



Short Communication: Regenerative agriculture – who shall drive the change

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Thesis:

Environmental concerns are now a priority at key global gatherings spanning political, social, and economic domains. Influenced by environmental activists like Al Gore and Greta Thunberg, world leaders are exploring effective strategies to tackle environmental issues, which often clash with various economic sectors' interests. Agriculture is a central topic in these debates due to its significant role in greenhouse gas emissions, water shortages, pollution and deforestation. There's a widely accepted view that it's not viable to pursue environmental goals at the cost of the economic well-being of specific industries and countries – latest farmers' protests in Europe strongly support this view. Consequently, the focus has shifted to seeking alternative approaches that maintain economic productivity while mitigating environmental harm and potentially reversing the adverse effects of industrial activities on the planet. A set of agricultural practices aimed to support soil health jointly referred to as regenerative is an example of such an approach. Although there is a consensus on the advantages of regenerative agriculture, issues related to funding, implementation risk and required expertise are still hotly contested. Finding a balance between public benefits and the risks and incentives for farmers remains a critical, yet unresolved issue that propels the conversation well beyond the realm of agriculture.

The article

To provide some context on the evolution of modern agriculture, it still lives in the aftermath of what was called the Green Revolution. The Green Revolution involved adopting advanced agricultural technologies, including high-yield crop varieties, extensive use of chemical fertilizers and pesticides, and new farming techniques. This transformation began post-World War II, aiming to increase food production to meet the growing population's needs. Initially, this approach was incredibly successful, leading to a more than twofold increase in crop yields within the first few decades. However, despite a colossal increase in the use of synthetic fertilizers, crop yields stagnated in the last decades, illustrating a diminishing return on these inputs. While intensive agricultural approach significantly boosted crop yields and farm productivity, leading to greater food security, it also raised environmental and sustainability concerns due to the heavy reliance on chemical inputs and water usage.

Agriculture has long been criticized for its extensive environmental footprint, accounting for 70-90% of global freshwater withdrawals, approximately 30% of greenhouse gas (GHG) emissions and 80% of deforestation and biodiversity loss according UN data summarized by 2024 World Economic Forum report (1). The continuously growing population puts excessive pressure on the food system, which can cause catastrophic and irreversible effects on the environment, should food production continue to follow traditional practices. The importance of food and environmental agenda are both captured in the UN 2030 Sustainable development goals – zero hunger and climate action (2), focusing, among other topics, on halting and reversing land degradation by prioritizing sustainable agricultural practices. Prominent international organizations like the Food and Agriculture Organization of the United Nations (FAO) and Davos World Economic Forum, leading advisory firms and research institutes focused on the task of increasing food production without a proportionate increase in related environmental risks, yet we still do not have the generally accepted strategy to move forward. The agricultural community weighs up a few options aimed to reshape the current food system – from cultured

meat and alternative proteins to agricultural practices aimed to address environmental concerns, cumulatively referred to as regenerative agriculture. Even though the latter approach has many supporters and is believed to be a mainstream scenario, a particularly important question remains without an answer – who should drive the change.

To address this question let us look at the food supply chain, the simplified version of it, focusing on four major participants and their relations with the regenerative practices. For that purpose, we single out input providers (seeds, biochemicals, fertilizers, equipment, finance), farmers (all those growing crops and/or animals, ranging from small farmers to multinational corporations), food companies and consumers. We leave out retail, logistics and other participants in the attempt to fit the argument into a small article and dive into the motivation of each group in terms of changes to the status quo.

Input providers. This group represents a mature segment of the economy dominated by large multinationals. These are sophisticated market players with large analytical and agronomical teams accumulating the bulk of the market's agricultural expertise. Most of them are public companies with primary responsibility to their shareholders to preserve and grow the market value, therefore one should not expect from such companies a massive risky investment in new technologies. Even though seed and chemical companies recognize the shift towards regenerative agriculture as an opportunity to grow in markets adjacent to their core business areas and signal markets about their interest, declaring plans to shape regenerative agriculture on hundreds of million acres, the execution is slow, and goals are rolled over to next years. The delays are explained by technological limitations and resistance of farmers, expecting extensive support in the process of transition to regenerative practices. The true reason being motivation – statistically, mature companies are not the ones driving change.

Farmers. This is the most controversial group, combining both vivid adepts and strong opponents of regenerative practices. As farmers often work on their own land, they are the first beneficiaries of regenerative practices, aimed in the first place at improving the soil's health. At the same time, farmers are those who are taking all risks of transition to regenerative practices. Being one of the most conservative and vulnerable groups from an economic viewpoint, most farmers oppose changes and rightly question whether they should bear all the risks of transition alone.

