Collective Regeneration to Accelerate the Shift in Agriculture

Anthony Myint

Updated 11 June 2024

Table of Contents

Author's Note

This paper tries to cover way too much ground, in part because it runs counter to the conventional wisdom about improving our food system. We will consider the shortcomings of the prevailing consumption-oriented approaches to regenerative agriculture and offer a production-oriented approach that is pragmatic, scalable, and, in many ways, a no-brainer.

Despite the immense need to change "conventional" farming and the overwhelming benefits of doing so, this change has yet to begin in earnest. You may find additional context in the References section, but if we're oversimplifying a bit, the food system is too complicated to change unilaterally. Tax increases are not popular with voters, so governments have not financed climate solutions at the needed scale. Corporations are required to maximize profits for shareholders, so businesses have not financed climate solutions at scale. Farmers lack the necessary technical and economic resources and consumers have had no way to effectively "vote with their dollar" to directly change agricultural production.

This position paper unpacks a new framework for all these sectors and stakeholders to team up: Collective Regeneration.

We explain this new concept and how principles like mass balance and going beyond insetting will unlock a large-scale agricultural transition – because it enables every government, every business, every farmer, and every citizen to take part.

Part 1: Changing Eating vs. Changing Farming

A decade ago, when the science of regenerative agriculture was first emerging, many food systems leaders (myself included!) jumped to the conclusion that making different choices around eating was THE way to transform our food system. Even now, many food-and-climate organizations are focused on price premiums for regenerative produce and federal policy to support an emerging regenerative marketplace.

This section will make the abbreviated case that US farming practices are barely responsive to changes in food purchasing, and in fact, changing our food system will require us to shift our attention from the economics of eating to farming, from retroactive rewards to proactive resourcing, from purity to progress, and to generally expand our frame of reference from individual choices to systemic regeneration.

Organic and the (in)effectiveness of price premiums

Let's begin with a clear-eyed view of the US food economy. Just 16% of each food dollar reaches a farm, and **0.0%** of that is explicitly earmarked to implement *the next practice on the next acre*. Ask any farmer or rancher – most need every dollar just to make ends meet with their current production methods, so whether you buy the $5 pint of "good" organic cherry tomatoes, the $3 pint of industrial organic cherry tomatoes, or the $2 pint of conventional tomatoes, the farmer is not setting aside $0.XX cents to invest in a hedgerow project or to plant cover crops. There is no economic mechanism translating the price premium of climate-smart produce from Farm A into the *implementation* of more climate-smart agricultural practices (and especially no way to influence Farm B). In addition to the cost of changing their practices, farmers are also worried about losing crop insurance eligibility, which is limited to USDA-approved "conventional" agriculture and also underpins agricultural lending.

The combination of significant barriers to change and the lack of a transition finance mechanism has effectively stifled the growth of organic agriculture in the US. Despite clear price signals and over 50 years of advocacy, we're left to wonder: "While demand soars, less than 1 percent of U.S. farmland is certified organic. So why don't farmers switch? Ultimately, we believe that the agricultural transition is too important to advance only at the pace of discretionary, "out of pocket" resource allocation by a small number of farmers. We need effective mechanisms to instigate transformative change, and we can look to other sectors – such as renewable energy – to create a successful playbook.

Retroactive Rewards vs. Proactive Resources

An analogy might be useful to interrogate the price signal logic espoused by classical economics. Imagine a public school system with sub-optimal educational outcomes and a few sterling exceptions, such as a valedictorian who went on to the Ivy League and now earns a high salary. We might deploy this success story to inspire more students to "be better" in the hopes that, *somehow*, current students would find a way to achieve better outcomes from the same educational system. An

extreme version of this approach would involve even *higher* salaries for Ivy Leaguers, rather than investing in the system as a whole.

Incentivizing students with the hope of higher salaries is a retroactive reward approach; a proactive resource approach would be to increase teacher salaries, provide curricular support, or perhaps even supply materials like laptops, nourishing school meals, or musical instruments. Of course, each action comes with a cost, and because the systems-level benefit of better educational outcomes is an abstract and distributed public good, it's hard to find the political will. But if funding "magically appeared", I think we'd all agree that the more directly beneficial use of the funds would be to supply them proactively (ten laptops) instead of retroactively (a 10% raise for one valedictorian).

