Oatly, "which is where governments and the private sector must play their part. It's why, as part of our pilot programmes, we incentivise farmers to partner with us by de-risking experimentation, paying incentives for practice adoption, data, and project participation."

Banks, investors and insurers are key to shifting the market towards sustainable practices. "Financial institutions with significant portfolio exposure to the agrifood sector [...] can influence clients and suppliers across value chains to improve their policies and practices, demand accurate quantitative monitoring and reporting from investees and drive financial flows towards more sustainable food systems," notes UNEP.

Cash crops

Considerable sums of money are being invested in regenerative agriculture by food companies. Nestlé is investing CHF1.2bn (£1bn), for example, while Unilever has joined forces with Axa Tikehau Capital to put together a private equity impact fund with a target size of €1bn (£0.86bn) to invest in regenerative agriculture companies. There are three priority areas: protecting soil health to enhance biodiversity, preserve water resource and help fight climate change; contributing to the supply of regenerative agricultural ingredients; and seeking to provide a catalyst for technological solutions to speed up the transition to regenerative agriculture. The fund is designed to nurture close collaboration between farmers, producers, manufacturers, retailers, technology providers and financial investors.

But corporate commitments tend to lack detail on how the transition will be funded at farm level. Of 75 major food companies recently studied for their commitments to regenerative agriculture by Fairr, just one, Mondelez, has targets spanning area, sourcing and financial, while Tyson Foods and Nestlé have targets covering two categories (area and sourcing, sourcing and financial, respectively)[22]. "While any quantification of targets is better than none, area-related and sourcing targets without discussing how farmers will be financially supported for achieving regenerative targets could raise doubts about the fairness and viability of these initiatives and projects," the investor backed initiative notes.

Premium price

At CMBC there is a slight premium paid for regenerative barley as well as support from an agronomist and peer-to-peer learning, through for example farm visits post-harvest to understand what's working and what's not. That approach could well evolve over time, says Cox.

In Mexico, Côte d'Ivoire and Indonesia, Nescafé is piloting a financial support scheme to help farmers accelerate the transition to regenerative agriculture. Best approaches in each country will be tested, with measures including:

- conditional cash incentives for adopting regenerative agriculture practices
- income protection using weather insurance
- greater access to credit lines for farmers

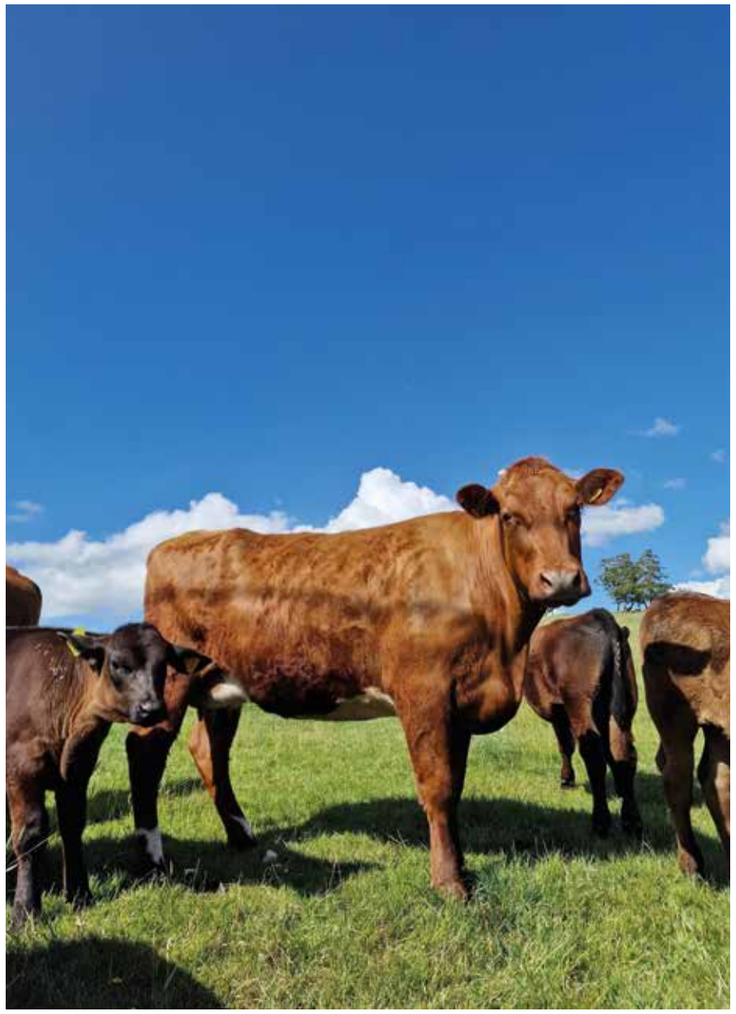
Widespread farmer adoption is key – from the dairy farms of south west England to the palm oil plantations of Malaysia. Some food companies will have thousands of suppliers to engage with and they will all need support. Farmers may well see their

costs reduce as they cut back on inputs but price premiums can also play a part, says Bertie Matthews, MD at Matthews Cotswold Flour. "If 30p or 40p on a bag of flour means we can continue to produce food on our land in 50 years' time, then it's worth it."

