

Key points

Agroforestry's integrated solution to the climate, nature, food security and poverty crises can be planet-sustaining if adoption costs in the tropics and temperate regions like Europe can be covered widely and soon.

Agroforestry adoption faces two challenges: sectoral splits between forest and farm authorities, leaving it overlooked by both; and financing gaps delaying the transition from outdated monocropping farming systems.

Anchoring adoption in forest and farm producer organisations, whose members' future depends on agroforestry's integrated solutions, is a necessary starting point for shaping enabling policies and support.

Direct financing of forest and farm producer organisations is an efficient way to spread agroforestry understanding, upskill management, cover the costs of adopting agroforestry, and organise shared labour inputs, aggregation and marketing.

Global future-proofing: why agroforestry needs widespread adoption soon

Agroforestry comprises land management practices that deliberately mix woody perennials (such as trees, shrubs, palms and bamboos) with crops and/or animals. This offers greater resilience in the face of risky monocultures failing from unpredictable weather events, fires, and pest and disease outbreaks. If adopted widely and soon, agroforestry could provide global future-proofing against the interlinked climate, nature, food security and poverty crises. This faces two main challenges: sectoral splits between forest and farm authorities, leaving it overlooked by both; and gaps in transition financing to overcome key uptake barriers. To drive agroforestry adoption, forest and farm producer organisations (FFPOs), whose members' future depends on its implementation, need to take centre stage. Expanding FFPO agroforestry transition finance can efficiently spread agroforestry understanding, upskill management, cover upfront costs, and organise shared labour inputs, aggregation and marketing of diverse products.

Agroforestry can be defined as any land management practice that incorporates woody perennials (such as trees, shrubs, palms and bamboos) with crops and/or animal husbandry. Agroforestry is as old as agriculture itself and is making a resurgence as monocrop failures in the face of extreme weather events, wildfires, and pests and diseases become more pronounced with climate change. Agroforestry offers resilience,¹ and not just for tropical agriculture, but also for temperate agriculture in regions such as Europe.²

Global benefits of agroforestry

Agroforestry provides an integrated solution to global crises such as climate change, nature degradation, food insecurity, and poverty and inequality. Addressing climate change, agroforestry mixes useful trees into crop and

livestock farms to increase the absorption and storage of carbon and give farmers adaptive options for food and income generation. Importantly, evidence from Europe also suggests that the more active management of land used for agroforestry results in fewer wildfire incidents than occur with forests, shrublands or grasslands, providing evidence of its potential to reduce fire risk and avoid the consequent release of carbon.³

Addressing nature degradation, agroforestry increases on-farm agrobiodiversity and tree canopy connectivity with surrounding natural forests, amplifying biodiversity conservation. Addressing food security and poverty reduction, agroforestry enhances light capture, increases soil fertility and improves water management, boosting food production, with a greater diversity of crops for consumption and sale.

Agroforestry is an incredibly flexible system. There are innumerable ways of usefully mixing different tree, crop and animal species.

Agroforestry systems provide shelter for many smaller animals too, including both vertebrates (small mammals, birds, reptiles, amphibians and even fish) and invertebrates (especially arthropods such as insects). These smaller animals are often critical for pollination and seed dispersal. They can also contribute important products, such as honey and wax production by bees.

Agroforestry embodies many of the principles of agroecology,⁴ which are increasingly recognised as the benchmark for a sustainable future.

Designing agroforestry systems

Agroforestry is an incredibly flexible system. There are innumerable ways of usefully mixing different tree, crop and animal species. System design is both an art and a science due to the high number of variables whose interactions can be observed over time.

Systems of agroforestry can be thought of as composed of up to ten structural elements (see Figure 1): emergent timber species, upper-canopy fruit and timber species, middle-canopy fruit and timber species, dwarf trees and shrubs, basic crops, root crops, vine crops, understory shade crops, and livestock and fodder species.

At one extreme of agroforestry design there are simple, semi-industrial systems focused on cash crops, such as oil palm agroforestry in Tomé Açu, Brazil (locally called Sistema Agroflorestal Dendê or SAF Dendê), where wider spacing of oil palm allows interplanting of cocoa, cupuaçu, banana, andiroba, açaí palm and black pepper.⁵ This not only increases per-unit-area production of palm oil, but also results in a much greater diversity of other products.

