



A unique strategy Recultivation of degraded Land



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healthy soils – healthy plants – healthy animals – healthy environment – healthy humans

SANOVITA Produktions- und Vertriebs GmbH Company Organization Chart



About us

Preceding research and development since 2007 build a solid basis for our purpose of refining particularly high-grade natural raw materials and minerals. Thus, we aim for improved soil, seed, plant and animal health. Our focus is on the composition of the contained nutrients. Special micronization and extraction technologies and state of the art quality management permanently guarantee high quality products. We have worldwide exclusive access to all used natural minerals and plant extracts.



STATUS QUO

In today's world it is estimated that 1 billion people are going to bed hungry. The population is growing and with it the demand for sufficient supply of food. Within the next four decades the population of the world will rise by about 30% and the demand for agricultural products is estimated to rise by 70%. Agricultural land is limited, deforestation has to stop and there is a competition developing for the use of crops for food or biofuels. The use of more chemical fertilizers and pesticides is certainly not a solution and water supplies are becoming more and more limited. The challenge remains to find more efficient and environmentally friendly measures to address these problems.









- ➤ 865 million people are threatened by starvation
- ➤ About 2 billion people are undernourished
- ➤ 20 million km² soils are degraded
- Expected world population by2050 up to 9 billion







OUR MISSION

Our mission is to cultivate healthy soil, healthy seeds, healthy plants and healthy animals. To be more precise, we want to provide sustainable agriculture with the potential to gain profit. Besides, we're not only doing research on further products, but also on sustainable integrated agricultural concepts. In addition to our products and concepts, we care about the minds of the future. In order to reconcile ecology and economy, we want to develop and implement and economical ecological sustainability.



Healthy Soil

The health of soil is a primary concern to farmers and the global community whose livelihoods depend on well managed agriculture. While there are many challenges to maintaining healthy soil, there are also solutions to innovate and maintain the fragile skin from which biodiversity springs.

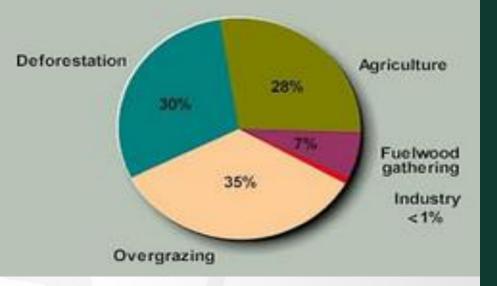


Soil is the earth's fragile skin that anchors all life on Earth. It is comprised of countless species that create a dynamic and complex ecosystem and is among the most precious resources to humans. Increased demand for agriculture commodities generates incentives to convert forests and grasslands to farm fields and pastures. Half of the topsoil on the planet has been lost in the last 150 years. In addition to erosion, soil quality is affected by other aspects of agriculture. These impacts include compaction, loss of soil structure, nutrient degradation, and soil salinity. These are very real and at times severe issues.

The effects of soil erosion go beyond the loss of fertile land. Sustainable land use can help to reduce the impacts of agriculture and livestock, preventing soil degradation and erosion and the loss of valuable land to desertification.



Human Activities Causing Soil Degradation



Soil degradation is defined as a change in the soil health status resulting in a diminished capacity of the ecosystem to provide goods and services for its beneficiaries. Degraded soils have a health status such, that they do not provide the normal goods and services of the particular soil in its ecosystem.

Soil degradation

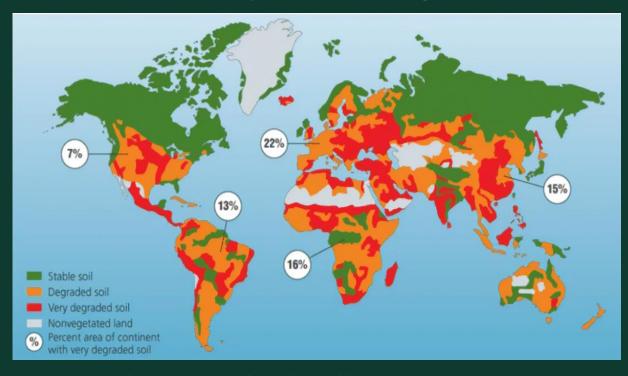
On the global basis, the soil degradation is caused primarily by:

- Overgrazing (35%)
- Deforestation (30%)
- Agriculture (28%)
- Fuelwood gathering(7%)
- Industry (<1%).



