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Regenerative Farming

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SOIL IS THE EARTH'S FRAGILE SKIN THAT ANCHORS ALL LIVES ON EARTH.

Introduction

- ✓ Literally it means renewing
- ✓ The term was coined by Robert Rodale**.**

Corner stone: healthy soil.

- ✓ Semi-closed system.
- ✓ Sustainability and beyond.
- ✓ 562 million ha of agricultural land has been degraded

(5 million ha annually).

What is regenerative farming?

- The focus of Regenerative Agriculture is on building soils, restoring watercourses, and encouraging biodiversity, while reducing dependency on outside inputs, improving livestock health and increasing farm yields and profitability.
- Kirk Gadzia sums it up as: "leaving it better than we found it".

1st Principle: regenerate than merely sustain

- Regenerative' practices embody fundamental redesign (Hill 1998). They utilise natural ecological services to replenish and reactivate the resource base.
- When agriculture is regenerative, soils, water, vegetation and productivity continually improve rather than staying the same or slowly getting worse.
- Regenerative agriculture is productive and profitable, instils a deep sense of personal satisfaction in farmers, rural communities and observers.
- Many of what are termed 'sustainable' agricultural practices represent only small improvements in current methodology.
  - At best, they impart a fleeting tinge of green to a deteriorating landscape.

2nd principle: Ecological Restoration

- Ecology restoration is the intentional activity that restores ecological processes to maintain ecosystem composition, structure and function.
- Habitat loss is the leading cause of both species extinctions and ecosystem service.
- Habitat loss can be reserve by conservation of currently viable habitat and restoration of degraded habitats.

GOALS

- Re vegetative
- Habitat enhancement
- Remediation
- Mitigation

3rd principle: RESTORATION OF TOP SOIL

- The most lasting and thorough

Restoration of topsoil lies in
imitating and accelerating the
natural processes that originally created it.

- Standard agricultural practices combined with rock dust can achieve a substantial degree of top soil restoration in a reasonable amount of time.
- Increasing soil organic matter also encourages soil microbiology which effectively 'brings it to life'.

PRACTICES OF SOIL RESTORATION

- It must be emphasized that soil aggregation is the best defense against erosion of all kinds.
- The roof of healthy soil is the groundcover of plants and plant litter, which buffer temperatures, improve water filtration and slow down evaporation, so that soil remains moister.

4th PRINCIPLE: Regenerative agriculture and food availability

- Availability refers to the physical availability of food stocks in desired quantities.
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- Globally, India is the third largest producer of cereals, with only China and the USA ahead of it. India occupies the first position in milk production and is the third largest producer of fish and second largest producer of inland fisheries in the world.
- A similar concern had been voiced by the National Commission on Farmers (NCF) in late 2006, "To double annual food grain production from the present 210 million tones to 420 million tones within the next 10 years, (by 2015),

- Between 1950-51 and 2006-2007, production of food grains (comprises production of rice, wheat, coarse cereals and pulses) in the country increased at an average annual rate of 2.5 per cent .
- The production of oils eeds, though has increased in recent years from 184.40 lakh tons in 2000-2001 to 297.99 lakh tons in 2011-2012, has not kept pace with the demand for edible oils in India**.**

Table: Achievable targets by bridging gaps through regenerative agriculture

State	Current area (x1000 ha)	Current yield gap (t/ha)	Additional production possible(x1000 ha)
Uttar Pradesh	**8418.0**	**1.346**	**11330.5**
Madhya Pradesh	**2831.8**	**2.071**	**5864.7**
Rajasthan	**2103.1**	**1.646**	**3461.7**
Bihar	**1483.0**	**1.196**	**1773.6**
Haryana	**2303.0**	**0.581**	**1338.0**
Gujrat	**660.7**	**0.714**	**471.7**
Maharashtra	**581.1**	**0.656**	**380.0**
Karnataka	**97.0**	**0.998**	**96.8**
Punjab	**3444.0**	**0.241**	**82.9**

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5th: **Holistic Management**