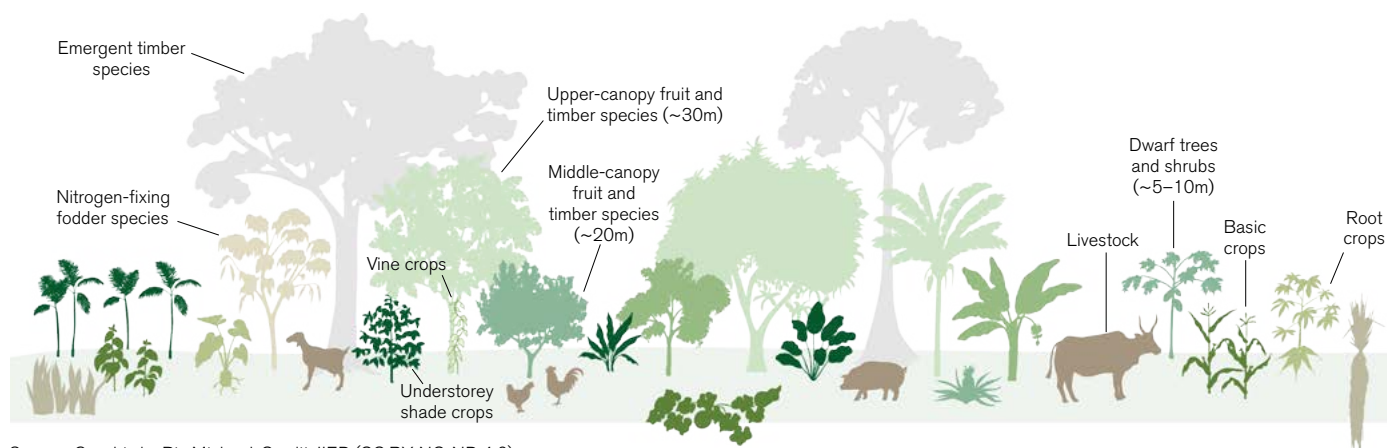
Other agroforestry systems offer similar production benefits. Examples include various economically useful and/or native canopy trees mixed above shade-grown crops such as coffee or cocoa in Bolivia and other countries.⁶ Additionally, a 20% increase in milk yields was obtained by mixing nitrogen-rich fodder trees into stall-fed milk cattle systems in the middle hills of Nepal.⁷ In Europe, much agroforestry adoption revolves around silvopastoral systems that mix trees into livestock production areas.

At the other extreme are hyper-diverse smallholder home garden systems that can cultivate from 50 to several hundred species of useful crops, trees and animals. Among these are the mosaic landscapes of Atsinanana in Madagascar,⁸ Cotacachi in Ecuador⁹ and the Selva Maya systems in Belize.¹⁰ These latter systems offer many different products for food, fodder, fuel, fabric, medicines, cosmetics and construction for both self-consumption and sale.

The earliest practitioners of agroforestry were agricultural domesticators of forests who left trees standing in a process of shifting cultivation (still widespread today). As agricultural intensification followed the industrial revolutions of the 18th and 19th centuries, 'green revolution' monoculture plantations were deemed a more profitable approach to agriculture. These were underpinned by increasing chemical fertiliser and pesticide use.

By the end of the 19th century, loss of forest cover saw an emerging interest in agroforestry as a source of wood. Then by the mid-20th century, concerns over the failure of 'green revolution' approaches to meet diverse community needs, coupled with growing problems of land degradation and forest loss, led to agroforestry's resurgence. The International Council for Research in Agroforestry was founded in 1978; now known as Landscape Alliance, it seeks to

Figure 1. Main structural elements of agroforestry systems



Source: Graphic by Ria Mishaal. Credit: IIED (CC BY-NC-ND 4.0)

promote agroforestry as a multifunctional solution to several global challenges.

