



Renovated *cabruca* area at the Boa Sorte Farm in Uruçuca, Brazil.
Photo: Pedro Santos

Cocoa agroforestry in Brazil through a public-private partnership

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“Cocoa produced in carbon-positive, biodiverse and regenerative agroforestry systems can be a commodity that generates urgently required income for small-scale farmers while driving the restoration of large areas of degraded forest landscapes in Latin America.”

Introduction

Historically, Brazil has been one of the most important cocoa-producing countries in the world, and is currently the sixth biggest producer. Initially, cocoa production was concentrated in the Amazon region, where the cacao species is native and cocoa consumption has a history of more than 5,000 years. Since the 1970s, the production of cocoa, promoted by the Brazilian cocoa research institute, the Executive Commission for Cocoa Cultivation Planning (CEPLAC) in the newly colonized areas along the Trans-Amazonian Highway, has been increasingly replaced by extensive livestock farming. The production of cocoa shifted mainly to the state of Bahia, where cocoa was cultivated under the trees of the highly biodiverse Atlantic Forest in a type of agroforestry system known as *cabruca*. This brought considerable prosperity to the region. However, the economic boom was abruptly halted in 1989 by a fungal epidemic, Witches' broom disease (*Moniliophthora perniciosa*). Thus, Brazil became a net importer of

cocoa beans. Since 1997, the Brazilian chocolate industry has imported an average of 50,000 tonnes per year from countries such as Côte d'Ivoire, Indonesia and Ghana to meet demand (Coslovsky 2023).

In the wake of sustainable development programmes and, more recently, with the emergence of the bioeconomy, interest in cocoa cultivation has been renewed in Brazil, especially when carried out in agroforestry systems. In the expectation that cocoa could become an alternative to unsustainable cattle-raising or unsustainably produced agricultural crops, many initiatives sprang up, often with international funding. Funders and the large industrial chocolate manufacturers have also recognized the potential of cocoa agroforestry to generate income and restore landscapes, and the manufacturers are playing an increasingly active role in promoting cocoa production in agroforestry systems by small-scale farmers in Bahia, Pará and elsewhere in Brazil.

In 2020, the Brazilian branch of the international food company Mondelez — accompanied by the German Agency for International Cooperation (GIZ) within the public-private partnership programme, develoPPP.de, of Germany's Federal Ministry for Economic Cooperation and Development — started the Sustainable Cocoa Production from Agroforestry in the Amazon and Atlantic Forest project to promote sustainable cocoa production in the country. The project aimed to build on Mondelez's Cocoa life programme (see Box 1), which pays farmers premiums and provides technical assistance on the condition that they comply with environmental regulations and adopt good agricultural practices.

The cocoa agroforestry project

Based on this approach, the project partners designed specific strategies for two regions: Bahia and Pará. In Bahia, together with the Cocoa Innovation Center (CIC), the project aimed to rejuvenate cocoa crops in over-aged *cabruca* stands. In Pará, the partnership joined The Nature Conservancy (TNC) Forest Cocoa initiative. Since 2013 the TNC initiative has promoted cocoa agroforestry systems as an alternative to livestock raising, and as a way to restore degraded pastureland. To achieve these goals, a number of innovative strategies and tools have been developed; these are detailed below.

Rejuvenation of *cabruca* systems in southern Bahia

The first cocoa seeds were brought to southern Bahia from Pará state in 1746. In the Atlantic Forest of Bahia, the plant found favourable conditions that allowed it to flourish: appropriate soil, tropical hot weather and plenty

Box 1. The Cocoa Life programme

Cocoa Life, Mondelez International's global programme, was launched in 2012 to secure a supply of more sustainable cocoa beans. The programme seeks to support cocoa producers and their communities through an integrated approach in three areas:

- Cocoa production as a prosperous business
 - The focus is supporting producers to increase their productivity levels and family income.
- Empowered cocoa communities
 - This component focuses on capacity-building activities targeting children, youth and women within cocoa communities to boost development through the promotion of entrepreneurship and education.
- Conserved and restored forests
 - The focus is to protect and restore the cocoa production landscapes where Mondelez sources from, in partnership with suppliers and communities.

of rain (Souza Júnior 2018). Throughout the next 270 years, the cocoa agroecosystem in the region expanded, based on the *cabruca*, a traditional agroforestry system where the cocoa is cultivated beneath the canopy of big native trees. Currently, there are more than 69,000 producers and around 420,000 ha covered with cocoa in the region (AIPC 2023), at least 40% of which is cultivated in *cabruca* systems (Mapbiomas Cacau 2020). Unfortunately, most of these *cabruca* areas were abandoned or left with very little management after the Witches' broom crisis, leading to extremely low productivity levels.