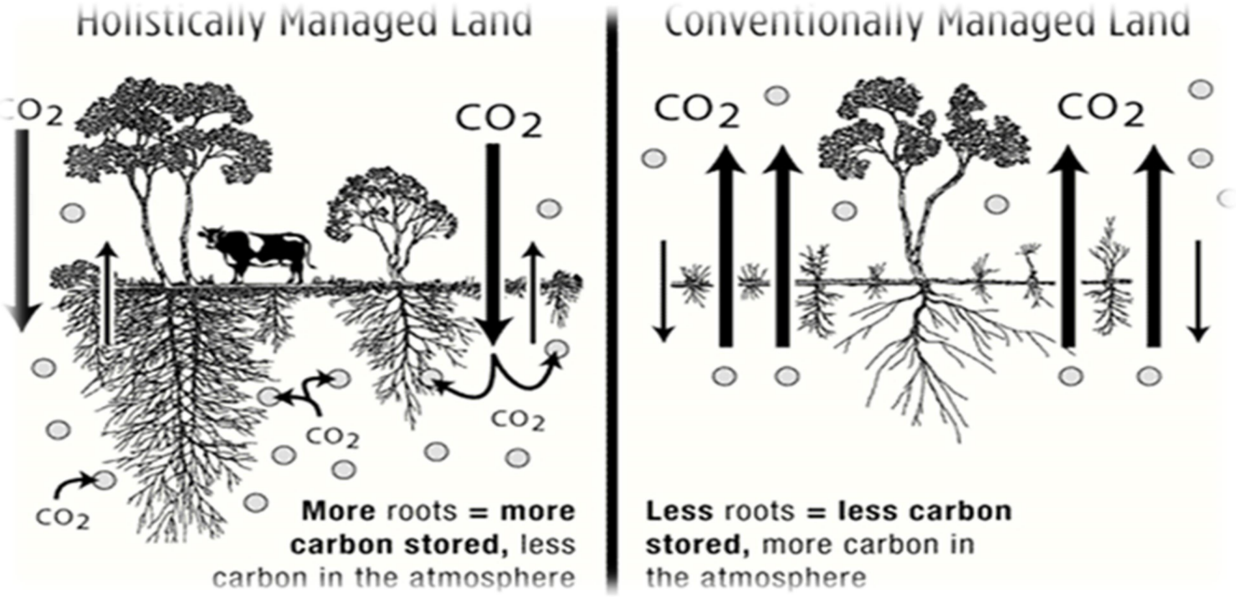
- Holistic Management is an animal and land management practice that mimics nature to benefit both grazing stock and biodiversity.

- Graziers across the world have discovered that they can increase production of their herds while also improving water and mineral cycles of environments under a Holistic Management regime.

- Holistic management was first developed over 40 years ago by Allan Savory, a Zimbabwean biologist.

- Holistic Management was conceived in response to increasing desertification in Zimbabwe and is now established across the globe as a primary Regenerative Agricultural technique.

- The process increases soil health, reduces erosion, improves biodiversity and enhances productivity by working with Nature.



Holistic Planned Grazing

- Holistic Grazing Planning, is a grazing planning procedure that helps you get your animals to the right place at the right time and for the right reasons.
- In short, grazing animals can, when well-managed, be used in a similar way to restore pastures to productivity – increasing species diversity, soil life, and therefore topsoil.

❖ Holistic planned grazing is similar to rotational grazing but differs in that it more explicitly recognizes and provides a framework for adapting to four basic ecosystem processes

➢ The water cycle.

➢ The mineral cycle including the carbon cycle.

➢ Energy flow, and.

➢ Community dynamics (the relationship between organism in an ecosystem).

6th PRINCIPLE: CROP DIVERSIFICATION

- Reduces risks against crop failure.
- Suppress weed growth.
- Reduce soil erosion.
- Reduce pest infestation.
- Increased yield stability.
- Recycling of nutrient reserves from soil depth.

7th Principle

- Multi income source Replanted trees as a source of income.
- The incorporation of tree into crop land and pasture can increase crop yield (often double or triple).
- Income through increased productivity of livestock.
- Generates income through diversification e.g. timber, fuel wood.
- Income generation through Increase fodder from edible leaves.
- Income can also be generated through the sale of seeds.
- Income can also be generated by the rent receive for agricultural land.
- Income from growing flowers and creepers.
- Increase economic activities create opportunities e.g. development of new business model such as cooperative.

