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# Hope is evergreen



DENNIS GARRITY

Director General,  
World Agroforestry Centre

Africa needs to increase its food production dramatically, and to do so in a way that is sustainable, affordable and does not further threaten biodiversity. Already around 30 per cent of its people — some 218 million — struggle with hunger daily and its population is predicted to grow from about 796 million in 2005 to 1.8 billion by 2050. Yet food production per head has been declining and yields of cereals have remained stagnant since the 1960s.

At the same time the size of landholdings has consistently shrunk: four out of every five of the continent's farms are now of less than 2 hectares in size. Farmers are trying to increase yields on

smaller farms with poor soils, amid increasing climate variability and with long-term climate changes ahead. Often, their only hope of producing more food is to expand cultivation by felling forests, posing a major challenge to biodiversity conservation.

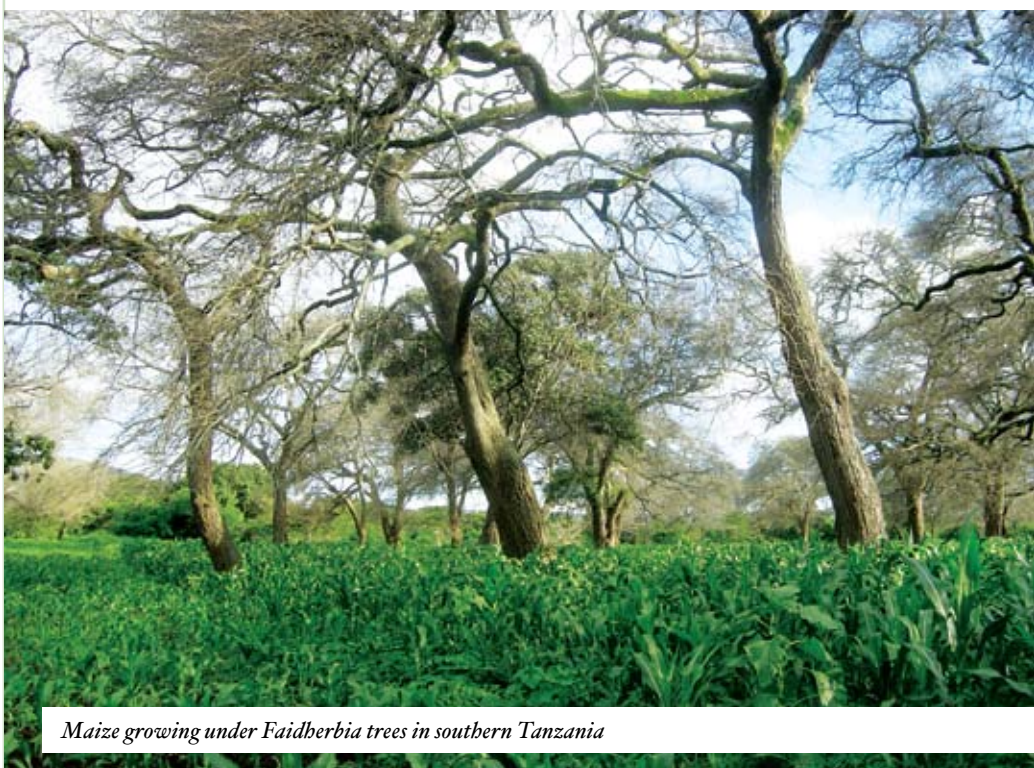
Science-based solutions that build on the best of local knowledge and practices — and are truly accessible and affordable — are the only way of ensuring agricultural growth that combats extreme poverty while preventing further deforestation. And hundreds of thousands of smallholder farmers in Zambia, Malawi, Niger and Burkino Faso have indeed shifted to farming systems that are restoring exhausted soils and dramatically increasing both crop yields and incomes. They are applying the principles of evergreen agriculture, which is emerging as a practice of enormous potential not just for increasing crop yields but also for introducing more trees into farms and preventing forest loss. It can be broadly defined as conservation farming that integrates trees with annual food crops and cover crops. Conservation farming is already practised on 100 million hectares of land around the globe. It involves three basic principles: disturbing the soil as little as possible (through minimum or zero tillage); keeping the soil covered with organic material like crop residues; and rotating and diversifying crops, particularly using leguminous species that replenish soil nutrients.

