



ESSAY

Food for thought: Regenerative agriculture is degrowth

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Information

Received 31 May 2022

Accepted 1 February 2023

Online 8 August 2023

Keywords

Regenerative agriculture

Agroecology

ecosystems management

soil health

post-capitalism

Ecological agricultural movements, such as regenerative agriculture and agroecology, epitomize degrowth principles in practice. If a planned reduction of economic throughput and energy consumption is to become reality (Hickel, 2020), agriculture must exist in harmony with planetary boundaries and in line with socioeconomic needs to contribute to frugal abundance, equitable livelihoods, and food sovereignty for all. Post-growth food webs must be centred around communities, localized provision, and culturally appropriate, nourishing diets. Agroecology offers a simpler way of life with more connection, community, and care. Regenerative is the agriculture of a degrowth future.

Despite the clear conceptual connections between regenerative agriculture and degrowth, the link between the two needs to be more explicit in academic literature (Gomiero, 2018). While the academic body of work on degrowth advocates for reforming agricultural and food systems, it does not offer a comprehensive understanding of the synergies and opportunities with regenerative agriculture (Strenchock, 2020). It is a missed opportunity not to recognize

and promote agricultural practices that can pioneer degrowth in practice for a sustainable, just future within planetary boundaries.

1. Regenerating ecosystems and communities

Regenerative agriculture is a set of holistic practices that increases organic matter in the soil and thus nutrient density in the produce and enhances biodiversity and water cycles. The regenerative movement emerged with the goal to end world hunger and reverse the climate crisis while reviving local economies and farmers' independence in the food system (Beste, 2019). Regenerative practices include no or minimal tilling, rejecting chemical pesticides and herbicides and synthetic fertilizers, integrating animal farming with pastures, and diversifying crop rotation using cover and companion crops. Where pastures and forages are incorporated into farmland, rotational grazing strategies fertilize the soil and improve the welfare of farmed animals while allowing pastures to recover (Lal, 2020). Agricultural approaches that regenerate ecosystems safeguard the balance of nature by respecting ecological interconnectedness and reciprocity (Hickel, 2020, p. 285).

Similar ecological agriculture movements run under different names, depending on their focus and framing, but share the same principles. When discussing their underlying logic and corresponding practices, the terminologies are virtually interchangeable. Agroecology is another way of referring to a system of food production that values healthy and diverse agroecosystems and social networks to secure livelihoods for producers and nutritious food for consumers (Friends of the Earth Europe, 2022). Agroecology incentivizes soil conservation and regeneration. Through acknowledging planetary biophysical limits and understanding the farm as a living classroom, it promotes biodiversity-friendly production. Agroecology embraces the entirety of the food system, as it is considered a science, a practice, and a social movement at once (Agroecology Europe, n.d.). The term agroecology is more typical for smaller, human-scale operations, such as smallholder farms, market gardens, or micro-scale growing systems, with added social and economic considerations for grower-consumer relationships (Strenchock, 2020; Strenchock, 2022). This goes beyond organic farming, a rapidly growing market of chemical- and GMO-free production certified by international standards (Beste, 2019). Permaculture similarly integrates land, people, and the natural world

in circular ecosystems, where agriculturally productive ecosystems are as diverse, stable, and resilient as natural ecosystems. However, it is a broader, multidisciplinary concept also applying to aquaculture, hydrology, energy, waste management, and more. Permaculture exemplifies the philosophy of working with, rather than against, nature in its wholeness (Permaculture Research Institute, n.d.). The holistic approach that connects these movements and practices brings humans into natural ecosystems to live as a part of nature, not apart from it.

Regenerative practices minimize external inputs—chemicals and heavy machinery—and address the needs of the land in a natural and sustainable way with the priority of improving soil health. They often draw on techniques long used by Indigenous peoples and small farmers who, by way of ecological intelligence, learned to live within the ecosystems that nourish them and others (Hickel, 2020, pp. 256-286). Holistic management embodies farming and ranching in nature's image. Today, frequent testing of soil biology helps farmers learn about their land ecosystems and deal with its complexity. Farmers usually experience advances in yield, profitability, and quality of life (Brown's Ranch, n.d.). That is because holistic soil management mitigates negative externalities, such as land degradation, drought, biodiversity loss, and water pollution. Thus, improved soil health helps farmers as well as diverse ecosystems thrive. Healthy soil captures more carbon, retains more water, and feeds more people.

