NUFFIELD
Farming Scholarships

Regenerative agriculture: a shared ambition for the future of farming?

Written by:

Samuel Smith NSch

February 2025

A NUFFIELD FARMING SCHOLARSHIPS REPORT

KINDLY SPONSORED BY:

McDonald's UK and Ireland

NUFFIELD FARMING SCHOLARSHIPS TRUST (UK)

Awarding life changing Scholarships that unlock individual potential and broaden horizons through study and travel overseas, with a view to developing farming and agricultural industries.

"Leading positive change in agriculture"

"Nuffield Farming" study awards give a unique opportunity to stand back from your day-to-day occupation and to research a subject of interest to you. Academic qualifications are not essential, but you will need to persuade the Selection Committee that you have the qualities to make the best use of an opportunity that is given to only a few – approximately 20 each year.

Scholarships are open to those who work in farming, food, horticulture, rural and associated industries or are in a position to influence these industries. You must be a resident in the UK. Applicants must be aged between 25 and 45 years (the upper age limit is 45 on 31st July in the year of application).

There is no requirement for academic qualifications, but applicants will already be well established in their career and demonstrate a passion for the industry they work in and be three years post tertiary education. Scholarships are not awarded to anyone in full-time education or to further research projects.

Full details of the Nuffield Farming Scholarships can be seen on the Trust's website: www.nuffieldscholar.org. Application forms can be downloaded and only online submission is accepted.

Closing date for completed applications is the 31st July each year.

ISBN: 978-1-916850-26-2

Published by The Nuffield Farming Scholarships Trust
Bullbrook, West Charlton, Charlton Mackrell, Somerset, TA11 7AL
Email: office@nuffieldscholar.org
www.nuffieldscholar.org

A NUFFIELD FARMING SCHOLARSHIPS REPORT (UK)

NUFFIELD Farming Scholarships

"Leading positive change in agriculture. Inspiring passion and potential in people."

Date of report: February 2025

Title	Regenerative agriculture: A shared ambition for the future of farming?
Scholar	Samuel Smith
Sponsor	McDonald's
Objectives of Study Tour	• Explore the adoption of regenerative agriculture across food and farming businesses: how it's understood and the varying levels of ambition. • Understand how companies can create an environment where it is desirable for farmers to invest time and money in regenerative farming. • Examine the relevance of regenerative agriculture movement within the broader sustainability sector.
Countries Visited	Italy, Netherlands, Switzerland, UK, USA
Messages	• RA can inspire profound, collective action, bolstering farm and supply chain resilience while aiding carbon drawdown and nature recovery. • However substantial investments and a systems approach are required to avoid it being a lukewarm movement, progressing too slowly to effectively respond to climate risk. • Companies championing RA are at varying stages of their journey, exhibiting disparate levels of ambition, resulting in a fragmented landscape. • While pilot projects are valuable, emphasis should now shift to mainstreaming RA through new business and financing models. • Projects must prioritise the needs of farmers, involve co-creation and engage with the nuances of change and risk, especially as initial costs can be high, with delayed returns. • Farmer support requires a triad of technical assistance, cultural acceptability, and financial incentives to de-risk the practice changes.

EXECUTIVE SUMMARY

Regenerative agriculture (RA) has captured the attention of major food companies – a term that encompasses various sustainable farming practices, some as ancient as agriculture itself. This study takes a supply chain perspective, exploring not how to "do" RA, but how it is being understood and how it can be propelled into the mainstream. The focus is on those in positions of power, such as large food companies and investors, aiming to create the conditions necessary for RA to succeed at scale.

The first section showcases different ways RA is perceived and its relevance in the broader sustainability landscape. The second section focuses on scaling up: how companies can create an environment where it is desirable for farmers to invest time and money in regenerative farming. The final section highlights themes often overlooked in RA, including social justice and equity, crop diversity, agroforestry, nutrition, and the debates over land use and livestock.

Five Key Insights About the Regenerative Agriculture Movement:

1. Collaborative efforts to set ambitious, shared goals for RA are valuable – as goals help to drive our behaviours and culture.
2. RA holds the potential to inspire profound, collective action, bolstering farm and supply chain resilience while aiding carbon drawdown and nature recovery. Substantial investments and a systems approach are required to avoid it becoming a lukewarm movement, progressing too slowly to effectively respond to climate risk.
3. Not everyone embraces RA; scepticism and concerns exist across different communities, making it an unsuitable framing for some farmers.
4. Companies championing RA are at varying stages of their journey, exhibiting disparate levels of ambition, resulting in a fragmented landscape.
5. Narrow perspectives of RA, focused on only a few practices, risk undermining more expansive regenerative ambitions, envisioned by many.

Seven Lessons For Companies Working to Scale Regenerative Agriculture:

1. While pilot projects are valuable, emphasis should now shift to mainstreaming RA through new business and financing models.
2. Projects must prioritise the needs of farmers, involve co-creation and engage with the nuances of change and risk – especially as initial costs can be high, with delayed returns.
3. Farmer support requires a triad of technical assistance, cultural acceptability, and financial incentives to de-risk the practice changes.
4. On-farm interactions between farmers and buyers are valuable to building trust and understanding; intermediaries can help facilitate this for larger companies.
5. Effective measurement is delicate and complex, with limited uniformity across companies despite efforts to align approaches. Certification programmes exist which can be valuable in fostering trust.
6. Many carbon offset schemes have integrity risks and a limited view of RA; they should not be relied upon or expected to help scale up RA practices.

7. Consumers should be engaged, but expecting buying habits to drive a RA revolution is complacent; value chains must help share any additional costs farmers incur.

In summary, the RA movement has huge potential as a transformative force in agriculture. While many are pursuing its ambitious goals, the journey is complex and should not be underestimated. It demands unlikely collaborations, big investments, new responsibilities, radical business models and creative, open mindsets.

TABLE OF CONTENTS

DISCLAIMER

The opinions expressed in this report are those of the author alone and not necessarily those of the Nuffield Farming Scholarships Trust, of the author's sponsor, or of any other sponsoring body.

All photos and graphics are the property of the author unless otherwise stated.

CONTACT DETAILS

Samuel Smith

Location: Inverness, UK

Email: ssmith1985@gmail.com

Website: thisissamsmith.com

Socials:

https://bsky.app/profile/swsmith.bsky.social

https://x.com/sam_w_smith

Nuffield Farming Scholars are available to speak to NFU Branches, agricultural discussion groups and similar organisations.

Published by The Nuffield Farming Scholarships Trust
Bullbrook, West Charlton, Charlton Mackrell, Somerset, TA11 7AL
email : office@nuffieldscholar.org
www.nuffieldscholar.org

CHAPTER 1: INTRODUCTION

This study is about regenerative agriculture (RA), a movement that in recent years has captured the attention of many major food companies.

Rather than concentrating on definitions of RA and how to "do" it, this study is focused on the role of those in positions of power – such as large food companies, investors, banks and governments – offering suggestions about incorporating RA into their strategies and creating the conditions for it to succeed at scale.

This report is divided into three parts:

1. **Chapter 3, 4 and 5** provide context to the challenges confronting our future and asks, how ambitious is regenerative agriculture? As a movement, it has rapidly increased in popularity within agriculture and supply chains, but are the existing initiatives and understandings ambitious enough and creating the type of shifts we need? What is the role of certification schemes? And finally, how can systems thinking help organisations that advocate for more regenerative agriculture?

2. **Chapter 6** focuses on how companies can best contribute to the growth and flourishing of regenerative agriculture.

3. **Chapter 7** highlights some of the themes that often sit at the fringes of regenerative agriculture, easily overlooked, yet vital for a healthy, sustainable future.

CHAPTER 2: MY JOURNEY TO A NUFFIELD SCHOLARSHIP

Figure 1: The author pictured volunteering at Soul Fire Farm, Petersburg, New York, during his Scholarship.

In 2008, I was fresh-faced out of Cardiff University and eager to embark on a career in sustainability. I wanted to be part of the efforts to inspire a rapid shift for people to live healthier, happier lives, within a fair share of the precious resources that our planet provides. This was the vision held by the entrepreneurial nonprofit Bioregional, where I landed my first job.

Bioregional was based on the edges of London and famous for helping create a pioneering development of eco homes called BedZED, where I subsequently lived. They were also involved in many other projects, including the first recycling scheme for businesses in central London, as well as setting up a small farm that I went on to manage, called Sutton Community Farm.

Figure 2: Sutton Community Farm team and volunteers (left); BedZED Ecovillage in South London, Credit: Bioregional (right).

Sutton Community Farm was my entry into food and farming. On a seven-acre site, we invited people to join us in growing vegetables, which we sold locally through a vegbox scheme and to restaurants in central London. We also tried, in our small way, to help tackle the complex web of problems that exist in our local food system, such as food poverty, poor diets and the loss of culinary skills.

While I managed this enterprise, I was not a farmer. I studied engineering and had a master's degree in Sustainable Energy. Prior to running the farm, I found

much inspiration from the permaculture design movement, which influenced my approach to design and running a business.

