October 2026

Non-Technical Summary

Gold Standard for the Global Goals (GS4GG) Voluntary Project Activity (VPA) "Functional Agroforestry for Carbon Removal within Coffee Value Chains in Minas Gerais and São Paulo State, Brazil" (GS23819) under the PoA "Global Syntropic Agroforestry Program" (GS13053)

Context

Forests are of great importance for biodiversity, climate, healthy soils, water retention, and food production. However, only in the State of Minas Gerais, Brazil, 3.10 million ha of tree cover was lost from 2001 to 2023, equivalent to a 17% decrease in tree cover since 2000 and 1.66 Gigaton of CO2e emissions.[1] Deforestation linked to agriculture is a major driver of climate change. Commodity-driven deforestation (including cattle pastureland, cocoa, coffee, soy, oil palm, etc.) contributes to 25% of the total tree cover loss worldwide.[2]

The economic impact on society is enormous. In terms of coffee, drier and hotter conditions are jeopardizing Arabica coffee production in Minas Gerais, with climate change and deforestation being the main causes. Since 2010, temperatures in coffee-producing municipalities have risen by 1.2° Celsius during the flowering period; projections indicate more days of extreme temperatures (above 34°C) by 2050.[3]

Many coffee producers in Minas Gerais have widely reported growing concern about water scarcity, extreme heat, and longer dry spells, which are consistent with observed climate variability and are increasingly undermining the resilience of coffee plants. These stressors matter because drought and unfavorable temperatures are among the major climatic limitations for coffee physiology and production, affecting growth and yield.[4] At the same time, the resilience of Arabica coffee is challenged when production landscapes lose conditions closer to its ecological origin. Coffea arabica is native to the shaded understory of Ethiopia's moist evergreen montane forests, where milder microclimates and intact forest-soil processes support plant performance. In simplified, full-sun systems with degraded soils, coffee can lose key supporting functions, such as microclimate buffering and healthy soil biological processes, that help maintain soil structure and water availability.[5]



Figure 1. Monoculture coffee plantation in Campo das Vertentes, Sul de Minas, July 2024.

Coffee in Minas Gerais is widely grown in full-sun systems, often in monoculture compared with agroforestry approaches. Farmers report that plantations are therefore increasingly exposed to pest and disease pressure,

[1] https://www.globalforestwatch.org/dashboards/country/BRA/13/?category=forest-change&location=WyJjb3VudHJ5IiwiQlJBIiwiMTMiXQ%3D%3D

[2] Curtis et al. (2018), Classifying drivers of global forest loss, https://doi.org/10.1126/science.aau3445.

[3] https://news.mongabay.com/2023/10/how-climate-change-could-jeopardize-brazilian-coffee/

[4] DaMattal & Cochicho (2006), Impacts of drought and temperature stress on coffee physiology and production: a review, https://doi.org/10.1590/S1677-04202006000100006

[5] Senbeta & Denich (2006), Effects of wild coffee management on species diversity in the Afromontane rainforests of Ethiopia, https://doi.org/10.1016/j.foreco.2006.05.064.

including bicho mineiro (Leucoptera coffeella), broca-do-café (Hypothenemus hampei) and ferrugem (Hemileia vastatrix)[6]. Conventional management commonly responds with higher reliance on chemical control (pesticides and fungicides) and other external inputs, and conventional systems are often characterized by greater dependence on agrochemicals and chemical fertilizers. Glyphosate is among the herbicides used in conventional weed management, and research indicates glyphosate can modify soil microbial communities and biochemical processes, potentially affect soil health and long-term crop productivity when used intensively. Such practices, combined with recurrent heat and water stress, have been associated with gradual declines in coffee productivity in several producing regions of Minas Gerais.[7]



Figure 2. Leucoptera coffeella (bicho mineiro)



Figure 3. Long dry spell in winter causes the coffee to suffer and can even cause the coffee to die. Bare, uncovered soil results in soil erosion, lack of retention of water, no micro-biological life, and soil compaction.