Price premiums for products like "certified organic" ingredients rely on the "retroactive reward" approach and have failed to drive change. However, since there are very direct community benefits to the shift to regenerative agriculture (e.g., resilience, quality, biodiversity, water conservation, and quality, etc.), many stakeholders would be incentivized to generate the necessary funds for a proactive resource approach. Money should "magically appear" and would create a win-win-win for farmers, consumers, and communities. Such an approach could scale radically through public-private collaborations and mass balance frameworks, analogous to the renewable energy transition, which we'll explore further in Part 2.

Purity vs. Progress

As a long-term proponent of regenerative grazing, I have experienced the topic's incredible contentiousness, both within and beyond the sustainable food movement. Even advocates with the same goals end up talking past each other because we can't reconcile the climate impact of beef as a product with the climate impact of grazing as a land management practice.

Proponents of regenerative beef may cite climate-positive Life Cycle Assessments in studies of adaptive multi-paddock grazing, which restores soil health by moving ruminants through grassland in tight herds. Opponents point to the shorter lives of cattle in feedlot operations (14-18 months) relative to their grass-fed counterparts (24+ months) and calculate a higher GHG emissions factor because the animals spend more time emitting methane or because grazing might take more land to meet current demand. But both groups are talking about beef instead of just focusing on the progress that's possible through grazing reform.

To my mind, the confusion stems from a misunderstanding of the conventional beef system, because all cattle start out eating grass for their first year or so before entering the feedlot in year ~2. Product labels aside, there is enormous potential for regenerative grazing, even if the cow is later sent to a concentrated animal feeding operation (CAFO). It doesn't take a ranching expert to understand that better grazing and land management in year 1 is a no-regrets solution for the 762 million acres of US pasture/rangeland. In fact, more holistic studies on regenerative grazing find carbon sequestration of 3.53 and 3.59 Mg C ha−1 yr−1 and 23% higher productivity/weight gain per unit of land area. Rangeland represents 83% of US agricultural land, meaning that hundreds of millions of acres can be mobilized for climate action with no change in consumption and no shift in the degenerative CAFO economy. This position contradicts consumption-based orthodoxies of

change, even though it is robust, “low-hanging fruit.” Neither the good food movement, nor the less meat movement are prioritizing progress in farming because they’re focused on the purity of the eventual eating.

The topic of who eats the beef is another systems-level quandary. If one thousand individual consumers chose a plant-based diet, we wouldn’t know if it actually contributed to meat replacement in the larger food system. So much depends on the boundary of analysis – plant-based meat sales in the US are soaring, but US beef exports concurrently hit record highs. In other words, successfully changing consumption does not seem to reduce beef production worldwide. It certainly reduces a personal or organizational carbon footprint, but because global demand for beef outpaces the reduction in first-world beef consumption, the macroeconomic impact is almost certainly not a 1:1 effect. There is definitely leakage and the effect of a shift in consumption may be negligible. In the absence of government intervention around production or consumption, the only *certain systemic progress* is improved grazing.

Even critics of regenerative grazing concede that these practices have the maximum potential to mitigate climate change when applied in highly degraded soil, where carbon has been lost. Already, half of the world’s agricultural land has been lost to soil degradation, and we have an “opportunity to sequester C from the atmosphere into the soil using adequate grazing management practices.” Perhaps after society has already addressed the catastrophic loss of soil on billions of acres, we should re-evaluate. For now though, improved grazing should be among our absolute highest priorities because progress is so plausible through collective regeneration.

Part 2: Public-Private Collaboration

I'm often invited to webinars and panels with titles like "Financing the Transition to Regenerative: Who Will Pay?" As it happens, an overwhelming body of market research shows that most consumers are willing to put their money into climate solutions and sustainability premiums. A globally representative study of over 130,000 respondents found that "69% said that climate action would be worth 1% of their personal income." A survey of over 20,000 respondents found that "Consumers willing to pay 9.7% sustainability premium, even as cost-of-living and inflationary concerns weigh" As we'll discuss in this section, consumer demand can and must be leveraged with public funding and policy to achieve collective regeneration. (*See additional market research in References*).