In evergreen agriculture, incorporating trees into farming systems — a practice known as agroforestry — is added to these principles. The trees usually offer many benefits to the farmer and the environment, including providing green fertilizer to build healthier soils and enhance crop production, and yielding fruit, medicines, livestock fodder, timber

and fuelwood. They also provide shelter, control erosion, increase biodiversity and offer greater resilience to climate change, while storing carbon.

Fertilizer trees — which draw nitrogen from the air and transfer it to the soil through their roots and leaf litter — have been shown to be able to double average maize yields or more. This equates to an extra three to four months' supply of maize for a family of six, assuming the average African consumes 1.5 kg a day.

*“Evergreen agriculture offers an affordable and accessible science-based way of better caring for the land and of increasing smallholder food production.”*



*Maize growing under Faidherbia trees in southern Tanzania*

One special fertilizer tree — *Faidherbia albida*, an indigenous African acacia already a natural component of farming systems across much of the continent — could be the cornerstone of future evergreen agriculture. It exhibits “reverse leaf phenology”, meaning that it sheds its nitrogen-rich leaves during the early rainy season and remains dormant throughout the crop-growing period: the leaves grow again when the dry season begins. This makes it highly compatible with food crops, because it does not compete with them for

light, nutrients or water during the growing season: only its bare branches spread overhead while the food crops grow to maturity.

In Malawi, maize yields have increased by up to 280 per cent when grown under the canopy of *Faidherbia* trees. In Zambia and Malawi more than 100,000 farmers have extended their conservation farming practices to include cultivating food crops within agroforests of *Faidherbia* trees. Extensive observations indicated that maize grown near the trees is



*Improved yields mean improved livelihoods and nutrition, and a route out of poverty*

dramatically more productive, and that the soil gets healthier. And in Niger, there are now about 4.8 million hectares of *Faidherbia*-dominated agroforests enhancing millet and sorghum production.

Evergreen agriculture offers an affordable and accessible science-based way of better caring for the land and of increasing smallholder food production. It allows us to glimpse a future of more environmentally benign farming, with much of our annual food crops being produced within a forest of full-canopy trees.

Most clearing of forests for agriculture is done by subsistence farmers striving to increase

their production and incomes, and to escape poverty. As rural population densities continue to rise, natural forests — and the services they provide — are increasingly threatened. A broad adoption of evergreen agriculture offers smallholder farmers the opportunity of improving their land's productivity, thus alleviating the need for further agricultural expansion and potentially leaving more natural forest intact.

Increasing agroforestry also offers the potential to produce forest goods and services on farms, and so further protect biodiversity. And if carbon markets were to become accessible to smallholder farmers, this would result in an

ever greater number of trees in agricultural landscapes.

Such experiences with evergreen agriculture and *Faidherbia* offer the basis for a proposed expansion across Africa. A broad alliance is emerging of governments, international donors, research institutions and international and local development partners committed to expanding this innovative approach to farming throughout the continent.

*This article has been compiled with assistance from the World Agroforestry Centre's regional coordinators: Festus Akinnifesi (Southern Africa) Jeremias Mowo (East Africa) and Antoine Kalinganire (Sabel).*



World Agroforestry Centre  
TRANSFORMING LIVES AND LANDSCAPES

United Nations Avenue, Gigiri • PO Box 30677 • Nairobi, 00100 • Kenya  
Telephone: +254 20 7224000 or via USA +1 650 833 6645  
Fax: +254 20 7224001 or via USA +1 650 833 6646  
Email: [ICRAF@cgiar.org](mailto:ICRAF@cgiar.org) • [www.worldagroforestry.org](http://www.worldagroforestry.org)