New study: Farmers protecting and growing significant amount of world's trees

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Although agriculture, particularly in the developing world, is often associated with massive deforestation, scientists from the World Agroforestry Centre demonstrated today, in a study using detailed satellite imagery, that almost half of all farmed landscapes worldwide include significant tree cover.

The findings were announced at the opening of the 2nd World Congress of Agroforestry, which is being held in Nairobi, Kenya this week. The World Agroforestry Centre is one of 15 centers supported by the Consultative Group on International Agricultural Research (CGIAR).

This is the first study to quantify the extent to which trees are a vital part of agricultural production in all regions of the world. It reveals that on more than 1 billion hectares—which make up 46 percent of the world's farmlands and are home to more than half a billion people—tree cover exceeds 10 percent.

"The area revealed in this study is twice the size of the Amazon, and shows that farmers are protecting and planting trees spontaneously," said Dennis Garrity, the Centre's Director General. "The problem is that policymakers and planners have been slow to recognize this phenomenon and take advantage of the beneficial effect of planting trees on farms. Trees are providing farmers with everything from carbon sequestration, to nuts and fruits, to windbreaks and erosion control, to fuel for heating and timber for housing. Unless such practices are brought to scale in farming communities worldwide, we will not benefit from the full value

trees can bring to livelihoods and landscapes."

From the data presented in the study, it is not possible in all cases for the researchers to discern precisely the products and services that trees are providing. However, a great deal of previous agroforestry research has documented a wide range of uses for trees on farms, including: fertilizer trees for improving crop yields and enhancing soil health; fruit trees for nutrition; fodder trees to feed livestock; timber and fuelwood trees to provide shelter and energy; medicinal trees; and trees that provide global commodities such as coffee, rubber, nuts, gums and resins. As equally important on the service side are uses such as erosion control, water quality and biodiversity.

"If planted systematically on farms, trees could improve the resiliency of farmers by providing them with food and income," said Tony Simons, Deputy Director General at the World Agroforestry Centre. "For example, when crops and livestock fail, trees often withstand drought conditions and allow people to hold over until the next season."

"What trees essentially provide to farmers is choice. Choice of enterprise, choice of market, choice for diversification, choice for low labour requirement, choice for multiple function," Simons continued. "Developing country farmers are spoilt for choice. Whilst Western Europe has some 250 native tree species and North America has a larger set of 600 trees species—the developing tropics has a staggering 50,000 tree species to manage and utilize. The priority is to find the right tree for the right place for the right use."

Previous estimates for the amount of farmland devoted to agroforestry have ranged from as low as 50,000 hectares to as high as 307 million hectares. But these estimates were not derived from detailed remote sensing data as was employed in this assessment. In this study, scientists were able to measure the amount of tree cover on each square kilometer

of the world's 22.2 million square kilometers of farmland.

The scientists—who included researchers from the International Centre for Integrated Mountain Development and the Katholieke Universiteit Leuven in Belgium—found that about 10 million square kilometers of agricultural land have at least 10 percent tree cover. That includes 3.2 million square kilometers in South America, 1.9 million in sub-Saharan Africa and 1.3 million in Southeast Asia. According to the report, "trees are an integral part of the agricultural landscape in all regions, except North Africa and West Asia."

Their data also show that people live with trees in farmed landscapes in virtually all of Central America, and in about 80 percent of such landscapes in Southeast Asia and South America. The proportion was lower but still large in sub-Saharan Africa, Europe, and North America, where trees are a significant feature on about 40 percent of agricultural land. The study observes that the extent of trees in farmland in North America and Europe is especially impressive, given the large commercial agricultural sector of these regions.

"This study offers convincing evidence that farms and forests are in no way mutually exclusive, but that trees are in fact critical to agricultural production everywhere," said Professor Wangari Maathai, founder of the Green Belt Movement. Professor Maathai was awarded the 2004 Nobel Peace Prize for work that included planting more than 30 million trees to provide food, fuel, shelter and income for Africa's rural poor.

Challenging Commonly Held Assumptions

Most notably, the researchers found that globally, there is no consistent tradeoff "between people and trees." There are areas with low population and little tree cover, and areas with lots of people and lots of trees. And the amount of tree cover—low or high—could not be explained solely by

climate conditions, they said.

"This underlines the importance of other factors," the study states, such as land tenure rights, markets, or "other policies and institutions," which influence tree planting, retention and management.

The authors also point to "documented cases" in which forests are initially cleared for agriculture development, but tree cover later returns, at least partially, as farmers seek to enhance production by planting useful trees that can generate income or provide other services, such as protecting watersheds.

According to experts at the World Agroforestry Centre, farmers, particularly in developing countries, would adopt various agroforestry practices more rapidly if their trees were included in international climate change mitigation schemes now under development.

Trees and Climate Change

Climate change talks set to take place later this year in Copenhagen will consider a new strategy focused on Reduced Emissions from Deforestation and Forest Degradation (REDD), which could include payments for carbon captured by trees and soils. Experts are discussing ways to ensure that agroforestry is part of the REDD investment mechanisms. The World Agroforestry Centre and the United Nations Environment Programme (UNEP) are developing a standard method for measuring carbon storage on all types of landscapes, which could provide a basis for providing farmers with a financial incentive to increase tree cover on their farms.

"The data in this report illustrate that agroforestry will be critical to efforts aimed at making agriculture more productive and sustainable in order to contribute to the alleviation of climate change," said Garrity. "It

is estimated that further investments in agroforestry over the next 50 years could remove significant amounts of carbon dioxide from the atmosphere."

The authors cautioned that the study may have underestimated the global extent of tree cover on farmlands. For example, the researchers used a system for classifying land as "agriculture land" that likely missed many areas—particularly in Africa—so dominated by tree crops that they were classified as forests, not "agroforests." However, scientists anticipate improved datasets will soon be available that will do a better job of identifying forested areas that are being used predominantly for agriculture purposes.

Source: World Agroforestry Centre

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