REGENERATIVE AGRICULTURE AS A BOON TO SOIL HEALTH

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ABSTRACT

Regenerative agriculture (RA) has been advocated as a way for achieving sustainable food systems. RA is seen differently by various actors, and there is no precise scientific description. Our findings reveal convergence in goals that improve the environment and emphasise the relevance of socioeconomic elements that contribute to food security. However, the aims of RA in regard to socioeconomic factors are broad and require a structure for execution. Based on our findings, we propose a preliminary definition of RA as a farming practise that leverages soil conservation as a starting point to regenerate and contribute to diverse ecosystem services.

INTRODUCTION

Soil health is important not just for enhancing the quality and amount of food produced, but also for making plants more resistant to pests and adverse weather. Given the current scenario, the concept of soil health has been modified and articulated as follows: "the continued capacity of a specific kind of soil to function as a vital living system within natural or managed ecosystem boundaries, to sustain animal and plant productivity, to maintain or enhance the quality of air and water environment, and to support human health and habitation" (Doran and Zeiss, 2000). Soil health is more than just improved crop output; it's a delicate balance of multiple soil functions, environmental protection, and plant and animal health (Doran, 2002).Taking care of the soil can reduce the level of inputs required for a given amount of quality produce. Agriculture contributes significantly to land degradation as a result of unsustainable management practises that impair soil quality and operational capability (Gibbs and Salmon, 2015).Regenerative agriculture is a farming method that focuses on preserving and restoring farmland and its ecology. In reality, agricultural and grazing practises help to mitigate climate change by restoring damaged soil biodiversity while also regenerating soil organic matter.

WHAT DOES REGENERATIVE AGRICULTURE INTENDS TO ACHIEVE?

The loss of healthy soil and biodiversity across the world as well as of local seeds and knowledge, poses a serious danger to our existence. Soil scientists predict that if present rates of soil destruction continue, we will not only face serious public health consequences from a degraded food supply, but we will also run out of arable topsoil. Feeding the globe, keeping global warming below 2 degrees Celsius, and ending biodiversity loss would be difficult without preserving and replenishing the soil. In addition to supplying surplus food to the country through intensive agriculture over time, the Green Revolution has deteriorated India's delicate Agro-ecosystems (Rahman, 2015).

The cornerstone of regenerative agriculture is that it not only "does no harm" to the land, but actively improves it via the use of technology that regenerate and revitalize the soil and ecosystem. Regenerative agriculture produces healthy soil that can produce nutrients dense food as well as improve, rather than degrade land, which eventually results in productive farms and a strong economy. It incorporates permaculture and organic farming to increase food production, farmers' incomes, and topsoil, including cover crops, crop rotations, composting, mobile animal shelters, and pasture cropping.

REGENERATIVE PRINCIPLES

- Tillage should be reduced or eliminated.
- Cover the soil to keep it secure.
- Use living roots to keep the soil alive.
- Boost biodiversity.

- Integrate livestock

NO TILL OR LOW TILL: By minimizing disruption to the soil ecosystem, plant roots are exposed to soil microorganisms that support healthy soil and carbon storage.

COVER CROPS: There are several advantages to covering the ground with plants. The soil has the ability to absorb water and carbon, which keeps the soil alive, avoids soil erosion by keeping the dirt from blowing away, and prevents desertification.

DIVERSIFIED PRODUCTION SYSTEMS: To mimic natural ecosystems and boost biodiversity, several crops are cycled in fields, potentially with animals, contributing to healthy soil.

***REDUCTION OR REMOVAL OF SYNTHETIC CHEMICALS*:** Plants are less likely to utilize soil microorganisms and obtain nutrients deep in the soil when synthetic chemical fertilizers are used, resulting in reduced carbon sequestration. Chemical pesticides harm biodiversity and contribute to contaminated water and soil, in addition to changing the soil microbial population. Pesticides may also be present in the food we eat, the air we breathe, and the water we drink, and they can cause birth abnormalities, cancer, and neurological diseases, among other things.

***PLANNED GRAZING*:** It will prevent overgrazing, and dung fertilizes the soil while also sequestering carbon. Pastured animals' health has improved, and they no longer require antibiotic treatment to be healthy. The following are some of the additional advantages of using regenerative agricultural practices:

- ***WATER AND SOIL HEALTH*:** The health of the soil and the health of waterways are inextricably linked. Healthy soil has a water-holding capacity of 20 times its weight in water, reducing runoff and ensuring drought resilience.
- ***INCREASED FARMER INCOME:*** Plants that are healthy, disease-resistant, and pest-tolerant grow in good soil, reducing the need for expensive fertilizers and pesticides. A farmer can also profit from ecosystem services provided by regenerative produced food by selling it at a premium price.
- ***SECURE FOOD FUTURE*:** Regenerative strategies to develop healthy soil, minimize agricultural pesticide usage, and increase crop resilience against a wide range of meteorological extremes will be critical to maintaining high levels of food production and ensuring better food security for people in the future.

A SHIFT TO REGENERATIVE AGRICULTURE ON A GLOBAL SCALE WILL:

- ***FEED THE WORLD:*** The small farmers currently with a small portion of land cultivate to feed the huge population.

- ***DECREASE GHG EMISSIONS:*** A new food system might be a significant driver of climate change solutions as existing system contributes between 44 and 57 percent of global GHG emissions.
- ***REVERSE CLIMATE CHANGE:*** Reductions in emissions are insufficient on their own. Fortunately, evidence suggests that boosting soil carbon stores can help counteract climate change. Soil organic carbon accounts for around half of all organic matter in the soil (Pribyl, 2010).
- ***IMPROVE YIELDS:*** Organic farms provide much better yields than conventional farms in the face of harsh weather and climate change.
- ***CREATE DROUGHT-RESISTANT SOIL:*** The incorporation of organic matter into the soil enhances its ability to hold water. Organic soil organic matter is increased via regenerative organic agriculture.
- ***REVITALIZE LOCAL ECONOMIES:*** Family farming provides an opportunity to assist local economies thrive.
- ***PRESERVE TRADITIONAL KNOWLEDGE:*** Understanding indigenous farming practices gives important ecological insights for developing regenerative organic agricultural systems.
- ***NURTURE BIODIVERSITY:*** Biodiversity is essential for agricultural productivity and food security, as well as an important component of environmental protection.
- **RESTORE GRASSLANDS:** Grassland makes up one-third of the planet's surface and is 70% degraded. We can assist them in recovering by implementing a comprehensive grazing strategy.
- ***IMPROVE NUTRITION:*** To generate a more diversified nutritional output from agricultural systems, nutritionists are increasingly highlighting the necessity of more diverse agro-ecosystems.

CONCLUSION

Producers that practise regenerative agriculture aren't only preserving the existing land resource so that it may be used in the future. They're really upgrading what's already there to make it better for future generations. It's a win-win-win situation: climate change mitigation, improved profit for farmers, and increased climatic resilience.

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