Renewable Energy's Blueprint Could Scale Regeneration

Local and regional control of energy policy has enabled a transformative shift from conventional to renewable sources: as of 2024, 96% of new US power plants will run on clean energy. Large cities like Los Angeles and San Diego have committed to 100% renewable energy, while 30 states and DC require minimum renewable/clean energy sources for electricity generation. Often, local public-private collaborations drive progress in spite of $760 billion in federal subsidies for fossil fuels (2022).

Food system leaders should look to the history of renewable energy as a testament to the power of local collective action. Like the energy sector, US agriculture is full of perverse federal subsidies for "conventional" practices, but it is still possible to chip away at the powers that be, as Beyond Coal proved by mobilizing communities one at a time, to decommission over 300 coal-burning power plants. Transformative change–one foodshed at a time–could mirror this kind of change in one energy grid at a time.

In fact, the US Food Economy has ample resources simply waiting to be mobilized (~$949 Billion from food service plus ~$885 Billion from grocery, adding up to ~1.8 trillion dollars in revenue). So, whereas fossil fuel subsidies are equivalent to ~50% of the domestic energy economy, the total amount of federal subsidies for unhealthy soil amounts to only ~1% of the food economy.

A 1% nationwide food tax is not on the policy horizon, yet almost every jurisdiction could create real climate action by establishing optional fees of 1% from the local food economy for reinvestment in the regional foodshed. San Diego, for example, could create a funding mechanism to scale up its Carbon Farming Program Pilot. A 1% optional (opt-out) fee at San Diego's 8,100 restaurants would generate over $100 million per year, or more than $400 per acre/year. Such regional funding for regenerative agriculture would also provide significant community-level co-benefits, like water conservation and resilience to extreme weather, meaning collective regeneration programs would be politically plausible. Philanthropy and food system advocates must begin to focus on beta-testing local policy frameworks to scale regeneration from the grassroots up.

Mass Balance

We know how to"improve the grid" from conventional to renewable energy: collective action programs like one dollar from each household's monthly utility bill goes into the cost of a multi-million dollar solar or wind project. As participants, we don't expect that our homes are receiving the specific electrons produced by the clean energy projects they funded; rather, we expect our energy grid to be incrementally decarbonized. This "mass balance" approach has advanced energy grids from coal to 10% renewable, then 20%, then 30%, and so on. This frictionless, incremental approach has also driven sustainability efforts such as recycling, sustainable building materials and is well known in food, but not yet embraced in regeneration.

We need to invest in restoring the soil that underpins our food system, whether that's a dollar from an individual consumer or a million dollars from federal subsidies. We can put our private and public dollars toward change in the field – even if regenerative wheat is mixed in with degenerative wheat, and even if regeneratively raised cattle end up in CAFOs. A bag of flour could be 10% regenerative, then eventually 20%, then 30%, etc. Millions of "conventional" ranchers could sequester carbon while improving their water use–regardless of what happens after the cow leaves their ranch. Every economy related to agriculture *could* engage in collective regeneration, whether it's $1/trash bill or 1 penny per lb or 1% or a round-up at the register. Thought leaders and decision-makers must embrace mass balance to mobilize these economies. In fact, a mass balance approach is the only path to truly scale regeneration, because the intense aggregation of food systems is logistically and politically entrenched.

Local and Regional Collective Action

The primary federal funding for conservation practices on farms is about $4 billion per year through the USDA's Environmental Quality Incentive Program (EQIP) and a recent windfall in the Regional Conservation Partnership Program (RCPP). This figure sounds big, but it amounts to a mere ~$4 per acre and is wholly insufficient for the task of regenerating US farmland. Federal grants to implement regenerative practices currently face a backlog of 100,000 farmers – and even more farmers would likely apply if not for the cost-share requirements, reimbursement basis, and cultural barriers related to federal grants.