Despite a strong passion for community food enterprises, an interest in the wider food system led me to Forum for the Future, a charity that works with small and large companies, bringing expertise in systems change, running collaborations and making sense of the trends shaping our future. Within a team focused on sustainable nutrition, I worked with food companies to support their sustainability ambitions, and on international collaborations, covering subjects such as protein, animal feed, and edible fats and oils. Around 2018, the regenerative agriculture movement started to gain traction with organisations I was working with. This led me to my Nuffield Scholarship application – keen to help make sense of this shift and help influence it in positive ways.

In 2020, I joined the Farm Carbon Toolkit, a non-profit that I was already contributing to as a Non-Executive Director. Interest in farm and soil carbon was finally gaining momentum and it's been exciting to be part of this enterprise as that interest has started to flourish.

I hope that the perspectives I've gleaned through this scholarship will be useful to others interested in making our food and farming systems more resilient, climate-friendly, and productive.

CHAPTER 3: AGRICULTURE IN A RAPIDLY CHANGING WORLD

Key lessons

- Extreme weather events are becoming a new normal. The food and farming sector, like the rest of society, are tasked to help mitigate and adapt to a rapidly changing climate.
- There is an increasing appreciation of regenerative practices, but mainstream carbon literacy and understanding of the big-picture implications on our food system is limited.
- Climate psychology may offer useful guidance to navigate the stresses and anxieties of extreme change.

3.1 Context

The last 200 years have seen enormous shifts in food and farming. From the industrialisation of agriculture and the green revolution, to the rise of supermarket culture, global trade and convenience foods, which have contributed to shifts in our diets and food cultures. Looking forward, the existential threats facing our planet will mean that how we farm and what we grow, will shift again, in ways that are difficult to fully comprehend and predict.

Already, the increasing instability of our climate and biodiversity losses are having an impact on yields and trade. Greenhouse gas (GHG) emissions have already led to a rise in the global surface temperature of 1.3 °C[1], increasing the risk of multi-breadbasket failure and the triggering of dangerous feedback loops, such as melting permafrost, the drying out of peatlands, wildfires and a major loss of the world's coral. The disruption from climate change, is in its infancy and is the single biggest threat to our food system, which is simultaneously tasked to increase yields[2]. In an awful circularity, the design of our existing food system and its land use is also one of the greatest causes of climate change. The stakes are high and a great upheaval lies ahead, whether society succeeds in keeping the climate in-check or not.

Meanwhile, unprecedented advances in communication and technology are reshaping how we share information and make decisions, with jaw-dropping breakthroughs in artificial intelligence. These advances have vast implications across different industries and society. In food and farming, AI-driven systems

[1] Based on six widely-used datasets. Copernicus (2024), Climate Indicators: Climate. Available at: https://climate.copernicus.eu/climate-indicators/temperature

[2] The Global Commission on Adaptation predicted that by 2050 the world will need half as much food again, while crop yields could be down by as much as 30%. Source: GCA (2019), Adapt Now: A Global Call for Leadership on Climate Resilience. Available at: https://gca.org/wp-content/uploads/2019/09/GlobalCommission_Report_FINAL.pdf

could help optimise precision agriculture, reduce waste, and enhance climate adaptation efforts. Conversely, the rapid spread of misinformation online could distort public understanding of food systems or impede collective action on sustainability.

Meanwhile, the human population continues to increase, albeit at a slower rate, as does the consumption of meat and dairy, particularly in upper middle-income countries[3]. Many social justice movements are working to increase equity in our food system and fight injustices, past and present. Yet in many parts of the world, civil liberties are being restricted, as we witness a global expansion of authoritarian rule[4].

Farming as a sector is subsidised in almost every country to ensure food security and market stability. Moreover, farmers are often constrained in systems dominated by large agribusinesses, which renders them price-takers, rather than price-makers, with limited ability to influence prices or market conditions.

All this context and change felt very present in the meetings throughout my Nuffield Scholarship journey and are important to acknowledge, as they impact how we understand and work to change our food and farming systems today. For example, Eric Toesenmier's work to champion diversity and agroforestry in our farming systems so that we can be better prepared to farm in a changing climate and to support mitigation; Soul Fire Farm's work to increase equity in the food system and attract new entrants who farm with nature rather than against it; and Stefan Schreiber at Stone Ranch in Switzerland, as they implement regenerative practices that will help them to increase their farming resilience in the future.

3.2 More Efforts Needed to Increase Climate and Carbon Literacy

At the beginning of my career (early 2010s), it was common for the dangers of climate change to be thrown into doubt within the media. A false balance was often created, whereby an expert raising concerns about the risks of climate change would be pitted against someone who either denied climate change was real or believed the risks were hyperbole. This false balance created uncertainty for the public and likely contributed to a slower pace of action during the previous decade when mitigation efforts have never been more critical.

In many countries, including the UK, the conversation has fortunately progressed and climate change is accepted as a major risk by mainstream institutions and companies. Today, working in sustainability has become a common vocation,

[3] Our World in Data (2023). Meat and Dairy Production. Available at: ourworldindata.org/meat-production#meat-consumption-tends-to-rise-as-we-get-richer

[4] Economist Intelligence Unit (2024), Democracy Index: conflict and polarisation drive a new low for global democracy. Available at: www.eiu.com/n/democracy-index-conflict-and-polarisation-drive-a-new-low-for-global-democracy/

with solutions embedded into the strategies of many businesses, and excellent resources are available to help us make sense of the priorities and the types of solutions we need. Project Drawdown, interviewed during this scholarship, serves as one example of an organisation helping to raise awareness and provide helpful perspectives around our priorities. Taken from their work, Figure 3 highlights sources and sinks of greenhouse gas emissions, reminding us that no business sector can be exempt from action.

However, global progress has not been uniform. In the United States, the presidency of Donald Trump marked a significant step backward, with climate change denial returning to mainstream political discourse and key environmental protections being rolled back. This shift is slowing international momentum at a critical time when urgent action is needed.

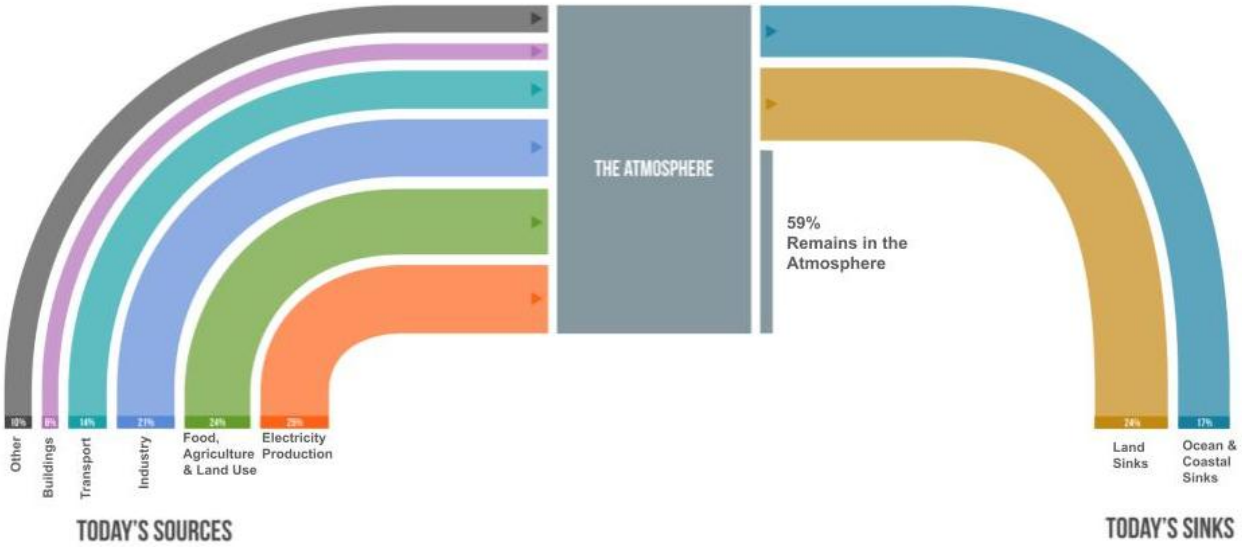

Figure 3. The primary emissions of greenhouse gases (on the left) and the natural sinks of greenhouse gases (on the right). Agriculture is a key emissions source, accounting for around a quarter of global emissions. How we practise agriculture can also enhance the size of the land-based sinks of emissions (on the right). Credit: Project Drawdown[5].

Throughout my Nuffield journey, it was disappointing to witness how poor carbon literacy remains within agriculture and more widely in business, and how rarely carbon is being measured and understood on farms. Not a single farm I visited on my scholarship measured or understood their carbon footprint.

Many interviewees, particularly sustainability professionals, felt that public policy and business responses to the climate crisis remain frustratingly slow. Despite glimmers of hope, our economic system and culture continue to reward handsomely businesses that neglect environmental protection. Despite our complete dependency on the natural world for survival, profit is still being put before the planet.

[5] Project Drawdown (2020). Farming our way out of the climate crisis.