To contribute to overcoming this problem, 32 long-term experimental plots were established on small farms to generate empirical evidence on rejuvenation strategies, including the testing of various clones and management practices (planting, pruning, fertilizing, irrigating, mechanization). The experiments in the Renova Cacau project demonstrated that proper pruning technologies and light management and other agricultural practices during and after the rejuvenation process, in combination with replacing old cocoa plants with genetically improved ones, allowed farmers to not only effectively control the Witches' broom disease, but also to increase cocoa production. The data generated indicate the possibility

of increasing cocoa production from 300 kg/ha, the Bahia state average, to over 1,500 kg/ha (Ahnert et al. 2021). Investments in the recommended technologies have proved to be economically viable, with an internal rate of return (IRR) above 12%; this corresponds to an average income of USD 1,000/ha/year (WCF et al. 2021). This income is attractive to the mostly poor small-scale farmers in the region and may help to bring them out of poverty. It may also convince young people to stay on the farms while conserving the *cabruca* system, with its rich biodiversity.

These experiments resulted in both technical guidelines and demonstration sites for training small-scale farmers in Bahia in the possibilities of rejuvenating their *cabruca* forests. These products have been used to illustrate the alternatives to 2,000 farmers who have participated in on-field courses. Another 2,400 families benefitted from technical assistance from the technicians of the Intermunicipal Consortium of Southern Bahia (CIAPRA), which provided training not only in technical aspects, but also in other areas relevant to small-scale farmers, such as restoration techniques, financing, crop diversification, participatory facilitation skills, commercialization, and environmental registration (*Cadastro Ambiental Rural*, or CAR); the latter included a partnership with the state government to expedite the process, which is complex.

Cocoa agroforestry to restore degraded land in the state of Pará

The state of Pará currently has around 150,000 ha covered with cocoa, more than 18,000 producers and an average productivity level of almost 1,000 kg/ha; it is the second biggest producer in the country (AIPC 2023). But, at the same time, the state accounts for 42% of the total deforestation in the Brazilian Amazon since 2008 (Assis et al. 2019). The municipality of São Félix do Xingu, where the TNC cocoa agroforestry project has been implemented since 2013, has the second highest deforestation rate in the Amazon, most of it to create pastureland for cattle.

Aiming to revert this critical scenario, TNC — in partnership with the project consortium — encouraged more than 300 farmers to adopt cocoa agroforestry systems to restore degraded pastureland. Unlike the *cabruca* system, these agroforestry systems are typically established on deforested land and combine cocoa with other commercial crops, native and not, such as banana and açai palm. The farmers also plant tree species for shade and for the production of timber and non-timber forest products, in accordance with the specific environmental conditions and the needs and preferences of the farmers. The efforts showed that restoring degraded land is possible but challenging. Initial costs to improve soil conditions are high, the process takes a long time, and there is a scarcity of family labour. In these situations,



Field days for smallholders in southern Bahia at one of the experimental plots of the Renova Cacau project, where youth and women are actively encouraged to participate. Photo: Pedro Santos

therefore, farmers might not dedicate their scarce labour to restoration activities unless they are supported with sufficient funding and technical assistance.

The establishment of agroforestry systems on medium- to good-quality soils, however, showed attractive financial results, with an IRR of around 15% and an average yearly income between USD 1,000 and 1,500/ha from cacao alone (WCF et al. 2021). This is more than six times the USD 150/ha/year that can be earned from cattle (Braga 2019).

The project also supported four local farmer organizations with participatory workshops and ongoing mentoring activities to strengthen their management capacities, including developing a business model and

exploring commercialization opportunities for both the private and public markets. Additionally, following a request from the producers, the project offered a full-time six-month computer course to train users in basic informatics and digitization skills.

To strengthen the diversification strategies of agroforest producers, the project also conducted capacity-building activities for the municipal and state technicians involved in the purchase of local produce for school meals. In Brazil, municipalities and state and federal educational institutions are legally required to purchase at least 30% of school meals from local farmers (federal Law no. 11.947/2009). As a result, in 2022 the Women's Fruit Pulp Producer Association of São Félix do Xingu sold for the first time USD 50,000 in fruit pulp to the São Félix municipality, and expects to earn USD 70,000 in 2023. Selling the wide range of tropical fruits cultivated in the agroforests, together with cocoa, not only generated important extra income for the women; at the same time, it provided agroecological nutrients for the local children: a win-win scenario.