This is especially welcome at a time when global food systems contribute to the transgression of planetary boundaries in the realm of biodiversity, land-systems, chemical flows, and climate change (Steffen et al. 2015). The global food system accounts for 30% of total annual greenhouse gas emissions, expected to increase by 30–40% by 2050 (Lunik and Raspe, 2021; FAO, 2021). Animal-based agriculture has a particularly large footprint, occupying 45% of total land area, contributing about 15% of all anthropogenic greenhouse gas emissions, and soaking up 8% of global water withdrawals (Lal, 2020; FAO, 2013).

These adverse effects on the environment, compounded by resource poverty of small landholders, result from the way animal husbandry and crop farming is practiced (Lal, 2020) as siloed industries with no regard for ecosystems, weather cycles, and biodiversity. Holistic

management offers a unique solution by reducing external interference with soil biology and landscape biodiversity and enhancing the benefits of the natural world. Areas where regenerative agroecology methods have been used have experienced not only improved crop yields but a rebound in insect, bird, and earthworm populations (Hickel, 2020, p. 286). These approaches can offset anthropogenic emissions by sequestering and storing carbon in the soil—without geoengineering or high-tech innovation—simply by working with nature.

The social story of regeneration is one of community. While conventional agriculture is driven by the world's biggest agricultural, pharmaceutical, and chemical fertilizer companies, regenerative farms are generally run by families or cooperatives, not corporations (Massy, 2018). Growers are often activists, educators, researchers, authors, and retailers in one. Through open networks they are able to collaborate and learn from each other. Tighter supply chains bypassing retailers allow for direct connections between producers and consumers, building trust and community. Depending on their marketing and social outreach strategies, farmers often interact with consumers directly at distribution points, markets, or at the farm (Strenchock, 2020), adding responsibilities to an already heavy workload.

Since holistic approaches require understanding of and care for complex ecosystems, they are more labor intensive than other agricultural models. Any kind of farming demands hard, physical work. Because regenerative farmers do not rely on heavy machinery, monocropping, or chemical inputs, they work more intensively. Weeding, seeding, and harvesting is done with care and respect, often by hand depending on the size of the operation. This intimate relationship between farm and farmer carries on along the food web; an appreciation of the intensive work and care throughout the growing and selling process increases the appeal of regenerative products.

One criticism of regenerative agriculture is its middle-class niche. Given the invested time and labor and the high quality and nutrient density of the produce, regenerative food is more expensive than mass-produced industrial food. Together with its lack of prevalence in conventional food stores, prices make regenerative farm products inaccessible to the majority of people. From a consumer's perspective, seeking out regenerative produce takes extra time, effort, and money. Because it is the regenerative farming community's intention to avoid

labels and conforming to certifications—understanding regeneration as a process and a set of principles instead of objective standards—purchasing these goods is best done directly from the grower or trusted retailers. Access to these forums, even a chance to make healthy, sustainable food choices, is a privilege.

However, the power of regenerative agriculture lies in its holistic knowledge of context. It can be adapted to any local context, culture, custom, or society. Regenerative principles will look different across the world—be it tropical food forests, arid pastures, or temperate market gardens—but holistic systems are able to create agroecological food webs available to local communities. In India, mass-scale dairy production comes from smallholder farms with an average herd size of 2-4 cows—not feed-fed, non-slaughter, non-fortified livestock, whose milk is consumed primarily by close family, and the surplus sold through cooperatives (Fernandes, 2022). Models and market channels vary across cities and states. Examples like this demonstrate how an alternative local model of smallholder farms and cooperatives can cultivate nutritional security, culturally appropriate diets, and the right to livelihood for communities while strengthening connections to the land where food comes from. The point of agroecological food webs is to re-localize food distribution and empower communities. Ecosystems are circular—food systems can be too.

2. Regenerative agriculture is degrowth in practice

Holistic management with its climate ambitions and immense ecological and health benefits is degrowth in action. Synergies appear with the environmental, economic, and societal aspects of degrowth. First, the agricultural practices themselves exemplify degrowth principles as they foster a circular flow of nutrients, reduce waste, and tap into natural solutions to balance insufficiencies or overshoots. In a natural equilibrium, soil health, water cycles, and ecosystems provide sufficient abundance for plants, animals, and humans, respecting planetary biophysical limits. Appropriate land stewardship and integrated grazing increases ground cover, which means capturing more solar energy through photosynthesis and converting it into sugars to grow root mass and intensify biological activity. Tilling that breaks up soil structure and biology is avoided. Increased soil organic matter and better soil structure boost water infiltration, storage, and retention, making landscapes more resilient

to droughts and floods. Animal- and plant-based fertilizers also support soil mineral cycling and availability (Soils for Life, 2021).