While there are courageous movements from younger people, such as the "School strike for climate", I was reminded that we should not assume younger generations around the world are enlightened and fully on board with taking climate action. Discussing the diversity of perspectives on climate change, one sustainability specialist I interviewed from Singapore, reflected on her experiences of how climate change is viewed amongst millennials in Southeast Asia:

> *"When the trauma of war, conflict, poverty and famine still exists in living memory, I am learning that the idea of "climate doom" is easily laughed off because the population has not come from a place where any sort of certainty or hope of a positive future was guaranteed in any way. The focus is to develop. Many of the younger generations of entrepreneurs and business leaders based in the urban centres in Southeast Asia are full of blind optimism and big on making investments into climate tech of the future as the crisis worsens, because they fully expect it to, and are kind of blasé about the human cost of it all."*

3.3 Managing Extremes: Perspectives on the New Normal

In recent years, we've started experiencing the early signs of a climate breakdown. Extreme weather events are a new normal that global society must adapt to. While travelling through Europe and visiting farms in 2022, the heatwaves were making headlines. Record-breaking temperatures were being set and wildfires blazed in Spain and Portugal. Europe's rivers were at historically low levels[6] and German barges, which transport millions of tonnes of commodities, were struggling to move along the Rhine River. It was the worst dry spell in 500 years[7].

While average changes to temperature and precipitation can cause changes in yields, it's the extreme climate events: heatwaves, droughts and the combination of these, which can seriously reduce yields or cause crop failure.

For example, when drought occurs, the rate of photosynthesis decreases, shortening the growing period and lowering the yield[8]. Exceptional water and heat stresses in 2022 and 2023 reduced the yields of many commodity crops and

[6] BBC (2022), Are drying rivers a warning of Europe's tomorrow? Available at: bbc.com/future/article/20220912-are-drying-rivers-a-warning-of-europes-tomorrow

[7] Toreti, A., Bavera, D., Acosta Navarro, J., Cammalleri, C., de Jager, A., Di Ciollo, C., Hrast Essenfelder, A., Maetens, W., Magni, D., Masante, D., Mazzeschi, M., Niemeyer, S., Spinoni, J., *Drought in Europe August 2022*, Publications Office of the European Union, Luxembourg, 2022, doi:10.2760/264241, JRC130493.

[8] Chaves, M.M., Costa, M., Saibo, N., 2011. Recent advances in photosynthesis under drought and salinity. Plant Responses to Drought and Salinity Stress: Developments in a Post-Genomic Era 57, 49–104. https://doi.org/10.1016/B978-0-12-387692-8.00003-5.

without major action, this will affect many of the world's most important crops, which will be in short supply if harvests are hampered[9].

When visiting farms such as Stone Ranch, in Switzerland, it had not rained for months. I could see how concerned the father and son team were. Inspired by various regenerative agriculture pioneers, they were working against the grain of conventional farming in their community. And while they felt it was more resilient and the right thing to do, it was still early days.

In the USA, interviewees reported an increasing stress on the landscape and amongst farmers. Elizabeth Reeves at the Sustainable Food Lab recalled a recent visit to a farmer in North Dakota, who said *"...it was the worst June since the last worst June. I'm exhausted and this is really stressful - and so are the advisors"*.

Figure 4: Stefan Schreiber and his son at Stone Ranch, Gründelmatt, Switzerland (top left); Les petites Fraises & Les Reussilles Farm (top right); Declining water levels on Lago di Tenno, Italy in 2024, compared to the recent past (below).

With climate pressures increasing, some adaptation will be necessary for most farms in the future[10], through strategies such as changing crop breeds, improved

[9] Financial Times (2024), *"Climate change is pushing up food prices — and worrying central banks"*. https://www.ft.com/content/125e89c0-308a-492f-ae8e-6834847d1186

[10] Hannah Ritchie (2024) - "Climate change will affect food production, but here are the things we can do to adapt" Published online at OurWorldinData.org. Retrieved from: 'https://ourworldindata.org/climate-change-will-affect-food-production-things-can-adapt' [Online Resource]

access to water and nutrients and smart decisions around planting. RA practices and mindsets are often complementary to this adaption, as they support farms to be more resilient and their farmers to build healthier soils.

With eco-anxiety on the rise[11], I often wondered during my scholarship how farmers are mentally coping with the stresses of increasingly unpredictable weather and warnings of potential ecological collapse. While some may turn to their faith for spiritual comfort, a growing number of psychologists are also focusing on this issue. Caroline Hickman, an academic and board member at the Climate Psychology Alliance, offered some useful suggestions, including:

- Rather than minimising or diminishing the problem, we need to learn to live with the uncertainties and to be comfortable with them.
- To acknowledge that it's okay to feel anxious about climate change and to remember you are not alone.
- The importance of taking action, so as not to feel powerless and helpless; transforming those anxieties into something positive.
- Holding onto a radical hope for the future; that it's not too late to change the ending of the story.

[11] BBC (2023), Climate change: Rise in Google searches around 'anxiety' [Online]. Retrieved from: https://www.bbc.co.uk/news/science-environment-67473829

CHAPTER 4: THE REGENERATIVE AGRICULTURE PARADIGM

"Some people tell us that the transition that's underway on regenerative agriculture is the biggest transition in agriculture in over 100 years".

— Rob Cameron (Nestlé, VP Global Head of Public Affairs and ESG).

Key lessons

- RA offers an ideal framing for food companies, with language that aligns better with the urgency felt to repair and restore our planet.
- Some companies view RA as a continuous journey, towards having farming systems that are more resilient and less dependent on ever-increasing costly inputs.
- Advocates often describe RA as a set of principles, focused on soil health. It can also be viewed as an entirely different set of goals and outcomes for our agricultural system.
- Not all ecologically-minded farmers embrace or align themselves with the framing. Those that do, come from a variety of positions e.g. new entrants, farmers inspired and motivated by other pioneers; or farms responding to a crisis in their business whereby business-as-usual is no longer an option; others might be curious, with the capacity or support to try new approaches and reach new markets.
- Various certification programmes exist and these can be valuable to foster trust, however there are mixed views on whether certification can stifle or support a successful RA movement.

4.1 An Ideal Framing for Food Companies

Through my scholarship journey, it was clear that for some farmers, the practices promoted within regenerative agriculture are not new or particularly disruptive. But for others, it had offered a major shift in approach, inspiring a rethink of how they interact with their land, crops, and livestock.

As a framing, it's gained huge momentum in recent years, drawing on long-standing practices promoted within conservation agriculture, organic, holistic management and permaculture. Advocates often describe it as a set of principles (see Figure 5) and some have considered it a shift in goals or mindset (Figure 6). In the USA, people like Gabe Brown, a farmer and author of *Dirt to Soil*, have been instrumental in popularising the concept with more mainstream farming audiences, distilling RA into five key principles that have resonated with many farmers and practitioners around the world.

At its core, RA usually emphasises practices that improve soil health, such as optimising crop rotations, multi-species cover crops, holistic grazing and reduced chemical inputs and tillage. It is also framed as a journey towards a farming system that's more resilient and less dependent on ever-increasing costly inputs.

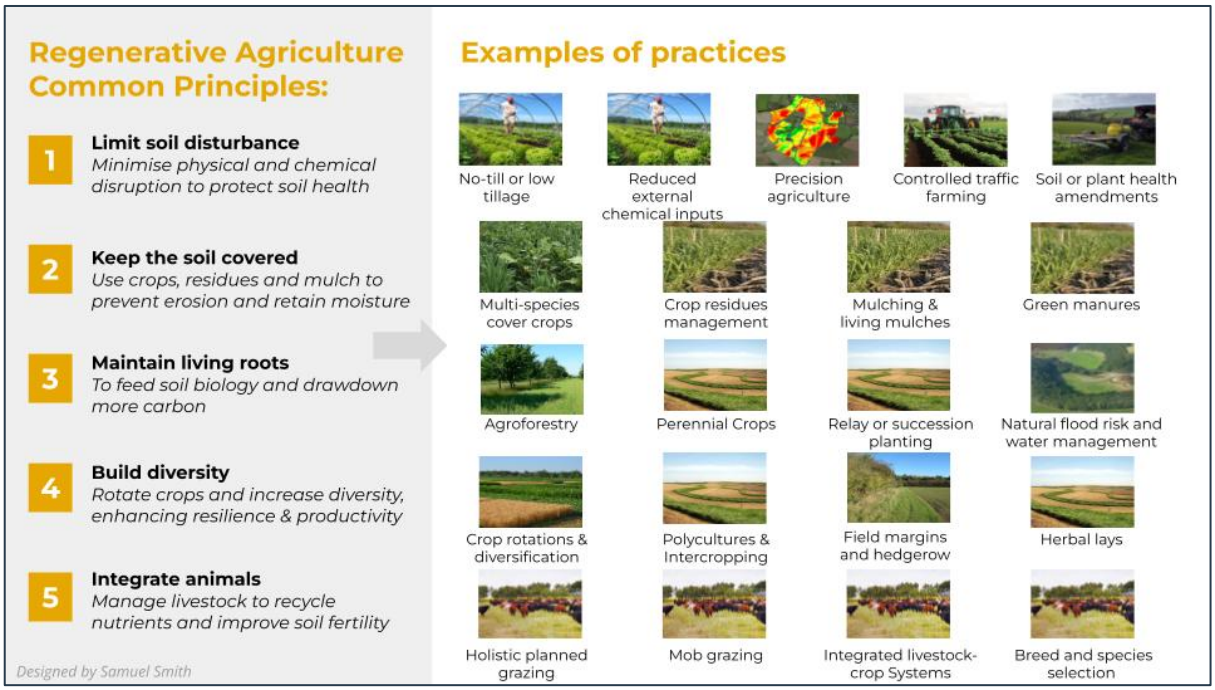

Figure 5. Common regenerative agriculture principles and practices.

