

Can agroforestry enhance ecosystem services provision without reducing productivity?

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Agroforestry (AF) is an important contributor to global efforts that seek to address climate change and maintain or increase ecosystem services. AF provides food and other products, while improving soil fertility, erosion control, water regulation and other regulating / maintenance ecosystem services, the supply of which varies from place to place and often includes trade-offs. Comprehensive evaluations of the overall effect of AF on ecosystem service provision in sub-Saharan Africa (SSA) are lacking and it is difficult to tell the degree to which different ecological conditions and management influence this potential. We conducted a meta-analysis to quantify effects of AF on crop yield, soil fertility, erosion control and water regulation in SSA. The analysis focused on 126 papers comparing AF and non-AF systems. Average crop yield was almost twice as high in AF as in non-AF; soil fertility improved by a factor of 1.2, control of runoff and soil loss was five and nine times better with AF, and infiltration was three times higher in AF compared to non-AF across all ecological conditions. We conclude that management of woody perennials in AF systems can provide multiple ecosystem services while improving productivity of crops.



Agroforestry provides woodfuel and other products that would otherwise be obtained from forests, reducing pressure on neighbouring forests and the time it takes to look for these commodities. Trees in agricultural landscapes also improve crop yield by regulating microclimate and improving soil fertility. Photo credit: Ylva Nyberg

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References:

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