Historic trends predict future global reforestation unlikely

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Increasing crop yield and decreasing food consumption are needed to slow or reverse deforestation. Credit: Madhur Anand

Feeding a growing global population while also slowing or reversing global deforestation may only be possible if agricultural yields rise and/or per capita food consumption declines over the next century, according to historic global food consumption and land use trends.

Published October 9, 2013, in the open-access journal *PLOS ONE* by Chris Pagnutti, Chris Bauch, and Madhur Anand from the University of Guelph, this research underscores the long-term challenge of feeding everyone while still conserving natural habitat.

To predict future global forest trends, the scientists used several centuries of global land use data from the United Nations Food and Agriculture Organization and other sources. They incorporated this data into their mathematical model designed to capture how land use transitions, including deforestation and reforestation, are driven by three key factors: agricultural yield, per capita food consumption, and world population change over time.

Based on historic trends that show growing food consumption outpacing rising agricultural yields, global forest cover is predicted to decline about 10% further, stabilizing at roughly 22% forest cover over the next century. Unless new technological advances increase yields, or strategies to decrease food consumption are introduced, a switch to global reforestation remains unlikely. Under an alternative scenario where food production and consumption stabilize, reforestation could increase global forest cover to about 35% if it occurs within the next 70 years. Additionally, researchers found that short-term trends in reforestation, deforestation, and abandoned agricultural land may play a role in understanding long-term forest trends.

The results suggest that equal effort should be directed toward finding ways to boost agricultural yield, disseminate those technologies to developing countries, and decrease per capita consumption, thus reducing land use pressures. Anand elaborates, "What is new here is the provision of a set of quantitative guidelines (the mathematical model outputs) that demonstrate exactly how much improvements to agricultural yield or decreases in consumption will affect forest cover dynamics in time. Not every outcome was predictable to us before we

had this model, especially the case of the 'false forest transition'."

More information: Pagnutti C, Bauch CT, Anand M (2013) Outlook on a Worldwide Forest Transition. *PLOS ONE* 8(10): e75890. DOI: 10.1371/journal.pone.0075890

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