

Regenerative Agriculture

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India's ranking of 105th out of 127 countries in the Global Hunger Index (GHI) 2024, with a score of 27.3, highlights the urgent need for improved food security. Regenerative agriculture can play a pivotal role in addressing this challenge by enhancing soil health, promoting sustainable agricultural practices, and boosting long-term food production to reduce hunger and malnutrition. The World Economic Forum defines regenerative agriculture as: "An approach to farming that uses soil conservation as the entry point to regenerate and contribute to multiple provisioning, regulating, and supporting services, with the objective that this will enhance not only the environmental but also the social and economic dimensions of sustainable food production." Regenerative agriculture, encouraged by the Indian government, focuses on natural inputs, minimal tillage, mulching, multi-cropping, and diverse native varieties to improve soil health, reduce irrigation frequency, conserve energy, and decrease reliance on chemical fertilizers and pesticides, thereby lowering input costs.



Source: google images

Types of Regenerative Agriculture

- **No-Till and Pasture Cropping:** This method minimizes soil disturbance by using specialised drillers for planting while leaving grasses for livestock grazing. It prevents soil erosion & preserves soil structure.

- Annual Organic Cropping: Organic methods are used for crop cultivation without synthetic chemicals. Though more labor-intensive & costly, it is gaining popularity as awareness of sustainable farming grows.
- Compost Tea and Compost: Compost tea enriches the soil with beneficial microorganisms, increasing organic matter in the topsoil, essential for soil regeneration and plant health.
- Biochar and Terra Preta: Biochar, a form of black carbon, enhances soil fertility and microbial diversity, improving soil retention and carbon sequestration by up to 70 times.
- Perennial Cropping: Perennial crops, which don't need replanting every year, reduce soil disturbance, conserve water, and prevent soil erosion through deep-rooted plants.
- Ecological Aquaculture: This practice integrates healthy aquatic ecosystems with farming by nurturing aquatic life with organic matter & trees, promoting biodiversity & supporting sustainable food chain.

Need for Regenerative Agriculture

1. Restoring Soil Health: Over 33% of global soil is degraded, including 96.4 million hectares in India affected by overuse of fertilizers, deforestation, and unsustainable irrigation (NRSC). Regenerative practices restore nutrients and improve soil structure for long-term productivity.
2. Enhancing Food Security: With current trends, there may not be enough arable soil to feed the global population within the next 50 years. Regenerative agriculture ensures sustainable food production by maintaining soil health and resilience.
3. Improving Water Efficiency: Practices like cover cropping and no-till farming enhance soil's water retention capacity, reducing irrigation needs by 20–30% & making agriculture more resilient to droughts.
4. Mitigating Climate Change: Agriculture accounts for 25% of global GHG emissions. Regenerative methods sequester up to 1.85 gigatons of CO₂ per year, playing a critical role in combating climate change.
5. Preventing Soil Erosion: Intensive farming causes severe soil erosion, with topsoil loss ranging from 50–90% in many regions. Regenerative agriculture builds soil aggregation and reduces erosion, preserving soil for future generations.
6. Boosting Biodiversity: By reducing chemical inputs and fostering natural ecosystems, regenerative practices enhance microbial diversity, support pollinators, and create habitats for various species.
7. Reducing Economic Costs: Farmers can save up to 20–40% on chemical fertilizers and pesticides by adopting regenerative techniques, improving profitability while promoting sustainability.

Benefits of Regenerative Agriculture

- Enhancing Soil Fertility
- Building Climate Resilience
- Conserving Biodiversity
- Reducing Input Costs
- Improving Food Security
- Revitalizing Rural Economies

Challenges in Adopting Regenerative Agriculture in India

- Lack of Awareness
- Initial Transition Costs
- Policy Gaps
- Knowledge and Research Deficit
- Short-term versus Long-term Gains
- Market and Certification Challenges

Way Forward

- **Harmonizing with Nature:** To address India's undernourishment crisis (224.5 million), agriculture must work with nature, as highlighted by the UN's 2022 report. Regenerative farming can be key in shift.
- **Chemical-Free Farming:** Emphasising natural inputs, crop rotation, and diversification can reduce reliance on chemicals. Global efforts and local initiatives are driving this shift, making it crucial for India.
- **Soil Health:** Improving soil health enhances water retention, with a 1% increase in soil organic matter boosting water storage by 75,000 liters per 0.4 ha. Policies should prioritise soil health for sustainable farming.
- **Global and Local Integration:** Regenerative practices are already thriving in states like Sikkim, Uttarakhand, and Andhra Pradesh. This sets a strong foundation for broader adoption across India.
- **Research and Policy Support:** Focused research and policies, such as the National Project on Organic Farming, will help scale regenerative farming and drive sustainable agricultural practices.
- **Regenerative farming** can address soil degradation and food security in India, enhancing productivity and climate resilience. Overcoming challenges requires collective efforts, and with the right support, it can transform India's agriculture sustainably.