

What makes Agriculture be Regenerative? (just a point of view)  
1st approximation: in search of a procedural and comparative view

**a) Introduction**

In asking this question, I want to awaken a careful look at the many approaches that arise on the subject. Suddenly, several farms are characterized as regenerative. Surely the "regenerative" reference brings an image gain. It's a new, fresh concept, full of desirable marketing attributes.

It is certainly advantageous to enrich the worn-out word 'sustainability'. It is worth asking: but worn out how? Worn out for what?

**b) Evident wear and tear of the term "sustainability"**

Nowadays any company, even commerce, thinks it is "sustainable". Just a chain of supermarkets adopts the sale of durable bags in the box, which it declares itself sustainable. But stay there!! And all the sale of products with tetra Pak packaging? By the way, the entire chain of suppliers of a supermarket, squandering nature to meet consumption??!! Let us be honest: the entire supermarket is UNSUSTAINABLE and so is our personal consumption. Constant wear of the word ... sustainable.

A car manufacturer produces cars that allow 95% recycling of materials at its disposal and becomes "a more sustainable manufacturer" than the others. But hold on!! Combustion engine cars are in themselves completely UNSUSTAINABLE. Then there's no point in makeup. Tremendous marketing "bar forcing" and even more wear to the word ... sustainable!



1st Conclusion: the word "sustainable" is without ballast and without consistency! Our entire consumer society is heading towards the abyss, the collapse of the planet, in a "sustainable" way. Then 'sustainable' emptied itself of real meaning. Weakened. A big wake-up call!

### c) What can, in fact, be sustained?

The answer is simple: nature as it is nowadays, intact or not. All native vegetation, although corrupted, can be sustained in all its vital functions. Think of the sea, rivers and lakes, what needs to be done to sustain them? Or native forests that ask to be sustained, preserved, spared (including the "cerrado" and the "caatinga" bioms in Brazil). Any native vegetation, which continues to resist degradation, needs and must be SUSTAINED, however much it demands recompositions. It's a team that plays great if it's not messed up.

Around it, every landscape called "productive", but degraded by colonization, needs to be REGENERATED. Where there was total loss of forest cover, for installation of agriculture, livestock or planted forests (*Pinus spp*, *Eucaliptus spp* etc); where there has been sudden decline of biodiversity, soil degradation, drying of springs and the breakdown of important vital functions of the landscape, fit regeneration actions. This is a team that can't play anymore and will have to learn hard.

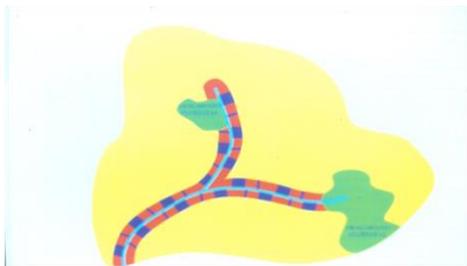
#### Important:

- Sustained landscape portions have a high degree of 'autodynamics': ecological succession happens by itself, spontaneously, they need low input/management.
- The portions that need to be regenerated require greater investment!

2<sup>a</sup> conclusion: sustain and regenerate are complementary and distinct actions!

### d) River basins, rivers and streams: recomposition

Let us look at the Brazilian landscapes as we observe them during our travels. The road passes over the most diverse bridges, over rivers and streams, around which we find clusters of trees of the most diverse configurations: abundant or scarce, high or low, simple or complex, they form a layer or strip of protection to the rivers, with very variable efficiency. Every river or creek with its riparian forests and its spring headwaters full of life, needs to be preserved and sustained. And when the riparian forests are fragile and insufficient, they need to be recomposed, restored, enriched, expanded by a conservationist management, according to the forest code (environment laws) and all its developments. But all this is still little, as it happens only along these narrow ranges of APP = permanent preservation areas (in Portuguese).



3<sup>rd</sup> conclusion: to rebuild and sustain the preservation areas of a watershed, it ends up recovering only a part of its original environmental functionality. The other part belongs to the exploratory activity of the landscape itself, agricultural-livestock-forestry, to then generate a totality.

The complete and simplified equation is:

Preservation areas + Conservation units + productive areas = total rural landscape.

### e) The regeneration of productive areas

The adjacent crops, without trees or abundance of life, form degraded landscapes, which need to be regenerated. A regenerative agriculture can only play its role with evidences, if it is installed on a degraded area. Emphasis on soil aspects, the effective presence of trees and a range of possible environmental services:

- rainwater infiltration in soils and erosion protection of soils,
  - soil enrichment with humus, leading to high fertility,
  - the expansion of agro-biodiversity, pollination services, by bees and many other insects,
  - carbon sequestration, carbon sink, a drop in GHG emissions;
  - natural biological insect control services (natural pest control);
  - support services for gene flow, connecting different fauna and flora corridors.
- And many others too.

### f) The ease of regenerating perennial crops

Crops that frequently appear to be the subject of carbon balance research and various environmental services are perennial crops, such as:

- Agroforestry cocoa, similar to “Cabruca”, shading trees, lots of biomass.
- Coffee with management of biomass, recomposition of preservation forests.
- Pastures in rotational management, wooded and generating rich biomass.



With the question: what would be the reason for this so natural protagonism? Would there be a relationship with the perennialism of these cultures, Cocoa, Coffee and Pastures? Maybe yes, let's examine and compare different production systems.

Next, an examination of the main vectors of these crops, in search of an answer.

The main vectors are:

- constant set-aside of production areas (no movement of soil);
- biomass management, covering and protecting the soil;
- greater or lesser presence of shading trees;
- The facilitated accumulation of carbon in the soil;
- the vicinity interspersed with native tree vegetation;

The vectors together naturally make these 3 systems:

- carbon accumulators and low GHG emitters.
- Preservation areas restorers, allowing the interconnection of forest fragments.
- Adders of good environmental practices / forestry / agricultural.