McKinsey, in its report 'The agricultural transition: building a sustainable future', suggests more "novel" financing approaches will be needed to encourage take-up of regenerative farming[23]. "Lack of access to capital also limits farmers' adoption of interventions with high investment needs, especially on small farms, and longer time frames of potential payoffs further limit uptake for farmers late in their careers."

There are some creative financing pilots underway which include cost-sharing (PepsiCo), profit-sharing (Cargill), non-competitive learning initiatives, voluntary carbon credit schemes and risk-sharing through so-called 'blended finance'.

Nestlé and 3Keel, a consultancy, are working on a new model – Landscape Enterprise Networks (LENs) – which connects groups of businesses with a shared interest in improving the quality of the region (usually through habitat restoration or regenerative farming practices)



with groups of land managers who can deliver the work on the ground. Water companies and local government bodies, for example, are involved in jointly financing initiatives on farms that will reduce nutrient run-offs from fields and reduce the risk of flooding. "It's all about cross-sector collaboration, shared interests and giving farmers the agency to choose their own path," says Matt Ryan, regeneration lead at Nestlé UK&I.

Some are taking more risks than others. Honest Burgers has smashed its supply chain model and rebuilt it entirely in order to secure a steady supply of regenerative beef. As the Honest website describes, "the only way to make sure all our meat is from regenerative farms is to cut out 'middlemen' and work with farmers directly". But farmers rear cows, not cuts, so to work with them "we have to buy the whole cow. All of it". This is a significant shift – only 70% of each cow is used to make the patties for Honest's burgers – but one that means the burger chain now has influence over how the farmers are farming and can ensure they're paid a fair price in return. "Farmers are now an integral part of our team – as they always should have been," notes co-founder Tom Barton. "You've got to give the farmer peace of mind."

Honest's producers are incentivised on the "right outputs", such as soil health, biodiversity, greenhouse gas emissions and animal welfare. As well as monitoring the environmental and ecological benefits of the meat being produced work will soon start on measuring the impact the changes have on the nutritional quality of the beef. "We're getting some good data and some good patterns and I really think we could be leaders in this space," says Barton.

Consumer appetite

Can regenerative approaches to farming offer nutritional benefits too? If that were the case the return on investment would certainly be much bigger, notes Bande at Quantis. EIT Food is working on research, for example, while small trials in the US last year showed promising results: the peas, sorghum, corn and soyabeans grown regeneratively showed on average more magnesium, calcium, potassium, zinc and vitamins; levels of sodium, cadmium and nickel – all broadly detrimental to human health – were lower[24].

Food companies will be eager to see more research as they look for ways to encourage consumers to buy into their plans to produce foods using regenerative methods. Companies can't work with farmers to grow sustainable crops and rear regenerative livestock if there isn't significant demand for it.

Consumer concern

Consumers are increasingly aware of the twin crises of climate change and nature loss facing the world but the links with food production and consumption are less widely understood. The prospect of a system that heals and restores is likely to resonate and agri-businesses know that. Some research has showed a baseline perception that more sustainably produced food is better for health than food produced conventionally but whether people are prepared to pay a premium for it is unclear.

A 2021 survey of US consumers by the International Food Information Council (IFIC) found that, given the choice, 66% would opt for a standard breakfast cereal rather than a more expensive one labelled 'grown with regenerative agriculture'[25]. Research by Danone with its customers showed people perceive the term as positive but don't necessarily know why[26].

In the UK, only 14% of consumers had heard of regenerative farming, according to a 2021 survey by AHDB[27]. An Alpha Food Labs study around the same time, commissioned by Beef + Lamb New Zealand (BLNZ) and New Zealand Winegrowers (NZW), showed 37% had heard of it[28]. The numbers of participants were small (41 in the UK) but the detailed questioning provided some encouraging results:

- 36% were prepared to pay 20% pay more for sustainably-produced food, but after learning about regenerative agriculture this jumped to 56%;
- the benefits of supporting local producers and gaining more transparency about what they are buying were top motivations for buying regenerative foods;
- of the six communication approaches that were tested with consumers, 'restoring ecosystems and soil health', 'addressing the climate crisis' and 'providing more nutritious, delicious food' were the top three that were "easy to understand and preferred".

What surveys show and what people do can be very different. Terms like 'sustainable' and 'regenerative' can be seen as vague (and as such are increasingly being targeted by green claims regulators). "If companies want to speak to the consumer, I think they should really focus on communicating the outcomes [and tell them]: what is better and what has improved?" says Quantis's Bande.

