Regenerative Agriculture: an introduction

Daniel Baertschi
Lead, Food&Beverage
Regenerative Agriculture Expert
Quantis Switzerland

Contact:
daniel.baertschi@quantis-intl.com
We aim to transform businesses to create a thriving future for people and the planet.
How we work

Who
We partner with leading global organizations in key sectors who are serious about reducing their environmental impact.

How
Our unique approach combines deep sustainability expertise with strategic business knowledge to help your company align within planetary boundaries.

What
We enable sustainable business transformation, helping you build resilience, unlock innovation and optimize your performance.
We guide you through a three-phased Sustainability Transformation Journey

**Assess**
Gather the best available data, metrics & insights
Identify opportunities for improvement

**Plan**
Define your ambition and strategic framework to guide the transformation
Set the goals and outline the roadmaps for actions

**Transform**
Put the transformation plan into action
Engage with stakeholders and activate across the supply chain and portfolio
10 Soccer Fields of Tropical Primary Forests Were Lost Every Minute in 2021

By Olivia Rosane  |  Apr 28, 2022 15:15PM EDT
“Whether we or our politicians know it or not, Nature is party to all our deals and decisions, and she has more votes, a longer memory, and a sterner sense of justice than we do.”

{Wendell Berry, American writer and farmer}
ORIGIN, DEFINITION, PRINCIPLES
“The health of soil, plants, animals, and humans is one and indivisible” (Howard 1943)”
CIRCULAR ECONOMY
(economics remains essential)

LINEAR ECONOMY
(only economics matters)

REGENERATIVE LIFE MODELS
(ecosystemic rules take over)

Regenerative Agriculture

- Robert Rodale, Founder of Rodale Institute. He concluded that regenerative organic agriculture is the preferred system.
- But: organic only was easier to „sell“ and there was an organised global movement (IFOAM).
- „Regenerative agriculture“ was „rediscovered“ after 2000, mainly by Australian/US farmers, activists (Darren Doherty, Charles Massy, Joel Salatin, Gabe Brown etc.)
- Growing interest globally as big corporations step in (General Mills, Unilever, Nestlé, PepsiCo, Danone, Indigo Agriculture, etc.)
- Today many companies and farmers with very different definitions.

1. PHYSICALISM
   Increase in diversity of plant species.
   Increase in diversity of businesses, people and cultures.
   Increase in diversity of personal experiences, capacities, opportunities and openings to new experiences.

2. PROTECTIONISM
   More surface cover of plants, ending wind and increasing beneficial microorganisms near the surface.
   More resistance to attack and cultural changes because of quantity and variety of businesses, people, crops that develops overall employee and community stability.
   Improvement of personal health and an ability to withstand crises accompanied by a boost in the body’s immune system.

3. PURITY
   Without chemical fertilizer and pesticides use a greater range of plants and other life forms in the soil.
   Vastly reducing the environment and multipliers by rearing and raising of plants, vegetables, and other crops in a way to improve health.

4. PERMANENCE
   More perennial and other plants with vigorous root systems begin to grow.
   Businesses and individuals become successful and stable, they can contribute more to the community.

5. PEACE
   Past patterns of greed and greed interference with growing systems are disrupted.
   Patterns of violence and crime are reduced, improving overall security and well-being.
   Rational human actions such as anger, fear and hate lessen to improve, and are replaced by tolerance, compassion and understanding.

6. POTENTIAL
   Nutrients tend to either move upward in the soil profile, or to accumulate near the surface, thereby becoming more available for use by plants.
   „Productivity“ symphonies of plant resources and many accumulate and are more available to more people.
   This positive qualities and resources in yourself and your environment become easier to access and affect more people around you.

7. PRIMACY
   Overall soil structure improves, increasing water retention capacity.
   Overall community life becomes, increasing the health and wealth of communities.
   Capacity for well-being and enjoyment increases.

Sources: Troublehum Towards Regeneration in Agriculture, Communities, and Personal Spirit.
“Regenerative Agriculture” describes productive farming principles and practices that, among other benefits, rebuild soil organic matter, improve soil health and restore soil biodiversity – resulting in reduced global warming through carbon sequestration in soil and biomass, improved water cycle and other ecosystem benefits.
Definition of regenerative agriculture*

- Regenerative Agriculture is a system of nature based agricultural principles and applied farming practices that increases biodiversity, enriches soils, improves watersheds and enhances ecosystem services.

