Newsletter – May 2020

Agroecology in Africa

Rural Development & Large-Scale Carbon Sequestration

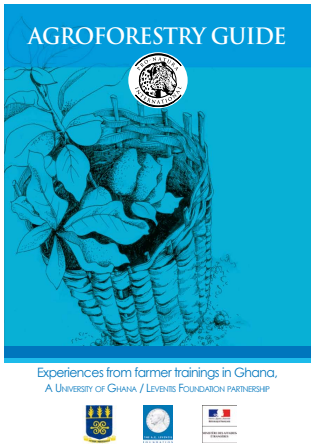
Agroecology covers three main areas: agroforestry, organic farming and "climate smart" techniques and products like no-till and biochar. The combination of agroforestry and biochar dramatically increases farmers' incomes by greatly improving yields while sequestering carbon on a large scale, all in a particularly profitable way.

For more than 30 years, Pro-Natura has led agroforestry projects in our planet's tropical zones to fight climate change while addressing food security issues and preserving biodiversity.

Pro-Natura works in partnership with the International Centre for Research in Agroforestry (ICRAF), a global centre of excellence in science and development based in Nairobi. Our shared objective is to apply "Climate-Smart Agroecology" at an African scale to sequester 600 million tons of GHG over the next 20 years while improving the livelihood of 10 million farmers by a factor of three.

Coffee tree agroforestry system

Agroforestry – Concept & Pilot Projects



Agroforestry is a land use management system where trees or shrubs are grown among crops or pastureland while respecting local traditions.

Agroforestry creates **synergies between trees and crops**: the soil becomes more fertile, and plants grow faster. Production is more varied and optimised, thus better securing farmer's revenues. This technique also maximises carbon sequestration in the landscape.

Some examples of Pro-Natura's agroforestry projects, that will be replicated at scale:

Training of young farmers in agroforestry

In Nigeria and Ghana, in collaboration with the Leventis Foundation and the University of Ghana, Pro-Natura has implemented a practical agroforestry education program which has benefited more than 5,000 young farmers, thanks to co-funding from the French Ministry of Foreign Affairs and the French Embassy in Nigeria.

Learn more: www.leventisfoundation.org.ng

Implementation of agroforestry systems around a nature reserve

In Ivory Coast, in collaboration with the French Ministry of Foreign Affairs and UNESCO's Man and Biosphere (MAB) program, Pro-Natura established agroforestry systems to protect and limit the deforestation of the Taï National Park, the most important refuge of tropical biodiversity in West Africa.

This knowledge and know-how have been widely shared in our two Agroforestry Practical Training Guides, available on Pro-Natura's website under the "Fighting Poverty" tab.

Cocoa agroforestry system

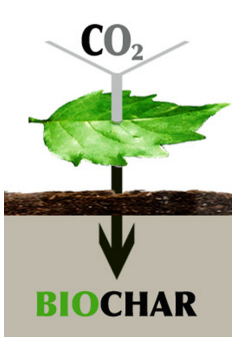
Biochar – Carbon Sequestration in the Soil & Better Yields

Agriculture and forestry both generate large volumes of woody residues (cereal stalks, rice husks, forest residues, etc.) which are not usually used, and often end up burnt, thus emitting CO_2. Pro-Natura has developed a prize-winning technology that recycles this green waste by carbonising it by pyrolysis, a process of heating it at high temperature in an oxygen-deprived environment. This makes it possible to conserve the carbon contained in this biomass in a solid form called biochar. Buried in granular form in the surface layer of the soil, one ton of biochar is the equivalent of 2.7 tons of CO_2 that remains sequestered in the soil for several thousand years.

In addition to storing carbon in the soil, this process increases agricultural yields and stimulates tree growth, thereby fixing more atmospheric carbon in plants and in the soil.

The many benefits of biochar for agriculture, and therefore for poverty reduction, are described on Pro-Natura's website in the "Biochar" section.

Combine Agroforestry & Biochar for Large-Scale Carbon Capture



Among nature-based solutions to tackle climate change, we believe agroforestry to be the most effective, allowing both the sequestration of carbon in trees and to fight deforestation, while also fighting poverty. By adding biochar, the soil's fertility increases, photosinthesys is enhanced and thus sequestration effects are multiplied, creating rich carbon sinks in the soil. In addition, the biochar production technology developed by Pro-Natura makes it possible to cogenerate clean electricity, thus avoiding CO_2 emissions.

This triple dynamic is particularly profitable for farmers and is the only one able to generate carbon credits at negative cost.

Biochar & Electricity Co-Generation

Pro-Natura has developed CarboChar, a biochar production technology that can produce between 1 and 10 tonnes of biochar per day depending on the size of the machine. It provides a **35% to 45% yield** (weight of biochar produced compared to by weight of biomass at 15% humidity) depending on the type of biomass used. In addition, continuous pyrolysis allows the process to be virtually autonomous in terms of energy, while also reducing operating costs. The heat energy generated during biochar production can be used to displace electricity from fossil fuels or to dry humid biomass.

CarboChar-3 and 4 can also co-generate electricity. They respectively produce 1MW and 2MW of sustainable heat that can be converted into electricity with an ORC (Organic Ranking Cycle) technology transforming thermal energy into mechanical energy and finally into electricity through an electrical generator.

Pro-Natura's CarboChar-1

Example of ORC made by Enertime

Pro-Natura International UK • 29 Downside Crescent, London NW3 2AN
Contact: guy.reinaud@pronatura.org

IUCN | Member