Key company commitments

Carlsberg Marstons Brewing Company: 30% of raw materials grown using regenerative practices by 2030 ... 100% by 2040

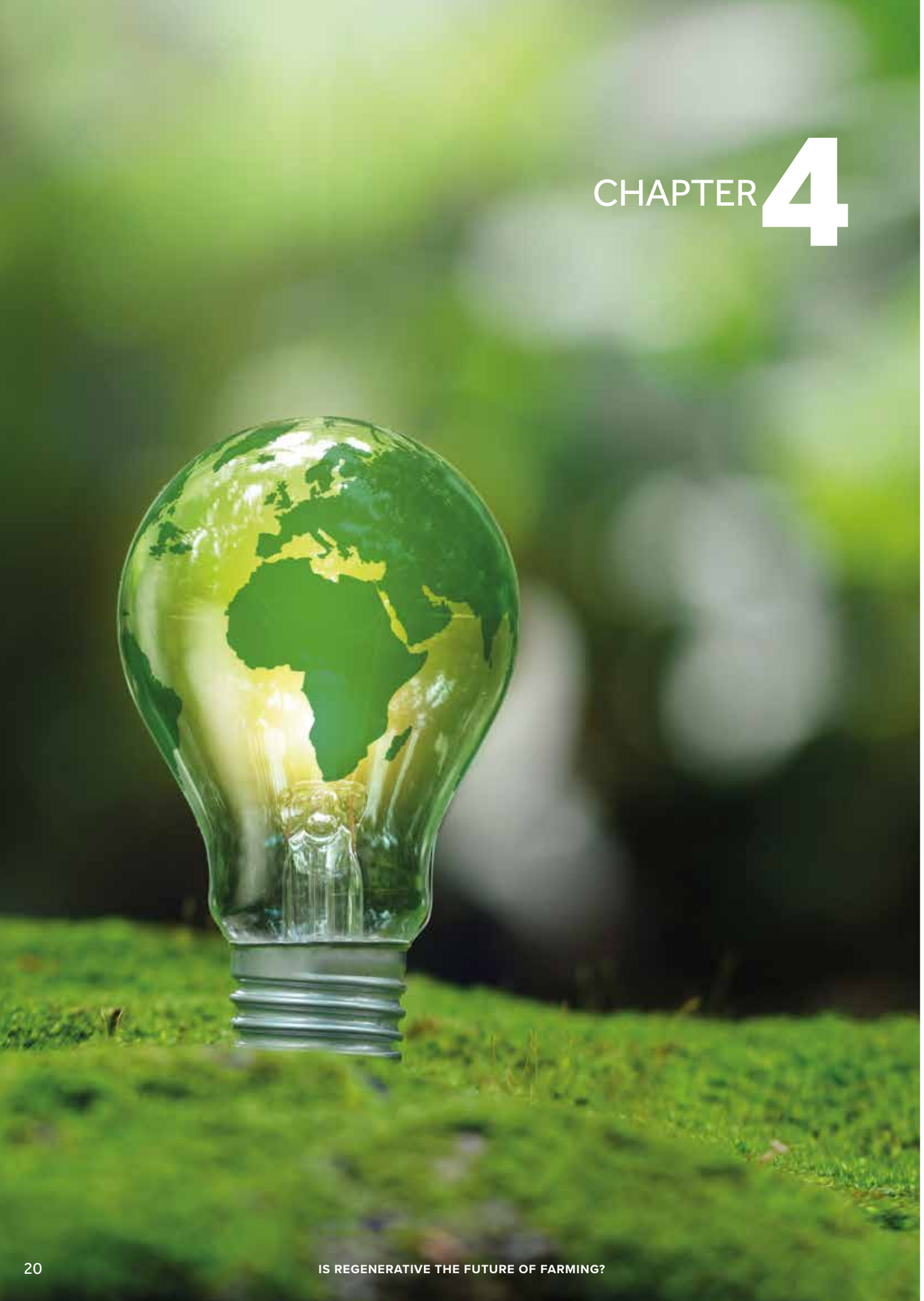
Compass: 70% of fresh meat, vegetables and dairy to be sourced from regenerative agriculture by 2030

PepsiCo: 7 million acres of land regenerative by 2030

Cargill: advance regenerative practices over 10 million acres across the US by 2030

General Mills: by 2021 115,000 acres enrolled in its regenerative programme (target is 1 million acres by 2030)

Nestlé: 20% of key ingredients from regenerative agriculture methods by 2025 and 50% by 2030



CHAPTER 4

Implications for net-zero

> "To get anywhere near net-zero, we need to collaborate more with our farmers within our supply chain to find the best practices to reduce carbon and benefit the farmer and biodiversity."
>
> **Matt Ryan, regeneration lead, Nestlé UK&I**

"The food system is currently eating itself," wrote Peter Elwin, head of food and land use at Planet Tracker recently; it is "destroying the natural capital base on which it depends as a result of extractive industrial practices. Transformation is essential."

But what environmental benefits will regenerative agriculture bring? Are they as impressive as some companies are suggesting and do we know what success looks like?

Food's footprint

Food and drink businesses carry hefty carbon footprints. Take Compass, the contract caterer, which has emissions of around 1.2MtCO_2e in the UK and Ireland, some 77% of which comes from the food it buys. Nestlé's global carbon footprint is 92MtCO_2e with 71% (65.6MtCO_2e) from 'ingredients sourcing'. By 2030 that needs to fall to 44.3MtCO_2e (business as usual would see emissions hit 97.1MtCO_2e).