When the carbon entering a system through photosynthesis is greater than the carbon leaving the system, it is called carbon sequestration. Under current agricultural practices, such as monocultures, soils lose 20-40% of organic carbon and thus act as carbon emitters instead of carbon sinks. Adding soil organic matter can enhance carbon sequestration, slow oxidation, and reverse desertification and thus mitigate the climate crisis (Weiske, 2007). The 2020 IPCC special report on climate change and land identified greenhouse gas mitigation opportunities in agriculture to be “cropland management, restoration of organic soils, grazing land management and livestock,” together with agroforestry practices such as rotational woodlots, long-term fallow, and integrated land use. The report states with very high confidence that “Land degradation in agriculture systems can be addressed through sustainable land management, with an ecological and socioeconomic focus, with co-benefits for climate change adaptation. Management options that reduce vulnerability to soil erosion and nutrient loss include growing green manure crops and cover crops, crop residue retention, reduced/zero tillage, and maintenance of ground cover through improved grazing management” (IPCC, 2020, B.5.1). In sum, sustainable management brings climate action by degrowing material footprint.

Second, the economic implications of regenerative agriculture, while embedded in the current capitalist production model, carry the seeds of degrowth from germination through cultivation to purchase and ingestion. At the micro level, regenerative farmers can reject the principles of growth, extractivism, and industrialism inherent in capitalist economies (Bukhart et al., 2020). Harnessing biological feedback loops—for instance relying on mycorrhizal fungi to share micronutrients among plant roots or on predator insects to deter parasites—creates efficiency without the need for external inputs. The current food production model centered on commodities incentivizes farmers and ranchers to produce more and more, without regard to the quality and nutrient density of the product reflected in pricing. Regenerative agriculture is changing that, linking growers and consumers who are willing to pay for a higher quality product (Brown, 2021). Quality food can balance calorific overload and overconsumption prevalent in capitalist societies, where the desire to sell and consume ever

more creates a paradox of fitness and health (Jackson, 2021). Quality, instead of quantity, becomes of highest value when we swap monocultures for biodiversity and automation for labor. Holistic management is labor and care intensive; such time and energy cannot be downsized, upscaled, or automated. Extraction-based agribusinesses have struggled to adapt regenerative methods precisely because they require time and labor, understanding the farm as an ecosystem, and forging an intimate relationship with the land (Hickel, 2020, p. 286).

Labor, according to Jackson (2021), upholds the conditions for life and biological survival. Labor is care and sustenance. Its value to society is vital. Yet these activities—housework, farming, caring for others—are left behind by capitalism. Currently, some workers in the food sector cannot afford basic services, unable to pay for the food they themselves produce. What Jackson calls the slow sector of the economy is where the labor of care provides services rather than material goods, where the emphasis is on spending time rather than selling things. The slow economy depends on human skills and is intrinsically less damaging to the Earth. This, according to Jackson, is the economy that matters, that provides prosperity, health, and wellbeing, and that serves as the foundation of a flourishing post-growth society. The reward of labor is life (Jackson, 2021, pp. 111-124).

Regenerative practices rooted in care and skill work at any scale, from vegetable pots through market gardens to 2,000-hectare operations. In that sense, agroecology is scalable. However, scaling as applicability to varied land size is in stark contrast with the economies of scale seen in capitalist systems, which depend on colonization and appropriation of increasing and externalized resources in order to create a system of mass production with minimized costs (Hickel, 2020). Agroecology encompasses the decommodification of production through building relationships and social benefits. It relocalizes supply chains and food systems through transparent networks of production and consumption (Strenchock, 2022). Since such food collectives are place-based by nature, they do not scale up like commercial firms. However, they do spread, exchange knowledge, and build networks. It is a fine balancing act of people, nature, and management (van Woerden, 2021).

