

Edible Forests

By Gunter Pauli

This article introduces edible forests as one of the 100 innovations that shape "The Blue Economy". This article is part of a broad effort to stimulate entrepreneurship, competitiveness and employment.

The Market for Reforestation

The World Bank's State and Trends of the Carbon Market Report states a total market value of carbon credits in 2010 that reached \$142 billion, slightly down from \$144 billion in 2009. Only a small fraction of the carbon sequestration projects covered afforestation, reforestation and sustainable agricultural land management projects. The BioCarbon Fund of the World Bank has invested since 2004 a total of \$91.9 million dollars in forest growth initiatives leading to 8.6 million tons of carbon emission reductions starting from degraded land with the purpose to restore, newly planted forest to produce fuel wood and/or and timber. The fact that the carbon finance is only delivered when the trees are standing and sequestering requires large upfront investments which limits the popularity of this scheme.

The total world forest area is just over four billion hectares, or 31 percent of the total land area. Only one third of that number is a primary forest due to the destruction of 40 million HA since 2000. This original cover is only half from five decades ago. Asia is the only region that has registered a net gain of 2.2 million hectares annually over the past decade, while South America and Africa had a net annual loss of forests of 4 and 3.4 million hectares respectively. The net loss of forest area over the period 2000 to 2010 was 5.2 million hectares. Israel and Bhutan are the only countries that entered the 21st century with a net gain of trees. Bhutan has protected its forest in a newly adopted constitution which stands at minimum 60 percent of the total land mass. Israel planted 240 million trees as a pre-condition to attract and provide livelihood for 250,000 new settlers. This implies that each settler's livelihood implies planting one thousand trees.

The Innovation

The challenge of reforestation projects is that these pursue only one target: fuel wood or timber, now complemented with the sequestration of carbon. The focus on a single output steers companies towards maximizing output whereby the temptation to seek quick solutions through genetically modified species sounds like an obvious choice. As a response to the increasing awareness of the damage to the land and soil caused by monoculture tree planting, several organizations have set out to certify sustainable forestry. Unfortunately, these certificates reduce the aggressive treatment of the land, but do not generate the additional benefits like food. After all, today you either have a forest, and live off the trees (wood), or you cut the forest, sell the wood, and farm the land. Is it possible to get out of the either/or trap?

Javier Herrero grew up on the island of Mallorca, part of the Balearic Isles of Spain, and has always been interested in combining his passion for nature with education. He would like children to develop their innate human potential in contact with the outside environment. He developed a learning system that evolves around initiatives that emerge from the children themselves. He was very inspired by the work of Fritjof Capra and the concept of ecological alphabetization. He decided to contribute to the creation of a pedagogy where the best environment for learning is a forest. However, forests are always a cost, and a productive forest which earns its investment back requires maintenance in an urban or peri-urban environment. Therefore, he decided to rethink the existing garden models that rely on annual planting and harvesting cycles to create a perennial edible forest as a way to learn about nature, grow food, and participate in the productive process of an ecosystem. He bridges the dichotomy between forest and farms, and then secures that this is not just about harvesting but improving the regenerative capacity of the land, both in terms of food and forest.

Javier went on to experiment for 15 years in diverse environments and concluded that a tiny forest can be set up at home, even on a balcony, or in an open space in the center of a city. And, if space is really too tight, he applied the age old philosophy that problems are opportunities, and started planting vertically, covering a whole wall which not only provides nutriment, it is even beautiful. Javier realized that one of the challenges is time. The creation of an edible forest requires patience. The preparation work may take one year, sometimes two since the creation of a small forest in a home garden is quite different from the development of a two hectare piece of land. It may take five years for the forest to start delivering its first harvest. After 15 years one can enjoy a mature forest that – if well maintained – will provide edible fruits and nuts forever. Javier made some simulations and concluded that if every family home and every school in the world were to embark on the creation of an edible forest on available land and space, inside and outside, one could bring the carbon concentration in the atmosphere back to pre-industrialization levels. Javier believes that humanity could even move from a permanent risk of world hunger, to sufficiency.

The First Cash Flow

Javier had the chance to demonstrate his concepts at the Parque Ecológico Urobia located in the town of Orba, situated between Alicante and Valencia (Spain). He carefully selected and planted 700 varieties of species ranging from fruit, wood, medicinal, aromatic, herbal and bush trees. A rain capturing system channels 450,000 liters of fresh water each year in and around the newly planted forest, providing more than a commercial irrigation system could ever afford. The canals – once constructed – supply an abundance of water by gravity in a region that has been traditionally suffering from long summers with heat waves and a shortage of moisture. Thanks to the abundance of water animals and birds returned. In cooperation with the Politecnico University of Valencia, Javier and his team are now assessing the rate of recovery of biodiversity. While Javier planted the trees, he created a system that received additional seeds brought in by the birds and the bees - for free. A

system that generates multiple revenues from a forest, serves as a learning tool, where shortage of water is converted into a surplus while regenerating biodiversity, and that is expected to function forever at no extra cost is a fine example of The Blue Economy.

The Opportunity

Over the past decades it has been agreed and even become a standard that all schools should have a gym. Sitting in uncomfortable chairs for hours without the right to move affected both the physical and mental health of children. The sport's hall became an integral part of school buildings. Time has come to move to a second indispensable component that every educational infrastructure should have: access to an edible forest. At a time when children are either underfed, suffering from hunger, or are overfed, suffering from obesity, parents and teachers have to secure a learning platform so that children know that fruits and nuts grow on trees, with sufficient water and light. In the forest there are several layers of nutriment production, from the soil with roots, the undergrowth with mushrooms and berries, to the canape with fruits. In this way children can take take their future in their own hands.

In a country like South Africa were there are two times more churches than schools, one could request all to join efforts and secure that the art of producing food is not a privilege of a few multinationals and mega-farmers, but a basic know-how in life that all children everywhere should be exposed to. As Javier demonstrated, with knowledge and patience, it is possible to create an edible forest that will produce forever once it reached maturity. Whenever land that was not productive can be converted into a space that generates food, then the value increases. This is why edible forests should not only be considered an indispensable tool for learning, it could very well be an opportunity for those who can imagine a new business model.

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... Further information on the 100 innovations at www.theblueeconomy.org

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