It's a tall order but companies like Nestlé are confident that regenerative agriculture could have a significant role to play in achieving those 2030 targets and eventually net-zero. "To get anywhere near net-zero, we need to collaborate more with our farmers within our supply chain to find the best practices to reduce carbon and benefit the farmer and biodiversity," says Matt Ryan, who is responsible for driving regenerative agriculture aligned with the company's net-zero climate ambition. "We are looking to ensure that in the future, our operations are having a positive impact on ecosystems to benefit farmers, the environment and society."

At CMBC, the UK business, just over a quarter (27%) of its full value chain emissions of 311KtCO2e come from growing and processing the raw ingredients it uses. Still, to have any chance of achieving net-zero by 2040, the brewer "has to start working" on those farm-level emissions, and it has to start working more closely with growers, explains Cox..

It is not alone. "[…] ingredients accounted for 42% of our corporate climate footprint, with oats as the biggest impact driver," explains Oatly's Duncan. "It follows therefore that our greatest opportunity and potential for emissions reductions in our supply chain is by reducing the impact from the ingredients we buy."

Having committed to net-zero many of the world's major food, catering, drink and hospitality companies are now facing the challenge of reducing the emissions in their full value chains (by around 50% by 2030 in many cases). This in part explains their keenness to embrace the concept of regenerative agriculture. But to what extent can this transformation in the way food is grown contribute to tackling both the climate and nature crises?

The short answer is: we don't know. The jury is still out on some of the claims being made by companies and just how much regenerative practices, like low tillage, cover cropping and mob grazing, can eat into those emissions. But work is ongoing throughout the food industry, as well as in universities and research institutes (often in collaborations), to better understand the impacts of regenerative agriculture.

> "I'm not saying [regenerative farming] is not really good and really necessary, and there's lots of important work that takes place to improve soils that is worth doing, but I am wary of things that say 'this is the solution to our climate footprint'."
>
> **Tara Garnett, director, Table**

Carbon cuts

Rabobank points to the IPCC's estimate that improved cropland and conservation agriculture and regenerative annual cropping practices can reduce emissions by less than 1GtCO_2e per year by 2030. Global net anthropogenic emissions were 59GtCO_2e in 2019, so the panel said to be wary of "overly optimistic claims".

That isn't to say there are not considerable carbon benefits to be reaped from a new approach to farming. The Task Force on Nature-Related Disclosures (TNFD) highlights regenerative agriculture as a potential nature-related opportunity to improve biodiversity. And both the Science-based targets for Forest, Land and Agriculture (SBTi FLAG) and the soon to be launched Greenhouse Gas Protocol Land Sector and Removals Guidance acknowledge the opportunities for carbon reductions and removals from regenerative agricultural practices in greenhouse gas inventories to meet climate targets.

There are emerging signs of the benefits this transformation in farming could bring across the food chain:

- Bain & Company has estimated that average annual farm emissions in Canada could be cut in half or more through crop rotations, use of cover crops, reduced tillage and better nutrient management[19];
- Nestlé estimates improving carbon storage in grasslands can contribute 15% of its 2030 reduction targets for dairy and meat ingredients[29];
- Heineken's 2021 global 'low carbon farming' pilots showed an average 25% CO2 reduction and 40% increase in CO2 sequestration during the farming process[30];
- Unilever's €1bn (£0.86bn) climate and nature fund is supporting a pilot for its Ben & Jerry's ice-cream brand that aims to cut emissions from 15 of its Dutch and American dairy suppliers to half the industry average within the next two years[31].

It should be noted that this is a delicate balancing act with companies negotiating trade-offs between goals to decarbonise, protect nature and produce enough healthy food. Some approaches will reduce emissions but see yields tumble; others will offer emissions savings and biodiversity benefits. Teasing all this out will take time.

The soil won't recover overnight, or even over the next few years. "It has taken decades to derogate soil carbon stocks across the world and now it will take decades to restore them," Yeo Valley founder Tim Mead told Just Food recently. The fact that soil is in the spotlight marks progress, however, with equal attention now being paid to what goes on beneath the ground as above it.

Regenerative agriculture has certainly become a key focus for many policymakers, food companies and farmers. Climate change mitigation, increased profit for farmers and greater resilience to a changing climate are all considered 'wins'. But perhaps not as big as some think. "Our view is that the practices grouped as regenerative agriculture can improve soil health and yield some valuable environmental benefits, but are unlikely to achieve large-scale emissions reductions," warns the World Resources Institute[32].

Asked whether the link between regenerative farming and carbon sequestration is provable and achievable at the levels agri-food businesses are claiming Tara Garnett, director of Table and co-author of its recent paper on regenerative agriculture[11], proffers some scepticism. "Permanence is a really big issue [and] measurement takes a long time. You might get the first flush of sequestration at reasonably good rates in the early years and then it tapers off, so assessing that over time is also going to be difficult. It's also very soil, water, climate, weather dependent. I'm not saying it's not really good and really necessary," she adds, "and there's lots of important work that takes place to improve soils that is worth doing, but I am wary of things that say 'this is the solution to our climate footprint'."

