A Shift to Regenerative Agriculture *and Agroecology*

SOLUTIONS TO REVERSE CLIMATE CHANGE

Abram J. Bicksler, Ph.D.
Agricultural Officer

Food and Agriculture Organization of the United Nations (FAO)
What Is Regenerative Agriculture?
Principles of RA

• Specifically, **Regenerative Agriculture** is a holistic land management practice that leverages the power of photosynthesis in plants to close the carbon cycle, and build soil health, crop resilience and nutrient density.

• Specific Principles include:
  • No till/minimum tillage
  • Soil fertility increased through biological means
  • Build biological ecosystem diversity
  • Increase well-managed grazing practices
**Some Practices of RA**

**REGENERATIVE AGRICULTURE PRACTICES**

The following farming, ranching and land use practices are used to create regenerative food systems and healthy natural ecosystems.

- Aquaculture
- Agroecology
- Agroforestry
- Biochar
- Compost
- Holistic Planned Grazing
- No-till
- Pasture Cropping
- Perennial Crops
- Silvopasture
Principles of RA
Principles of RA

6 Core Principles of REGENERATIVE AGRICULTURE

- Minimize soil disturbance
- Keep the soil covered
- Integrate livestock
- Understand context of your farm operation
- Maximize crop diversity
- Maintain living root year-round

General Mills
### Conventional Agriculture vs Regenerative Agriculture

<table>
<thead>
<tr>
<th>Conventional Farming Practices</th>
<th>Regenerative Farming Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak, easily erodible soils</td>
<td>Biologically active soils</td>
</tr>
<tr>
<td>High input costs</td>
<td>Low input costs</td>
</tr>
<tr>
<td>Ever-increasing quantity of synthetic fertilisers and pesticides needed</td>
<td>High water infiltration and storage</td>
</tr>
<tr>
<td>High irrigation requirement</td>
<td>High crop diversity</td>
</tr>
<tr>
<td>Low crop diversity</td>
<td>High biodiversity</td>
</tr>
<tr>
<td>Low biodiversity</td>
<td>Healthy local ecosystem</td>
</tr>
<tr>
<td>Polluted water bodies</td>
<td>High water holding and filtration capacity</td>
</tr>
<tr>
<td>Health risks of chemical exposure for farm workers</td>
<td>Low health risks to farm workers</td>
</tr>
<tr>
<td>Low resilience</td>
<td>Tasty crops with high micronutrient content</td>
</tr>
<tr>
<td>Threat to long-term yields due to soil degradation</td>
<td>Increased resilience</td>
</tr>
<tr>
<td></td>
<td>Support long-term yields</td>
</tr>
<tr>
<td></td>
<td>Multiple revenue streams</td>
</tr>
</tbody>
</table>
What is Agroecology?
Agroecology

- Over **30 definitions** adopted by government, Academia and NGOs
- Applies **ecological concepts & principles** to optimize interactions between plants, animals, humans and the environment while taking into consideration **social aspects** needed for a **sustainable and fair food system**.
- Highly **knowledge-intensive**, builds upon farmers’ collective knowledge & innovations
- **Context specific**
Agroecology: Common Points

• The diversification of production systems, livelihoods options and products in space and time.

• Contextualization of approaches valuing local ecosystems and food heritage and culture

• Particular attention to human and social values and rights

• Co-innovation between farmers and researchers

• A territorial and decentralized approach favouring cooperation between actors

• Responsible and equitable governance of natural resources

• Looking beyond production systems to the entirety of the food system
Main Interpretations of Agroecology

Main interpretations of agroecology

- Scientific Discipline
  - Plot/Field approach
  - Agroecosystem ecology
  - Ecology of food system

- Movement
  - Environmentalism
  - Rural development
  - Social/Political movement for sustainable agriculture; Policy

- Practice
  - Technique
  - Landscape management practices

An Overarching Umbrella

Many different approaches/options can exist as long as they incorporate elements that are moving towards sustainable food systems:

- **Production practices:** e.g. Agroforestry, SRI, IPM, Organic, Conservation Agriculture, Regenerative Agriculture...
- **Environmental dimension:** Biodiversity, Climate Resilience, Ecosystems...
- **Economic dimension:** PGS, Farmer’s markets, Value addition...
- **Social dimension:** Farmers organization, Social movements, Focus on decent work...
Different Starting Points Towards AE Transition

FIGURE 9
DIFFERENT STARTING POINTS TOWARDS AGROECOLOGICAL TRANSITION

CONNECT TO MARKETS
- Relocalize
- Diversify
- Mechanize
- Reduce chemical inputs
- Build & exchange knowledge

SUBSISTENCE AGRICULTURE

INDUSTRIAL AGRICULTURE

DIVERSIFIED AGROECOLOGICAL FARMING

Source: IPES-Food 2020
The 10 Elements of Agroecology: Guiding Transitions To Sustainable Food and Agricultural Systems
The 10 Elements of Agroecology

- Myriad of interactions and interdependencies
- Common characteristics, foundational practices and innovation approaches
- Emerging properties
- Context features
- Enabling environment
Commonalities – both RA and Agroecology seek to:

- Mainstream biological diversity
- Protect and restore critical ecosystem services
- Harness the full potential of natural processes
  - Close nutrient cycles
  - Improve water retention
  - Control pests and diseases
  - Reduce synthetic inputs, irrigation and other threats to ecosystem function
  - Improve health
- Improve soil health \(\rightarrow\) increase SOC \(\rightarrow\) climate change mitigation and adaptation

How can they both contribute to the fight against Climate Change?
Contributing to the Fight Against Climate Change
Contributing to the Fight Against Climate Change

• Both contribute to adaptation and mitigation of climate change
• Entry points include:
  • (Bio)diversity
  • Contextualization
  • Recycling and improved ecosystem functioning
  • Synergies
• Resilience is an emergent property of a healthy, functioning system
• Resilience cuts across dimensions of sustainability
THANK YOU

Abram J. Bicksler, Ph.D.
Agricultural Officer
Food and Agriculture Organization of the United Nations (FAO)