Regenerative farms can, and sometimes do, grow. Independent of the size, farmers over time are able to cut input cost and at the same time increase their yield per land unit, quality of

produce, and thus their profit (Brown, 2017). Its ability to grow, within planetary boundaries and without extraction or exploitation, would render regenerative agriculture growth agnostic. Applying Kate Raworth's Doughnut Economics (2017), regeneration lands between the social foundation and ecological ceiling. In this model, regenerative farming is clearly a generative enterprise as it strives to meet the needs of people within planetary means and generate benefit through its purpose, networks, governance, ownership, and finance (DEAL, n.d.). Even a profitable regenerative operation is not an extractive enterprise, as considerations for the living environment and planetary health trump the extraction of financial value. This way, growth is a mere byproduct of responsible and reciprocal operation, not an end goal in itself.

Nevertheless, the profitability of regenerative practices can prompt farmers to downsize—in direct contrast with the capitalist imperative to reinvest. Farms, driven by fear for survival, are under strong pressure to acquire more land to increase their often thin margins. In a world of direct competition and artificial scarcity, growers' lives are governed by the imperative to intensify production and maximize output, justifying new rounds of enclosure and colonization of lands, forests, and waters in a blind pursuit of growth (Hickel, 2020, pp. 56-62). But a better understanding and cooperation with the land can help resist the urge to invest in ever more inputs and resources. In some cases, regenerative practices replace some inputs with others, for instance, synthetic fertilizers with cover cropping. However, the real transition lies in replacing inputs with management, costs with care. With appropriate management, smaller farms can be more profitable. A regenerative grower from Arkansas said, "Our ultimate goal is to continue to downsize, to get smaller and to do more on those acres" (Chappell, 2021). And this is possible because regeneration increases the carrying capacity of the land, as testified by regenerative rancher Dr. Allen Williams: "Compared to our neighbor, we have easily three and a half times more forage growing per acre. I can carry three and half times more cows on the same five thousand acres" (Soil Health Academy, 2020). This not only negates the mainstream growth imperative but also allows for shorter working hours (Hickel, 2020) and re-appropriating free time (Liegey & Nelson, 2020) away from the field, summed up in the maxim "You need to have a farm you can work, not one that will work you" (Chappell, 2021).

Third, in addition to the practical and economic factors, regenerative agriculture is also degrowth-specific in its organizational and societal aspects. Just like the degrowth movement, regenerative networks tend to be decentralized, multidimensional, open, and non-hierarchical (Liegey & Nelson, 2020). Non-hierarchical food production circumvents big corporations and long supply chains and constructs more equitable food systems. These empower producers and support their resilience in the face of market pressures, climate risks, government interventions, and economical shocks.

In all its forms, sustainable agriculture brings people together in the collective sphere. Local food cooperatives, food self-provisioning, and community supported agriculture are prime examples of degrowth in practice (Liegey & Nelson, 2020). The social principles of degrowth are embedded in agroecology. In the name of solidarity, holistic food systems can unite diverse people from all walks of life and create communities that enjoy spending time together in a collective struggle towards a common goal (Strenchock, 2022). These principles underpin food sovereignty defined in the Declaration of Nyéléni (2007) as “the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems.” Food sovereignty puts people before profit and places them at the heart of food systems. Civic consciousness and engagement can pave the way out of the present, unsustainable system of corporate food trade. Especially in times of crisis, alternative food economies emerge (Calvário & Kallis, 2016); food cooperatives revitalize communities, augment production, and change consumption habits in favor of local products (Tsagkari, 2017).

Finally, the importance of empowerment binds holistic agricultural principles to degrowth. Empowerment, at the community as much as the individual level, means passing on competency between generations, networks, regions, and communities to uphold the values of balance, reciprocity, and prosperity as health (Jackson, 2021). Learning by doing is intrinsic to holistic management. The opportunity to learn something new every day from nature can motivate young people and communities to get involved in agriculture and participate in the food system that sustains them. Wanting to adapt to nature then becomes a way of reappropriating the societal value of farming and food giving (Liegey & Nelson, 2020).

There are myriad possible food systems that are sustainable, localized, resilient, and healthy and conform to degrowth principles of frugal abundance, autonomy, and conviviality (Nelson & Edwards, 2021). Regenerative agriculture is one of them. Gabe Brown (2021), a North Dakota rancher and educator sums it up: “Nothing can take more carbon out of the atmosphere and store it in the soil than regenerative agriculture. We can keep the nutrients on the farm, on the ranch, where they should be, so to heal the water cycle. Regenerative agriculture has the ability to produce food much higher in nutrient density, thus helping our gut microbiome, thus helping to build our immunity. No matter our concerns, regenerative agriculture has the ability to bring people together.”