- By sequestering carbon in soil and aboveground biomass, Regenerative Agriculture aims to improve soil health and to decrease the amount of carbon dioxide in the atmosphere. At the same time, it requires less input to produce sufficient yields, strengthens resilience to climate instability, and contributes to a higher vitality of rural communities.

- The system draws from decades of scientific and applied research by the global communities of organic farming, agroecology, holistic grazing, and agroforestry. It combines ancient knowledge and modern science and technology.

*based on http://www.regenerativeagriculturedefinition.com/
Principles of regenerative agriculture

- **Minimization of disturbance** of the soil and soil surface (through processing, pesticides, artificial fertilizers, etc.)
- **Protecting the soil** surface by vegetation or mulch etc.
- Maximize **living roots in the soil** (agroforestry, perennial crops)
- Creation of a high **diversity** (crop rotation, mixed crops, etc.)
- Integrating **animals** (Holistic Management, Mob Grazing, Silvopasture etc.)
Compete with Nature
Disturb Soil
Monoculture
Reductionist

Partner with Nature
Protect Soil
Diversity
Holistic
"Life is the best bioindicator of success in regenerative systems. Life is the currency that drives carbon sequestration."

–Jonathan Lundgren
Agroecologist, Director of ECDYSIS Foundation and CEO of Blue Dasher Farm
Number of research articles using the term "regenerative agriculture" (USA)
Main challenges for farmers practicing regenerative agriculture

- Willingness to take **risks** and leave the comfort zone  
  ➔ new paradigm
- Risks associated with **transition**  
  ➔ support the transition
- Need for **investment in new tools** etc.  
  ➔ finding alternative financing mechanisms
- Need for good business management with **key performance indicators**  
  ➔ data management
- **Learning**, training, coaching are a big need, but limited and not accessible  
  ➔ train the trainer, farmer-to-farmer coaching
Success factors of regenerative agriculture

- Knowing nature, understanding connections and continuously optimizing the operation, based on observation
- Willingness and will to lifelong learning through training, coaching, mentoring and exchange with other farmers
- Develop the vision of the farm as an integrated system and formulate and visualize a clear mission statement
- Use suitable technology and environmentally compatible products in a targeted manner, keeping input costs as low as possible
- Actively work with traders, sales markets and optimization of value creation

SALT – Sloping Agricultural Land Technology, Vietnam
Potential for carbon sequestration

- Plants use CO₂ from the air and water from the soil to build carbohydrates.
- Plants exude carbohydrates through their roots to feed soil organisms.
- Soil organisms release CO₂ through respiration.
- CO₂ from the atmosphere enters the soil through decomposing plant matter, root exudates, and other organic materials.
- Solar energy is used by plants to absorb CO₂.
Carbon Storage in Earth's Ecosystems

Achieving net-zero by 2050 depends on the Earth's natural carbon sinks.

The world's forests absorb around 15.6 gigatonnes of CO₂ each year. That's around 3X the annual CO₂ emissions of the United States.

Carbon Storage
Tonnes of Carbon per Hectare*

- Boreal forests: 344
- Temperate forests: 120
- Temperate grasslands: 236
- Tropical forests: 123
- Deserts and semideserts: 42
- Tundra: 64
- Wetlands: 43
- Tropical savannas: 29
- Croplands: 2

How well soil stores carbon depends on soil type, vegetation and climate. In general, the wetter and colder, the better.

At a ground depth of one meter
Sources: IPCC, NASA

Where is Carbon Stored?
Living Biomass: Leaves, twigs, roots of trees, trunk & branches
Dead Biomass: Woody debris, leaf litter
Soil

Forests play a critical role in regulating the global climate. They absorb carbon from the atmosphere and then store it, acting as natural carbon sinks.

However, around 8.1 gigatonnes of CO₂ leaks back into the atmosphere due to deforestation, fires and other disturbances.

Carbon stored
Soil
Atmosphere
Plant & animal life

Soil contains almost 2X as much carbon as the atmosphere and living flora and animals combined.
"No civilization has outlived the usefulness of its soils. When the soil is destroyed, the nation is gone."

1949 – Lloyd Noble founder of the Noble Research Institute
Thank you