CURRENT AGRICULTURE SYSTEM *Profit maximisation for a small number of powerful players over the short-term*	SHARED GOALS PRODUCTIVE VIABLE PROFITABLE FOOD SAFETY	REGENERATIVE AGRICULTURE SYSTEM *Equitable economic prosperity allowing people and planet to flourish long-term*
Externalizes environmental impacts		Restores ecosystems services at the landscape level (soil health, water quality, biodiversity)
Economies of scale and intensive, specialised production		Localise and diversify production systems
Maximise calories produced	>>>	Maximise nutrition and public health
Competitive price reduction for consumers	>>>	Connection between consumers and production
Maximise profit for power holders in supply channels	>>>	Equitable distribution of value
Systemic racial injustice	>>>	Fosters racial justice and social equity

Figure 6: Regenerative agriculture system goals and outcomes, adapted from the Growing Our Future project[12].

From discussions with larger food companies, it was clear that "regenerative" offers an ideal framing for their efforts to support sustainable agriculture. There

[12] Forum for the Future (2021). www.forumforthefuture.org/scaling-regenerative-agriculture-in-the-us

are three reasons for this. First, as shown in Figure 7, the language of "regenerative" is attractive and offers much-needed hope, since many people feel an increasing urgency to repair and restore the planet, not just to conserve or sustain it. Second, as a relatively new framing, it's not weighed down by dogmatic definitions or standards. This gives useful flexibility around interpretation and means any farmer can be welcomed to embark on a "regenerative journey" within their local context. Finally, many farmers are already interested or on board with the framing, making it an easy option for food companies to join the regenerative bandwagon.

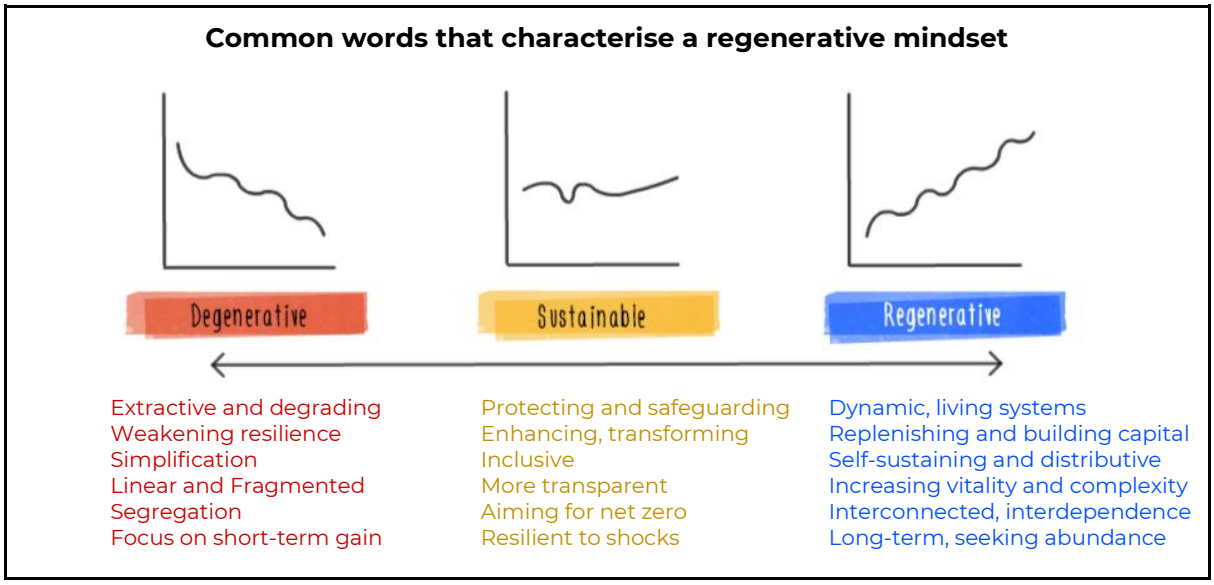

Figure 7. How the language around regenerative offers a hope to go-beyond conventional sustainability efforts.

For food companies, a switch to regenerative agriculture is also critical for their future. The majority of a retailer or food brand's GHG emissions sit within their supply chain (known as Scope 3), often at farm-level. So the work to improve the carbon footprint of the farms in a supply chain will contribute significantly to the overall emissions reductions across the supply chain (which also include transport, packaging and manufacturing activities, as well as food waste).

Hence, regenerative is clearly a compelling framing. A notable example of a company that has embraced it is Nestlé, the world's biggest food company. They pledged to source up to 50% of their key ingredients regeneratively by 2030. As of 2022, they claimed 6.8% of their key ingredients are sourced through regenerative agriculture methods.

4.2 Greenwash or Genuine Change?

While big brand interest in regenerative agriculture is exciting, some fear that this might end up a lukewarm movement, especially if the progress to implement and scale-it is slow. Furthermore, Øistein Thorsen from FAI Farms

suggested that “rushing into regenerative agriculture, might miss some of the interesting nuances of it, such as changing commercial relationships”.

When I attended the 2022 Regenerative Agriculture Summit in Amsterdam, activists blockaded the entrance to express their frustrations and fear that big food companies are pretending to lead the transition to a more resilient and equitable food system, but really, they are primarily at the root of our interconnected social, climate, environmental and health crisis”[13].

Figure 8. Protesters at the Regenerative Agriculture Summit in Amsterdam (left) and inside the conference (right).

Reflecting on the corporate embrace of the “regenerative” space, another attendee, Konrad Hauptfleisch, of Starfish Organic suggested that “…they [big food companies] fail to understand that their extractive business model cannot be tweaked to be more organic, regenerative or fair. It needs to be fundamentally restructured and redesigned. And I don’t see that happening”[14].

These dissenting voices led me to consider that there is a divergence in ambition, which could be distinguished as light or deep regenerative agriculture. Light regenerative agriculture refers to the valuable improvements which may come from following the five RA principles[15] leading to outcomes such as enhanced soil health, reduced chemical inputs, and increased farm business resilience. In contrast, deep regenerative agriculture goes further, with a wider set of goals and ambitions (such as the themes discussed in Chapter 7) for a more fundamental transformation of food systems. This includes shifting power dynamics, equitable

[13] Natural Newsdesk (2022), Activists blockade regenerative agriculture summit, warn of ‘neo-colonial’ practices by major sponsors and speakers. Available at: https://naturalnewsdesk.co.uk/2022/09/07/activists-blockade-regenerative-agriculture-summit-warn-of-neo-colonial-practices-by-major-sponsors-and-speakers/

[14] Konrad Hauptfleisch (2022), LinkedIn post: www.linkedin.com/posts/konrad-hauptfleisch_agriculture-business-organicfarming-activity-6973185067133136896-IMIH/

[15] Regenerative agriculture is often associated with having five principles: keep the soil covered, minimise soil disturbance, preserve living roots in the soil year round, increase species diversity, and integration of livestock. Khangura, R.; Ferris, D.; Wagg, C.; Bowyer, J. Regenerative Agriculture - A Literature Review on the Practices and Mechanisms Used to Improve Soil Health. Sustainability 2023, 15, 2338. https://doi.org/10.3390/su15032338

value distribution, and rethinking commercial relationships to create a genuinely resilient, fair and just food system.

Whatever the levels of ambition, on a webinar in 2023, reflecting on the hype and proliferation of commitments around RA, Philippe Birker from Climate Farmers (an organisation working to support a scale-up of RA and working with around 700 farmers across Europe) said he believed he hadn't seen the risk shifting:

> *"Everyone wants farmers to transition towards regenerative, but they are still left alone with the risks that transition brings for them, which includes the cost, especially in the first three years. Unless risk is taken away or shifted from the farmers, we will not see the transition at scale that we want to see"*[16].

4.3 Who is Changing?

What types of farming businesses are shifting towards RA? With the average farmer in Europe aged in their 50s, Philippe Birker suggested this led to a tendency for many to be more risk averse. Birker also reflected that the pioneering farmers they work with, who are transitioning to RA, are often ones that are desperate – in critical situations where they have to change (for example, to manage soil health challenges), or ones that are young and idealistic, and willing to take the risks with them. George Monbiot, in his book *Regenesis*, suggested there's a third category: the farmers that benefit from having privilege, e.g. those paying no, or below average rents, or receiving a guaranteed income from other sources.

The farms I visited through my scholarship were highly motivated to be environmentally sustainable but often didn't fall neatly into these categories. Some may have come from a more privileged position to experiment, but many simply had intrinsic motivations (a sense of ethical responsibility), as well as a belief that it was a more resilient approach for the long-term. Many were inspired by movements such as organic or biodynamic, or prominent voices in the sector, such as Michael Pollan, Gabe Brown and Allan Savory.

4.4 The Mixed Views Over Certifications and Definitions

It's been said that most users of the term "regenerative agriculture" employ it without reference to any specific definition[17] and because of this, many times during my scholarship, I heard a critique about how "anyone can call themselves a regenerative farmer!".

