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The role of corporate supply chains in scaling regenerative agriculture. A farmer perspective.

Written by:

Alastair Trickett NSch

October 2024

A NUFFIELD FARMING SCHOLARSHIPS REPORT

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Date of report: October 2024

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

Title	The Role of Corporate Supply Chains in Scaling Regenerative Agriculture. A Farmer Perspective.
Scholar	Alastair Trickett NSch
Sponsor	The National Trust & The Yorkshire Agricultural Society
Objectives of Study Tour	<ol style="list-style-type: none"> 1. To understand perspectives, motives and challenges relating to regenerative farming along the value chain. 2. To understand how corporates are supporting farmers to adopt regenerative management, along with the opportunities, challenges and risks. 3. To take a future-backward view on what corporate intervention must look like to achieve their stated ambitions and wide-scale adoption.
Countries Visited	Australia, Germany, India, Netherlands, Singapore, United Kingdom, United States, Qatar.
Messages	<ol style="list-style-type: none"> 1. We must start thinking about farm management in terms of complex systems not a linear process. 2. Most farms remain profitable by unknowingly liquidating their natural capital. This undermines long-term profit and resilience and makes change increasingly difficult. 3. The sustainability objectives of corporates stand to benefit farmers, and farmers are fundamental to the corporates hitting these objectives. We are just not good at working together yet. 4. Corporates need to drop their pilot and project approach to working with farms in favour of collaborating pre-competitively to enable a bottom-up farmer-led transition to regenerative agriculture. 5. Any corporate intervention on farm must consider the unique context of each farm and support change with appropriate investment and risk sharing. 6. Platform technology should be embraced to target investments on farm, nudge behaviour change and collect verified ground-truth data.

EXECUTIVE SUMMARY

The cost of food is below the real cost of production. Due to the efficiency and scale of modern food systems, most farmers produce commodities and have relied on the unconscious drawing down of natural capital to remain profitable – mainly soil carbon which has degraded soil health.

Due to low profitability, farmers are locked into a growth and under-investment paradigm; soil health, the basis for long-term profit and resilience to extreme weather events, has been eroded. This forces the farmer to channel any available investment into short-term profit drivers with a known and immediate return, namely artificial fertilisers, agrochemicals and tillage. However, these themselves further propagate the insipid erosion of soil health and biodiversity, the foundations for long-term profit and resilience. The decline of natural capital continues, and the most important assets underpinning a farm's profit and resilience are under-invested and unable to recover.

Breaking out of a low-profit, low-investment cycle on farms and affecting a systems change to regenerative agriculture is very hard. It requires an acknowledgment of the hidden costs and damage done in the current farm management approach. It requires accepting and learning an alternative approach along with investment in new machines and infrastructure. And it requires a leap of faith because the time taken for the underlying systems of fertility to recover and support plant and animal growth are unknown and different on each farm.

Fortunately, corporates are interested in supporting farmers to transition to regenerative systems to achieve their own overarching sustainability objectives, particularly driven by brand communications, procurement risk and regulatory compliance considerations resulting from climate change.

However, current efforts from corporates to support farmers underestimate the scale and nature of the challenge. They take a pilot and project approach characterised by top-down interventions of singular management changes, devised by consultants. This is how professionals have been trained in project management; however, it isn't fit for a challenge of this scale and pace, nor does it give credit to the new technologies available to make interventions both more meaningful and cost-effective. Most importantly it misses the enormous challenge of changing a farmer's mindset, and accounting for the fact each farm operates in its own unique environmental and management context.

They also get tied up investing in infrastructure that enables the segregation of ingredients from farm to fork as a pre-requisite to sustainability without considering the alternatives. This assumption, that segregation must precede sustainability overlooks some of the most successful initiatives bringing about

sustainable market transformation. They could benefit from studying the successes of Better Cotton, fairtrade or renewable electricity which all have the concept of mass balance at their core.

Precompetitive collaboration between corporates would enable targeted bottom-up change on farm. The recognition that farms supply multiple customers with overlapping needs presents the opportunity to pool resources, get more support to farmers and ease the overall burden of change.

Shared investment in platform technology would unlock the asymmetry between data held on farm and budgets held by corporates. I consider this to be the best vector for achieving a farmer-driven system change, financially supported by the corporates whilst meeting quantified reporting requirements.

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

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CHAPTER 1: INTRODUCTION



Figure 1: the author

When I was very young my grandfather ran dairy, pig and arable enterprises on the farm. He completed a Nuffield scholarship in the 1960's, writing his report on the long boat trip back to the UK from Australia, my granny in tow.

In the 1980's, my father took over running the farm, and after doing his own Nuffield Farming study, wound down all enterprises except arable farming seeking to capitalise on the opportunities resulting from specialisation.

Some of my earliest memories are of helping him cut open silage bales to feed the heifers on bitterly cold Sunday mornings before traipsing back inside for a roast lunch.

I left behind my childhood on the farm and Yorkshire, to study analytic philosophy at St Andrews University in Scotland before following a right-of-passage to London. The early part of my career was spent on a mix of business consultancy and commercial roles within fast-moving-consumer-goods companies.

I ended up at a multi-national food company leading the negotiation of a legal and commercial framework to list multiple food brands from a portfolio of companies on a global e-commerce platform. Ironically, the sticking point became indemnifying against farmer practices in the supply chain in far-away countries. But more importantly, I became fascinated in seeing farmers and food-production spoken about from 'the other side of the fence'. So, in 2017, with my wife, by then a qualified lawyer, I took the leap and returned to my roots.

Since my return to the farm, I have brought my commercial experience to grapple with the unique challenges of family farming, and have often fallen short. It has been a steep learning curve in farm management, sustainability and family business dynamics.

It became clear to me that the concept of sustainable food production held by my colleagues in London didn't match the reality on the ground now I was farming. It was much more complex; in fact it involved embracing complexity. And despite what I had come to believe myself, farming animals was part of the solution.



So, as the third generation in the ever-emerging story of our farm, animals have returned to the land. Indeed, our 1,000-acre landscape looks more like what my grandfather would recognise, a mix of cereals, cows, sheep and grass leys.

Alongside my work on the farm, in 2020 I co-founded a regenerative red meat supply business, Grassroots Farming Ltd, to work with restaurant chains intent on supporting farmers to produce ingredients with a demonstrable positive environmental impact. Three years later the company breached the £1m turnover hurdle, bringing us face-to-face with all the challenges involved in aligning stakeholders from farm to fork to affect meaningful systems change on how our land is managed.