World map of soil degradation

If unsustainable convetional farming continues at the present rate, by 2050 one third of the world's agricultural land, which is already seriously degraded, will increase by a further 40 million hectares!!!!



Population and consumption degrades soil!

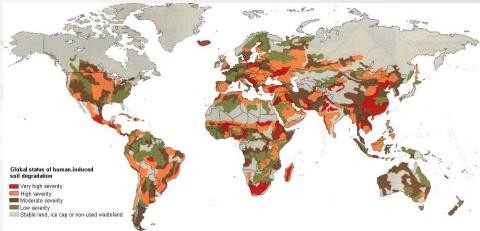
Feeding the world's rising human population requires changing our diet or increasing agricultural production. Land suitable for farming is running out

We must find ways to improve the efficiency of food production!

Mismanaged agriculture turns grasslands into deserts; removes forests; diminishes biodiversity; and pollutes soil, air, and water. Fertile soil is blown and washed away



Soil erosion – World map





Soil erosion is a naturally occurring process that affects all landforms. In agriculture, soil erosion refers to the wearing away of a field's topsoil by the natural physical forces of water and wind or through forces associated with farming activities such as tillage.





In geomorphology and geology, erosion is the action of exogenic processes (such as water flow or wind) which remove soil and rock from one location on the Earth's crust, then transport it to another location where it is deposited.



Land degradation

1. Deforestation:

Deforestation is the removal of a forest or stand of trees from land that is then converted to non-forest use. Deforestation can involve conversion of forest land to farms, ranches, or urban use.

2. Excessive use of Fertilizers and Pesticides:

Excessive use of fertilizers is causing an imbalance in the quantity of certain nutrients in the soil. This imbalance adversely affects the vegetation.

3. Overgrazing:

Increase in livestock population results in overexploitation of pastures. Due to this, grass and other types of vegetation are unable to survive and grow in the area.

4. Wind Erosion:

At places where there is no vegetation and soil is sandy, strong winds blow the loose and coarse soil particles and dust to long distances.

5. Water Erosion:

Water erosion is the removal of soil by water and transportation of the eroded materials away from the point of removal. Water action due to rain erodes the soil.

6. Wasteland:

Wastelands are the lands which are economically unproductive, ecologically unsuitable and subject to environmental deterioration.

Land degradation is defined by the UN Environment Program as "a long-term loss of ecosystem function and services, caused by disturbances from which the system cannot recover unaided"

(Dent 2007, p. 92)

It is considered one of the most fundamental and persistent environmental challenges.

From: <u>Journal for Nature Conservation, 201</u>2



1. Deforestation

Deforestation

Without plant cover, erosion can occur and sweep the land into rivers. The agricultural plants that often replace the trees cannot hold onto the soil and many of these plants, such as coffee, cotton, palm oil, soybean and wheat, can actually worsen soil erosion. And as land loses its fertile soil, agricultural producers move on, clear more forest and continue the cycle of soil loss.



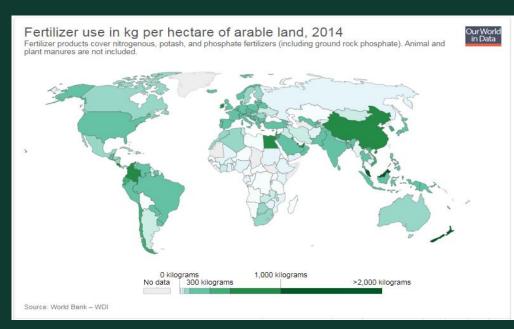
2. Excessive use of Fertilizers and Pesticides

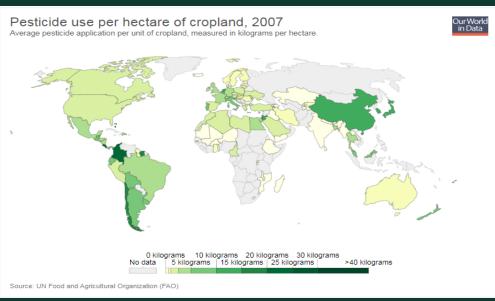
Synthetic fertilizers have dramatically increased food production worldwide. But the unintended costs to the environment and human health have been substantial. Nitrogen runoff from farms has contaminated surface and groundwater and helped create massive "dead zones" and ammonia from fertilized cropland has become a major source of air pollution.

