

**PROFOR**

COFFEE AND COCOA AGROFORESTRY SYSTEMS: PATHWAYS TO DEFORESTATION, REFORESTATION, AND TREE COVER CHANGE

Highlights

- Coffee and cocoa are drivers of both deforestation and reforestation. In the last five decades, the expansion of cocoa cultivation led to the disappearance of 14–15 million hectares (ha) of tropical forests globally.
- Reforestation occurs via the inclusion of shade trees in coffee plantations. At least six broad shade canopies typologies have been identified describing a gradient of increasing crop husbandry intensification, crop yields, and reductions in tree canopy cover.
- Programs such as the Global Forest Watch Commodities Initiative, Maphubs, and the Cocoa and Forest Initiative help producers and traders track supply chains to source zero-deforestation cocoa.
- Similarly, major international cocoa and coffee suppliers such as Nestle, Kraft Foods, and Starbuck have begun their own partnerships and initiatives to ensure that their supply chains avoid deforestation and protect natural forests.
- Public-private initiatives such as the Honduran Agroforestry, Environment, and Climate Change Program and the Columbian Federation of Coffee Growers have shown that governments can partner with the private sector to reduce deforestation through policies and incentives.
- Governments and development partners can stimulate further ANTI-deforestation and REFORESTATION initiatives by making more explicit the legal regulations governing the cultivation and use of timber shade trees and by establishing clearer tenure rights for smallholder farmers and corporate producers.



Introduction

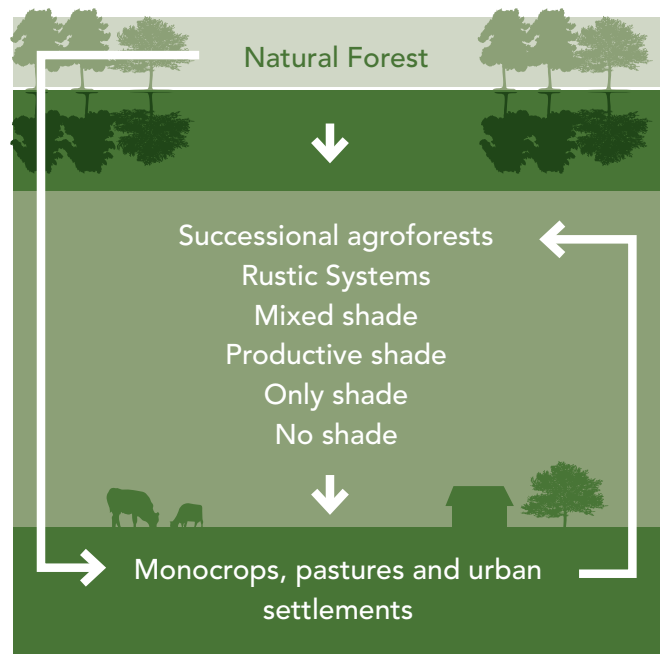
Coffee cultivation covers 11 million hectares and involves 10 million farmers producing 9.22 million tons of green coffee annually. Coffee production influences the livelihoods of some 125 million people. Cocoa cultivation covers 10.2 million hectares and involves 10 million cocoa farmers producing 4.47 million tons of dry cocoa beans annually. Cocoa production influences the livelihoods of some 40-50 million people. Coffee and cocoa are cultivated mainly by smallholder farmers.

Globally, 48% of coffee and 31% of cocoa are cultivated under shade in agroforestry systems. Shade trees provide shelter to the crops, livelihoods for farmers and many ecosystem services. Yet the use of shade is decreasing due to crop intensification and shade tree removals to achieve higher crop yields.

Coffee and cocoa are drivers of both deforestation and reforestation. In the last two centuries, coffee production was responsible for dramatically transforming the landscape of the highlands in the New World by displacing sugarcane, cattle, and other minor crops as well as by displacing natural forests. In the last five decades, the expansion of cocoa cultivation led to the disappearance of 14–15 million hectares (ha) of tropical forests globally. Coffee and cocoa plantations may be established following four different pathways. (Figure 1) Transition pathways are not linear either in time or in space.

Coffee and cocoa plantations differ widely in terms of the use of trees in the shade canopy and in crop husbandry practices. At least six broad shade canopies typologies have been identified describing a gradient of increasing crop husbandry intensification, crop yields, and reductions in tree canopy cover. These typologies include (a) forest-like systems resulting from the introduction of coffee and cocoa in the natural forest ecosystem (successional agroforests), (b) rustic systems and cabruacas, (c) mixed shade systems (various shade tree species, different plant habits and sizes), (d) productive shade systems (timber or fruit tree

FIGURE 1. LEAVES PATHWAY FOR THE ESTABLISHMENT AND MANAGEMENT OF COFFEE AND COCOA AGROFORESTRY SYSTEM



species), (e) specialized shade systems, and (f) open sun, no-shade systems.

