

# Agroforestry and Its Benefits

Source: [en.reset.org](http://en.reset.org)

Published: March 1, 2017



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Agroforestry is the management and integration of trees, crops and/or livestock on the same plot of land and can be an integral component of productive agriculture. It may include existing native forests and forests established by landholders. It is a flexible concept, involving both small and large-sized land holdings.

Scientifically speaking, agroforestry is derived from ecology and is one of the three principal land-use sciences, the other two being agriculture and forestry. Agroforestry differs from the latter two principals by placing an emphasis on integration of and interactions among a combination of elements rather than just focussing on each element individually.

Agroforestry has a lot in common with intercropping (the practice of planting two or more crops on the same plot) with both practices placing an emphasis on interaction between different plant species. Generally speaking, both agroforestry and intercropping can result in higher overall yields and reduced operational costs.



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## **The Benefits of Agroforestry**

Over the past two decades, a number of studies have been carried out analysing the viability of agroforestry. The combined research has highlighted that agroforestry can reap substantial benefits both economically and environmentally, producing more output and proving to be more sustainable than forestry or agricultural monocultures. Agroforestry systems have already been adopted in many parts of the world.

According to the [Agroforestry Research Trust](#), agroforestry systems can include the following benefits:

1. They can control runoff and soil erosion, thereby reducing losses of water, soil material, organic matter and nutrients.
2. They can maintain soil organic matter and biological activity at levels satisfactory for soil fertility. This depends on an adequate proportion of trees in the system- normally at least 20% crown cover of trees to maintain organic matter over systems as a whole.
3. They can maintain more favourable soil physical properties than agriculture, through organic matter maintenance and the effects of tree roots.
4. They can lead to more closed nutrient cycling than agriculture and hence to more efficient use of nutrients. This is true to an impressive degree for forest garden/farming systems.
5. They can check the development of soil toxicities, or reduce existing toxicities-both soil acidification and salinization can be checked and trees can be employed in the reclamation of polluted soils.

6. They utilize solar energy more efficiently than monocultural systems different height plants, leaf shapes and alignments all contribute.
7. They can lead to reduced insect pests and associated diseases.
8. They can be employed to reclaim eroded and degraded land.
9. Agro forestry can augment soil water availability to land use systems. In dry regions, though, competition between trees and crops is a major problem.
10. Nitrogen-fixing trees and shrubs can substantially increase nitrogen inputs to agro forestry systems.
11. Trees can probably increase nutrient inputs to agro forestry systems by retrieval from lower soil horizons and weathering rock.
12. The decomposition of tree and pruning can substantially contribute to maintenance of soil fertility. The addition of high-quality tree prunings leads to large increase in crop yields.
13. The release of nutrients from the decomposition of tree residues can be synchronized with the requirements for nutrient uptake of associated crops. While different trees and crops will all have different requirement, and there will always be some imbalance, the addition of high quality prunings to the soil at the time of crop planting usually leads to a good degree of synchrony between nutrient release and demand.
14. In the maintenance of soil fertility under agro forestry, the role of roots is at least as important as that of above-ground biomass.
15. Agro forestry can provide a more diverse farm economy and stimulate the whole rural economy, leading to more stable farms and communities. Economics risks are reduced when systems produce multiple products.

As well as building on practices used in forestry and agriculture, agroforestry also works towards land protection and conservation through more effective protection of stock, control of soil erosion, salinity and water tables and a higher quality control of timber.

A denser, more-dependable tree covering can provide shelter to livestock during the warmer months allowing the animals can conserve energy. That same tree covering helps block out wind, helping to boost water retention levels that can help produce a more robust crop yield.

According to the [Central Queensland Forest Association](#) (based in rainforest-rich Northern Australia), agroforestry can improve land protection in the following areas:

***Salinity and water table control:***

Salinity is mainly caused by rising water tables. Trees help to lower water tables, acting as pumps to take up water from the soil and then evaporating it to the atmosphere.

***Soil erosion control:***

Soil erosion or loss results from the action of wind and water on unprotected soils. The forest canopy, roots and leaf litter all have a role in controlling soil erosion.

***Water logging:***

Through water removal, established trees can substantially reduce water logging in their immediate area, which may result in improved land uses, e.g. pasture or crop.

Agroforestry can have immense benefits for the environment and the farmer (a detailed breakdown of agroforestry's main benefits can be found on [AgriInfo's site](#)). For farmers, the ability to maintain some sort of control over land and production in the face of climate change means agroforestry could hold huge promise for the agricultural sector.

On an environmental level, agroforestry's ability to help prevent soil erosion while simultaneously aiding water retention and promoting soil fertility could help provide a solution for areas where rainfall is irregular or might become irregular due to climate change while dense plantations of trees would also help absorb CO2 and regulate local temperature.

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