Source: Stanford Report - Mark Shwartz

Pesticides have been used extensively throughout the world to increase agricultural output and protect crops from pests and diseases. They are also used for controlling disease vectors. Many pesticides can cause detrimental health effects, including both organophosphate and organochlorine pesticides.

Source: Pure Earth - Blacksmith Intitute





Causes of Land Degradation

 Overgrazing: Too many grazing cattle, sheep, or goats, which can destroy vegetation and as a result, soil is exposed to erosion.





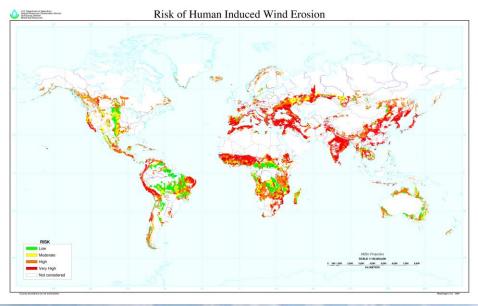


3. Overgrazing

Overgrazing occurs when plants are exposed to intensive grazing for extended periods of time, or without sufficient recovery periods. It reduces the usefulness, productivity, and biodiversity of the land and is one cause of desertification and erosion.

Unsustainable grazing is one of the most diffused land management problems at the global scale.







4. Wind erosion

Wind erosion is a widespread phenomenon causing serious soil degradation. It is estimated that about 28% of the global land area experiencing land degradation suffers from this wind-driven soil erosion process. In agricultural lands, soil erosion by wind mainly results from the removal of the finest and most biological active part of the soil richest in organic matter and nutrients.



5. Water erosion

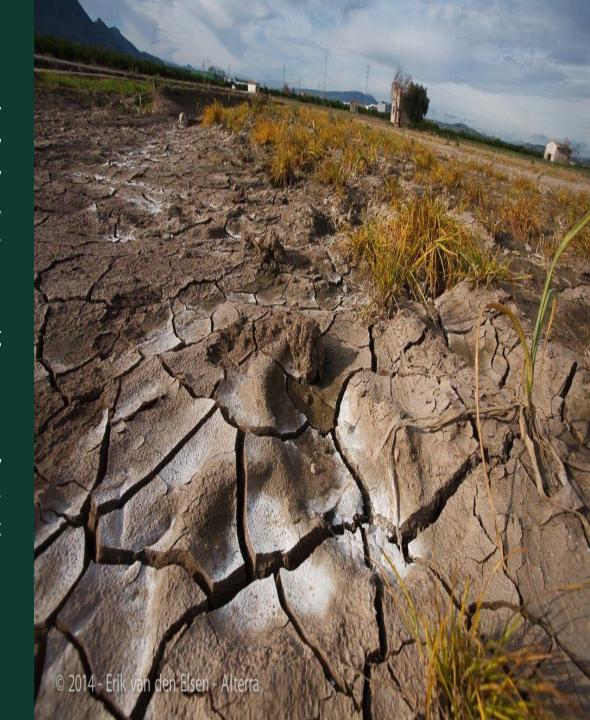
Water erosion is caused by the detachment and transport of soil by rainfall, runoff, melting snow or ice, and irrigation. Excessive erosion can threaten the production of agricultural and forest products. Erosion may also impact water conveyance and storage structures and contribute to pollution from land surfaces. Water erosion may occur within rills, interrill areas (the regions between rills), gullies, ephemeral gullies, stream channels, forest areas, and construction sites.



6. Wasteland

Wastelands are ecologically unstable lands which are low in productivity and severely affected by soil erosion, stress conditions, and hostile environmental conditions. These areas can be abandoned mine lands, mine tailing disposal site, deforested areas, overgrazing land, and barren lands.

The loss of fertility followed by erosion also leads to the conversion of marginal forest lands into wastelands.