The most relevant recommendations to reduce the deforestation footprint and to increase the contribution of coffee and cocoa agroforestry systems to reforestation are detailed below.

Reduction of Deforestation

Governments and producers can improve the legal, institutional, policy, and financial frameworks to increase the value of forests on private land and to enforce protection measures in conservation areas. This includes increased

investment in the use of modern technologies to monitor land use changes in real time. Major cocoa companies have recently committed to zero-deforestation supply chains in combination with other important elements of commodity production such as no clearing on carbon-rich peat lands, no clearing on high conservation value areas, no clearing on high carbon stock areas, and transparency in their production practices. Tools like the Global Forest Watch Commodities and MapsHubs help companies examine where their cocoa beans come from and the location's relationship with nearby forests, thus helping cocoa companies to make supply chains traceable and transparent.¹ Additional support to curb deforestation comes from climate initiatives linked to the United Nations' Framework Convention on Climate Change program to Reduce Emissions from Deforestation and Forest Degradation (REDD+).

Government and private sector agents can also support industry and value chain measures aimed at sourcing only from certified origins that are not linked to deforestation areas. Stakeholders can help enforce zero-deforestation pledges as well as support multi-stakeholder platforms aimed at reducing deforestation and securing sustainable coffee and cocoa economies. Recently, the cocoa industry launched the Cocoa and Forest Initiative to tackle the triple challenge of increasing productivity on limited land, reducing pressure on forests and ecosystems, and enhancing climate change resilience and reduced emissions (e.g. a climate-smart cocoa economy). The initiative has been signed by 22 major cocoa companies and the governments of Cote d'Ivoire and Ghana, the two largest world cocoa producers. The initiative can be applied to other countries and geographies as well. For signatory companies, a vision for zero-deforestation cocoa is summed up in several overarching principles and key strategies including (a) the protection of all remaining natural primary and secondary forest, (b) legality and transparency, (c) the integration and alignment of zero-deforestation goals into long-term public and private sector strategies, (d) sustainability programs that operate at scale through jurisdictional or landscape approaches, (e) public-private cooperation, and (f) sustainable financing to stimulate local producers to restore or replant their cocoa farms to increase productivity.²

Reforestation

Reforestation through coffee and cocoa agroforestry systems has three components including (a) retaining trees in the shade canopy, (b) avoiding losing coffee and cocoa areas to other crops and pastures, and (c) replacing monocrops and degraded pastures with agroforest cocoa/coffee. Reforestation can be achieved through the following efforts.

Good agricultural and post-harvest practices: Increasing

1 www.maphubs.com
2 <https://innovation-forum.co.uk/analysis.php?s=think-big-to-tackle-deforestation>

the profitability and financial resilience of coffee and cocoa farming can lead to reforestation through the application of good agricultural and post-harvest practices such as the renovation and rehabilitation of unproductive plantations, the use of superior genetic material, agroforestry practices, integrated pest management, and the application of other inputs such as fertilizers. Value chain interventions such as (a) certification for sustainability, (b) improving commercial links between producers, exporters, and manufacturers, (c) appropriate financing mechanisms, and (d) supporting the development of value chains for the on-farm production of timber and fruits can also improve profitability.

Corporate Best Practices: Reforestation can also be increased by expanding cocoa sustainability initiatives currently supported by major companies. The Swiss Platform for Sustainable Cocoa involves the private company Chocosuisse, the State Secretariat for Economic Affairs, and nongovernmental organizations such as Swisscontact and Helvetas.³ The Blommer Chocolate Company has a similar multi-stakeholder partnership and programs in Indonesia in which the Sulawesi Alliance of Farmers, OLAM, and the USAID Agribusiness Market and Support Activity all take part. Kraft Foods pledged that all of its coffee brands in Europe will use fully certified sustainable sourcing by 2015.⁴ Starbucks sources from coffee farmers certified to its own Coffee and Farmer Equity (C.A.F.E.) Practices standard of ethically-sourced coffee in partnership with Conservation International through its Global Farmer Fund and the COCOA Practices, a program aimed at using 100% ethically-sourced cocoa by 2020 in all Starbucks cocoa-based beverages.⁵

Further, Nestlé, in partnership with the Rainforest Alliance, has implemented the global Grown Respectfully Ambition, the Farmer Connect Program, and the Nestlé Cocoa Plan with activities in 32 countries.^{6,7} The Lindt & Sprüngli Group, a global leader in the premium chocolate market, developed its Sustainability Strategy with the goal to achieve the full traceability of its cocoa beans through the supply chain by 2020. Progress made through this program has been published on The Forest Trust Transparency Hub platform.

