Mapping the evidence of agroforestry’s impacts on agricultural productivity, ecosystem services and human well-being in low- and middle-income countries

Agroforestry practices have been widely studied across low- and middle-income countries (LMICs), but rigorous evidence on the effects of interventions designed to promote and support agroforestry on farmers’ land remains limited.

What is this evidence and gap map (EGM) about?

Agroforestry, defined as the integration of trees and woody shrubs in crop and livestock production systems, is widely promoted as an effective means to address conservation and development objectives across the world.

Governments, donors, and NGOs have invested in a range of programs to spur agroforestry adoption, including farmer capacity development, tree germplasm provision, market development, and community advocacy. However, systematic understanding of the impacts of these programs and agroforestry practices more generally remains lacking.

To advance such understanding, this EGM collates existing evidence on the impacts of agroforestry on agricultural productivity, ecosystem services, and human well-being in LMICs. The EGM includes studies that compared farmers and farms where agroforestry was practised to those without agroforestry, to assess at least one dimension of agricultural productivity, ecosystem services, and human well-being.

What studies are included?

This EGM includes studies that evaluate the effects of agroforestry practices and interventions on agricultural productivity, ecosystem services, and human well-being.

A total of 20,271 studies were identified. Only 396 of these met the inclusion criteria to be retained for the EGM. Of these studies, 344 examined the effects of agroforestry practices only, 40 examined the effects of agroforestry interventions, and 12 were systematic reviews. The studies spanned the period from 2000 to mid-2017, with India, Indonesia, China, and Ethiopia the most studied countries.
Most of the studies were observational. Only eight studies used rigorous quasi-experimental methods to evaluate the impacts of agroforestry interventions. None of the included studies used experimental designs (random assignment).

**What are the main findings of this EGM?**

The eight impact evaluations came from different country contexts, with only Kenya having more than one study. The most studied interventions were incentive provision to motivate farmers to plant and maintain trees on their land, and farmer capacity development.

Human well-being, particularly income and household expenditure, was the most studied outcome category for impact evaluations, followed by impacts on agricultural productivity, with minimal evidence for ecosystem services outcomes.

Practices relating to the integration of crops and trees (agri-silviculture) comprised more than three quarters of the 344 studies on practices. In contrast to the intervention studies, ecosystem services was the most well-studied practice outcome category, followed by agricultural productivity, with minimal evidence for human well-being outcomes.

Of the 12 included systematic reviews focused on agroforestry practices, 11 were rated as high risk of bias, and only one was rated as medium risk of bias. Trees integrated with plantation crops was the most common agroforestry practice discussed in the reviews while ecosystem services was the most studied outcome.

No systematic review examined the effects of agroforestry on human well-being.

**What do the findings of the EGM mean?**

Our study reveals that rigorous evidence on the effects of agroforestry interventions on farmers’ land remains extremely limited. This finding is especially notable given the large volume of literature documenting the uptake of specific agroforestry practices and widespread promotion of agroforestry as a strategy to advance the 2030 UN Sustainable Development Goals (SDGs).

The most urgent need in this field is to address the gap in primary evidence on the impacts of agroforestry interventions and on the impacts of agroforestry on social and economic outcomes. Systematic review of the available studies on intervention impacts would be useful to establish a baseline and provide insights to inform future research, policy and programming relating to agroforestry.