Missing targets

Given the debate over the measurable benefits of various regenerative interventions, in particular where carbon removals are concerned, many companies have held back from modelling precise contributions to their net-zero targets. Compass's target to source 70% of fresh meat, vegetables and dairy from regenerative agriculture by 2030 is "an important sustainability commitment made in recognition of the role regenerative agriculture can play in the food industry's overall transition" says Ball. "Equally we are acutely aware of the challenges in accurately modelling impact and scalability given the complexity and political economy of food production in crowded islands such as the UK & Ireland, and the expected global increased demand of 30-50% by mid-century. This means we need better data and better definitions; so our modelling is anchored in the specifics of our supply chain and current commercial realities; and so we arrive at a practical approach that isn't overly simplistic. This is what we're working hard to focus on."

Fairr's analysis shows that nearly 60% of the largest 75 agri-food companies in the world mention 'regen ag' as part of their sustainability strategies[22]. These can broadly be split into six major themes, including carbon removals/sequestration, improved soil health, biodiversity benefits, water-related improvements, improved farmer income and reduced agrochemical inputs.

However, almost two-thirds of the companies only referenced unquantified and general statements of intent and/or

> "Tracking and measuring the impact of the initiatives at farm level and then communicating that at corporate level will be a major challenge."
>
> **Max Boucher, senior manager (biodiversity), Fairr**

pilot projects to reflect their commitment to regenerative agriculture. Most companies reviewed as part of the analysis provided no information regarding the scale of their regenerative programmes and how key stakeholders, including farmers, will be supported. Just 33% had quantified targets.

Max Boucher, senior manager (biodiversity) at Fairr, is wary of some of the claims being made. Tracking and measuring the impact of the initiatives at farm level and then communicating that at corporate level will be a major challenge, he says. A balance must be struck between clear, verifiable and beneficial outcomes without being overly prescriptive to farmers. It's not easy: "In regenerative systems people rely on tight feedbacks, and they need the power to observe, experiment and adjust their response to indicators of environmental change," explained Philip Loring in a 2021 paper for the journal *Agriculture and Human Values*.

Uncertain certifications

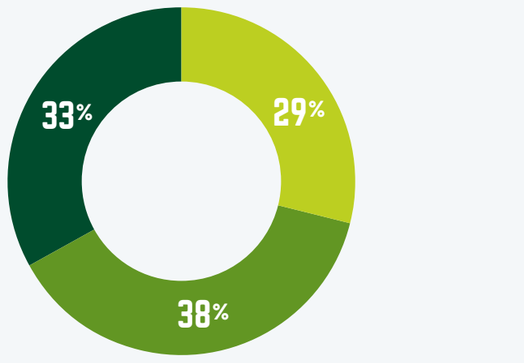
Loring, associate professor in food, policy and society at the University of Guelph, Canada, has previously warned how "[…] a relentless focus on single outcomes, such as carbon, coupled with industry's instinct to define and standardise, threatens the transformative potential of agroecology". Agroecological systems, which share many of the same characteristics as regenerative systems, are "networks of relationships, not collections of practices. They cannot be easily rendered into a set of definitions, standards or technological principles."

SFT's Jones is similarly concerned. She points to the "trap" in adopting binary approaches like organic which can create divides in the farming community. "People often come at it the wrong way around," she explains, "they think of a label and then work backwards".

Regenerative agriculture certification schemes are already available covering farms, products and supply chains. Together the Regenerative Agriculture Alliance, Regenagri, Savory Institute's Land to Market and the Soil Carbon Initiative are certifying or monitoring 2 million hectares of land globally, according to Rabobank. This is compared to almost 75 million hectares covered by organic. It's therefore far too early to say how consumers will react to these certifications, says Rabobank's Lunik.

Investors demand more clarity

One in three major agri-food companies has a quantifiable target on regenerative agriculture:



Source. Fairr 2023 (assessment of 42 of the world's largest agri-food companies)

> "People often come at it the wrong way around: they think of a label and then work backwards."
>
> **Adele Jones, executive director, Sustainable Food Trust**

The Sustainable Food Trust is supporting the development of a global farm metric and is working with the Regen10 coalition along with WBCSD, Systemiq, IUCN and the Ikea Foundation to provide "a universal measurement framework for use by producers, communities, business, and scientists".

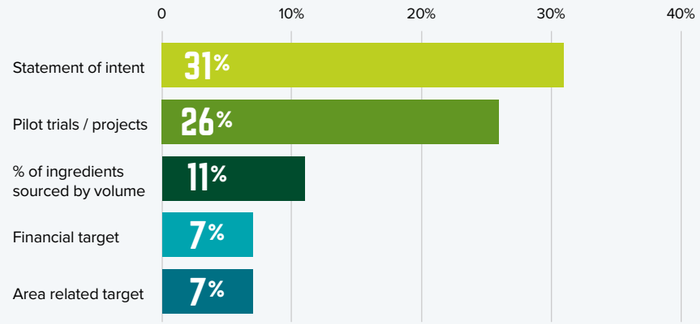
The likes of Nestlé, ABInBev and Diageo are all involved in the SAI Platform, which is aiming to, among other things, "harmonise the industry around regenerative agriculture principles and practices". Trials are currently underway on what the dairy protocol might look like; if the likes of Nestlé, Arla, Fonterra and Muller can agree on one tool to measure and report in a way that compares apples with apples (or in this case milk with milk) it could have huge impact as companies measure and benchmark internally and externally. Consider, for example, if all Arla's UK suppliers matched the emissions footprint of its top 10% performers, the average footprint per kilo of milk produced would drop from 1.13 to 0.95kg CO_2e.