Many food system leaders overlook the potential for city, county, or state-level policies to make a real difference. Collective action programs of the kind we have seen in relation to energy bills, energy transition finance across local economies, recycling, and disposal have yet to manifest in agriculture, But the early groundwork is being laid. Counties, including Boulder, Marin, Santa Clara, San Miguel, and Sonoma, are creating conduits for funding to flow from urban centers into rural regeneration through regional healthy soil funds. These five counties could accelerate these programs and three thousand other counties could begin programs.

Dozens of states now have nascent agricultural funding programs (which is great!), but the total funding available is a drop in the bucket. Almost every state-level program has less than $1/acre/year available because agricultural transition has not been a priority use of taxpayer dollars. If we compare that to the $20/acre/year that a modest 1% from the food economy would

typically generate, we can envision a path forward for a rapid transition to regenerative agriculture that is unconstrained by the tax base, through public-private collaboration.

Compost Policy

Compost application on agricultural lands is perhaps the most efficient carbon sequestration practice. Regional compost supply is booming, due to new organic-waste reduction policies in California, Washington and numerous cities around the country, and federal funding may be deployed to accelerate diversion from landfills as well. The trouble is, these programs do not include funding to move compost the "last mile" to farms and ranches.

A regional approach to compost management represents an opportunity to close nutrient loops, bridge urban and rural economies, and optimize carbon sequestration. The federal government is not well situated to lead this charge, given that the USDA's NRCS did not even recognize compost as a conservation practice until 2020 (interim CPS 808), finalizing its inclusion in 2022 (CPS 336). This despite documentation of the central role of composting in cultivation since 2350 B.C.

Because funding for compost application on working lands must scale, and because waste diversion policies are already creating the added supply, regional economic programs are the highest leverage policy opportunity in the entire regenerative agriculture landscape. Simple mechanisms mirroring renewable energy programs, like $1 per trash bill, could generate $1.3 Billion per year nationwide for compost purchase, transportation, and spreading, incentivising agriculturally suitable quality and use.

Insetting: A Crucial First Step in a Larger Paradigm Shift

On the surface, offsetting is a potential financial mechanism for agricultural climate solutions, but there is already prevailing criticism around soil carbon offsets because as little as 5-10% of each soil carbon credit dollar would reach farmers. Offsetting is also inherently retroactive, whereas carbon insetting is a proactive resource mechanism we embrace. However, even in the case of insetting, it may not be possible to reconcile insetting within existing carbon accounting paradigms.

Rather than insetting in the current sense of supply chain decarbonization accounting, we ought to utilize a simpler, purely financial accountability system. Taking this position to the logical extreme, each $1 used for decarbonization could be tracked (regardless of the resulting quantity of ecosystem services or tons of CO2e reduction/removal). Before immediately dismissing this proposed paradigm shift, consider this theoretical explanation for a pure financial impact model. The shift from inventory accounting to a new form of "economic allocation-based insetting" is the clearest way forward in food system carbon accounting. This is a complex topic that warrants analysis among carbon accounting experts, but our fundamental focus on resource allocation also applies to inset accounting. Instigating the change in farming is the ultimate shared goal, regardless of how we track and account for carbon, biodiversity, water, resilience, equity, nutrient density and prosperity.

Collective Regeneration

In summary, a transformative shift in agriculture can be accomplished by proactively and directly deploying resources to change farming.

Instead of credits/products/price premiums (indirect and retroactive reward approaches), a more sensible approach to align incentives with systems-level outcomes would be for the food economy to engage in collective regeneration. This could be viewed as simply internalizing the externalities to generate robust resources for the proactive "next practice on the next acre."

Many accountability frameworks (ESG, SEC reporting requirements, Science Based Targets Initiative, etc.) are in the nascent stages of a multi-year evolution and may never be able to universally consider co-benefits. Society cannot wait and must urgently embrace fiscal accountability and action instead of delaying to achieve consensus around technicalities and reporting. Simple disclosure about the financial resources used for decarbonization would suffice. If one company used 1.0% of revenue for public good and another used 0.0001% of revenue for public good, all public disclosures would be crystal clear.

