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## Nutshell Series

1. The Savory Brittleness Scale
2. Carbon Sequestration
3. Ecosystem Processes
4. Grazing Animals
5. Run-off
6. Water Cycle
7. Root Cause
8. Plant Succession
9. Irrigation
10. What is Holistic Management®?

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*Semilla Besada*  
*Nutshell Series*

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*Carbon*  
*Sequestration*  
*and what it means for*  
*dryland design and*  
*management*



# Carbon Sequestration *and what it means for dryland design and management*

**Al Gore's film** An Inconvenient Truth has brought the carbon crisis to public attention as nothing else has. We are all now aware of how carbon emissions are contributing to global warming. We all now know what we can do about it.

**Reducing** carbon emissions through increased technological efficiency and reduced consumption is one approach. In other words, we tackle the source of the carbon.

**The other** is to expand those natural environments where carbon is removed from the atmosphere and locked up in some other biological form. These are known as carbon sinks.

**Since the Kyoto Protocol**, companies have been allowed to offset their carbon emissions by using carbon sinks. For example, they can offset their impact on the environment by funding the planting of trees.

**Carbon sequestration** is the process of removing carbon from the atmosphere and locking it up in some other biological form.

**All green plants**, algae and many bacteria sequester carbon. They remove carbon from the atmosphere through photosynthesis. This converts water and carbon into food and oxygen using energy absorbed from the sun.

**Anything** that causes bare ground results in the loss of the capacity to sequester carbon. The more plant, algal and bacterial life is lost, the more carbon will remain in the atmosphere and increase global warming.

**Seventy percent** of the world's landmass is brittle, and it is desertifying at a staggering 161,000 hectares a day. The Mediterranean is one such area. Brittle landscapes are particularly vulnerable to the inappropriate use of conventional temperate land management practices, such as ploughing.

**Tree planting** is one of the most popular attempts to increase carbon sinks, but is this the most effective thing to do? What about all the other green plants, algae and bacteria? What about the carbon sequestering capacity of soil? Carbon is stored both above and below ground. Building soil carbon is one of the most effective ways in which to sequester carbon in brittle landscapes.



**Interesting statistics** reveal the following soil carbon sequestration capacity per hectare:

Temperate grasslands 236 tonnes

Tropical forests 123 tonnes

Tropical savannah 117 tonnes

Temperate forests 96 tonnes

Croplands 80 tonnes

The global estimate is that 2500 GT (gigatonnes) of carbon is sequestered in soils, compared with 550 GT above-ground (in the form of all living things, including trees) and 607 GT in the atmosphere.

**Under regenerative** grassland management soil carbon can be built at the rate of 20-25 tonnes/hectare/year. A tree takes much longer to mature and hence much longer to reach its full carbon sequestration capacity.

**For the first time in Europe**, residential educational programmes at Semilla Besada consider new insights for sustainable design and management of dryland environments.

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