Figure 2: My grandfather, Michael Trickett, at the start of his Nuffield Farming Study Tour.



CHAPTER 2: BACKGROUND TO MY STUDY SUBJECT

In 2019, regenerative farming was a fringe movement. Two years later I was reading about it on the side of a breakfast cereal packet. That is because corporates are rapidly realising that farmers hold the solutions to some of their biggest board-room issues. As a result, they are increasingly engaged in how the land that produces their raw ingredients and materials is managed.

Much has been written since 2019 about regenerative agriculture, and there are many greater experts than me. However, there is a lack of thinking about how to build the most effective interface between corporates and farmers to help each other achieve their aims; in effect, bridging the gap. As a farmer with a corporate background, if I can add value anywhere, it is here.

Over the last few years, brands have been making ‘north star’ commitments to regenerative agriculture, publicly announcing targets without yet knowing how they’re going to hit them. It is abundantly clear that any corporate commitments around regenerative agriculture will be superficial unless they can successfully engage farmers.

And herein lies the opportunity and risk. Regenerative agriculture holds many promises. If brands plan and execute their sustainability, procurement, and investment strategies well, they can unlock enormous benefit not only for themselves, but also to society and farmers. If they execute poorly, they could undermine and erode all the promise.¹

So, the simple question is this - how are supply chains currently engaging with farmers, and how can they do it better?

¹ When I was travelling in California I visited a philanthropist with a very successful tech background in Silicon Valley. Amongst other investments, she had bought a regenerative farm south of Big Sur. We were walking through the vineyard during the sunset when I asked her: “Imagine we’re 10 years in the future and it’s all gone wrong. The regenerative farming movement has had all its promise and trust undermined. What went wrong?” And she replied simply: “Good intentioned corporate strategy was poorly executed. It turned to ineffective greenwashing.”



CHAPTER 3: MY STUDY TOUR

In spring 2020, my study tour took me to Western Australia and Queensland looking at cereal, beef, sheep and fruit farms. Three weeks later, standing on an island off Brisbane, it felt like the light-switches around the world were turning off as the COVID-19 pandemic took hold. Within 24 hours I had booked a flight and was back home, with two weeks to go before the start of lambing, glad to not be quarantined on the other side of the world.

During 2021 I was grounded and confined to desk research, however I was fortunate to conduct a series of insightful online interviews with a range of consumer goods companies across Europe and North America.

When travel opened-up in summer 2022, I flew to California where I spent time with academics, start-ups and farmers across Central Valley, the Sonoma hills, Santa Cruz, San Francisco and Silicon Valley.

In 2023 I joined a Nuffield Global Focus Program to travel in a group of nine scholars from Japan, Canada, Zimbabwe, Australia, New Zealand and Ireland around Singapore, India (Tamil Nadu and Punjab), Qatar, Germany and finally Washington DC and Pennsylvania.

Throughout my travels I gained a privileged perspective into the interconnected nature of climate change, supply chains and food security from first hand conversations with ambassadors and trade attachés, corporate sustainability professionals, business owners, NGO's, large-scale and small holder farmers and academics across three continents and eight countries. The backdrop of the global COVID-19 pandemic and the land-war in Europe triggered by Russia's invasion of Ukraine served to heighten people's awareness of the fragility of structures we take for granted.



Figure 3: A 20,000-cow air-conditioned milking parlour in the Qatari desert.



CHAPTER 4: FOUNDATION CONCEPTS

4.1 The Definition Challenge

There is a belief amongst farmers that they should have the right to define regenerative agriculture, that they should get to decide what falls within the scope of its definition, and not non-farmers in board rooms wearing suits.

And behind that sits another deeper belief; the belief that regenerative agriculture needs to be defined to be a valid concept worthy of discussion.² The *definition* challenge is often touted by detractors, who move from 'no one can tell me what it actually is', to 'therefore it's all a load of nonsense'. This argument is often found in the company of 'it's just common-sense farming like our grandparents used to do'.

I take issue with all these claims whilst also being agnostic about the term *regenerative agriculture*. I am not a sandal wearing farmer who worships the cycles of the moon! I am a grounded commercial farmer who is also deeply concerned about what is happening to our climate and biodiversity.

However, I have come to recognise the power of the term *regenerative agriculture* to galvanise action and investment across supply chains, all the way from policy makers to shareholders and customers. The extent to which I am against the term *regenerative agriculture* is due to the culture war it propagates within the farming community. Although, perhaps, that says more about farmers than the term itself.

If farmers take the time to look around, they will see the idea of regeneration being applied to much more than agriculture. Nowadays it is applied to economics, finance, civic planning and yes, farming. This resurfacing, and the traction it gains, should come as no surprise as we enter the Anthropocene era when the human impact on the planet is stark before our eyes.³

Yet, in none of the parallel industries where regenerative philosophies have taken root, does it appear to be as contentious as in farming.

² I use the word *belief* deliberately as these are often stated as prima facie fact.

³ It is easy to forget that stories of regeneration are rooted deep in the human psyche, featuring in our earliest narratives; one needs to look no further than religion and the stories of death and rebirth for examples.



4.2 What is Regenerative Agriculture?

Let us start with the goal, then the management principles and then some specific techniques.

The **goal** of regenerative agriculture, as I see it, is to restore and enhance the health and vitality of agricultural ecosystems including soil health, biodiversity, water resources, and community whilst minimising emissions and maintaining profitable yields.

Setting aside the community and human elements (which are critical), I understand this as farming in a way that restores the uninhibited biological functioning of the landscape whilst profitably maximising yield. This is different to conventional agriculture, understood as post WW2 farming supported by the introduction of artificial fertilisers, which has been focussed on maximising yield with little thought to the consequences on nature or society.

As with the goal, the **management principles** of regenerative farming also differ in comparison to conventional farming. They emerge from the concept of biomimicry, which means mimicking nature.⁴

Practitioners of regenerative farming are encouraged to study how nature works to understand how to restore a farm's ecosystem health. This is how some of the most well-known management principles have been reached and they include: keeping the soil undisturbed; keeping it covered (minimising bare earth); always having a living plant with roots growing in the soil; maximising diversity of plants; and re-introducing livestock.

The fact it is driven by the principles of biomimicry means the application of regenerative agriculture can and should look different on each farm. In other words, because each farm has different natural systems, for example different soil types and weather systems, the techniques used to maximise ecological functioning on each farm will be different. This principle of 'adapting the tools to the context' also applies to a single farm setting which experiences different seasonal challenges from year to year.

Furthermore, because the history of farm management will look different on each farm, the regenerative techniques used to restore natural systems will also look different and evolve over time.