---

[16] Innovation Forum (2023), Nestlé Global Virtual Event: Implementing regenerative agriculture at scale. www.innovationforum.co.uk/articles/nestle-global-virtual-event-implementing-regenerative-agriculture-at-scale

[17] Textile Exchange (2022), Regenerative Agriculture Landscape Analyis. Available at: https://textileexchange.org/app/uploads/2022/09/Regenerative-Agriculture-Landscape-Analysis.pdf

In response to this criticism, various certification programmes have been created (Figure 9), particularly in the USA. While still niche, many of these programmeprogrammes are growing and helping the sector understand what it might take to be called a regenerative farm. Alongside the much-needed clarity and alignment, importantly certifications allow for an external verification process which helps build trust through the supply chain, while supporting a price premium model to be created for farmers.

Figure 9: Examples of Regenerative Agriculture Certification Programmes.

For example, the Regenerative Organic Certification (ROC) has been adopted by tens of thousands of organic farms worldwide, and the ROC logo is now seen on products made by Patagonia, Nature's Path and Alter Eco. As of 2023, the Ecological Outcome Verified standard of the Savory Institute's Land to Market programme has been adopted by more than 80 brands in the food and fashion industries.

However, over the scholarship, I also heard resistance to certifications and definitions, on the basis that they can stifle progress and work to exclude mainstream farmers from engaging in regenerative agriculture.

Øistein Thorsen from FAI Farms offered a useful insight, that "the need for a definition varies in different sectors, and with regenerative agriculture, the drive for definition is from big companies."

For the most part, I discovered that a "programme investment model" seemed to be growing just as much - whereby companies invest into practices or outcomes in their supply chain - rather than a certification-based price premium model.

CHAPTER 5: THINKING IN SYSTEMS

"When we try to pick out anything by itself, we find it hitched to everything else in the Universe."

— John Muir

It was clear while studying my scholarship that a systems change mindset is essential if we are to scale regenerative agriculture in a sustainable way. Systems thinking can be used for many purposes, from designing resilient farm businesses to identifying impactful policies in the sector. Although, as I discovered, this way of thinking is still uncommon.

A food systems approach allows us to consider the full web of actors that influence how we grow food and what we eat, beyond just the direct supply chain. It helps us to view the world around us as a set of interconnections, and use this understanding, with various tools, to identify areas for action.

5.1 Why A Systems Approach Matters

It is an understatement to say the food system is complex. It's gigantic in its scale and shaped by thousands of multiple, interacting drivers (Figure 10 showcases one attempt to map it). Drivers include changing environmental conditions such as the climate and the availability of resources, as well as ideas and narratives that shape policies and culture.

Often, people do not naturally think in systems and failing to do so, can make it more difficult to predict how an intervention (such as a new policy or programme) might play out and understand whether it drives a positive change overall. A food systems perspective allows us to consider how a specific focus impacts and is influenced by the entire system of which it is a part.

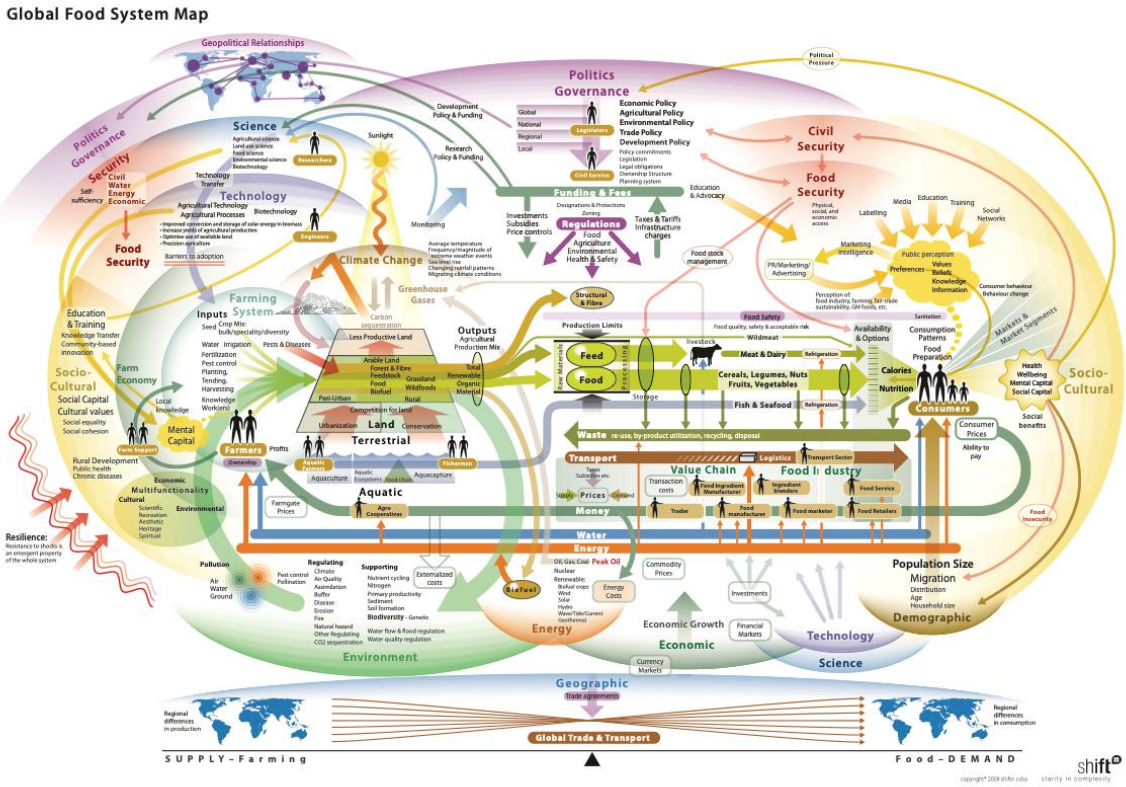

Figure 10. Attempts to map the global food system demonstrate the bewildering breadth and complexity of interconnections. Are such diagrams only comprehensible and useful to the author who prepared them? Credit: ShiftN[18]*.*

Systems theory also confirms some realities that are obvious to some people. For example, how attempting to control complex systems is extremely difficult and how many well-intentioned endeavours can fail. And one of the starkest warnings from systems science is how a system can appear stable and then collapse without warning.

5.2 Systems Thinking Principles To Help Scale Regenerative Agriculture

So what are the implications of this way of thinking? Valuable conversations and time spent listening to system-thinking advocates, provided the following insights:

1. **Finding root causes of problems can be a waste of time.** Complex systems like our food system are self-organising and emergent. They are greater than the sum of their parts and we need to learn how to interact, or "dance" with them, rather than have a mindset that we can solve them. Otherwise, we set ourselves up for failure.

[18] ShiftN. (2016). Global food system map [slide]. Retrieved from https://shiftn.com/_uploads_pdf/shiftN-Global-Food-System-Maps-kopie.pdf [29 Aug 2023]

2. **We must redefine the goals of our food system and dream big.** Our agriculture system, as it exists today, is incredibly successful at achieving the goals of maximising profit and driving efficiency from productive land over the short term. Albert Einstein wisely observed that *"the world as we have created it is a process of our thinking. It cannot be changed without changing our thinking"*.

   For many, the word "regenerative" invites us to dream big; and having big goals is important. Donella Meadows, the pioneer of systems thinking, believed that if we culturally can't speak of our goals, then we literally can't create the systems that give us a chance to move towards them.

   Are the goals of our agricultural system starting to shift in the UK? Perhaps, with the movement towards public payment for public good and the efforts of various collaborative work, such as The Consensus on Food Farming and Nature[19] and the Food, Farming and Countryside Commission[20].

3. **Remember "we operate in food systems, not supply chains".** Josiah Meldrum, Co-Founder of Hodmedod's, a UK company that specialises in British-grown pulses and grains, suggested that it's helpful to sometimes drop the notion of a supply chain, which locks us into linear thinking. He describes their company as *"one of many nodes in a network of supply that's built on trust, transparency and the free flow of information, a network that celebrates difference and diversity. Moving ideas, connecting people and businesses; resilient because no one node is completely dependent on another, but all offer mutual support"*.

4. **Just because a system is complex, doesn't mean that solutions are complicated**. For example, the soil food web is a vastly complicated system with millions of organisms interacting in ways we don't understand. However, within regenerative agriculture, we are given a set of simple, broad strategies that help us to consciously manage that complexity and improve the health and resilience of our soils.

   Various systems approaches exist to help find the right solutions, to move our complex food system in a more sustainable direction. These include

[19] A shared vision and understanding for building a better food system, signed by various NGOs: www.foodfarmingnature.org

[20] A charity that brings together people and ideas from different perspectives to find the practical and radical solutions which also tackle the climate, nature, health and economic crises of our time: ffcc.co.uk

work to identify positive feedback loops and leverage points[21].

A systems perspective can also be useful for farmers who feel marginalised and unfairly blamed for some of agriculture's negative impacts on the environment. System maps, such as in Figure 11, help us to see the bigger picture. Building on these can help uncover the unfair power dynamics at play, and the different (and often contradictory) pressures a farmer might face as they work to maintain a viable business that balances the production of goods with other ecosystem services.

This mindset reminds us that farming businesses are inextricably part of a larger food system, in which responsibilities and accountabilities are shared. It drives home the message of how collaboration is vital for transitioning quickly to a more regenerative farming future. And it tells us that singling out and blaming individual actors within a system is unfair and unhelpful to overall progress.