Finally, large chocolate companies such as Mars, Ferrero, Kraft Foods, and Hershey have pledged to source coffee and cocoa beans only from sustainable, certified origins by 2020. Mars Incorporated is committed to purchasing 100% of 23 key raw materials from sustainable sources through independent certification programs such as UTZ certified, RA, Fairtrade International, and the Roundtable of Sustainable Palm Oil. Mars' outstanding programs include the Sustainable in a Generation program to eliminate GHG emissions from its operation and the Vision for Change program in Cote d'Ivoire to support on-farm production to increase cocoa yields.

3 <https://www.chocosuisse.ch/wp-content>

4 <http://www.kraftheinzcompany.com/>

5 <https://www.starbucks.com/responsibility/sourcing/coffee>

6 <https://www.nescafe.com/the-future-of-coffee>

7 <http://nestlecocoaplan.com/better-cocoa>

Optimization: Optimization of the trade-offs between crop husbandry intensification and the reduction in shade level and species richness can also contribute to reforestation. However, conceptual models and tools for the optimization of multi-objective coffee and cocoa shade canopies have not yet been developed and mainstreamed in the portfolio of good agricultural practices promoted for these two crops.

Improved partnerships: Companies, governments, and nongovernmental organizations can come together to improve the legal, institutional, policy, and financial frameworks to make trees in the shade canopy visible to farmers, extension services, policy makers, development planners, and financial institutions. Local partnerships can secure tree tenure rights for farmers and certification of timber trees, both of which are needed to facilitate the harvest, transport, and use of timber trees by farmers. Partnership initiatives can promote the vision of timber trees as crops that need proper management to fully realize their contributions to both livelihoods and the environment. There are a number of successful examples of legislation, policies, and certification labels that promote the planting, retention, and use of trees in the shade canopy of coffee and cocoa.

The Honduran government's Program of Agroforestry, Environment, and Climate Change (Decree 56-2007) is a good example of alignment between agriculture, forestry, environmental legislation, and policies. This decree promotes the planting of timber trees in coffee farms by giving the National Coffee Institute the capacity to certify tree planting to facilitate the harvest, transportation, and use of timber produced in coffee farms. As of 2017, over 1.5 million timber trees had been planted as a result of this program. In Colombia, the Colombian Federation of Coffee Growers, a public-private organization, has developed a far-reaching forest program to promote better silvicultural practices, to increase tree cover on coffee farms, to protect forest patches, and to implement other good land management practices across 58 municipalities.⁸ In Ethiopia, a partnership between the government, the Nespresso Sustainable Innovation Fund, TechnoServe, and the International Finance Corporation has joined forces and provided funding to promote the planting of shade trees on

8 www.federaciondefeteros.org

40,000 smallholder coffee farms while leveraging funding from REDD+ programs.⁹

In Guatemala, the national Forest Law created a portfolio of economic incentives to stimulate tree planting under agroforestry systems including shaded coffee and cocoa to promote forest plantation as well as to improve forest management. One of the programs focuses on smallholder farmers with less than 15 ha of land. This program, known as the PINPEP Law (Decree No.51-2010), has supported some twenty thousand reforestation projects covering 69,405 ha with governmental support approximating USD\$58 million.¹⁰ Coffee certification standards such as Smithsonian Bird Friendly® and the Rainforest Alliance have specific requirements in terms of tree species richness, vertical stratification, crown cover, and phenology, with each of which farmers must comply.

Recommendations

The drivers, recommendations, and knowledge gaps identified above, as they apply to the countries studied for this report, are common and adaptable to most coffee and cocoa producing countries in Asia, Africa, and Latin America. However, the legal contexts on forests and tree tenure, as well as the roles of governments, vary across coffee and cocoa regions and countries. More in-depth analysis is needed on the specific conditions (e.g. legal frameworks and tree tenure rights) leading to deforestation, the cultivation of coffee and cocoa, and the use of trees in the shade canopy as they pertain to each geographic region. Concerted collaborative action between government authorities, industry, traders, farmers, financial institutions, donors, and other value chain actors can assist in the promotion of sustainable coffee and cocoa production. Finally, cooperation between governments is essential to address the many facets of the question: *how can we simultaneously minimize the deforestation footprint of coffee and cocoa cultivation while increasing their roles as agents of reforestation?*

9 <https://www.biocarbonfund-isfl.org/ethiopia-program>

10 <http://inab.gob.gt>

The Program on Forests (PROFOR) multi-donor partnership generates innovative, cutting-edge knowledge and tools to advance sustainable management of forests for poverty reduction, economic growth, climate mitigation and adaptation, and conservation benefits. Through its programs, PROFOR is advancing forest-smart development, which recognizes forests' significance for sustaining growth across many sectors, including agriculture, energy, infrastructure, and water.



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