Challenges to agroforestry uptake

Sectoral splits: the promotion of agroforestry has been constrained in part because neither agriculture departments nor forest departments saw it as their central mandate. Agroforestry emerged as a specific term only in 1977, with new recognition of its importance. At different times, agroforestry has been promoted for food security (by agriculture departments), for increasing timber and fuelwood production (by forest departments), or later for environmental service provision (by climate and nature agencies). However, only recently has it risen to prominence as a single holistic solution to global crises.¹¹

Financing gaps: despite widespread consensus that agroforestry can provide an integrated solution to global challenges, no concerted finance for an agroforestry transition has so far emerged. Scientific reviews point to eight main barriers that constrain smallholder farmer adoption of agroforestry. Many of these reflect a gap in transition finance. There is a lack of finance to:

- Build awareness of agroforestry benefits
- Overcome upfront costs of system establishment
- Cover additional labour requirements (especially for early weeding and pruning)
- Provide training in these more complex systems
- Develop seed stores and seedling nurseries of diverse components
- Create space and scale to aggregate sufficient product to access markets
- Conduct market research to sell multiple products, and
- Advocate for supportive policies and incentives.

Individual isolated smallholder farmers can rarely overcome this suite of barriers. But many examples are emerging worldwide of groups working together in diverse producer organisations to overcome the barriers to upscale agroforestry systems. While there are routes to mobilise internal finance,¹² more needs to be done to bridge this finance gap to transition from monoculture to diverse agroforestry systems.

Delivering on agroforestry uptake

Despite some semi-industrial agroforestry systems alluded to above, large-scale mechanisation does not easily fit with agroforestry. For larger-scale farmers in primarily temperate Australia, Europe, and North and South America, there may be a mechanised 'lock-in' to monocultures. In these cases a special

approach combining land reform and transition finance could be needed to increase prospects for more labour-intensive agroforestry systems. Harmful subsidies, such as those for ultra-processed foods and fossil fuels, could be redirected to pay for a transition away from such 'locked-in' contexts.¹³

When looking at where agroforestry is expanding, it is often through collective action by largely tropical smallholder farmers and their FFPOs. They have the incentive to maximise productivity on a small land area and the labour intensity to deliver an integrated solution that improves local food production and income, restores nature, and both adapts to and helps to mitigate climate change.

Recent research by the Forest and Farm Facility surveyed known examples of expanding agroforestry, documenting seven case studies from tropical countries.¹⁴ These comprised: two Bolivian cooperative examples of shade-grown coffee; an Ecuadorian federation of shade-grown cocoa and coffee producers; a Madagascan union of home garden agroforestry producers; a Nepalese stall-fed dairy cattle fodder cooperative; a Tanzanian association of home garden and livestock-rearing smallholder farmers; and a Vietnamese cooperative cultivating sequential cinnamon and star anise woodlots and incorporating other medicinal plants and spices until the tree canopy closes.

Despite their diversity, each producer organisation had developed tactics to overcome the main barriers to agroforestry adoption. Analysis revealed eight main elements and 24 tactics that aided agroforestry uptake.¹⁵ While not every producer organisation adopted the same tactics, all deployed at least one tactic to overcome each of the eight main barriers to agroforestry adoption.

The main elements of this strategy and the more specific tactics include the following:

1. Sharing experience to promote agroforestry benefits:

- Facilitating agroforestry awareness raising, and
- Managing farmer exchanges to share successful models.

2. Mobilising finance to bridge the upfront adoption cost gap:

- Securing project linkages to fund initial uptake costs
- Setting up saving and credit cooperative organisations to fund adoption, and
- Accessing government funds to support adoption.

3. Developing incentives or tactics to offset additional labour demands:

- Minimising or subsidising additional labour costs through project training and finance, and
- Setting up competitions for high performers to incentivise additional labour.

4. Building capacity for complex agroforestry system management:

- Running, or facilitating external experts to run, technical training courses
- Promoting traditional knowledge transfer from experienced farmers, and
- Encouraging external farmer exchanges to learn new approaches.

5. Providing agroforestry system species components:

- Procuring seeds through new partnerships and establishing community seed banks
- Developing the technical skills and facilities for tree seedling nurseries, and
- Running farmer seed fairs and other exchange mechanisms.

6. Cooperating between members to secure tenure and achieve landscape scale:

- Encouraging local farmer group formation to ease collective sales of crop, tree and livestock products, and
- Mobilising collective community responsibilities in communal areas.

7. Combining advocacy voice to shape enabling policies:

- Fighting to secure tenure and tree rights for members
- Working with government to improve access to finance and to provide incentives, and
- Collaborating to access markets, including markets for payments for ecosystem services.