Another important achievement resulted from the work that TNC conducted with the Pará state environmental agency to develop and approve the state-level Normative Instruction No. 07, from 2019 (Portal legislativo 2019), which allows the implementation of agroforestry systems with cocoa to restore legal reserve areas. This provides an important motivation for farmers to restore the environmental conditions on their farms, because it reconciles legal requirements with the possibility of earning a good financial return.

In Pará state cocoa cultivation is mostly done by small-scale farmers and within agroforestry systems, 70% of which are in degraded areas (Venturieri et al. 2022). The recent expansion of cocoa agroforestry systems indicates the great potential of this commodity to become an important driver of large-scale forest landscape restoration in biodiversity hotspots such as the Amazon rainforest.

Challenges

The project tackled a number of structural challenges that hamper the spread of sustainable cocoa agroforestry in Brazil. For example, many small-scale farmers suffer from limited access to technical assistance and credit, partly due to the low availability of public services, but also because of a high degree of informality. In fact, convincing farmers to join the project was not easy, because they feared that the required official registration



A highly biodiverse agroforestry system in Pará state, where several tropical fruit species, as well as native timber trees and trees that provide non-timber forest products, are planted together with cocoa. Photo: Pedro Santos



Due to the legal insecurity of harvesting valuable timber from trees more than 30 years old in cocoa agroforestry systems of the Trans-Amazonian Highway, producers are cutting down the trees to cultivate cocoa under direct sunlight in a monoculture system, a recent trend that is growing rapidly in the region. Photo: Anderson Serra

of the land (CAR) would involve costs and reprisals by government authorities due to existing environmental liabilities. Setting up a more integrated assistance service — that combines technical, environmental and financial expertise at the level of cooperatives and municipal organizations — emerged as a promising approach to overcome these problems. Such an approach, however, would require financial and institutional support by the state and the federal government.

Another problem that the project experienced was the strong and exclusive focus of many stakeholders, such as government, private companies and landowners, on just one plant: cocoa. In some cases, agroforestry systems are promoted more as a way to produce cocoa than as an opportunity to diversify or for their associated potential for income generation, risk reduction, climate resilience and biodiversity conservation. And paradoxically, trees planted in agroforestry systems are subject to legal insecurity; they can be legally harvested by the farmer under the existing forestry law, since the necessary steps to obtain a timber-cutting permit are unclear and confusing. This neglect of products other than cocoa encourages the current trend of growing cocoa in direct sunlight outside of agroforestry systems, resulting in a dramatic decrease in the environmental value of cocoa production.

Key lessons learned

The tools and strategies developed in this project have been adopted by several cocoa agroforestry initiatives in Bahia state and in the new cocoa-growing areas along the Trans-Amazonian Highway, where the number of cocoa farmers supported by different initiatives, including government and NGOs, will increase to more than 3,000 over the next year. However, this success should not obscure the fact that many challenges still need to be overcome in order for small-scale farmers in Brazil to establish and maintain financially attractive, biodiverse and sustainable cocoa agroforestry systems that generate income while restoring and maintaining soil fertility and biodiversity.

In addition to informality, lack of technical assistance, and difficulties in access to credit, there is a widespread lack of skilled and unskilled labour. Also, value chains for the other products from agroforestry systems need to be developed, and the necessary legal steps to obtain a licence to harvest the timber from trees in the agroforestry system need to be clarified by the government. Institutional markets, such as the one for school meals mentioned above, could be important in promoting diversification, but this requires systematic efforts in capacity building for municipalities as well as producers.



Cocoa agroforestry with açai palm, rubber tree (*Hevea* sp.) and Brazilian mahogany in Pará, Brazil. Photo: Pedro Santos

Recently, new due diligence initiatives in Europe have increased the pressure for product traceability down to the plot level. Attributes such as no deforestation, no slave labour or child youth labour, fair wages for workers and a living wage for producers are all critical to the future of sustainable cocoa production. However, considering that 80% of Brazilian cocoa is still marketed informally by intermediaries, it is uncertain how or even if these new requirements can be implemented without putting further pressure on the weakest element of the value chain: small-scale farmers.

Conclusions

Harnessing the potential of cocoa production in agroforestry systems for sustainable local development in Brazil depends mainly on two actions:

- Valorizing the immense product diversity of cocoa agroforestry systems (firewood, timber, fruits, oils, nuts and seeds, fibres, cosmetics) to discourage farmers from cultivating cocoa in direct-sunlight monocultures.
- Establishing a support system (at the level of cooperatives and municipal organizations, or through the private sector) that assists farmers not only in the production of cocoa, but also in the other aspects of agroforestry, and in the entire set of legal, environmental and technical issues relevant to becoming successful and sustainable.

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