

Producing sustainable cocoa: under what conditions?

Frédéric Amiel, Alexandre Muller, Yann Laurans (IDDRI)

Developing the production of cocoa, derived from a tropical fruit tree, is closely linked with forest landscapes and the way these are changing. Under what conditions can we continue to produce, and thus consume chocolate, without exacerbating the deforestation already underway in tropical forests? Can production in forest areas be expanded whilst preserving biodiversity? Likewise, which models could support production in already deforested areas with a wealth of biodiversity? How could we ensure that production in these already deforested areas is not extended to the detriment of the forest?

To tackle these questions, many view “agroforestry”—i.e., cultivating cocoa trees alongside other trees—as the most promising solution. Yet, the notion of agroforestry encompasses a whole range of on-the-ground realities, not all of which are compatible with preserving biodiversity. To what extent, under what conditions, and in which situations can agroforestry provide answers to the above questions?

This Issue Brief proposes an overview of the current knowledge and ways forward for sustainable cocoa production, which factors in the different regional contexts.

KEY MESSAGES

Planting shade trees on cocoa farms, in line with an ‘agroforestry’ logic, usually fails to compensate for deforestation, either in terms of stored carbon or the diversity and abundance of trees.

To halt imported deforestation driven by the demand for chocolate, importers will need to adopt a strict zero-deforestation policy that excludes any cocoa from protected areas as well as any cocoa from areas that have been deforested, even legally, as from 2016.

Development aid policies for the sector need to be adapted to the production contexts: in West Africa, support the restoration of biodiversity on cocoa plantations rather than the use of simple or minimal agroforestry, as is the case today, and which fails to offset deforestation; in Latin America, strengthen “virtuous” supply chains, notably the most complex forms of agroforestry involving a good level of biodiversity; in central Africa, support the demarcation between forest areas to be excluded from production and the farming areas where production can be developed.

1. EUROPEAN COCOA IMPORTS HAVE A HEFTY IMPACT ON FOREST BIODIVERSITY

The cocoa tree thrives in climates where its cultivation competes with tropical forests. Clearing tracts of forest for cocoa production is common practice and leads to good yields during the first years of production (Ruf, 1995; Bitty *et al.*, 2015).

Cocoa-planted areas rose from 4 million hectares (ha) in the 1970s to over 10 million ha in 2013 (according to the FAO-STAT database). Two to three million hectares of this 6-million-ha expansion were gained at the expense of forest areas (Kroeger *et al.*, 2017), which means this is a major source of global deforestation, even though its impact can be relativized compared to other activities such as livestock or soya farming.

This deforestation—and the associated sustainability issues—concerns chocolate-consuming developed countries, their governments in charge of regulation and providing cooperation, and their agri-food multinationals

Europeans are concerned first and foremost given that the European Union (EU) is the world's leading cocoa importer. Cocoa represented 8% of the imports contributing to deforestation driven by the European market between 1990 and 2008 (2010 data), ranking third behind soya (60%) and palm oil (12%). This amounts to an "imported deforestation" of 600,000 ha (European Commission, 2013). Moreover, European multilateral aid, the many national development agencies and corporate sustainability programmes are key actors in delivering financial and technical assistance to producing countries. This assistance includes support to the supply chains and thus fully contributes to defining the farming and commercial practices of the cocoa sector in the producing countries. Today, most of the production is located in West African countries (above all, Côte d'Ivoire and Ghana), then in Latin America (cocoa originates from this continent). The still densely forested region of Central Africa (e.g., Gabon, Congo-Brazzaville) also view cocoa as offering attractive development opportunities.

Lastly, the EU and some of its member states have been engaged for several years now in in-depth discussions on imported deforestation, and are crafting strategies to combat the phenomenon.¹ There is thus hope that the Community will regulate the import of agricultural products derived from deforestation, including cocoa.

The European Union, its member states and companies thus have two levers to act on in order to influence the future of the cocoa sector: (1) define which cocoa, produced under which conditions, they will continue to import and (2) specify which production models they will support through their different international cooperation programmes.

¹ France adopted its strategy to combat imported deforestation on 14 November 2018: https://www.ecologique-solidaire.gouv.fr/sites/default/files/2018.11.14_dp_sndi_mtes.pdf

2. IS AGROFORESTRY AN ALTERNATIVE TO DEFORESTATION?

Cocoa is mostly produced on smallholder farms run by small producers helped by their family. Larger producers sometimes hire plantation workers. Overall, there are an estimated 5 million cocoa producers worldwide.

The type of production is usually differentiated using agro-economic criteria and the number of shade trees present on a cocoa farm (Ruf, 2011). Generally, production methods are classified into five types.