Many companies are currently ploughing their own furrow however. Grassroots, a collective of regenerative farmers that works with the likes of Honest Burgers and the Ethical Butcher, has its own set of standards that are in tune with regenerative concepts such as feeding animals mainly grass (not imported soya), improving soil health, creating new habitats, using livestock within arable rotations, encouraging biodiversity and minimising the use of chemicals and pesticides[33]. This is not organic farming: rather than instruct farmers what not to do, Grassroots' approach is farm-specific, allowing producers to focus on changes that have the most benefits. "Each farm can build their own five-year plan setting out how they will apply the standards," says co-founder Alastair Trickett.

Oatly has its FARM programme (see Chapter One), Carlsberg has started building a protocol for its farmers, while First Milk farmers receive a "regenerative score" based on a number of metrics, also highlighting areas for improvement. What's really resonated with the milk producers, says First Milk sustainability director Mark Brooking, is that this approach is not something you pass or fail. Farmers also to a certain extent feel freed from the world of tick-box accreditations. "You can't be 'more' farm assured' but you can always be more regenerative," he says.

Can promises evolve into plans?

Specific and time-bound company targets relating to regenerative agriculture are rare



Source. Fairr 2023. Note. Some companies have targets spanning more than one category

CHAPTER 5

The future for regenerative agriculture

> "My personal feeling is that creating new and positive environmental stories about livestock animals, and therefore meat and dairy consumption, is a thing that should be treated with utmost caution."
>
> **George Cusworth, postdoctoral researcher, Oxford Martin School**

If regenerative agriculture is to play a key role in meeting national and corporate environmental ambitions, while helping build resilient farming enterprises and flourishing rural communities, it will need to be delivered successfully at scale.

The question of whether we can feed the world through regenerative approaches alone is arguably moot in the absence of a common definition. But modelling has shown that, in theory at least, a model of farming that works in harmony with, rather than in opposition to nature is achievable at scale but only with a significant shift in diets. A 2018 IDDRI study commissioned by the Soil Association modelled a 100% agroecological or organic Europe where livestock are either grass-fed or fed on 'leftovers'[34]. The results showed that the European population could be fed healthily and sustainably, with sheep meat consumption remaining at current levels and a small reduction in beef (3%), but with significant reductions in pork (60%) and poultry (66%) which depend on cereals for much of their diets.

In a UK-specific context, countrywide adoption of regenerative farming practices would produce double the current amount of vegetables and pulses, and result in a 75% decline in pork and chicken production, according to the Sustainable Food Trust whose 2022 report, 'Feeding Britain from the ground up', models how a complete switch to sustainable and regenerative farming practices across the UK would impact British diets[35].

Livestock tension

This tension between the need to reduce meat and dairy consumption at a population level and the role of livestock in regenerative farming systems has largely been absent from mainstream dialogues but some believe it's an issue that now has to be confronted head on. In his blog, farmer Martin Lines wrote that "it is far from clear how some of the agribusinesses developing their regenerative procurement strategies will approach the consumption issue", especially those whose product portfolios skew heavily towards meat and dairy. "For the versions of regenerative agriculture interested in changing farm management practices rather than broader social and consumption trends, these are tricky and unanswered questions," he added.

George Cusworth, a postdoctoral researcher at the Oxford Martin School and co-author of the Table paper on regenerative agriculture, says "there clearly is some optimisation to be done about livestock, arable integration and grazing on the margins, but my personal feeling is that creating new and positive environmental stories about livestock animals, and therefore meat and dairy consumption, is a thing that should be treated with utmost caution."

Policy priority?

Policy makers, in the UK at least, have so far been resistant to recommending that the public lower their consumption of meat and dairy in line with the kind of reductions modelled by Dimbleby (30% by 2032[36]) and the Climate Change Committee (20% by 2035[37]).

There is concern among some farmers that ELMS treats environmental improvement as separate to food production which runs contrary to the ethos of regenerative farming being a holistic approach to land management.

Nevertheless, experts are clear that policy will be a key enabler of a shift to regenerative agriculture. Garnett says the UK government's refusal to discuss consumption along with the scrapping of a planned horticulture strategy are examples of how policy is "moving in the wrong direction" particularly in its failure to take a systemic approach to food system challenges and solutions.

The government's new environmental land management schemes (ELMS) are designed to pay farmers for the provision of public goods not currently rewarded by the market. Most interviewees say they are adopting a 'wait and see' approach to whether the schemes can deliver the government's environmental ambitions although there is concern among some farmers that ELMS treats environmental improvement as separate to food production which runs contrary to the ethos of regenerative farming being a holistic approach to land management.