Soil degradation Area in km²

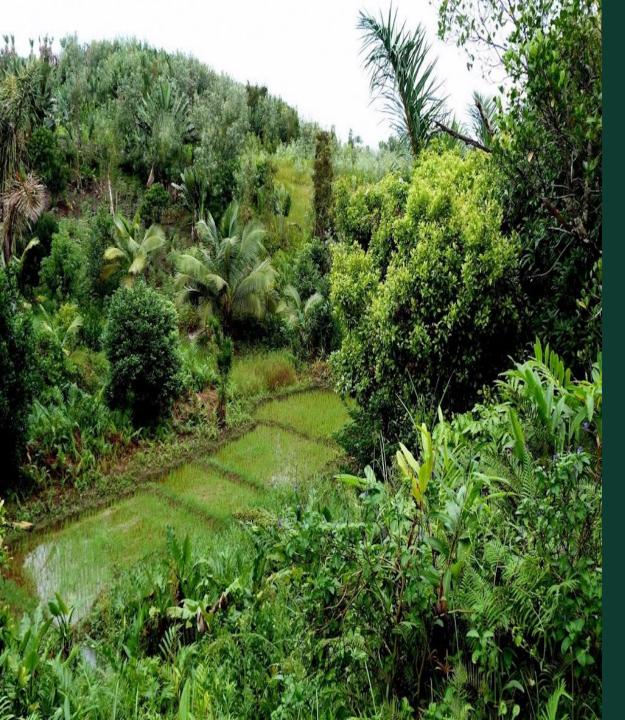
A soil is regarded as degraded if some of the main features like the ability to provide plants with nutrients, filter water and accommodate a large number of microorganisms.

Approx. 1.965 billion hectares of land are worldwide affected by a slightly to severe degradation.

This is more than half of the worldwide utilizable farmland.

| Degree of Degradation Area in km ² | |
|---|---------------------------|
| Slightly degraded soils | 7.465.000 km ² |
| Medium degraded soils | 9.040.000 km² |
| Severe to extreme degraded soils | 3.145.000 km² |





Our philosophy

- ➤ The world population is steadily growing as well as the demand for food supplies.
- The destruction of productive soils is of growing concern and must be prevented.
- ➤ The challenge is to take measures to find sustainable solutions for these problems.
- ➤ There are different options to recultivate degraded soils.
- The objective is to increase crop yields by sustainable and environmentally responsible methods.









Recovered plantation



THE SOLUTION

Projects:

- 1. Agroforestry projects
- 2. Agri food projects
- 3. Intercropping



- ➤ The application of the SanoTerra Concept and the ecologic product lines herbaland ® and herbagreen® is the most efficient way to fertile soils, to supply the plants with nutrients and trace elements.
- These nutrients are easily absorbable by soils and plants, reduces the nutrient loss of soils, improve plant growth and raise crop yields significantly.
- ➤ The herbaland® products along with the SanoTerra Concept provides an option to recultivate degraded soils for agricultural use.





1. Agroforestry is a land use management system in which trees or shrubs are grown around or among crops or pastureland. It combines agricultural and forestry technologies to create more diverse, productive, profitable, healthy, and sustainable land-use systems.

1. Agroforestry projects



There is some evidence that, especially in recent years, poor smallholder farmers are turning to agroforestry as a mean to adapt to the impacts of climate change.





2. Agri Food projects



The FAO concept of food security says that food security is a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences (that is, that satisfies people's quality and cultural preferences) for an active and healthy life on a continued and sustainable basis.

(Source: FAO, 2000c)

Within the agro-industrial sector, rural and urban food industries are major actors in agrifood systems and can therefore have a positive impact on food security, provided they have the capacity to offer safe, high-quality food to consumers on a sustainable basis, and to help boost the incomes of processors and producers. Agri-food enterprises range by scale from those narrowly linked to the immediate post-harvest stages of primary production to the most highly developed, largest-scale enterprises.



3. Intercropping

Intercropping is a multiple cropping practice that involves growing two or more crops in proximity. In other words, intercropping is the cultivation of two or more crops simultaneously on the same field. The most common goal of intercropping is to produce a greater yield on a given piece of land by making use of resources or ecological processes that would otherwise not be utilized by a single crop.



The SanoVita Concept

Herbagreen® Product Line

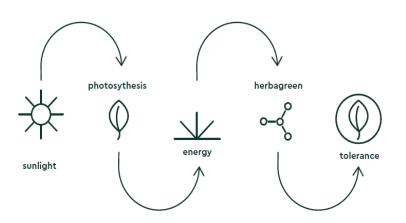






Increase tolerance against abiotic and biotic stress

Photosynthesis is the basis for plant growth. An improvement in photosynthesis consequently leads to higher energy and increased plant growth.