In addition to heat and drought, frost events and strong winds increasingly damage productive coffee areas, and full-sun systems offer no buffering canopy. Despite the benefits of shade trees, agroforestry uptake across Brazil's principal coffee zones, including Minas Gerais and São Paulo, remains below roughly 1% of the cultivated area. Farmers face well-documented barriers, such as limited technical knowledge of system design and species selection, upfront seedling and labour costs with a delayed return, and uncertainty over yield effects.[8]

This is where the project "Functional Agroforestry for Carbon Removal within Coffee Value Chains in Minas Gerais and São Paulo State, Brazil" comes in to change that situation.



Figure 4. Hemileia vastatrix (ferrugem) causing early leaf fall and drying out of branches.

[6] Venzon (2021), Agro-Ecological Management of Coffee Pests in Brazil, https://doi.org/10.3389/fsufs.2021.721117.
[7] Mancini et al. (2021), Impact of agroecological management on plant diversity and soil-based ecosystem services in pasture and coffee systems in the Atlantic forest of Brazil, https://doi.org/10.1016/j.agee.2020.107171.
[8] Maia, A. G. et al. (2021), The economic impacts of the diffusion of agroforestry in Brazil, Land Use Policy 108, 105489; Dias, C. G., Martins, F. B. and Martins, M. A. (2024), Climate risks and vulnerabilities of the Arabica coffee in Brazil under current and future climates considering new CMIP6 models, Science of the Total Environment 907, 167753.

Applied Approach, Objectives, and Location of the Project

Rather than restoring cleared land, the project integrates planned tree corridors into existing, productive coffee farms. Planted tree rows build a protective canopy and a permanent reservoir of natural pest enemies, so that plantations become more resilient to pest and disease outbreaks and to drought, frost and wind, while generating Gold Standard-certified carbon removals as a new income stream for producers. The design follows Clima's Forest Coffee Methodology, built on syntropic agroforestry principles, and was tested in a 2025 pilot covering around 80 ha with 14 producers in the Cerrado Mineiro, Matas de Minas and Sul de Minas regions.

Tree rows are placed between every 5th and 12th coffee row, with corridor lines spaced roughly 20–40 m apart, so that mechanisation lanes remain intact and coffee productivity is maintained. Depending on topography and management, one of two planting-design models is applied per farm: Model 1 (Mechanised) for flat, mechanised estates and Model 2 (Manual) for sloped or manually managed farms. Site preparation is deliberately low-impact: soil disturbance is limited to individual planting pits, and leguminous cover crops are established between rows to improve nitrogen cycling, soil organic matter and moisture retention.

Species are selected for ecological succession, functional complementarity and local market value. The corridors combine medium-stratum species such as Erva-Baleeira (Varronia curassavica), Fedegozinho (Senna Cernua) and Ingá (Vera and Édulis) which repels the bicho mineiro; high-stratum, nitrogen-fixing and pest-regulating species such as Ingá, Fedegoso (Senna macranthera) and Mulungu (Erythrina spp.); and emergent species such as Guapuruvu, Paricá, Mogno-Africano (Khaya spp.) and Teca, which provide shade, timber and long-term carbon storage. Coffee is kept as a managed shrub of about 2 m, medium and high shade trees are pollarded to about 3 m to regulate light, and emergent trees can reach 20–30 m.



Figure 5. Coffee producer Carmem (Usha) with the freshly planted tree corridor seedlings established within a productive coffee plantation in Minas Gerais, Brazil, 2026

Seedlings are produced by accredited nurseries under Clima's supervision and quality control and are delivered to participating producers through cooperative-based regional distribution events. Farmers receive training on site preparation, planting, leaf-cutter ant control, green cover and post-planting care, followed by one follow-up training per year on pruning and pollarding.

By integrating trees into coffee, the agroforestry corridors enhance biodiversity by creating year-round habitats for natural pest enemies and pollinators, improve microclimatic conditions through shading and wind protection, support soil regeneration and erosion control, and increase carbon sequestration in both biomass and soils, strengthening the long-term resilience of coffee production.

In addition to the functional agroforestry systems within productive coffee plantations, the project will contribute to revegetation of adjacent plots on producer's private lands via small clusters of planted trees, to create landscape connectivity and further impact biodiversity.