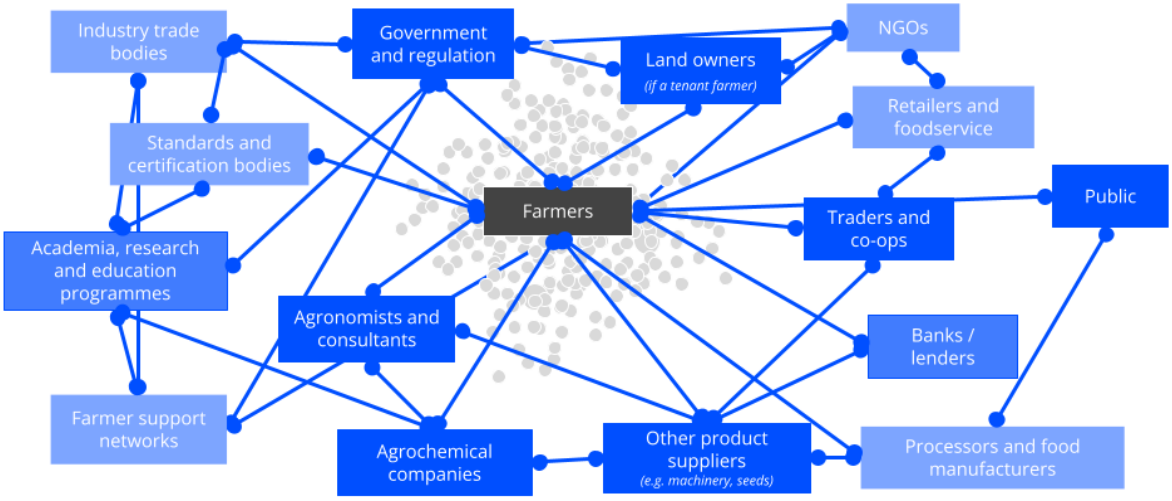

Figure 11. A system map identifies the many actors that might be influencing a farm's transition to regenerative agriculture (drawn by the author).

[21] Leverage points are places where small adjustments or actions can lead to large and meaningful shifts in a system.

CHAPTER 6: HOW CAN COMPANIES SUPPORT THE SCALE-UP OF REGENERATIVE AGRICULTURE?

Key lessons

- Pilot projects are valuable, but the emphasis should now be on mainstreaming regenerative agriculture through new business and financing models.
- Programmes must prioritise the needs of farmers, involve co-creation and engage with the nuances of change and risk – especially as initial costs can be high, with delayed returns.
- Farmer support requires a triad of technical assistance, cultural acceptability, and attractive financial incentives to de-risk practice changes.
- On-farm interactions between farmers and buyers are valuable to building trust and understanding; intermediaries can help facilitate this for large companies.
- Effective measurement is delicate and complex, with limited uniformity across companies, despite efforts to align approaches. Certification programmes also exist and can be valuable for fostering trust.
- Many carbon offset schemes have integrity risks and a limited view of RA; they should not be relied upon to scale up RA practices.
- Consumers should be engaged, but expecting buying habits to drive a RA revolution is complacent; value chains should share any additional costs.

6.1 Key Principles For Companies

For those working with companies who are attempting to support or influence farmers on a RA journey, the following principles were suggested through interviews:

1. Properly Acknowledge the Scale and Impact of What's Being Asked of Farmers

We are often reminded that the transition towards more regenerative practices is not a one-off project. It is a long-term, knowledge-intensive journey on which farmers embark, and then continuously seek improvement. It is also going to be different for each farm.

Yet for many farmers, transition means change, and change means risk. In one webinar I attended, Ian Matts from Brixworth Farming commented that if we add to this a message that the journey of transition is of an unknown length, to an

unknown destination, where the benefits may not be realised quickly, farmers may start to feel panicky.

Transition is no small ask and it's understandable that some farmers will want to carry on as they have been, accepting some of the risks each year. So, for success in scaling RA, it's important for companies to carefully design their programmes to provide good support, understanding, and incentives over the longer term to help mitigate the risks for farmers.

2. Understand the Payback and Invest

The initial costs for adopting some RA practices can be significant (and can come with uncertainty), but over time, business resilience and profitability per hectare should increase. Companies wanting to see the scale-up must consider how they financially support farmers to overcome any large, initial costs, as well as how the risk of transition could be shared.

3. Be Adaptive to Local Conditions and Needs

This applies both regionally and based on scale. Smallholders have very different challenges from large-scale farms. This was a clear message from large companies I spoke to, such as Olam and Mars.

4. Don't Get Stuck In Pilots: Be Brave and Scale-Out

It's common for companies to have an approach of running pilots (or creating demo or reference farms) to validate a new technology or approach before scaling out to a wider community through a peer-to-peer approach. For example, Nestlé do this through their Farmer Connect programme, and this approach makes logical sense.

However, there are many who feel increasingly frustrated, perhaps impatient, by the prevalence of this approach. This was a clear message for companies to move on from the treadmill of just doing pilot projects at the Regenerative Agriculture Summit.

5. Don't Assume Citizen[22] Buying Habits Will Drive Significant Change

The prevailing approach of most major food brands and retailers is to be consumer-driven and pro-consumer-choice, meaning that if a product ticks the boxes of being legal, safe and desirable, it will be stocked and sold.

Some business leaders I spoke with believe that having positive messaging around sustainability and RA will help motivate buyers towards pro-

[22] 'Citizens' rather than 'consumers', being the preferred term, as explained here: www.foodethicscouncil.org/programme/food-citizenship

environmental choices[23]. At conferences, there is often at least one speaker that advocates this approach, with the hypothesis that "educating buyers" or "the next generation", will transform buying habits and drive change, giving businesses the clear signal to "embrace regenerative". One senior business leader from a major plant-based drinks company, believed that just providing the carbon footprint data at the check-out till would be enough to drive a major change.

The research does not back this up, often suggesting that communications on their own, tend to have a very modest impact on behaviour change. And many of my interviewees felt it complacent and indeed risky to expect that more enlightened consumer buying habits will drive a RA shift. There is clear support around communicating RA and engaging buyers with it, but many believe it should not warrant a price-premium - and if we're trying to make regenerative agriculture the mainstream, then it should be treated like the mainstream now. The combination of public policy and a more ambitious value chain will need to absorb any additional costs.

6. Show Up On The Farm

Elizabeth Reeves at the Sustainable Food Lab (SFL) explained to me that the most successful supply chain projects are those when the companies they work with show genuine care about the farmers they source from. To build trust and create real change, many companies are now learning the importance of engaging directly with farmers, rather than working through intermediaries in the supply chain.

> ***"Companies that take time to show up in the farming communities they source from and show why they care, help build a higher level of trust and buy-in for new initiatives.".***
>
> — Elizabeth Reeves (2023)

While it's not unusual for food companies to visit farms to learn more about the challenges and opportunities that farmers are facing, it's not always facilitated well. One of the skills an organisation like SFL brings is helping companies to show up on farms and for everyone to get the most out of the experience. One example exercise is to start the meeting sitting in a circle, with each participant sharing what they care about.

[23] There is various research available on what types of messaging best motivates consumers to choose more sustainable products. For example, Maskell, J. (2022), To scare or not to scare? Is a message of fear more effective than a message of hope? Responsible Science, Vol. 4.

Figure 12. A farmer meeting, facilitated by the Sustainable Food Lab. Image courtesy of the Sustainable Food Lab.

7. Build Trusted Advisor Networks

For large food companies, showing up to every farm is not practical. Companies such as Nestlé and Pepsico source from thousands of farms. As such, those who are serious about scaling RA are investing in the capacity of trusted advisor networks to operate at scale.

An example of this in the USA is the North Dakota Trusted Advisor Partnership. Through this, skilled crop consultants who are focused on soil health can provide a trusted and valuable communication link between the food company and farmers. Elizabeth Reeves suggests that each single advisor can reach around 20-30 farmers, covering 30-70,000 acres.

6.2 Types of farmer-support

My time with Elizabeth Reeves from the Sustainable Food Lab was valuable in understanding how companies can best support farmers with change. They believe that companies must ensure the following three pillars of support exist simultaneously to support the most effective change[24]:

1. **Technical support** - that's independent of input sales. For example, providing farmers with access to trusted, independent advisors; quality learning events and farm tours.

[24] These insights came out of the Scale Lab initiative, a partnership between SFL and the Midwest Row Crop Collaborative that involved practitioners and experts from ten leading companies and The Nature Conservancy.

2. **Cultural acceptability** - on the basis that farmers who are part of strong community networks where peer-to-peer learning can exist are more likely to embrace RA and feel comfortable experimenting, without worrying about social exclusion. This doesn't need to be over-engineered; farmers are good at sharing information. Events and social networks such as WhatsApp and Facebook groups can be effective.

3. **Financial incentives to de-risk the practice change**. For example, conditional cash transfer (practice or outcome-based payments), cost-sharing, support finding markets for new crops, or novel forms of crop insurance, which protect regenerative farmers from weather and price volatility.

Case Study: Crop Diversification in America's Corn Belt

Across America's Midwest, a two-crop rotation of corn and soy is commonplace. The introduction of a third grain crop into this rotation can help farmers to start putting into practice some of the regenerative agriculture principles, which in turn, can improve the long-term resilience of the soil, as well as their farming systems and businesses. It's a small, but impactful step.