The SanoVita concept provides nutrients, e.g., Iron, magnesium and micro-nutrients stimulate the metabolism of plants to enhance chlorophyll synthesis and its efficiency.

Biotic stress is the result of damage to plants by other living organisms, such as bacteria, viruses, fungi, parasites, beneficial and harmful insects, weeds, as well as cultured native plants.

Abiotic stress is defined as the negative impact of non-living factors on living organisms in a certain environment. (Dryness, moisture, frost and heat damage, etc.)



The SANOVITA Plant Health PRODUCT LINE



Herbagreen's very positive effect on plants in general, especially on the improvement of the production properties of cultivated plants, such as yield increase, better quality of the agricultural products and reduced cost of the plant production.











Herbagreen® Product Approvals

- ✓ Federal Office of Consumer Protection and Food Safety
- ✓ Regional Council Stuttgart/Germany for Agriculture, Rural Areas, Veterinary and Food Administration
- ✓ FiBL Research Institute of Organic Agriculture



Environmental Impacts of the SanoTerra ConceptHerbaland®Product Line



- > Sustainable and ecological agriculture
- CO2-neutral production of biofuels
- Regeneration of degraded soils
- > Erosion control
- > Improvement of biodiversity
- ➤ Generation of employment in rural areas and incorporation of small farmers
- > Sustainable investment in safe future local markets

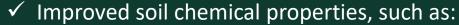
The SanoTerra Concept, based on "Terra Preta "principles:

- √ Soil improvement Soil chemical properties
- ✓ Soil improvement Soil physical peoperties
- ✓ Soil improvement Soil biological properties
- = Profitable for the farmers and investors
- = Healthy food for farmers (subsistancy) and consumers
- = Beneficial to the environment

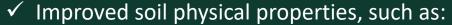


The SanoTerra Concept, based on "Terra Preta" principles:





- Cation Exchange Capacity (CEC)
- Soil pH- buffering
- Redox- potential (oxygen availability)



- Water retention capacity
- Soil porosity (soil humidity, soil aeration)
- Soil aggregates stability (soil structure)



- ✓ Improved soil biological properties, such as
 - Root penetration (root growth)
 - Soil organisms (micro- organism activity)
 - Soil organic matter content (stable organic matter)

Improved Soil HealthSustainably Fertile Soil

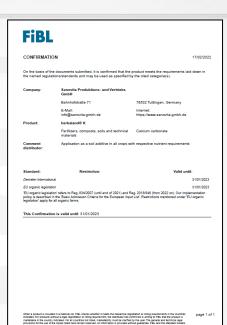


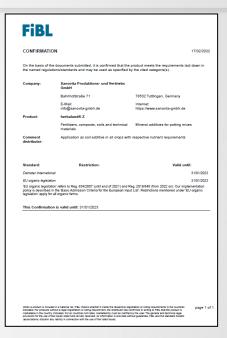
The SANOVITA Soil Health PRODUCT LINE



The above listed products in combination with the "Sanoterra Concept "supports the recultivation of slightly to medium and even heavy degraded soils.







Herbaland® Product Approvals

✓ FiBL Research Institute of Organic

Agriculture







SanoTerra + SanoVita Concept

Herbagreen® + Herbaland® Product Line

Impact of the application of the SANOVITA product lines and SANOTERRA Concept

SANOVITA PRODUCTS impact

- > Higher yield
- > Improved quality (e.g. shelflife, taste)
- > Increased plant vigor
- Stronger plant's immune system
- Higher tolerance abiotic stress (e.g. draught, frost)
- Higher tolerance biotic stress (e.g. fungi, bacteria)

SANOTERRA CONCEPT impact

- > Long term land management
- > Sustainable Water Management
- Sustainable safeguarding the food supply
- > Improvement of the living conditions of the rural population
- > Preservation of the environment

Healthy soils





Healthy plants



Healthy enviroment





Healthy humans

plant health

soil health





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If you have questions, we are here for you.

Please do not hesitate to contact us...

Technology and production for quality and outstanding results