The **techniques** of regenerative farming are those that enable that farmer to start mimicking nature and restoring ecosystems whilst remaining productive and profitable. For example, most regenerative farmers will try to evolve to a point

⁴ Albrecht famously said: "...if the science textbook and nature disagree, throw out the textbook."



where they can avoid using insecticides in favour of adopting integrated pest management. Why? Because, aside from it making long-term financial sense, it restores a balanced system of biodiversity on the farm. Most farms will try and avoid ploughing. Why? Because disturbing the soil (for no good reason) damages soil health, taking it further from its natural state, which has evolved over billions of years to grow healthy plants.

As farmers and supply chain professionals, we are often guilty of approaching this system from the wrong end. We focus on the techniques being used, whether that is a consultant promoting cover cropping, or farmers vilifying ploughing. Instead, we should define the goals of that farm in its environmental context. Then understand how it can be mimicked using the tools and management decisions at our disposal.

During the last few years that I have been engaged in understanding regenerative agriculture in its broader context, much has changed. Over that time, corporate focus has shifted from aligning with an emerging sustainability trend, to seeing it as the movement most likely to help them manage complex nature dependencies in their supply chain. With this shift, the importance of defining regenerative agriculture diminishes in comparison to understanding the realistic outcomes and how to achieve them at scale.

4.3 The Importance of Systems Thinking

A common thread of regenerative movements, including regenerative agriculture, is the central role of systems thinking. Understanding systems is important to making regenerative agriculture a success in the field, but also is necessary for supply chain interventions to be successful. As I'll explain later, the lack of a systems approach is the root cause of some of the shortcomings I've witnessed. So, what is systems thinking?

Systems thinking is an approach to understanding and analysing complex systems as interconnected and interdependent entities. It involves looking at the bigger picture rather than focusing on individual parts, recognising the relationships and feedback loops between different components of a system.

When it comes to farming, the following features of systems theory are particularly relevant:

Holistic Perspective: Considering the entire system as a whole rather than isolating individual parts. It emphasises understanding the relationships, interconnections, and dependencies between various elements within the system.

In practice: looking at the farm production system alongside the farm environment and the interdependencies between the two. And recognising that



each farm has a unique context in which to apply a regenerative farming system.

Interconnectedness: Systems thinking recognises that changes in one part of a system can have ripple effects and impacts on other parts.

In practice: acknowledging that actions can have unintended consequences, such as the unintended negative consequence of a yield-boosting nitrogen fertiliser on soil health.

Emergent Properties: Acknowledging that systems have emergent properties that cannot be understood by examining individual components in isolation. These emergent properties arise from the interactions and dynamics between the elements of the system.

In practice: better integrated pest management outcomes emerging from improved soil health.

Feedback Loops: Systems thinking focuses on feedback loops, which can be reinforcing (positive feedback) or balancing (negative feedback).

In practice: high fungicide applications inhibiting the breakdown of organic matter by soil fungi, which limits soil health, reduces natural plant immunity, which increases the need for fungicides.

Dynamic Behaviour: Systems thinking recognises that systems are dynamic and evolve over time. It considers how the system behaviour can change due to internal and external factors, and how the system responds and adapts to these changes.

In practice: how the carbon-nitrogen balance in soils can develop over time, which then impacts how soils respond to carbon or nitrogen applications as it evolves.

Non-linear Relationships: Systems thinking challenges linear cause-and-effect thinking and explores the complexities of the system's behaviour.

In practice: cover-cropping may not have an immediate linear effect on the subsequent crop's yield but may be a critical part of enabling a reduced tillage system which then accelerates soil health improvements which support improved yields.

By adopting a systems approach, both farmers and supply chain professionals can get a more comprehensive understanding of agriculture and the challenges it faces. We can develop a better language of how agriculture must evolve within a changing climate and support the development of sustainable and effective on-farm transitions.



Figure 4: Inside a free-range egg-laying shed. Haren, Germany. 2023.



CHAPTER 5: HOW MARKETS UNDERGO SUSTAINABLE TRANSFORMATION

I spent the first part of my career in the company of multinational, fast-moving consumer goods (FMCG) companies, including four years at Associated British Foods, a £13bn turnover global company. I was simultaneously fascinated by the scale of impact these companies could have if they directed their combined resource towards a system change in agriculture, and confounded at how they would do it given the limitations that come with operating at that scale.

When it comes to analysing corporates, we quickly get into the realm of very large supply chains enveloping huge processors and millions of acres of farming. The fact that a few companies together control whole markets presents an opportunity for initiatives that facilitate cooperation in sustainable supply chain development.

Lucas Simons, a sustainability strategist and author, has spent time analysing how markets transform in response to sustainability issues, particularly the cocoa, palm oil and coffee markets. He has identified four distinct stages:

1. The awareness and project phase: sustainability innovations and initiatives are still in their early phases and face significant challenges. A small number of pioneering companies or individuals who are motivated by sustainability concerns take the lead in developing sustainable products, services, or business models. The focus is on experimenting, learning, and proving the viability of sustainable practices.
2. Transition Stage: sustainable practices begin to gain traction, scaling up to reach a broader market. During this stage, early adopters, often motivated by cost savings or market opportunities, join the movement. There is a growing recognition of the economic benefits and competitive advantages associated with sustainability.
3. Consolidation Stage: sustainability becomes more mainstream and integrated into business practices. The focus shifts from individual initiatives to systemic change. There is a growing emphasis on collaboration, standardisation, and policy engagement to drive sustainability at a wider scale.
4. Transformation Stage: a fundamental shift in the market and industry dynamics. Sustainability practices become the norm, and businesses that fail to integrate sustainability into their operations face significant risks. This stage is characterised by a new paradigm where sustainability is fully



embedded in business models, supply chains, and consumer expectations. It requires continuous innovation, collaboration, and the ability to adapt to evolving sustainability challenges and opportunities.

These stages represent a progression from initial exploration and experimentation to a state of widespread adoption and market transformation.

I believe strongly that not only are we witnessing this pattern when it comes to regenerative agriculture, but that these corporates don't have the time to let it run its course. In the final section of this report I discuss why leap-frogging to pre-competitive collaboration is particularly critical to ensuring successful adoption of regenerative agriculture by farmers. But in the next chapter, I highlight some examples of how corporates are approaching this challenge currently.