Since 2016, the Sustainable Food Lab (SFL) has been involved in a major landscape-scale initiative with various supply chain partners and NGOs to explore such a shift. It provides a fascinating case study that demonstrated how various pilots found that change was viable (with positive impacts on business resilience, soil health and the wider food system), yet despite many good intentions and some success, the system remains frustratingly stuck in the inertia of business as usual, with most farmers and companies on the path of least resistance.

To support change, Elizabeth Reeves at the SFL explained how companies must invest in growing the market for diverse grains, so that farmers have options and confidence. Governments also need to ensure crop insurance programmes incentivise crop diversification and work with companies to co-invest in underlying infrastructure.

It seems that while there's much excitement and many commendable commitments around regenerative agriculture, we should not be complacent that these will overturn the many barriers that lock-in the status quo. Continued well-coordinated effort is needed.

Further detail can be found on this case study at:
thisissamsmith.com/blog/food/crop-diversification-in-americas-corn-belt

6.3 Getting the Financial Incentives Right

Financial incentives were a common concern during my interviews. Although studies show a positive long-term economic case for regenerative agriculture, the challenge often lies in financing the early years of transition. Often, the costs

weigh too heavily on the shoulders of farmers. I learnt about several financing approaches (outside of public subsidies) and case studies that can support change:

1. **Price Premiums, Practice-Based and Outcome-Based Payments**: Some companies offer price premiums for products grown using regenerative methods, incentivising farmers to adopt RA practices. For example, in partnership with Fonterra in New Zealand, and First Milk in the UK, Nestlé has been providing additional payments to farmers adopting more regenerative practices.

   One interviewee told me that increasingly, there is a shift towards outcome-based payments, whereby payments are based on the achievement of specific environmental outcomes rather than the practices used. An example of this is the USA Soil and Water Outcomes Fund.

2. **Longer, Multi-Year Contracts** between farmers and buyers were acknowledged as an approach which can offer greater security to farmers during a transition phase.

3. **Conditional Cash Transfers and Cost Sharing Models**: Where companies help cover the costs of new equipment or inputs, can be common. For example, companies may provide funds for direct drilling equipment, milking machines, or biodigesters to support sustainable farming practices.

4. **Sustainability-linked Friendly Loans** that beat market rates are another method to incentivise change. The Real Farming Trust's LEAP Fund is a good example of this in the UK.

5. **Blended Finance** was highlighted in my interview with Rabobank, which involves combining funds from different investors (e.g. banks, government and philanthropic organisations). Crucially, they felt, the presence of a public investor in the mix creates leverage and distributes risk. The AGRI3 Fund is one example, mobilising $1 billion of financing towards projects and businesses which protect and restore forests, promote sustainable agriculture and support rural livelihoods.

   In a similar way, in the UK, Landscape Enterprise Networks (LENs) are offering a new model where multiple stakeholders – companies, farmers, and investors – come together to share risks and achieve broader landscape-scale changes.

6. **New Forms of Crop Insurance** - while crop insurance is less common in the

UK - in many countries it can provide a mechanism that can help protect farmers adopting RA practices, to help stabilise income. For example:

- **Soil Health-Linked Insurance** qualifies farmers who invest in practices that improve soil health for lower premiums or payouts if they face yield reductions during extreme weather events. I found this concept was being explored in the USA, but I did not find any major insurers offering it.

- **Index-based insurance** that pays out if the weather deviates significantly from the expected norms. For example, this has been trialled in Kenya and Ethiopia to protect farmers against drought risks.

6.4 Mobilising Investors

It was increasingly reported during my scholarship how investors are beginning to see the potential in regenerative agriculture. With initiatives such as the Regenerative Fund for Nature and partnerships between AXA, Unilever, and Tikehau Capital, there is growing momentum. However, meeting the estimated $700 billion required for scaling RA over the next 30 years[25] will require further investment and innovation in financial support.

6.5 Measuring Regenerative Agriculture

Any company serious about helping scale RA in their supply chain needs some practical way to measure and understand progress. However, as RA is a relatively novel and loose paradigm, it lacks common metrics to assess change over time.

As covered in section 5.4, this has motivated the design of various certifications schemes. While useful, these can be cumbersome for some farmers, who may already be asked to report on various other performance metrics. This was the motivation for collaborative initiatives such as the Global Farm Metric which is attempting to establish a common language for the food and farming industry.

There were two frameworks I paid attention to during my scholarship: Savory Institute's Land to Market programme, which claims to be the first outcomes-based regenerative sourcing solution, and Nestlé's Agriculture Framework, since they are the biggest food company in the world and have RA commitments.

Both frameworks are geared around similar goals (improving soil health, increasing biodiversity, enhancing ecosystem functions and reducing environmental impacts); they both emphasise measuring outcomes rather than just practices, and they place value on transparency and traceability in supply chains, as well as collaborating with farmers.

[25] Croatan Institute (2021), Soil Wealth. Available at: https://croataninstitute.org/wp-content/uploads/2021/03/soil-wealth-2019.pdf

In the case of Nestlé, their vast, international scale presents the challenge of achieving depth vs. breadth with scaling-up RA. While an impressively comprehensive approach has been designed, some critics suggested their approach is inherently too broad and shallow, because of their size.

Case Study: Ecological Outcome Verification (EOV) at Hickory Nut Gap

In Fairview, North Carolina, I spent time at Hickory Nut Gap Farm, which has a business partnering with over 100 local and regional farmers to supply grass-fed and pasture-raised meat for retail and wholesale customers.

Farmers Jamie and Amy Ager have been inspired by the USA regenerative farming movement, particularly Holistic Management. As such, their farming practices aim to restore and heal the entire farming ecosystem through sustainable and fair treatment of both their land and animals. They have been one of the first companies to have a "regeneratively raised" claim on their packaging, approved by the USDA.

"Regeneratively Raised" beef is marketed and sold by Hickery Nut Gap Farm

Hickery Nut Gap Farm is a Savory Hub, using a regenerative agriculture-specific certification called "Ecological Outcome Verification" (EOV) to measure land health outcomes such as soil fertility, biodiversity, and water retention. Farmers who meet the standards receive the Land to Market seal, which can be used to promote their products in the marketplace.

CHAPTER 7: THINKING BIGGER: MISSING THEMES IN REGENERATIVE AGRICULTURE

Over my scholarship journey, many people shared important issues that they felt were missing from the conventional narrative associated with regenerative agriculture. In this final chapter, I cover some of these themes.

7.1 Social Justice and Equality

In 2017, Terra Genesis was one of the early organisations grappling with the definition of regenerative agriculture, for which they consulted across many diverse communities. Several years ago, when I interviewed their CEO, Luke Smith, he stressed how their evolving understanding of regenerative agriculture was that it must include a greater focus on social justice and inequality.

I found this theme well understood at Soul Fire Farm, an Afro-Indigenous centred community farm who are committed to uprooting racism and seeding sovereignty in the food system. I spent the day volunteering there, alongside a community of people, motivated to create a more socially just food system.

Figure 13. Volunteering at Soul Fire Farm, 2023

Established by Leah Prenhanamn, the 80-acre farm grows and distributes food locally, particularly to those living under "food apartheid"[26], while running projects that share knowledge and resources related to food and land sovereignty.

"Regenerative" is a theme often used at Soul Fire Farm, but using an interpretation that stresses a deep reverence for the Earth and the wisdom of Indigenous farming communities, who have been marginalised and uprooted from their ancestral land[27]. A reminder that for many communities, the idea of

[26] Food apartheid describes systemic and structural inequities in access to healthy, culturally appropriate, and affordable food, particularly in Black, Indigenous, and other marginalized communities.

[27] See also "White-washed Hope, A Message from 10+ Indigenous Leaders and Organizations": www.culturalsurvival.org/news/whitewashed-hope-message-10-indigenous-leaders-and-organizations

regenerative agriculture is not new, but rooted in millennia-old Indigenous sustainable farming practices, and woven together with spiritual traditions.

7.2 Crop Diversity and Agroforestry

"Nature has introduced great variety into the landscape but man has displayed a passion for simplifying it".

— Rachel Carson, Silent Spring

It is said there are around 300,000 species of edible plants, yet just 20 species account for 90 percent of the world's food. And of these 20 species, just three crops – wheat, maize and rice – supply more than half. We are heavily reliant on a tiny handful of crops and a similar simplification exists within livestock too. For example, 99% of cows are a single breed: the Holstein. Many campaigners suggest our future resilience depends on increasing crop and genetic diversity.

An interest in crop diversity was a reason for my visit to Eric Tolsenmier in Massachusetts and conversations with Josiah Meldrum of Hodmedods in the UK.

Toensmeier is the author of several books focused on perennial cropping systems, biodiversity, and nutrition. He stressed how nature has given us a remarkably rich tapestry of edible plants and that so many of the most promising solutions in our food system are biological, not technological.

Understanding the role of trees in farming systems is also an important aspect of Toensmeier work. Promoting how they can be best incorporated on farms to maximise benefits, such as the provision of timber, fibres or nutritious foods, as well as other roles, such as beneficial shade, shelter and improving soil health, not to mention carbon sequestration and storage.