- Full-sun production, which is a cocoa monoculture with zero shade.
- Simple light-shade agroforestry, meaning with fewer than 10 shade trees per hectare and a tree canopy covering less than 65% of the ground (cocoa trees included). This almost always involves planted trees, mainly fruit trees, rather than partially preserved natural forest.
- Simple medium-shade agroforestry with from 10 to 15 trees per hectare and a canopy covering between 65 and 85% of the ground.
- Simple heavy-shade agroforestry with at least 15 trees per hectare and a canopy covering over 85% of the ground.
- Complex heavy-shade agroforestry with at least 50 trees per hectare, whose complexity is linked to the number of successive layer of vegetation.

On the other hand, the types of production have almost never been characterised from the point of view of biodiversity. At most, we are able to characterise the levels of biodiversity conservation for the "full-sun" and "shade" models based on studies addressing the different parts of the ecosystem (soil, fauna, flora), but there is no distinction between the different agroforestry systems shown in Table 1.

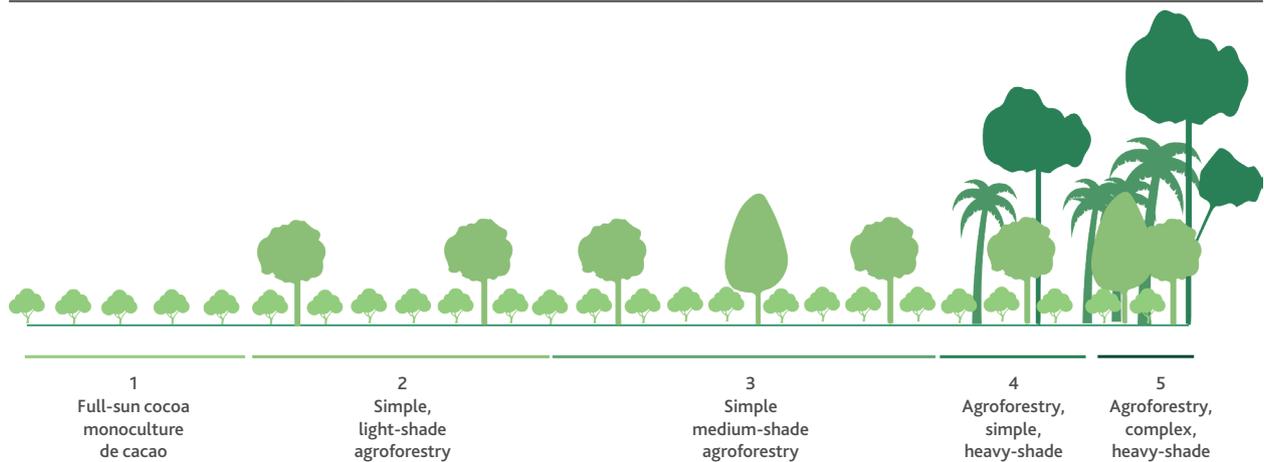
TABLE 1. Biodiversity conservation levels for different cocoa production methods compared to natural forests

Production method	Variety of species as a % of the species variety found in natural forest (high values)		
	Native forest trees	Flore	Faune
Full-sun cocoa	0 %	20 %	ND
"Shaded" cocoa	40 %	68 %	100 %*

Source: the authors, based on the available literature. Note (reading the table): in a shaded cocoa plantation are 40% of native forest tree species found in a nearby natural forest (and not, of course, 40% of the number of trees).

* With the notable exception of bats, whose specific variety is only 60% compared to a natural forest.

These results show a sharp contrast between full-sun farming practices with severe consequences for biodiversity and the more protective shaded practices, whose results are nonetheless far from comparable with the biodiversity present in natural forest areas, especially in terms of tree species diversity.

FIGURE 1. Simplified view of types of cocoa production and agroforestry

Source: IDDRI

Moreover, the results shown are high values and, depending on the system considered, the reality of biodiversity presented in the shaded agroforestry systems is somewhere between the values for full-sun cocoa and the ones for the shaded cocoa.

Since the criterion of the number of trees per hectare is uppermost in people's minds, there is a strong temptation to promote agroforestry models and set them as the main criterion for the sustainability of cocoa supply. In reality, this solution does not hold good for all of the producing regions.

Clearly, in light of these results, no type of cocoa plantation can claim to match forest ecosystems in terms of biodiversity. This means that cocoa cannot be viewed as being cultivated under "zero deforestation" when it comes from an agroforestry plantation established in place of a forest.