Benefits and Weaknesses

- There are numerous economic and environmental benefits
- Farmers benefit from regenerative farming by Growing fresher and healthier foods.
- Farmers benefit from regenerative farming by Reducing expenses. With fewer expenses related to pesticides, fertilizers and tillage, farmers can save money.
- 3. The environment benefits from regenerative farming through Less carbon dioxide in the atmosphere. Carbon dioxide is a leading greenhouse gas. Regenerative farming helps store carbon dioxide in the soil, in turn helping to lessen global warming.

- 4.The environment benefits from regenerative farming through Reduced pesticides and fertilizers in the environment Farms that use cover crops and other regenerative farming techniques help keep nutrients in the soil and have significantly less soil erosion.
- 5. Farmers benefit from sales of firewood and timber in the local economy is significant.
- 6. Farmers benefit by increase crop yield by the incorporation of tree into crop land increase the crop yield(often double or triple). In Malawi AFSP integrates fertilizer, fodder, fruit, fuel wood with the food crop on small farm on a national scale and resulting in 100-400 % yield increase. (references-Lessons from sub-Saharan Africa)
- 7. The environment benefits from regenerative farming by Less fossil fuel use With less tillage, fertilizer and pesticide application, farmers can potentially spend less time out in the field using heavy the productivity of livestock machinery thus using less fossil fuels.
- 8. Farmers benefit by increasing the livestock productivity-Grazing animals are attracted to edible tree pods so spend more time on the farms and depositing manure.

Some of the weaknesses and constraints of regenerative farming

1. **Droughts reduce** the impact of FMNR as farmers are often forced to cut trees for income during famine times. Trees that coppice however, have a very high recovery rate, so that FMNR can be readily restored when seasons improve.
2. **Proximity to markets** may limit the establishment of FMNR.
3. **Climate is** a significant barrier to FMNR in lower rainfall areas where tree growth rates are slower.
4. **Cultural values** are also a significant barrier to the adoption of FMNR because farmers have different perceptions of the value of trees and natural resources.

Case Study

Regenerative Agriculture in Iowa

- Dick and Sharon Thompson operate a diversified crop and livestock farm near Boone, Iowa. Originally, the Thompsons practiced high-intensity, mono crop farming using synthetic pesticides and fertilizers just as all their neighbors did. Fertilizer, pesticide, and petroleum prices were rising faster than crop prices.
- They began looking for a better way to farm. So they have developed a set of alternative farming techniques they call " regenerative agriculture ".
- Rather than depend on synthetic chemical, herbicides and pesticides to keep their fields clean of weeds and pests, the Thompsons use a variety of old and new techniques including crop rotation, cover crops, and mechanical cultivation.
- Before planting, animal manure is spread on fields to rebuild fertility. During the summer, cattle are pastured on fallow land, using intensive grazing techniques that discourage weed growth and spread of manure over the whole field.
- The soil organic content the sentinel indicator of soil health registers At 6% which is more than twice that of their neighbors gisters at 6 percent.

Case Study David Clay field

- Faced with rising production costs,

  David Clayfield made the link that improving soil health could address the problem.

- David eliminated the use of chemical and acid-based fertilizers, replacing them with biologically-based soil conditioners which balance the mineral and microbial status of the soil.

KEY RESULTS

- Yellow sands have turned into dark, healthy soils with a substantial increase in soil organic matter.
- Irrigation requirements have reduced from the region's typical seven to eight mega liters per hectare each year to five to six, subsequently reducing the energy used for pumping and distribution.

CONCLUSION

- Regenerative agriculture allows natural systems to maintain their own fertility, build soil , resist pests and diseases and be highly productive.
- The transition to regenerative agriculture is necessary to avoid being locked into a system that depletes our soils and is dependent upon an energy resource in decline. As regenerative agriculture implies a continuing ability to recreate the resources that the system requires.
- There is great potential in the widespread application of regenerative agriculture , but they are not being adopted on a large scale. So Government should develop policies to promote it to farmers.

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