The Climate Change Committee has said that land use and agriculture in England remains "one of the few sectors where the government has not set out a coherent, strategic approach to coordinated policy to meet the multiple needs for land"[38]. A land use framework planned for later in the year is due to set out how England will manage land use for multiple functions such as food security, recreation, climate mitigation and adaptation, and nature recovery.

Questions of scale

As for the global potential to realise the kind of regional production scenarios modelled by IDDRI and SFT based around 100% regenerative approaches we have a long, long way to go. The Sustainable Markets Initiative is coordinating an Agribusiness Task Force designed to accelerate regenerative agriculture into becoming the predominant agricultural system in the world. With members including the likes of Mars, PepsiCo, Bayer, Waitrose and McDonald's the ATF has some significant corporate clout behind it. Despite many companies and governments acknowledging the benefits of regenerative agriculture and despite efforts to advance approaches on the ground, it has concluded that regenerative farming is not scaling fast enough to address the challenges the world faces with the rate of growth needing to triple to reach 40% of global cropland by 2030 and deliver against the need to limit climate change to 1.5 degrees.

In a white paper on scaling up regenerative farming the ATF identified three major current barriers to scaling regenerative agriculture[39]:

- The short-term economic case is not compelling enough for the average farmer;
- there is a knowledge gap in how to implement regenerative farming;
- drivers in the value chain aren't aligned to encourage regenerative farming.

These barriers are surmountable but it needs a commitment to change throughout the value chain. The ATF highlighted five specific interventions:

- Agree common metrics for environmental outcomes;
- build farmers' income from environmental outcomes;
- create mechanisms to share the cost of farmers' transitions;
- ensure government policy rewards farmers for transition;
- source differently to share cost across value chains.

This final intervention is perhaps the most challenging to deliver in the context of current business models. Indeed there are fears in some quarters that scaling up regenerative agriculture in a commercial context means untethering it from its roots as a farmer and community-centric movement characterised by inclusivity and collaboration, especially where carbon and biodiversity credits are traded and the language of regeneration is used as a tool to sell more product.

If at its heart regenerative agriculture is about achieving biological diversity and resilience at a farm level, which may in turn mean farms producing lower volumes of a more diverse range of outputs, how can that be accommodated within the mainstream procurement model whereby buyers demand consistent volumes of consistent products from a limited pool of suppliers?

Jones at Compassion in World Farming believes this paradox can only be solved by engaging commercial and marketing teams in the transition to regenerative agriculture, not just sustainability teams. "Until buying strategies are aligned with sustainability strategies you won't get to a position where companies will guarantee supporting the transition to regenerative farming."

Ball at Compass says the caterer is committed to working with its procurement teams to remodel partnerships with its suppliers in order to support a long-term transition to a sustainable food system - within which regenerative agriculture has a role. "The changes we need across the supply chain cannot happen without navigating the economics that underpin it," she says. "We have to work with suppliers in a shared understanding and modelling of land use so we can

"Empower the farmer, through knowledge exchange and by paying them a fair price for what they do, and by recognising the risks they are taking,"

James Smith, farmer, Loddington Farm

"Until buying strategies are aligned with sustainability strategies you won't get to a position where companies will guarantee supporting the transition to regenerative farming."

Tracey Jones, director of food business, Compassion in World Farming

> "A common approach to measurement and metrics is the antidote to greenwashing [but it] still has to offer flexibility so that farmers and food companies can focus on what's important to them".
>
> **Adele Jones, executive director, Sustainable Food Trust**

collectively maintain or increase food production and at the same time materially improve the state of the environment."

Ask producers what they want to hear from those businesses committed to supporting regenerative agriculture and they will often come back to the need to respect local context and a farmer's instinctive command of what is required to regenerate their own landscape. "Empower the farmer, through knowledge exchange and by paying them a fair price for what they do, and by recognising the risks they are taking," says Smith at Loddington Farm.

Metrics matter

Still, it is widely accepted that to guard against charges of greenwash from those companies publicly supporting the adoption of regenerative farming – and perhaps at some point promoting foods farmed regeneratively through their marketing – some safeguards are required in the form of consistent measurement and transparent reporting. "A common approach to measurement and metrics is the antidote to greenwashing," says Jones from the Sustainable Food Trust, who stresses that such an approach "still has to offer flexibility so that farmers and food companies can focus on what's important to them".

Chong at Clear says it is "helpful to the nexus of farming and ecology when we are able to express quantifiable outcome". The issue, she suggests, "is where people claim that they have been able to show outcome, but when you look deeper into the details it is not what they claim it to be. The issue is not in trying to measure something, the issue is in over-claiming and not substantiating the claim."

Chong says the risk of unsubstantiated claims speaks to the importance of transparency around environmental performance. "It has to start with everyone in industry coming together and saying we are willing to commit to the sharing of data and then in time, through the transfer of knowledge, we will be able to come up with an agreed standard."

For Smith at Loddington Farm, the journey towards building consumer trust in regenerative agriculture and what it can deliver is one that needs to be navigated with care. But given the damning evidence of the broken nature of our current food system, it's a journey that must be taken. "We've been reductive for decades," says Smith. "In the future I think there's a real imperative that every bit of mainstream food production should be regenerative."