Objectives

The project aims to support coffee farmers in integrating trees into their existing full-sun coffee plantations in order to restore soils, stabilize or potentially increase coffee productivity and farmers' income, strengthen the resilience of coffee production against climate extremes, pests and diseases, and remove carbon dioxide (CO_2) from the atmosphere through carbon sequestration.

To achieve this, the project's key objectives are to: (i) generate high-quality carbon removal credits through Gold Standard certification under the PoA; (ii) improve soil health, water regulation and farm resilience through stratified tree corridors within coffee; (iii) strengthen functional biodiversity,

including natural enemies of coffee pests and pollinators, and reduce dependence on chemical inputs; and (iv) provide producers with a new income stream, with 65% of carbon revenues paid to the farmers, while promoting the inclusive participation of women and youth in training activities.

The project will be implemented on coffee farms of producers associated with the partner cooperatives Cooxupé, Expocacer and SanCoffee[9], located in the coffee regions of Sul de Minas, Campo das Vertentes and Cerrado Mineiro in the state of Minas Gerais, and in coffee areas of the state of São Paulo within the cooperatives' areas of operation, South-East Brazil (see map in the following). Participation is voluntary, with a minimum of 1 ha per producer.

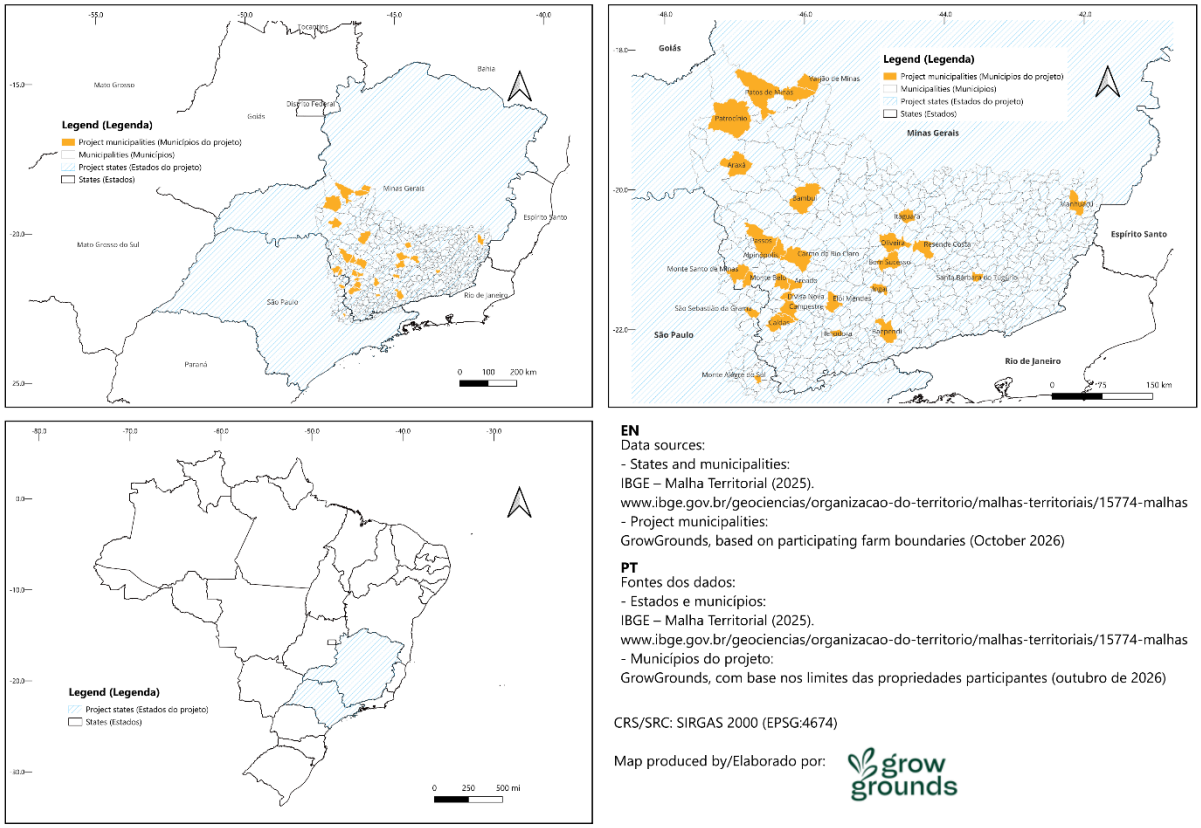


Figure 6. Project area of the VPA "Functional Agroforestry for Carbon Removal within Coffee Value Chains in Minas Gerais and São Paulo State, Brazil"