CHAPTER 6: WHY BRANDS ARE INVESTING IN REGENERATIVE AGRICULTURE

There are three common reasons that emerged from all my conversations to understand why brands are beginning to take more notice of their farm suppliers, in particular the environmental conditions in which their raw ingredients are produced. These are:

1. Because ethical sourcing is part of their brand identity which also helps with consumer marketing and employee retention.
2. To address the nature dependency risks in their supply chain, whether that's protecting against harvest failures due to climate change, and climate litigation from unknown externalities like pollution.⁵
3. To respond to regulation and supply chain disclosures, particularly around net-zero.

This final reason is the single biggest driver: reducing Scope 3 emissions (indirect emissions that occur in the upstream and downstream value chain of the company) on the carbon budget. For most food products, whether that's beer or beef, most of the emissions relate to primary production of raw materials rather than, say, transport or manufacture.

However, talking to the founder of a major UK hospitality business, their driver for putting regenerative agriculture at the heart of their procurement was to ensure they could hire people in the future to work for them. Particularly, how they could hire front-of-house waiting staff in their twenties when one of their primary ingredients – beef – is so closely associated with climate change⁶.

Of course, most organisations are driven by all these objectives to a greater or lesser degree, which are collectively referred to as 'intersecting sustainability goals'. In fact, as one sustainability consultant said to me, "it's being called regenerative agriculture, but that's just to have terminology to hang it all on".

⁵ "Will we still be able to buy what we need in 10 years?" These were the words from the Sustainability Manager of a major corporation in North America when I asked her why they were investing in regenerative agriculture. This was echoed by the agriculture director of a Canadian multinational in the UK. In his words: "Last year our procurement was really hit by the impact of climate shocks in the field during summer. It added a lot of cost to our business."

⁶ In Autumn 2022, I joined a panel for a live podcast in front of an audience of graduates seeking to enter the food industry, chaired by Food Matters, in Southbank, London. The questions from the graduates centred around how they could tell whether a prospective employer had genuine integrity backing up their sustainability pledges.



The more time I spend immersed in the topic, the more I believe this to be true. To the big corporates the most important aspects are the outcomes, not what the programme is called or even necessarily what messaging sits behind it.

Historically, the role of farmers has been to produce raw materials to make products. Now their role has expanded to help corporates build their brands, mitigate supply risks, and respond to regulations. This not only means corporates need new ways of working with farmers, but it places more importance on the role of farmers within the supply chain.



Figure 5: Workers washing potatoes on farm, Punjab.



CHAPTER 7: THREE EXAMPLES OF MARKET INTERVENTIONS WITH FARMERS

7.1 Cotton

In the summer of 2022, I spent two weeks in California visiting almond, vegetable and beef farms adopting regenerative agriculture practices. In the valley of San Jose was a large farm adopting regenerative practices across vegetables and cotton.

The managing director had been approached by an organisation operating in fibre supply chains to lobby and support textile brands to invest in sustainable farming. They had teamed up with a consortium of brands who agreed to work pre-competitively in defining a model for regenerative cotton production. They brought the expertise of university academics into the project and went in search of a farmer to trial their new system.

They wanted to pioneer a cover crop using a blend of seeds and a new cotton planting regime. When the cover crop matured, it was destroyed to make way for young cotton plants. The aim was for both good cotton yields and improved farm environmental outcomes. The success of the pilot would be used to recruit more cotton farmers.

However, they ran into several problems. The first was the farmer himself, the managing director in this case, who felt his opinion wasn't valued. What did he know compared to the academics or consultants and was he really going to argue with the big corporates? He said words along the lines of 'I didn't want to be the stereotypical farmer who always knows best, but I could see they didn't want my expertise, they wanted my land'. He felt side-lined from the process even though he knew farming and his land better than anyone else.

The cover crop seeds grew so vigorously that it took three times the usual dose of herbicide to kill them; when the plants finally died, they left a thatch of organic matter on the ground so thick that it smothered the young cotton plants, resulting in a poor cotton population and a very low yield.

They are now re-running the trial, but the farmer is leading the on-the-ground implementation with the academics doing the measurement.

There were many aspects of the trial to celebrate, namely galvanising pre-competitive collaboration and having the support of an academic institution. However, when it came to working with the farmer, it pointed to a pattern I've seen multiple times characterised by a top-down approach where experts 'tell' the farmer what to do. Not only does it lead to very poor engagement with farmers, who are not bought into the programme, but it leads to poor results. The risk is that the farming system is seen as inadequate, whereas really it was the project management approach that was inadequate.



Figure 6: Researchers from Davis University, California on an almond farm in Central Valley

7.2 Barley

A key ingredient for beer is barley, used in the malting process. It goes without saying that the price of barley affects the cost of brewing beer. And, as outlined earlier in the report, corporates are investing in the ability of farmers to produce a consistent supply of raw ingredients amidst the impact of climate-induced shocks.

Moreover, barley production accounts for about 30% of the carbon footprint of a pint of beer⁷. These are the two biggest reasons why multiple major brewing corporates are looking to transition barley growers towards climate-smart farm management practices.

I spent some time speaking to a major brewer in Ireland to understand their approach to working with farmers. First, the brewer works with their maltsters to identify the farmers which grow the barley that ends up in their beer. Because the corporations and maltsters set the specification for the barley each year in a purchasing contract, they're able to identify those farmers they're working with and start to push the specification into more environmental areas. However,

⁷ <https://www.fwi.co.uk/arable/barley/yorkshire-barley-growers-plan-for-zero-carbon-beer>



there is a clear recognition from the corporates that the farmer is not their customer, but the other way round, so they can't push too hard.

The corporate identified a consultancy to work with the farmers, firstly to design the new practice they want their farmers to adopt, in this case planting a winter cover-crop before sowing barley in the spring. They set-up trials on specific farms and agree the relevant parameters to measure before, during and after. And finally, they set up on farm meetings to demonstrate the trials and share the lessons learned.

The corporate funds the cost of the cover-crop seed to incentivise farmers to participate in the trial. Especially in Ireland, where the government has committed to cutting agriculture emissions by 25% by 2030, there is a sense that change is coming, and the corporate can help de-risk that for the farmer.



Figure 7: Workers take a break on a vineyard, Big Sur, California.

7.3 Beef

When it comes to the climate debate, beef needs no introduction. Major brands are under customer, shareholder, and political pressure to take steps to measure and reduce the emissions found in their beef supply chains. This means working with farmers to first measure and then evolve their farming practices.

I spoke to a major fast-food outlet in the UK that sells a lot of beef burgers to understand their approach. The outlet followed the same approach as the barley



farmers in Ireland and cotton in California. It is an approach familiar to large organisations trying new things.