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About Footprint Intelligence

The ever-shifting sustainability debate makes it vital for businesses to have accurate intelligence to make informed decisions. Footprint Intelligence is Footprint Media Group's research and analysis division, helping companies develop successful strategies in the context of responsible business practices. Footprint Intelligence aims to drive, promote and share best practice by helping industry resolve pressing sustainability issues. It asks tough questions and finds answers. It uses research and industry insight to bring businesses together to identify solutions, opportunities, trends and challenges.

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About Nestlé Professional

At Nestlé Professional®, hospitality is more than just a business. It is our business. This means inspiring the next generation of culinary talent through Nestlé Professional® Toque d'Or®; striving in the field in Nutrition, Health and Wellness; and collaborating with the industry for a more sustainable future. From coffee to cocoa, and from food waste to water, Nestlé works with farmers, chefs and operators continually to help make sustainable strides forward.

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Footprint Intelligence was commissioned by Nestlé Professional to write this report. The research comprised in-depth, semi-structured interviews with industry experts, desk-based research, involvement in industry events and forums, and comments and insights from opinion leaders linked to the industry.

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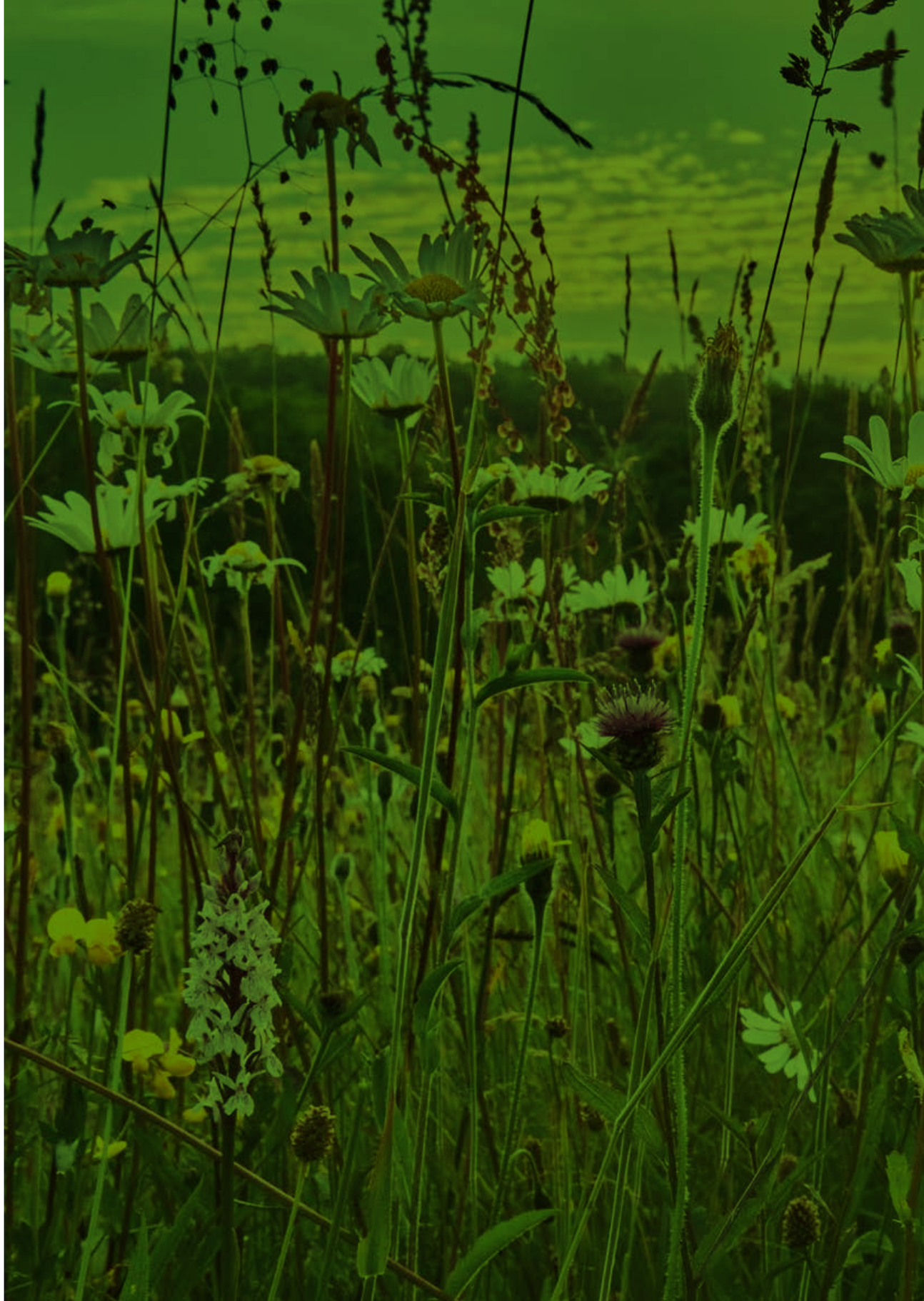


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