It is expected that farmers should be the ones who understand the value of agricultural land and the damage caused by traditional agricultural practices. However, numerous examples of lacking crop rotation compensated by a heavy use of fertilizers and chemicals prove that latest statistics and knowledge on soil's health remain either untrusted or unclaimed, even though numbers are staggering. According to FAO, 33% of the Earth's soil is already degraded and over 90% could become degraded by 2050, if current unsustainable practices persist (3). Farmers' lack of longer-term vision in favor of present profits can be explained by insufficient information and education leading to bad choices but can also result from economic pressure caused by sectoral inherent risks and uncertainties, such as weather variability, disease outbreaks, and fluctuating market prices. Even though governments recognize challenges of farming and provide subsidies and support programs, either the focus of programs

is off, or the amount of support is not sufficient to stimulate farmers' transition to regenerative agricultural practices.

Food companies. The profile of food companies resembles that of input providers – this segment is dominated by large mature corporations - the major difference being the positioning within the supply chain. Food companies have access to and to a greater degree depend on end consumers, who play a significant role in influencing the adoption and implementation of regenerative practices through their purchasing decisions and demand for transparency and sustainability. As regenerative agriculture gains traction, it becomes a part of larger conversations within major corporations and a broader food industry. For instance, Walmart has declared its intention to become a “regenerative company” by protecting, managing, and restoring 50 million acres of land by 2030 (about twice the area of Ohio) (4). This move by Walmart and similar actions by other large companies reflect a growing recognition of the importance of sustainability and regenerative practices in agriculture within the food industry. While supported by consumers, the interest of big names in regenerative agriculture also triggers concerns from farmers, who fear Walmart's purchasing teams and rightly question how Walmart's cost-cutting business model goes along with the support expected by the transitioning farmers. As it becomes common to expand the definition of regenerative agriculture to include equity and social aspect, there is a risk that participation of food discounters in this market will negatively affect the interests of small farmers and rural communities.

Consumers. This is the most numerous and most diverse group of all. People find themselves in different life situations, varying by age, income, beliefs, and many other metrics which affect their choices. Being at the end of the food chain, consumers are the most influential participants, creating demand and driving changes. Consumers are increasingly seeking out products that are not only healthy but also produced in ways that are beneficial to the environment. This demand has led to a rise in sales of regenerative products, which have been growing by more than 20% over the past year. Consumer demand for transparency has led to the emergence of third-party certified regenerative labels. Although today there is no commonly accepted standard in regenerative labeling, there are six major certification systems, supported by major food companies and retailers, such as Whole Foods and General Mills (5). Having said the above, we acknowledge that the interest in regenerative agriculture starts from a very low base. The Regenerative Agriculture Consumer survey, issued in 2022, targeting 1,000 college-educated consumers with income above national average reveals that 65% of respondents would be interested to learn more about the connection of food production and regenerative agriculture practices, while only 19% claimed they know anything about the subject. At the same time, most respondents are not ready to pay more for a food grown applying regenerative practices, only 12% indicating strong preference to pay a premium (6).

Where does it leave us? The change is coming but at a slow pace. Big corporations are releasing commitments to invest in the field, consumers express interest in the new sustainable and environment-friendly way to grow food but progress is weak. Farmers, apart from a small number of enthusiasts, express concerns. The most radical part of concerns takes the form of protests, like March 2024 protests in Poland, which highlight the tension between the EU's environmental goals and the immediate economic concerns of its agricultural sector and are

symptomatic of the global situation. These events underscore the challenges of balancing climate policies with the needs of local economies, especially in sectors as vital and sensitive as agriculture.

Acknowledging the challenge, in January 2024 the World Economic Forum in Davos issued a report called “100 Million Farmers: Breakthrough Models for Financing a Sustainability Transition” (1). Authors start with several assumptions:

1. Due to devastating and continuing environmental damage caused by agriculture, which is only increasing due to growing population, remedial actions must be taken today. The report aims to achieve tangible results by 2030.

2. Economic challenges are the most crucial of challenges faced by farmers on transition to regenerative agriculture. Even though there are studies that argue that fully transitioned farms can match and even exceed the pre-transition profitability, there is a consensus that first years of transition will show a decreased profitability and will require significant investment in new equipment.