It follows a typical 'project' format. Step one was to convene a small group of trial farmers, again by working with the aggregator in the supply chain, in this case the abattoir. Step two was to find a consultant to advise on what regenerative farming techniques the farmers should be adopting (co-incidentally, in this instance the consultant was a friend of mine), and how to measure the impact. Step three is to trial the new approaches on farm, this time predominantly around increasing rotational grazing of cattle. Step four is to analyse and share the results before bringing more farmers into the programme.



Figure 8: Ranching beef and sheep, Sonoma, California.

7.4 Common features

I chose these three examples because they're indicative of the approach being taken by most of the corporates I interviewed across potatoes, snacks, beverages, cereals, fashion, confectionary and red meat sectors. The most striking realisation is that we're firmly embedded in the *pilot and project phase* defined by Simon Lucas (see Chapter 6). Their approaches are characterised by the following features:



1. A top-down approach driven either directly by the brand or by a consultant. Corporates have an unconscious bias towards taking a command-and-control approach to supply chain projects. But, whereas this might work with simple, linear interventions across a few actors, it doesn't translate well to driving a management system change in a natural landscape across thousands of suppliers.
2. Focussing on a single technical intervention to hang the project around, whether that's planting cover crops or rotational grazing. This keeps the projects simple and measurable. However, it also leads to inefficient investment on farms, risks alienating farms which can't successfully implement that tactic and pins the evaluation of an entirely new farm management system (regenerative vs. conventional) on the success of one intervention.
3. Starting with a small group of farmers before scaling up.
4. Working through the aggregators or processors.

To show the implicit assumptions behind how these interventions must operate, it is useful to think about the features that are broadly absent from the approach currently being taken.

1. Interventions are not chosen by the farmer to impact common areas of benefit for them and the supply chain.
2. Management is not decentralised and led from the bottom up.
3. There is no ability for the corporate to target investment towards the most efficient projects on each farm.
4. There is no real focus on farmer behaviour or mindset change, or system change management.
5. There is no obvious mechanism to scale the interventions fast across the supply base, cost affectively.
6. There is no real collaboration between corporates in recognition that they are trying to solve similar problems, and it is likely that the same farmer will supply more than one of them.

Whilst there is much to be excited about in the way corporates are beginning to engage with farmers, there are also many ways in which their approach needs to evolve to get successful outcomes for both them and the farmer. To do this well, any approach by corporates needs to be aware of, and overcome, some existing challenges inherent in dealing with a broad supply base of farmers.



Figure 9: Sorting and spinning wool from around the world, Punjab. 2023



CHAPTER 8: CHALLENGES THAT MUST BE OVERCOME

The growth and under investment system archetype for agriculture

The growth and underinvestment archetype describes a common pattern found by system dynamics theorists when analysing complex non-linear systems. It looks at different types of interdependent feedback cycles operating in a system to understand why that system behaves as it does and what possible leverage points there are to change.

I believe this to be the most common archetype defining agriculture systems. Both farmers and supply chain professionals need to recognise it for what it is and be focussed on identifying and investing behind the leverage points to exit this system archetype. Let me explain how it manifests on farms.

Firstly, the profitability of agriculture is very low by industry standards, with return on capital deployed generally coming from the increasing valuation of underlying assets, namely the value of the land market. This low profitability starves investment into assets that have longer-payback cycles – for example, the dependencies each farm has on nature, particularly good soil health, water management and biodiversity.

At the same time there is a short-term investment loop in the form of tillage and agrochemicals including cheap fertiliser. Given the low profitability of most farms, these short-term investments are critical to business survival; farmers are incentivised to invest because they give a reliable annual return on the investment.

However, three things happen:

1. Management resource is diverted away from looking at the long-term but critical investments (like soil health).
2. Secondly the investments in agrochemicals and tillage directly degrade those assets that support profit over the long-term (again, soil health).
3. Thirdly, naturally this re-enforces the need to invest in the short-term loop making it a negative feedback cycle on profitability.

The ubiquitous fridge magnet quotation 'if you do what you've always done, you'll get what you've always got' has never been more appropriate than when discussing the role of supply chains in changing farm and landscape outcomes. We are at an inflection point. For regenerative farming to gain meaningful traction and deliver its lofty potential, both farmers and supply chain professionals need to think differently, and fast.



In this chapter I discuss the common challenges that need to be addressed by supply chains to successfully engage with farmers.

8.1 Asymmetry and poor farmer returns.

Many farmers have been pushed to a point where they can neither afford to continue nor afford to change. They are protagonists and victims of a food system that has evolved with all our implicit support.

As commodity supply chains have developed and grown, power has accumulated with buyers. The value and risk attributed to each party's role in bringing a product to the consumer is not reflected in their total share of the consumer pound spent. There is an asymmetry.

How did this come about? Firstly, on a commercial level, most farmers produce commodities. The milling wheat produced on one farm is indistinguishable from that produced on another. If what you sell can easily be bought from another supplier, your ability to set the price is undermined. You become easily substitutable and simply compete on price, and a race to the bottom ensues.

As power has accumulated with the buyer over time, the price paid to farmers has therefore broadly settled at the cost of production. Or, in the EU, where subsidies like the European Common Agriculture Policy masked the true break-evens on farms, the price sits below the true cost of production. Remove these subsidies without alternative support and most farms will go bankrupt. The commoditisation of supply chains from the aggregation of power in the pursuit of efficiency has undermined the value of food.

This has had the corollary effect of leading to ecologically extractive systems. In simple terms, the quick fix chemical fertility and pest control we now use to prop up yields comes at the detriment of natural fertility and pest control that already existed in our farms. We have been unconsciously withdrawing from these natural fertility banks at a hidden cost that no-one has paid for (an externality) to the point of ecological bankruptcy.

As a result, farmers are highly suspicious of buyers approaching them to work 'collaboratively', and with good reason. They have been stung in the past. I personally have lost count of the number of stories of farmer contracts being cancelled, being lower than the cost of production, being extractive and unnecessarily punitive. When I tell farmers that I work with corporates I receive a sympathetic look, as if it won't be long before I'm stabbed in the back.

In addition to inheriting the system described above, there are new emerging challenges that farmers must face in their future careers. These include exposure to high and volatile input costs; degrading natural assets such as soils and water reserves; vulnerability to extreme weather events that risk destroying an entire



year's income in a week; and increasing regulation to tax negative environmental externalities driven by the actions of the entire supply chain.

Corporates with regenerative supply chain programmes need to plan for rebalancing this asymmetry as a pre-requisite to successful future collaboration and system change. Whether that's through paying premiums, risk sharing the change process through capital support or other market mechanisms.