In the tropical climate of Columbia, he spoke passionately about the intensive silvopasture systems, some of which, he suggested, have been able to operate on a similar carbon footprint as intensive feedlot systems in the USA. Dense plantations of trees are browsed down by the animals – and some types of leaves in these systems have been identified to reduce methane emissions, while the pasture grasses in the genus Brachiaria have been found to capture nitrogen in the urine of grazing livestock before it can off-gas a N_2O.

As we discussed the RA movement, there was a frustration in his voice: *"...all we hear about is holistic and adaptive grazing, yet there are so many examples of tropical farmers doing a better job, and not getting the climate finance, recognition or markets for "climate-friendly" meat".*

Toensmeier believes that tropical silvopasture systems can achieve intensification, emissions reduction and carbon reduction all in one package. Yet, these agroforestry systems are not getting the attention and investment they deserve from food companies. Rather, some of the most inspiring examples of

low-carbon farming are getting overlooked or ignored, perhaps due to cultural biases, language barriers, or because the good case studies simply get overshadowed by more mainstream agricultural narratives and popular figureheads.

Figure 14. Eric Toensmeier on his homestead, 2023

7.3 Nutrition

A health crisis has crept up on us, driven largely by changes in our modern Western diet. In 1950, less than one percent of the UK population was clinically obese. Today, that figure stands at 28 percent. Over 80 percent of processed food sold in the UK is considered unhealthy[28] and diet related disease is now the biggest cause of avoidable illness and death in the developed world.

During my scholarship, I was curious to ask my interviewees if RA might help challenge "what" we produce, not just "how" we produce it. Especially important, since the land available for agriculture is increasingly pressured as the human population continues to grow and the climate changes.

What I discovered was mixed. Many growers embracing RA were making the links between improved soil health and the nutritional value of their crops. Many also had an inherent distaste towards highly-processed foods. Some, as they embraced RA, were moving towards more mixed farming systems and direct-sales, which promoted quality, nutritious produce.

However, with companies, the subject of nutrition and diets often seemed to sit on the sidelines of RA, or were a separate theme. However, it felt clear that companies serious about supporting a healthier food and farming system, must advocate for a regenerative agriculture that also provides healthy, nutritious food.

[28] Based on analysis of the nutrient profiles of products sold by 18 large food companies, representing half the processed food products sold in Britain (quoted in the book Ravenous, by Henry Dimbleby). 'Unhealthy' products are defined as those that the World Health Organisation deems unsuitable to market to children.

Such an approach then aligns with the “regenerative food system” goals, discussed in Chapter 4.1 (Figure 6).

7.4 Land Use and the Role of Livestock

A significant portion of global agricultural emissions and land use is associated with livestock production. Yet, livestock are often an integral part of regenerative, mixed farming systems, when managed responsibly.

It is important to distinguish between industrial livestock systems and pasture-based systems. Industrial systems, particularly for chicken and pork, account for around 70% of global meat consumption and rely heavily on grain-based feeds. In contrast, pasture-based systems offer greater potential for integrating regenerative agriculture practices.

However, the debate around sustainable livestock remains complex and understandably confusing, as it requires balancing multiple factors: carbon opportunity costs, nutritional value, emissions per kilogram or hectare, and the specific cultural and local contexts (besides wider sustainability issues such as impacts on nature, water quality, and resource consumption).

While many of my interviewees understood these complexities, few offered a clear path or vision around what our livestock sector and diets would look like in the future, if either regenerative farming were to truly become mainstream, or if agricultural emission reductions were aligned with what’s required to limit global warming to 1.5°C.

It was evident from some interviews, including a major investor in agriculture, that RA does not even enter the conversation for many industrial livestock companies, which prioritise efficiency above all.

Livestock's role is undeniably sensitive, provoking strong emotions and different opinions. While this report does not have the scope to explore all the nuances, it is clear that better dialogue around livestock is essential. Distinguishing systems that contribute positively to landscapes from those that are environmentally destructive and polluting is critical.

There is growing convergence around the concept of "less and better" meat and dairy, where “better” refers to pasture-raised or regenerative options. However, farmers, food companies, and governments remain hesitant to advocate for reduced meat consumption. This reluctance persists despite robust evidence – from climate models, public health studies and resource-use analysis – that significant cuts in meat consumption, particularly in middle- and high-income economies, are essential for achieving climate targets and ensuring global food security.

To drive a system-wide shift toward regenerative agriculture, clearer narratives are needed to define the types of livestock systems that align with these principles – and just as importantly, to identify those that do not.

CONCLUSIONS

Momentum has been growing around regenerative agriculture (RA). Several years ago, it was possible to list the handful of major food companies talking about it. Today, many committed farmers are championing it, countless companies use the framing, and various conferences are devoted to it.

The overarching question in my scholarship was whether RA is a shared ambition for supply chains. While I was inspired by many farmers and organisations who use the term, I was not surprised to discover that interpretations and ambitions were varied, with many risks of greenwashing from food companies.

Reflecting on these varied ambitions, it became clear that there is a divergence of viewpoints – what could be described as *light* versus *deep* RA. *Light* RA referring to the work happening within more conventional agricultural systems and supply chains, focusing on improvements that enhance soil health, reduce chemical inputs, and increase resilience – while largely maintaining existing systems and commercial relationships. In contrast, *deep* RA calls for a more expansive set of goals and a fundamental transformation, including shifts in power dynamics, equitable value distribution, and a restructuring of commercial relationships to foster a genuinely resilient and just food system. Recognising this divide is crucial to ensuring the movement's transformative potential is fully realised, while also valuing the efforts already being made across different contexts and scales.

Despite different understandings of RA, I did find hope in the concept of tipping points. Experimental evidence demonstrates how small but committed minority groups can trigger a shift in conventions, creating a cascade of social and behavioural change. Momentum can be felt in the regenerative agriculture movement, across food companies, farmers, and even some politicians. Mindsets are shifting and many farmers feel empowered and excited about the changes that are possible when embracing a regenerative journey.

There also seems to be a growing interest in systems thinking. For large companies and investors seeking change at scale, a systems change mindset is undoubtably helpful. It can help identify powerful leverage points and interventions that can create positive feedback loops. This approach can support bolder ambitions and collaborations, which are essential for fostering deeper, longer-term positive change.

Yet we must be realistic. Moving toward a regenerative farming future does not guarantee we'll fix our climate and nature crises, but it is a journey that offers hope. For farmers, it's an opportunity to help increase their resilience and regain a sense of control, to proudly produce quality, nutritious crops and healthy livestock, all within an increasingly unpredictable climate.

ACKNOWLEDGEMENTS AND THANKS

I am forever grateful for the generous time and support that people have given to me during my Nuffield Scholarship journey. My particular thanks to:

- Stefan Schreiber and his son at **Stone Ranch**, Gründelmatt, Switzerland
- Corinne Wälti, **Biosuisse**, Switzerland
- Bernadette Oehen, **FIBLSchweiz**, the Research Institute of Organic Agriculture, Switzerland
- Valérie Piccand at **Les petites Fraises & Les Reussilles Farm**, Switzerland
- The rewilding at **Oostvaardersplassen**, Netherlands
- **Fruiitine Van West**, Netherlands
- Dr Dario Fornara, **Davines Group, Rodale Institute European Regenerative Organic Center**, Italy
- Elizabeth Reeves at the **Sustainable Food Lab**, Vermont
- Annie Louise & Isaiah at **Flying Cloud Farm**, North Carolina
- Jamie & Amy Ager at **Hickory Nut Gap Farm**, North Carolina
- Arash Ghale and Annie Benson at the **Rodale Institute**, Pennsylvania
- Various staff and volunteers at **Soul Fire Farm**, Grafton, New York
- Eric Toensmeier of **Perennial Solutions**, Massachusetts
- Justin Holt at the **Nutty Buddy Collective**, North Carolina
- David Hamilton, **Fairview Fermentory**, North Carolina
- Harry Langford at **Rabbobank**, Netherlands
- Josiah Meldrum at **Hodmedods**, UK
- Marco de Boer at **reNature**, Netherlands
- Heidi Yu Spurrell, **Future Green**, Singapore
- Various people interviewed from supply chain companies and NGOs present at the **Regenerative Agriculture Summit**, Amsterdam, 2022.
- Staff and alumni at **Forum for the Future** and the **Farm Carbon Toolkit**.

During the scholarship, I wrote several blogs covering my visits and learning. These are available at www.thisissamsmith.com:

- Reflections From Meeting Eric Toensmeier, Mar 2024
- Crop Diversification in America's Corn Belt, Feb 2024
- Scaling Regen. Ag: Lessons from the Sustainable Food Lab, Feb 2024
- The Rodale Institute: a 40-year comparison of organic vs conventional farming, Jan 2024
- Flying Cloud Farm, Nov 2023
- Demystifying farm carbon offsetting: three watch-outs for farmers, Aug 2021
- Thinking Regeneratively, Jun 2020
- Eight questions for the regenerative agriculture movement, Jan 2020Regenerative agriculture: a shared ambition for the supply chain? Nov 2019

ISBN: 978-1-916850-26-2

Published by The Nuffield Farming Scholarships Trust
Bullbrook, West Charlton, Charlton Mackrell, Somerset, TA11 7AL
Email: office@nuffieldscholar.org
www.nuffieldscholar.org