3. Hauling a post-capitalist future

Micro farms and regenerative ranches create social and environmental benefits synergistic with degrowth and thus have the potential to pioneer systemic degrowth in not just abstraction but lived realities. Further research is welcome on food systems for degrowth to better understand short supply chains, farmer priorities and dilemmas, and consumer patterns (Strenchock, 2020). Now, the degrowth movement should embrace regenerative agriculture because it is feasible and hopeful and ultimately manifests abundance.

At the moment, the ideal scenario of global economic degrowth and localized limited growth is not planned and implemented across governments and societies. Hence, the storytelling of grassroots-level degrowth must present diverse lived narratives not just abstract concepts (Nelson & Edwards, 2021). Regenerative agriculture is an entry point for mainstreaming degrowth practices from the bottom-up. If a comprehensive, strategic reorganization of societies worldwide along degrowth values and perspectives is currently not feasible, regenerative agriculture can still sow the seeds of degrowth in the formal economy on the one hand, while creating localized post-capitalist economies on the other.

First, because it offers profitability, regenerative agriculture can be well integrated into the current profit-oriented economic system. In the transition trajectory towards a post-growth future, such compromises will be necessary. Terzi (2022) argues that growth can be for good if popularly backed policies reshape capitalism and address inequalities. He finds that

although up until now extraction and efficiency were the driving forces behind capitalism and growth, it does not necessarily have to always be this way. In his optimistic, long-term view of humanity's historical, civilizational challenges, capitalism can be made green and sustainable if we manage resources in the most efficient way possible. Applying this lens, growth in regenerative crop yields and associated health gains can be accounted for as good growth. Besides, "re-generation" evokes a positive, hopeful imagery implying a return to a more prosperous, lively state, a future that is better than the present. Coupled with a leeway for good growth, the hopeful, practical image of regenerative agriculture as an example of degrowth in reality can assuage fears that the ideas of "limits to growth" or "planned reduction" may elicit in conversations outside the degrowth movement.

Second, these practices already exist; working examples are wide and diverse. Regenerative farms are mushrooming across the agricultural regions of the United States as well as Australia, and alternative food networks bloom in Europe. In Australia, soil nutrition and pasture ecology approaches have reached ten thousand farmers, about 10% of all farmland on the continent (McCosker, 2020). In Central Europe, degrowth-compatible food self-provisioning has been a prominent response to the deepening global food crisis. Driven by a yearning for fresh and healthy food, hobby gardening, or family tradition, food self-provision and food sharing networks cultivate non-certified organic produce and slash agricultural greenhouse gas emissions and food waste. They achieve sustainability objectives implicitly, without a formal movement or targeted action (Daněk & Jehlička, 2020).

In a call for bold climate action, religious leaders pleaded: "we must choose to eat, travel, spend, invest and live differently (...) Choosing life means making sacrifices and exercising self-restraint" (Vatican, 2021). This is no small quest. Degrowth and sustainability are easier to achieve in agriculture than energy for example, because the foundations already exist and do not require technological innovation. For that, we can extend the notion of sustainability to outcome rather than intention. Education and value discovery through decolonizing the imaginary (Liegey & Nelson, 2020) are indispensable, yet limited and slow in front of the imminent challenges of the planetary crisis. In the near term, before societal values change, we should work with what is, drawing on the desire for a good life that is not destructive at the same time (Jehlička, 2022).

The way we eat defines our way of life. Food is an obvious and essential prerequisite to a good life, whether in growth or frugal abundance. And therein lies its power. Living as one planet—because there is only one and because on it, we are all one (Hickel, 2020)—as opposed to exploiting other species and natural resources not only is our only option but should be our ultimate goal as humans. Sustainable transformations in how we produce and consume our food have massive potentials for carbon capture, biodiversity and landscape conservation, freshwater preservation, land use, and public health. Everybody eats. Everybody has the power to make a difference. We must harness this potential and make a sustainable way of life accessible, enjoyable, and inevitable for all.

Conflict of interest

The author has no conflict of interest to disclose.

Funding

The author did not receive any funding for this research.

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