Diary entry 4th June 2022: Today we were shearing sheep. Yorkshire.

The inequalities of the wool market never feel more present than when shearing sheep. It costs farmers more to pay the shearers than they make from selling the wool. The shearers get paid £1.50 an animal. The farmer will sell a fleece for just £1.00.

Raw wool is valued at £0.25 per kilogram, but once made into a sweater sold on the high street, it is valued at £180 per kilogram (that's a 500g wool sweater with a £90 RRP).

This means the farmer sees 0.1% of the product value, a product made almost entirely of wool from their farm or others like theirs. Clothing brands want to show consumers that their products are green, so the natural thing is to push this onto the farmers and to start asking them to comply with new standards, undergo audits, and submit carbon footprints. You can see the irony for just 0.1%.

How much longer can a farmer produce food to feed people, look after the nation's wildlife, drawdown CO₂ into the soil, provide for clean rivers and air when society values their work so little. This is an industry where one farmer a week takes their own life.

8.2 Opaque supply chains and causal integrity

An important feature of today's efficient and scaled supply chains is their structural opacity. In other words, it's very difficult to trace products from field to consumption at scale.

However, corporates need to know who their suppliers are before they can report on their supply chain's nature dependencies or emissions. Furthermore, it is difficult to ask a supplier to change what they do if you don't know who or where they are.

Often there are simple ways to get around this. A breakfast cereal company will work with a grain buyer to fill a contract for an amount of oats, say 20,000 tonnes. The contracts will be advertised and awarded to farmers and will include the quality specification, but also the requirement to supply data about how the crop was grown. So long as the oats can then be kept separate through the mills then,



in theory, we can understand where the oats came from and how they were grown.

However, this is a very simple example, and it can become complicated in two ways by the amount of processing required and the type of goods being bought. In discussions with one major fashion brand making leather goods, it emerged that the hides used in their products passed through 15-20 pairs of hands between leaving the farm and reaching their factory, spanning Uruguay and China before being retailed in Europe. Crossing multiple countries means crossing different cultures and regulatory environments.

The second complication arises when what is being bought by a company isn't being sold by a farm. This almost always happens in meat supply chains: farmers sell cows, businesses at the end of the supply chain buy steaks (for example), and the carcass gets split in multiple directions.

This leads to challenges with economics as well as traceability. The amount of beef a restaurant, for example, may be buying from each farm, even if they could trace it, isn't valuable enough to incentivise the farmer to do things differently. They could double the price they pay for their sirloins and yield the farmer a few hundred pounds more per annum. Not enough to incentivise the farmer to change their production methods, or harvest data to suit the brand's requirements.

Sometimes, forward-thinking brands are willing to waive direct traceability to a farm in favour of working within a landscape, known as a *catchment* or *supply shed* or use a *mass balance* system.

Supply shed

Supply sheds, or catchments, use geographic approximation to allow a company to claim the impact or benefit of changing farm systems in the supply chain. They may not be able to know exactly how much of their product came from which farm, and therefore what degree of emissions reduction has occurred. However, they can approximate and extrapolate over a region of suppliers within geographic guardrails. This has benefits in the sense of removing the need to separate a product through every stage of the supply chain; however, there are also areas to watch-out for, in particular that multiple companies aren't claiming the same emissions reduction.

Mass balance

The mass balance model originates from the work of the Rainforest Alliance and Fairtrade. It can now be found in most international sustainable supply chains. The concept of is one of balancing the *mass* procured by the end customer, against the *mass* sold from a certified farm or farms, without segregating and tracing the physical product through the supply chain.



For example, to claim palm oil is sustainably sourced using mass balance the company must ensure that for every litre of sustainable palm oil it buys, one litre leaves a certified farm and enters the supply chain. It doesn't need to ensure that the particular litre produced ends up in their product.

This concept is easy to understand when we think about renewable energy. For every watt of energy my household uses under our renewable energy contract, one watt of renewable energy enters the grid. By taking out a renewable energy contract, I'm placing a quantum of demand (a demand signal) on the grid, which is then matched by an equal supply. I don't expect to have a new cable plugged into the side of my house that comes directly from a wind turbine.

This model works where the quality of the sustainable product is indiscernible from the conventional product, i.e. there is a high degree of fungibility. My lights works the same regardless of the type of energy powering them. A chocolate biscuit tastes the same regardless of whether the cocoa comes from a sustainable farm. A cotton jumper feels the same, regardless of whether the cotton is sustainably produced.

With this recognition, what mass balance achieves is a more efficient use of budgets; to invest into the sustainable production of ingredients on farms, rather than investing behind the capability of a supply chain to segregate ingredients from farm to fork. Segregation becomes a costly, but avoidable, pre-requisite to working on improving the sustainability of farms. Under mass balance, their investment is more cost-effective and direct at achieving their objective: sustainability not product quality. It is therefore faster to scale and have impact.



Figure 10: Visiting a cardamom and banana farmer, Tamil Nadu. 2023.



8.3 The context dependant nature of regenerative agriculture

A challenge many brands face is dealing with the highly contextual nature of regenerative farming. Ultimately, what we're all trying to achieve is a farm that is more resilient to climate change by rebuilding its underlying functional ecosystem health. But the specific practices adopted will be different for each farm.

Saying to all farmers 'you must plant cover crops' is attractive for several reasons. It is a simple, linear intervention, and it can be set-up as a monitored trial by collecting data before, during and after.

However, it is also problematic on a few levels. Firstly, it overlooks the myriads of other implementations that could yield faster results in certain farm contexts. For example, on certain farms it could be better to incentivise spreading compost than planting cover crops.

Secondly, mandating certain practices is a slow way to affect change, whether that's soil resilience or the farmer's mindset. Many farmers may wish to engage with a corporate to use their backing to become more climate resilient, but don't want to grow cover crops because they know it won't work.

Thirdly, it is risky. If we pin everything on the success of one year's cover crops, and in association pin the programme's success to this, we risk writing off regenerative systems on the back of one year's failed cover crops.

To engage farmers in changing their systems to be more resilient to climate change and reduce emissions, corporates must become comfortable with a bottom-up approach that lets farmers lead on what approaches to adopt on their farm, even if that means sacrificing the simplicity of a unified linear top-down intervention.

8.4 Engagement and the human challenge

To paraphrase the words of Gus Speth, US Advisor on Climate Change, 'I thought we could solve climate change with 30 years of good science. I was wrong. This is a human challenge'. In other words, it was mischaracterised as a technical challenge, whereas it is in fact an engagement challenge. And the same goes here.