Remarks:

- A. When there is a management for high productivity, with intensive use of inputs and irrigation, as is the case of irrigated cocoa targeting 4500 to 7500 kg/ha, this pro-climate balance can reverse.
- B. When a production area already has several good practices, there can only be regeneration if there is an intensification of regenerative actions. There should always be a difference between "before" and "after".
- C. An example of this are coffee plantations that adopt the practice of windbreak OR soft-shading, going beyond biomass management.
- D. Another example are cattle farms that start to adopt the silvopasture/ILPF (Brazil).

**g) A case apart: sugar cane**

With the sugarcane culture giving 5 cuts until replanting, we can consider it to be semi-perennial, or multiannual. Certain sugarcane management techniques, such as green manure in the regrowth (and other organic additions), in addition to the use of treadmills instead of tires, can increase the number of cuts to 6, 7 and sometimes to 8. However, they will be followed by the same sugarcane plantation reform, with intensive use of machinery. Remembering that the phytosanitary and weed management always requires intensive use of tractors and even airplanes.

The main vectors are:

- intensive traffic of heavy machinery in planting and harvesting;
- intensive spraying with herbicide in the early stages of the regrowth process;
- intensive chemical fertilization, increasing the traffic of machinery;
- Cancelling the fabulous contribution of organic matter by the high clumps of the cane;
- Negative climate balance also due to the high environmental cost of inputs;

For these reasons, sugarcane does not bring the benefits of the aforementioned perennial crops, although it provides a respectable biomass to the soil (powerful root system and straw of the no-burning harvest).



Remarks:

- A. Only sugarcane plantations that supply the 'gourmet pottery' stills, which are perennial to the point of providing 30 to 60 refurbished cuts, have vectors that are "all the more" regenerative.
- B. Organic sugarcane can improve climate-negative indices/vectors, especially if it is associated with native forest fragments in significant proportions. In this case, the organic management + pro-climatic performance of forest fragments generates several environmental services in a satisfactory volume.

## h) The orchards in *Plantation* style

They are the orchards made in monoculture, the fruit trees lined up and the street giving way to a tractor. A heritage of colonial farms of Africa and Central America, the British-American "Plantation" system.

The main vectors are:

- very frequent spraying with pesticides and heavy traffic of tractors;
- Fertilization: solid, liquid, foliar. Machine/inputs traffic, with high environmental footprint;
- Consequences for the carbon balance: strong emission of exhaust gases into the atmosphere;
- The sum of these vectors abolishes carbon sequestration of trees and weed biomass.

There is the possibility of changing this configuration and achieving more climate-positive results, as we will address in the caveats.



Remarks:

- A. In organic orchards with few sprays and alternating row management (there is always a row with flowering weed), several regenerative indexes/vectors improve significantly. But we would have to practice the operations with an electric tractor and brush cutters. to achieve a more significant level, as well as increase agro-biodiversity by windbreak hedgerows, to enhance various environmental services.
- B. In orchards in ART management, the polyculture of various fruit trees, the constant supply of regenerative fertilizers, the dessavannization of the rows and the management of biomass with electric brush cutters, significantly improve all regenerative indexes/vectors.
- C. In agroforestry systems of pronounced fruit farming, especially in the agroforests managed by *Ernst Goetsch*, we reach the highest indexes/vectors of regeneration.

## i) Extensive vegetable gardens

Horticulture in extension, with vegetables covering several hectares, often in total monoculture, presents the worst regeneration rates.

The main vectors are:

- Overall average input of organic matter; much too less;
- normally no regenerative fertiliser; but intensive irrigation;
- Intense use of inputs with a very high environmental footprint.
- Very frequent soil revolving (roto-cultivator 2 to 5 times per year);
- As a rule, no windbreak, no trees in the system.

This configuration makes horticulture extensive to less regenerative agricultural activity.

### Remarks:

- A. In organic gardens, with intensive use of organic fertilizers and planting of windbreak hedgerows, the indexes/vectors improve somewhat.
- B. In a regenerative garden by the ART method, vitalized with regenerative fertilizers and interspersed by agroforestry strips, the indexes/vectors improve to the point of surprising any analysis.



### **j) Agroforestry systems**

They are regenerative by nature, and there may be considerable variations. Agroforestry systems can be quite static, but they can also be more dynamic or much more dynamic! The commercial productivity of the SAF depends on dynamism. How many foods are they able to generate and sell? The intensity of biomass cycling and a series of regenerative indices/vectors also depends on:

#### The main vectors are:

- ground at rest, with little or no traffic of tractors;
- on-site fertility, without inputs or very few;
- Agrobiodiversity is quite high, normally no need for actions for plant health;
- massive presence of trees, resulting in large carbon sequestration;
- provision of water cycle services, infiltration, ground water feeding;
- Non-adjacent, even non-contiguous, protection to ground water and springs;
- the provision of pollination and population control services (insects, etc.);
- the functions of wildlife corridors and the propagation of biodiversity;
- low greenhouse gas (GHG) emissions; agroforestry performance is similar to forests;
- High potential for carbon sequestration in trunks, canopy and soil.

### **Classification and certification systems**

There are already several classifications about the degree of regeneration of many production systems. Each one is listing its parameters and the indexes that enable it to be considered "regenerative". It is like a gold rush, the attempt to achieve the external recognition of the own system, in the eyes of the public and the market. This topic is very vast and deserves to be covered in an exclusive publication.

**End**

May the reader understand the findings of this text as ONE point of view, a way to enrich the debate. We should discuss many points of view at congresses and events, and with a large audience. We should listen to each other, seeking to improve our own practices. Regenerative agriculture is just beginning!

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