8. Joining forces to share knowledge, add value and access new agroforestry markets:

- Researching markets and prices for unusual crops or products — especially from trees
- Procuring aggregation, processing and packaging facilities
- Participating in or running market-linking events
- Developing standards and approaches for shared certification and labelling
- Investing together in brand development that highlights agroforestry benefits, and
- Agreeing market development partnerships with like-minded business partners.

Financing the global agroforestry transition

Each Forest and Farm Facility case study presented clear evidence of the economically competitive nature of diverse agroforestry systems, especially when nutritional and environmental benefits are included. Whether agroforestry systems are economically competitive or not depends on how well components are designed, managed, marketed and sold; but once established, many farmer organisations find them highly competitive. Getting to that point, however, may require some enabling transition funding.

A useful role for willing donors is to recognise the imperative of an agroforestry transition in both the global North and South, and to channel enabling investment directly to producer organisations to undertake the strategy described above until their systems start to attract private-sector investment. This is not about bringing in external experts, but involves supporting FFPOs to be the main agents of change in building sustainable agroforestry business models that can then attract private-sector investment.

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FIND OUT MORE

This briefing is based on our research report, 'Agroforestry uptake: tactics that smallholder farmers use to overcome barriers to adoption', available at www.iied.org/22677iied

Notes

¹ Crews, TE, Carton, W and Olsson, L (2018) Is the future of agriculture perennial? Imperatives and opportunities to reinvent agriculture by shifting from annual monocultures to perennial polycultures, *Global Sustainability*, 1(e11). doi:10.1017/sus.2018.11. / ² Sollen-Norrlin, M, Ghaley, BB and Rintoul, NLJ (2020) Agroforestry benefits and challenges for adoption in Europe and beyond, *Sustainability*, 12(17), 7001. doi:10.3390/su12177001. / ³ Damianidis, C, Santiago-Freijanes, JJ, den Herder, M, Burgess, P, Mosquera-Losada, MR, Graves, A, Papadopoulos, A, Pisanelli, A, Camilli, F, Rois-Díaz, M et al. (2021) Agroforestry as a sustainable land use option to reduce wildfires risk in European Mediterranean areas, *Agroforestry Systems*, 95, pp.919–929. doi:10.1007/s10457-020-00482-w. / ⁴ Agroecology Coalition (2024) The agroecology assessment framework. / ⁵ Hoffner, E (2021) Can palm oil be grown sustainably? Agroforestry research suggests it can, and without chemicals, *Mongabay*, 31 March / ⁶ Escobar Guevara, JL and Fernández Arancibia, B (2025) Innovations to promote adoption of coffee agroforestry in Bolivia: the role of ASOCAFE. IIED, London. www.iied.org/22641g / ⁷ Acharya, D, Shah, R and Kharel, B (2025) Upscaling agroforestry for dairy production in Nepal: the role of the Setidevi Cooperative. IIED, London. www.iied.org/22649g / ⁸ Raharison, TS (2025) Innovations for agroforestry uptake in Madagascar: the role of FITAFA. IIED, London. www.iied.org/22648g / ⁹ Suquisupa Herrera, CT and Herrera Ochoa, JG (2025) Innovations for adopting agroforestry in Ecuador: the role of the APEOSAE Federation. IIED, London. www.iied.org/22669g / ¹⁰ Macqueen, D, Gonzalez, M and Stuart, N (2025) Agrobiodiversity booms as botanic gardens serve farmers. IIED, London. www.iied.org/22629iied / ¹¹ Leakey, R (2024) A multifunctional future for tropical agriculture: scoring multiple Sustainable Development Goals simultaneously?, *Agriculture for Development*, 47(2). / ¹² Núñez del Prado Nieto, I, María da Silva Rodrigues, L, Alessio, FJ and Macqueen, D (2026) Growing your internal finance: a toolkit to guide forest and farm producer organisations. IIED, London. www.iied.org/22721iied / ¹³ IIED (2023) Carbon-intensive ultra-processed ingredients subsidised by nearly \$43 billion a year. Press release, 28 November. www.iied.org/carbon-intensive-ultra-processed-ingredients-subsidised-nearly-43-billion-year / ¹⁴ Macqueen, D and Springgay, E (2025) Agroforestry uptake: tactics that smallholder farmers use to overcome barriers to adoption. IIED, London. www.iied.org/22677iied / ¹⁵ See note 14.