3. THE NEED FOR DIFFERENT APPROACHES ACCORDING TO PRODUCTION AREAS

In Ghana, our field studies show that cocoa is almost exclusively produced using a simple agroforestry light-shade or medium-shade system. The requirement that cocoa be cultivated in a "complex agroforestry" system (i.e., with a high density of natural forest tree species) would today imply that this country be excluded from the supply chain, which would not be economically bearable. This would probably also apply to Côte d'Ivoire, whose production typology is generally similar to that of Ghana. Yet, these two countries are the world's leading cocoa producers (precisely because cocoa trees dominate the landscapes). In these two countries, corporate purchasing policies and governments' and aid donors' policies should of course exclude any new forest conversion and any cocoa from forest reserve areas. They should also invest in restoring agricultural ecosystems by

promoting the transition of existing farming methods to more complex agroforestry, and by reducing chemical inputs to protect the soil, fauna and flora.

On the contrary, in other regions, particularly Latin America where cocoa has always been a traditional crop consumed by producers, we find complex heavy-shade agroforestry systems, as seen in the Dominican Republic for example. These production systems should not only be given full attention by national development policies and buyer preferences, but also support from development agencies. However, the markets concerned are niche and high-quality markets. Their supply chains have relied on organic and fair-trade certification but, as the global market's supply of certified cocoa increases, its price is moving closer to the price of the conventional cocoa market. As a result, the producers' interest in investing in costly certification procedures is waning.

This is the case despite the world's growing demand for cocoa, which mostly involves a low-quality cocoa mainly used in confectionary and preparations. In such countries, purchasing and development policies should focus on maintaining pre-existing systems by guaranteeing their long-term profitability through support to purchase prices and economic encouragement for virtuous practices.

Lastly, some countries that are not historically cocoa-producers have announced their intention to massively boost their production in the coming years. Such is the case of Gabon and Congo-Brazzaville, for example. These countries are both endowed with extensive forest cover (85% and 65% of their territory, respectively) and are among the planet's last extensive areas of intact tropical forest. Here, the development of cocoa farming should be conditional on adopting a method that demarcates areas of strictly "zero-deforestation" cultivation or, in other words, established exclusively in non-forest areas or areas of lesser ecological interest. This methodology could be based, for instance, on the High Carbon Stock Approach developed in

the palm oil sector.² It could go hand in hand, as is the case in Southeast Asia, with so-called "territorial" approaches whereby local development actors and companies agree on a plan for agricultural and forestry land use, in which supply sectors and conserved forests are clearly demarcated. This involves implementing an approach that dovetails the respect of forest communities' rights and the protection of carbon-rich areas and high conservation value areas.

The conversion of the chocolate-cocoa sector towards the sustainability of biodiversity should not therefore follow a one-size-fits-all approach, but be differentiated depending on the main areas of production and supply and the countries involved.

Lastly, any "zero-deforestation" policy needs to integrate two criteria: on one hand, the criterion of legality that excludes any conversion of protected areas (national parks, nature reserves, forest reserves, etc.); on the other hand, a baseline year after which any deforestation, including that legally authorised, is considered to be non-compliant. As the first companies in the sector committed to a zero-deforestation horizon in March 2017 at a meeting of the World Cocoa Foundation, it would seem appropriate to consider land-use status in 2016 as the baseline year.

² <http://highcarbonstock.org/>

REFERENCES

Bitty, E. A., Bi, S. G., Bene, J.-C. K., Kouassi, P. K., & McGraw, W. S. (2015). *Cocoa Farming and Primate Extirpation Inside Cote D'Ivoire's Protected Areas*. *Tropical Conservation Science*, 8(1), 95113. <https://doi.org/10.1177/194008291500800110>

European Commission (2013). *The impact of EU consumption on deforestation: Comprehensive analysis of the impact of EU consumption on deforestation* (No. 063).

FAO (2015). *Global forest resource assesment 2015*. Consulté le 20 septembre 2017, à l'adresse <http://www.fao.org/3/a-i4808e.pdf>

Kroeger, A., Bakhtary, H., Haupt, F., & Streck, C. (2017). *Eliminating Deforestation from the Cocoa Supply Chain*.

Ruf, F. (1995). *Booms et crises du cacao, les vertiges de l'or brun*. Paris : CIRAD-SAR, Ministère de la coopération, Karthala.

Ruf, F. (2011). The Myth of Complex Cocoa Agroforests: The Case of Ghana. *Human ecology: an interdisciplinary journal*, 39, 373388.

Citation: Amiel, F., Muller, A., Laurans, Y. (2018). Producing sustainable cocoa: under what conditions?, *Issue Brief* N°14/18.

This article received funding from the French National Research Agency under the Investissements d'avenir programme [ANR-10-LABX-14-01] and the French Development Agency (AFD) within the framework of a research agreement..

CONTACT

frederic.amiel@iddri.org

Institut du développement durable
et des relations internationales
41, rue du Four - 75006 Paris – France

WWW.IDDRI.ORG
[@IDDRI_THINKTANK](https://twitter.com/IDDRI_THINKTANK)