3. Regenerative agriculture will benefit multiple parties, not only farmers, through increased sector resilience (reduced risk), decrease in GHG emissions and carbon sequestration, reduced freshwater use and pollution, healthier nutrition, reduced risk of deforestation and increased biodiversity. It means that the cost of transition should be in the first place financed by beneficiaries of transition from the whole ecosystem, including finance institutions, insurance companies, governments.

4. Initial capital required for transition to regenerative agriculture should be provided through various private and public sources, including concessions and catalytic capital. Such an approach requires coordination as well as a consistent and supportive legal framework and widely accepted industry standards.

The report gives rough estimates of the cost of transition. For US only (which is 10% of global wheat and oilseed acreage globally) the application of just two regenerative practices – no-till farming and cover crops – would cost from \$25 to \$80 bn. It will cost much more for the world. In addition to that, the UN estimate is that developing countries face a \$300 bn annual gap in the financing of agri-food systems. The report specifically emphasizes the importance of global implementation, since the achievement of certain sustainability goals, like GHG emissions reduction and reverse deforestation, is possible only through involvement of developing countries. Hence the acute need for global cooperation and coordination, not only across sectors, but also across nations.

As much as I enjoyed reading the 100 Million Farmers report, I doubt that the scale of suggested changes is realistic for implementation by 2030. I bet the implementation will take much longer than that if it is possible at all. Governments are not good at reaching long-term binding agreements, at least not of such magnitude and in such a short time frame. Yet the report sets a good starting position and defines the problem - lack of leadership and finance. Choosing between leadership and finance, I would start with leadership. Finance will follow.

We briefly concluded above that input providers and food companies would support the change rather than lead it. We also touched on challenges faced by farming communities, who will execute the change, rather than drive it. Consumers, the last group, are invested in the environmental agenda at large but know little about regenerative agriculture. Also, they are not ready to pay for the change from their own pockets. Indeed, consumers are often driven by financial motives in daily decisions and

often lack time and perseverance to dive into the specifics of agriculture. Still, at primal level consumers, as humans, care about the prosperity of future generations and form longer-term priorities that are delegated to be taken care of by politicians. It is through governments that consumers can and should lead the change in regenerative agriculture, interconnecting such vital parts of human life as food systems, climate and health.

Based on our previous experience of advising national governments on agricultural policies, we summarized and curated the bulk of opinions on transition to regenerative agriculture and adjusted them for time constraints. We believe that national governments should consider the following immediate steps that leave a chance of achieving tangible results of transition to regenerative agriculture by 2030.

1. National leadership. Even though the sustainability goals are achievable only when regenerative practices become a global industry standard, the pace of transition is different for every country. The importance of food security and the scale of change creates a new leadership niche, which is now vacant and will be taken by a technology leader with a sizeable food production and exports to influence global markets. Global leadership will pay off initial investments both to public and private sectors of that nation.

2. Finance. Consolidate all existing support programs in a single fund, which would prioritize sustainable agricultural practices and will form private-public partnerships, as we witness in other sectors. Cross-sectoral expertise can offer novel solutions. Health and climate sectors are immediate candidates for knowledge transfer and are immediate beneficiaries of a successful transition.

3. Innovation. Once money pours into the sector, it will attract a critical mass of talent, which will bring in knowledge and will develop expertise. I believe that the agricultural sector will be transformed by innovation, as many other sectors before were. Technology will also provide transparency and accountability for the cost of transition.

4. Transparency. Timely, reliable, and structured information will allow clear differentiation of farmers and will focus governmental and private support mechanisms. Traceability will help end consumers to ensure that the bulk of their support ends up in farmers’ hands, which will motivate new farmers to join sustainable agricultural practices.

5. Accountability. Pledges and promises made by input providers and food companies need to be reviewed by independent auditors, progress being reported to the public and to the regulator. Properly audited and standardized food labeling will stimulate trust and adherence to regenerative practices along the food value chain.

6. Land protection. As societies evolved to adopt a Red List of Threatened Species, known as a tool, that assesses the health of biodiversity and protects endangered species, in the same fashion, governments should consider adopting mechanisms for assessment of soil health and protection of agricultural land from damaging and exhausting agricultural practices. Once technology ensures transparency of agricultural practices and history of land use, enforcement of protective mechanisms becomes possible.

7. Implementation in phases. Even two regenerative practices, if they become an industry standard, will change the world. It may be difficult to achieve all goals by 2030 but addressing low-hanging fruits will bring quick results and will strengthen the confidence and determination to keep going.

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