The project will be certified as Gold Standard carbon project under a broader framework, known in the carbon market as 'Programme of Activities (PoA)'. A PoA establishes the guidelines for any project that will make part of the PoA.

The present project is a regular VPA under this PoA. The first VPA of the PoA (called real case VPA) is the project "Transforming Coffee Production Systems in Brazil with Agroforestry to Store Carbon, Regenerate Ecosystems, and Improve Farmer Livelihoods in Mantiqueira de Minas" (GS23685). As the present VPA is located in different regions, a dedicated local stakeholder consultation (LSC) is held for it in two regional sessions: in the Cerrado Mineiro (Monte Carmelo, 16 November 2026) and in the Sul de Minas (Guaxupé, 18 November 2026).

Involved Parties

GrowGrounds ApS (GG), being the Coordinating and Managing Entity (CME) of the PoA and at the same time project developer of this VPA, is a Danish-based impact-driven start-up that is focused to decrease coffee's negative CO2 impact

[9] We will onboard more partner cooperatives over time.

and helps farmers to move away from monoculture coffee farming to syntropic agroforestry systems, while giving farmers access to the global carbon market.

Clima Agroambiental Ltda (Clima Café de Floresta) is the implementation partner and technical operator of the project. Building on its Forest Coffee Methodology and its field experience with ecological tree corridors in coffee in Minas Gerais, Clima is responsible for the technical design of the corridors, farmer onboarding, technical assistance and training, seedling logistics and nursery supervision, and field data collection.

The coffee cooperatives Cooxupé, Expocacer and SanCoffee are the cooperative partners of the project and are responsible for producer mobilisation, the institutional interface with their members and the regional seedling distribution hubs. Cooxupé is one of the world's largest coffee cooperatives, with an existing technical-assistance infrastructure and a digital onboarding platform for producers.

Carbon Credits

Greenhouse gas (GHG) sequestration achieved through the planting of trees will result in carbon credits following Gold Standard certification rules and procedures. The PoA will apply the Gold Standard methodology "Sustainable Transformation through Afforestation, Reforestation and Revegetation (STARR)".

The project aims to pay back at least 65% of revenues from the sale of carbon credits to the farmers as direct money transfers. The remaining revenues are shared between Clima (15%) and GrowGrounds (20%) to finance technical implementation, carbon certification and project management costs. Payments are made from Year 2 onward, upon issuance and commercialisation of verified carbon units.

Duration, Scale and Time-schedule

The duration of the project is 30-40 years, in line with Gold Standard long-term requirements for afforestation/reforestation activities.

The project start date is planned for November 2026, with the planting of the first trees. Tree planting takes place during the rainy season, from November 2026 to March 2027.

The PoA, along with its real case VPA (GS23685) implemented in Mantiqueira de Minas, Minas Gerais, received the Design Certification in December 2025. The present regular VPA is expected to reach Design Certification in May 2027, subject to successful validation and completion of the required legal, technical and stakeholder processes.

In its 2026 cycle, the project is planned to be implemented across up to approximately 500 hectares of coffee landscapes through phased enrollment and farmer onboarding. Enrollment closes once the cumulative contracted area reaches 500 ha; obligations to enrolled producers continue over the 30-year permanence period.

Farmer enrollment through the cooperatives has already started. Farmer trainings and seedling distribution will take place alongside the local stakeholder consultation in November 2026.

Compliance with the Safeguarding Principles

Any VPA to be implemented guarantees to follow all safeguards as defined in the Gold Standard requirements, which are as per the following.

Principle 1 - Human Rights

The project respects internationally proclaimed human rights and is not complicit in violence or human rights abuses of any kind, as defined in the Universal Declaration of Human Rights. It does not discriminate on the basis of gender, religion or sexual orientation.