This is for one very simple reason. To change a farming system on the ground is very hard. Farmers must contend with everything from low profitability, high capital cost, high risk, knowledge barriers, fear and pride, as well as years of legacy management.



If I'm a farmer, my neighbours tell me one thing, my business partners say another, and my agronomist something else. Let alone what my farm consultant, landlord or social media thinks. The challenge of solving the technical problem of working out what mix of cover-crop seeds to use, pales in comparison.

But let's pretend I've decided to try something new; I must then turn it into a practical success, whilst many of the conditions for success are outside my control. For example, I've decided to plant a cover-crop but then it doesn't rain for two months. I plan to apply compost but then it's too wet to spread it on the fields. I plan to graze an arable crop but then it doesn't grow big enough to graze because it's eaten by pigeons.

Why would I keep trying a new approach when it's hard to start and even harder to make work. Especially when I know the system I have been using at least pays the bills.

The difference between sticking with a transition, trying different approaches, accepting risk and being outside your comfort zone, versus sticking with what you know, is a mindset change. I spent time with a rancher in the Sonoma hills of California who said: "To make small changes, change how you do things. To make big changes, change how you see things." I later realised he was quoting Gabe Brown in his book *Dirt To Soil*.

More specifically, I must *believe* that a regenerative system will be better for my farm. The challenge is too hard and too complex to implement if I don't first believe in why I'm doing it.

Both corporates and farmers recognise this, but it doesn't yet feature in their programmes. In the words of one corporate with a market capitalisation of US\$98bn, "I know the single biggest risk is that farmers walk away". In another corporate's words, "within our trial some farmers are already doing this stuff. If everyone was like them, they wouldn't need me". I asked a trial farmer directly whether their customer would meet their 2030 aims. His response was "no, or if they do it will be because a small group of farmers are going to do it anyway".

This presents both a challenge and an opportunity to corporates. If they invest and successfully engage farmers to change their mindset towards their farm, then the biggest challenge is overcome. The technical part will be driven through by farmers, so long as they have the flexibility to adapt the transition to their farms' context. If they don't, then they will spend a lot of time and money without achieving any lasting change or real impact.

A true 'alignment of incentives' comes from successfully engaging farmers in the value of a transition, so they begin to deliver it in their own right.



To solve farmer engagement and drive lasting change through aligning incentives, corporates need a new 'farmer-centric' framework. Trials do play an important role, but they're not the whole picture.

There are two ways to get a farmer to change their practices on the ground. The first is to directly ban or incentivise a certain practice within the terms of a contract, from the top down. This could be a ban on using ivermectin wormers in beef. And the simple outcome is they won't use these practices, for as long as it makes financial sense. However, their compliance is inelastic. In other words, their incentive doesn't extend beyond gaining the financial reward.

The second way is to start with the *why*. Explain that farms with better soil health more reliably produce a profit through periods of extreme weather. If you're a beef farmer, you can grow more grass through periods of drought if you have healthier soils that retain water. Explain that dung beetles play an important part in cycling manures into the soil, to improve its health, and therefore their populations should be encouraged. Next, financially incentivise the farmer to monitor dung beetle populations on their paddocks. Finally, explain that using ivermectin wormers kills dung beetles and there are other management tactics that can be used instead, which also save money on veterinary medicines. The outcome is that farmers will try to find alternatives to ivermectin.

This second philosophy of behaviour change is more enduring and elastic. Through engaging first with *why* a new system is beneficial, the farmer takes ownership of the change. If a chosen management practice is no longer practical halfway through the growing season, they will choose the next best option rather than giving up and reverting to old practices immediately. But still try to achieve the objective which is improved soil health (in this example).

Mindset change is further supported by using a *show don't tell* model. As the saying goes, *you can't define healthy soil but you know it when you see it*. I have witnessed this first hand on my farm. I was trying to convince someone that the soil under a rotationally grazed five-year herbal ley had improved from when it was intensively arable cropped, but my persuasive words were falling on deaf ears. That was until we went out into the field with a spade and dug up a mound of earth that smelt like sweet garden soil and was full of roots and life. Then the penny dropped.



Figure 11: Banana farming, Mackay, Australia. 2020

8.5 Scaling cost-effectively with measurement & reporting

The final challenge to overcome is how to scale the intervention fast and cost effectively.

The corporates I spoke to are all taking a similar approach of trialling with small groups of farmers, refining, and then rolling out. However, setting aside the engagement challenge from a top-down approach which we covered before, there are three challenges to overcome in the roll-out: scale, pace and cost-efficiency.

Any of the interventions that I researched needed to **scale** between 20 and 220 times before they met the corporate's publicly stated commitments. If the focus shifts from meeting a pledge to meeting regulatory reporting, standards or shareholder expectations about supply risk mitigation, then the multiples are bigger. That's a very steep staircase to climb. Of course, there will be programmes which are much further ahead than those I researched.

The second is one of **pace**. Farming happens according to the seasons, which means most new interventions happen annually, or at best, twice a year. If I apply compost, it will be once a year and then I can judge outcomes in the crop health, yield and soil condition as the season progresses. Same with using a crop establishment technique like no-till, or with outwintering cattle. Conversely, if an intervention fails, such as a cover-crop failing to establish, then I must wait a year



before I can try again and apply the lessons learned. Likewise, corporate interventions aimed at onboarding farmers into a new programme happen according to the crop growing seasons.

This limits the iterative feedback loop from the trials to yearly. If the corporate pledges are pegged to 2030, for example, then the number of iterations to improve or increase farmer membership is equal to the number of years remaining before that deadline. So not only is it a very steep staircase to climb, but there are also not many steps on it.

The third challenge to roll-out is **cost efficiency**. Currently, these programmes are facilitated by an army of consultants who engage up and down the supply chain, most notably with farmers. However, the elephant in the room is how a consultant led programme across thousands of farms and millions of acres can both be cost effective, nimble and achieve its detailed aims.

For supply chain programmes to engage farmers at scale, fast and cost effectively, they must begin to challenge their bias towards a central command and control approach and consider alternative de-centralised bottom-up approaches that make better use of available technologies.



CHAPTER 9: RECOMMENDATIONS

The following features should be developed as critical components of future supply chain interventions aimed at supporting the system transition to regenerative farming. Taken together they will remove the heavy lifting from the corporates, reducing their costs, increasing their deployment speeds, increasing their reporting capability and magnifying their ability to engage farmers and manage nature dependent risks in their supply chain.