If we can move past purity and focus on progress, each $1 or $1 million *could* be mobilized urgently through mass balance, to restore the climate and improve water cycles, biodiversity, resilience, nutrition, and prosperity. Capitalism *could* regenerate at scale once thought leaders, business owners, and consumers embrace collective regeneration. We could team up and create transformative change in agriculture with a modest 1% shift in the current food economy, and this affordable shift would create an immense multiplier effect of benefit.

We're taking meaningful action now and we invite you to join us in building this Table to Farm movement. Almost all of us can afford to make this change, and the truth is, we can't afford not to make it.

References: Changing Farming to Reverse the Polycrisis

Some of the following citations are scientific and others are recommendations from leading organizations, but taken as a whole, these resources show that changing farming is necessary and incredibly beneficial.

Climate

- Total Potential: " Scientists estimate that global soil carbon restoration could sequester up to roughly 294–331 Gt-CO2-eq, with an upper limit of ~489 Gt-CO2-eq"
- Within the context of the whole challenge: "existing management strategies on current agricultural lands have the potential to **reduce global temperatures** by the end of the century, sequestering as much as 1.78 Pg C year−1."
- Best case scenario: "If carbon sequestration rates attained by exemplary cases were achieved on crop and pastureland across the globe, regenerative agriculture would sequester more than our current annual carbon dioxide (CO2) emissions"

Water

- A global plan to "Safely and naturally cool regional and the global climate by three watts per square meter to offset and buffer the greenhouse warming we have induced to date."
- Common knowledge: "One percent of organic matter in the top six inches of soil would hold approximately 27,000 gallons of water per acre"
- Micro study of the actual cooling from a mere two hedges: The two hedges could consume 68.44% and 60.81% of the net radiation through latent heat of ET on the summer day, while their cooling rates on air temperature were 1.29 °C min−1 m−2 and 1.13 °C min−1 m−2, respectively

Biodiversity

- "The biodiversity crisis -- i.e. the rapid loss of species and the rapid degradation of ecosystems -- is probably a greater threat than global climate change to the stability and prosperous future of humankind on Earth.
- More than a third of the world's land surface and nearly 75% of freshwater resources are now devoted to crop or livestock production.
- Biodiversity is as Important as Climate Change–How Regenerative Agriculture Can Help

Nutrition

- Dozens of studies reflect increased nutrient density from farms implementing regenerative soil health practices.
- ...studies consistently show that organic and regenerative crops contain higher levels (phytochemicals) than conventional crops, and often several times more.

Resilience

- Only 60 Years of Farming Left If Soil Degradation Continues

- The emerging global vision is to create a new food financial architecture with governments, the private sector, and development partners mobilizing as much as US$400 billion a year until 2030 - far less than the cost of inaction estimated at $12 trillion a year in environmental, social, and economic damage to communities, families, livelihoods and lives.

Prosperity

- Regenerative Cropping: $115 billion cost to implement at global plausible adoption rate with $3,725 billion in operational savings and profit.
- Managed Grazing: $49 billion cost to implement at global plausible adoption rate with $4,530 billion in operational savings and profit.
- "American consumers spent an estimated $1.1 trillion on food...the true cost of the U.S. food system is at least three times as big—$3.2 trillion per year." (without even considering the opportunity cost).
- Crop insurance eligibility, which is limited to USDA-approved "conventional" agriculture and also underpins lending.

Market Research

- 69% would contribute 1% of their personal income in exchange for climate action
- "Consumers willing to pay 9.7% sustainability premium, even as cost-of-living and inflationary concerns weigh"
- 88% of people in the US and UK want brands to help them be more environmentally friendly
- On average, 70 percent of purpose-driven shoppers pay an added premium of 35 percent more per upfront cost for sustainable purchases
- Plant-Based Meat Market
- US Beef Exports to Asia

Other Works Cited

- How much of the food dollar do farmers get?
- Good Farming Practice Determination Standards - USDA
- While demand soars, less than 1 percent of U.S. farmland is certified organic. So why don't farmers switch?
- Ramping up sustainable circular economy with mass balance solutionsClimate-positive Life Cycle Assessments - White Oak Pastures
- Is Grass-Fed Beef Really Better for the Planet? - NPR
- Voisin Rational Grazing as a Sustainable Alternative for Livestock Production
- Nearly all new US power plants built in 2024 will be clean energy