

OpEd

Business unusual: another agricultural revolution is needed to satisfy the demands for food tomorrow

We need to drastically modify global agriculture by incorporating trees into the farming environment

The world stands at a critical juncture in the second decade of the 21st century. International policymakers have begun to face the unspeakable possibility that we might be running out of food and the land to grow it. Staggeringly, we need to grow as much food in the next 40 years as we have done in the past 8,000 years.

The recently published United Nations *Africa Human Development Report* estimates that one third of all Africans do not get enough food to eat. Two thirds of agricultural land in Africa face degradation or collapse by 2030. Meanwhile, the global population continues to grow, and people in expanding economies are demanding more food.

A new way of doing business is essential if we are going to meet the demands for food tomorrow, let alone in 2030 when urban populations become the majority in developing countries or by 2050 when we expect nine billion mouths to feed.

About 140 million hectares of forest and woodland have been lost worldwide since 1990 to plant huge swathes of food crops. But trees play a fundamental role in almost all the Earth's ecosystems and provide a range of benefits to rural and urban people. Landscapes without trees can quickly erode.

As natural vegetation is cleared for agriculture and other types of development, however, trees need to be integrated into agriculturally productive landscapes — a practice known as **agroforestry**. These trees yield more than environmental benefits. Adding trees to cropland can be highly profitable, producing valuable fruit, rubber, coffee, oil, cocoa, medicinal and energy products.

Agroforestry is an integrated land use that subsistence farmers throughout most of the world have developed. Almost half of the world's farmland already has more than 10 percent tree cover. But that is not enough to supply the goods and ecological services needed today.

With growing recognition that agriculture needs to drastically shift to incorporate more sustainable farming systems, agroforestry is gaining more and more prominence. It is increasingly promoted by land use managers and international development organizations for its ability to bring both livelihood and environmental benefits, especially in some of the poorest and most degraded areas of the world.

Natural forests are increasingly threatened as populations grow. This pressure can be lifted by growing trees outside forests that provide the same goods and services. For example, thousands of smallholder farmers in Africa, Latin America and Asia are benefitting from growing superior varieties of indigenous fruit trees to earn extra income. In addition they are increasing on-farm biodiversity.

Trees outside forests also have a role in climate change mitigation and adaptation. Trees store carbon both above and below ground. According to the Intergovernmental Panel on Climate Change “transformation of degraded agricultural lands to agroforestry has far greater potential to sequester carbon than any other managed land use change.” Trees also help to buffer against the impacts of climate change by reducing erosion and runoff, improving water retention and providing shade.

The United Nations Convention to Combat Desertification sees agroforestry as a key to rehabilitating land while generating production and income for land users. And the success of African countries has started to build momentum. Following reforms to the forest code in Niger, for example, farmers have again been cultivating trees and the country has seen a tremendous increase in tree cover on over 5 million hectares in the past 20 years.

In Senegal, planting strips of *Casuarina* spp. in the Niayes coastal stretch north of Dakar has stopped the movement of sand dunes and allowed market gardening to thrive. Fertilizer trees that capture nitrogen from the atmosphere and transfer it to the soil provide a low cost way for farmers to improve soil fertility and boosts crop yields. In Malawi, Zambia, Kenya, Tanzania, Niger, Burkina Faso and other countries in sub-Saharan Africa, fertilizer trees are doubling and tripling average maize yields. Yet the need to overcome policy constraints in other countries is still holding farmers back from taking full advantage of growing trees on their farms.

Clearly, a new and entirely different agricultural revolution is needed, where farm production is intensified and sustained by maintaining and enhancing the productive capacity of land rather than destroying it in search of short-term gain. In this light, trees have to be part of the future landscape. All branches of governments, development agencies and businesses need to work together in this endeavor, otherwise we cannot remodel our existing, defective agricultural system to meet the pressing needs of the future.

Dr Tony Simons
Director General
World Agroforestry Centre
Nairobi
Kenya