9.1 Pre-competitive collaboration

Pre-competitive collaboration in industry refers to cooperative efforts undertaken by companies operating in the same industry or sector to address common challenges or pursue shared goals before they become competitive issues. It involves collaboration among competitors to achieve outcomes that benefit the entire industry while preserving their individual competitive positions. The value of this approach to scaling regenerative agriculture supply chains is clear.

Companies must become better at acting on the insight that farms have multiple customers who share a common interest in climate-smart agriculture. Farms are the first link in the supply chain for multiple different companies. The land that grows oats one-year will grow barley the next, is the natural capital that impacts the local tourism board as well as the regional water company and can be used as loan collateral by a bank.

I would like to see pre-competitive collaboration across a broad spectrum including shared challenges, information sharing, joint research and development, and standards development. This collaboration should represent different industry verticals: fashion, beverage, cereals, meat, utilities, tourism, and real estate, for example. Participants would need to agree on a set of environmental metrics that jointly meet their objectives, as well as a toolkit of regenerative practices to incentivise farmers to adopt.

More collaboration between organisations would multiply the return on investment from budgets invested on farms as well as speed up the pace of learning and ultimately increase the chances of achieving their defined goals.

9.2 Develop a technology platform to deploy across suppliers

It is difficult to see how whole supply chains, regions and perhaps industries can undergo a regenerative farming system change without technology playing a key



role. This isn't necessarily farm technology like autonomous tractors, but platform, engagement and data businesses.

Demand for reporting on, and ultimately steering, the nature dependencies of productive natural capital assets is only set to increase. And technology will be critical to cost-effectively achieve this at scale. Whether that is in gathering data, automating investments into farming systems, or analysing big, open data layers.

A platform allows a space around which different companies can coalesce in a pre-competitive environment. If corporates can agree on the regenerative toolbox, data collection and incentivisation, these can be coded into the platform which can then be deployed to whole geographies of farmers at a time.

From a farmer perspective, it forms one portal where schemes can be selected, data uploaded and investment accessed. It provides an exciting opportunity to turn farms into API's for the supply chain; supplying their farm production data in return for financial support and incentives. Against this backdrop there is fertile ground for nudge and behavioural economics to trigger system change.

9.3 Prioritise AI verified ground-truth data

The rapidly developing field of AI poses exciting opportunities to unlock new verified reporting of the adoption and outcomes of regenerative agriculture in supply chains. The value of ground-truth data collected by farmers is undisputable; we need to rapidly develop the technology that engages and rewards farmers for collecting this. A technology that addresses the asymmetry, or imbalance, between the relative abundance of data on farms but little capital, and relative scarcity of data at the customer end of the supply chain, but available capital.

AI can not only give top-down insight from large open data layers like satellite data on habitat mapping, but it also can provide bottom-up verification of farmer practices or landscape functioning, for example soil health. It can count and classify worm species in a soil sample using a phone camera, or classify soil health based on analysing aggregation, compaction and rooting depth from a photo uploaded to an app.

Not only does this provide verification, but it is also cost-effective and engaging for farmers to use. For the corporates, it unlocks reporting of nature dependencies at a supply chain level from the most granular of ground-truth data.



9.4 Enable ground-upwards adoption

A successful intervention by corporates in a supply chain will put farmers in control as much as possible, which means stepping away from the top-down central command and control model.

Farmers should be supported to learn about the nature dependencies and impacts of their farm, and which management approaches encourage the long-term profit-driving ecosystems on their land to recover. With this knowledge, they will be best positioned to choose which particular management options from the *regenerative toolbox* are the best fit for their farm.

Not only will this save corporate investment going towards the wrong tools for the wrong farm, but by selecting the right tools, the improvements will be more rapid. If the farmer is invested in the decision making, they are more incentivised to make it work or find workable alternatives.

Again, it is easy to see the value that platform technology deployed to farmers via web and mobile apps can add. Farmers can be steered towards adopting practices most suitable for their land based on data relating to their farm type, their geography, weather, and local ecology. Based on information they supply, farmers can be offered a range of options from the *regenerative toolbox* with various financial incentives, implementation support and data-capture requirements.

9.5 Incentivise and reward

To address the asymmetry that has developed in the supply chain, a successful corporate intervention needs to reward or assist the farmer changing her practice. This is not just on ethical grounds, as fairness should form a key part of a regenerative supply chain, but on practical grounds.

The cost of change, whether in cash, intangibles or risk is significant. Support from the corporate can come in many forms, such as downside yield protection, price premium for the harvest bought, working capital support, investment in on-farm capital projects or some other revenue injection such as farm data procurement.

I have written a lot above about the potential for a platform which, within the parameters agreed through a pre-competitive forum, aims squarely at nudging farmer mindsets towards adopting appropriate regenerative management options within supply geographies. When it comes to investment, pre-competitive engagement allows budgets to be combined, providing a bigger incentive to the farmer and better value-for-money for the corporates. The



investment should be targeted towards what counts on each farm, not wasted on a top-down approach.

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Figure 12: mob grazing cattle on a herbal ley. Author's farm, Yorkshire. 2024



CHAPTER 10: AFTER MY STUDY TOUR

On the farm I continue to re-frame business decisions based on the emerging reality of climate change; the need to re-assess risk and find the crossover between achieving enough profit to support our family whilst improving the resilience of the soil to withstand climate shocks. We now rotate sheep, beef cows, herbal leys and arable production around our cropping land.

Grassroots Farming continues to grow, keeping pace with the evolving demand and capability of down-stream businesses. In 2024 we introduced a new model for hospitality businesses; a system of directly linking them to farms through a volume-based levy that supports farmers to adopt our verified reporting standards. We're trading up to 500,000 kgs of beef through this in year one.

I continue to enjoy connections with academia and business, supporting investors building their thesis around regenerative farming, and delivering an undergraduate lecture at York University as well as supporting the N8 network of universities with their interface with regenerative agriculture.

An unplanned stay in hospital put waste to a week's speaking engagements I had in Germany, the Czech-Republic and the Netherlands in late summer 2023 about systems change to regenerative supply chains.

On an early autumn morning in 2023, with Hannah Senior (a fellow scholar), I welcomed a Nuffield Global Focus group from Harare, Zimbabwe, into Heathrow. We had organised a week's study tour to NGOs, investors and start-ups in London, then up to the stunning pastoral landscapes of the Lake District, with farm and business tours in-between.

I'm positive and excited about the future of collaboration to bring about regenerative primary industries. I look forward to many years of offering my support whenever my experience and perspective can add value. Experience and perspective gained, in large part, from my Nuffield Study Tour, for which I will be forever grateful.



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