Principle 2 - Gender Equality and Women's Rights

The project activity does not support any form of discrimination based on gender. The project will take into account the gender roles and capacities of women and men to participate equally in the design and consultation activities of the project activity.

Principle 3 - Community Health, Safety and Working Conditions

The project will not expose the community to increased health risks and will not adversely affect the health of workers and the community. Workers involved in the project activity are not exposed to unhealthy working environments, as the project activity will not involve hazardous chemicals or other hazardous materials. It will be ensured that youth/farmers involved in tree management practices activities will be properly trained and equipped with protective equipment as and when necessary.

Principle 4 - Cultural Heritage, Indigenous Peoples, Displacement and Resettlement

The project activity will not negatively impact cultural heritage, indigenous peoples or displace or resettle people. The project is not located on lands/territories claimed by indigenous people; Indigenous Peoples' and local community areas as well as culturally significant sites are excluded from eligibility.

Principle 5 – Corruption

The project does not involve, complicit in, or inadvertently contribute to corruption or corrupt projects. The project is implemented on farmers lands who have full control over their land.

Principle 6 -Economic Impacts

No negative economic consequences are expected from the project activity. On the contrary, the project is expected to contribute to sustainable economic growth. The project will respect all labor rights and follow the respective national laws.

Principle 7 - Climate and Energy

The project will sequester CO2, which will be monitored and verified in accordance with Gold Standard carbon requirements.

Principle 8 - Water

The project will not have any negative impact on natural water patterns/flows or cause further erosion and/or instability of water bodies. Buffers of 15 m around water bodies and waterways, as well as wetlands, are excluded from planting. On the contrary, increased vegetation through trees and other plants allows for better water retention and infiltration, which has a positive impact on groundwater availability.

Principle 9 - Environment, Ecology and Land Use

The project will not have any negative impact on the environment and ecology. The project does not adversely affect or alter intact high conservation value (HCV) ecosystems, critical habitats, landscapes and key biodiversity areas. Only agricultural land without forest cover in the preceding 10 years is eligible, so the project creates no incentive for forest clearance.

Contribution to Sustainable Development

The project aims to contribute to the following Sustainable Development Goals (SDGs):

SDG 2 – Zero Hunger



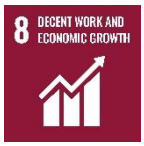
The project activity will implement resilient agricultural practices, hence create better soil conditions and sustainable food production systems, which will benefit farmers in form of stable incomes and food for subsistence. The project activity expects to reduce or even eliminate the use of external inputs (chemical or organic fertilizer, pesticides, herbicides, fungicides) resulting in cost savings for the farmers. The farmers will benefit from the carbon project in form of cash and/or in-kind payments.

SDG 4 – Quality Education



The project activity will provide training/workshops to farmers and technicians on agroforestry corridor design, planting, leaf-cutter ant control, green cover, and pruning and pollarding following syntropic farming principles, thereby enhancing their skills and knowledge of sustainable agriculture. This will make their work more efficient, effective and sustainable for soils and the environment.

SDG 8 – Decent Work and Economic Growth



The project activity expects to create jobs for technicians, service providers for conducting pollarding activities, for staff carrying out monitoring activities and others. Hence, the project activity will increase business and income opportunities in the municipalities where the project will be implemented.

SDG 13 – Climate Action



The project activities result in carbon removals through planted trees. Soil Organic Carbon will also be enriched.

SDG 15 – Life on Land



The project activity expects to integrate tree corridors into up to 500 ha of full-sun monoculture coffee plantations of different coffee farmers in Minas Gerais and São Paulo, creating diverse agroforestry systems following syntropic farming principles. This will provide new habitats for flora and fauna, including natural enemies of coffee pests and pollinators.

Contact

Christina Singh
Chief Operations Officer
Email: christina@growgrounds.org
Phone: +45 4176 0744

Dr. Rodrigo Castriota
Local Focal Point – Clima Café de Floresta
Email: castriota@climacafe.com.br
Phone: +55 31 99272 7219