

FINANCE BRIEFING

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CARBON CREDITING MECHANISMS, NATURE-BASED SOLUTIONS AND SMALLHOLDERS

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AN OVERVIEW IN THE CONTEXT OF THE SAFE PROJECT



One solution that allows smallholder farmers and vulnerable groups to receive financial rewards for protecting forests is the generation and trading of carbon credits deploying Nature-based solutions (NbS) within Carbon Markets. In this context, NbS are defined as a collection of nature-based approaches that (i) reduce, (ii) avoid (such as REDD+) or (iii) remove emissions.

NbS offer several co-benefits for nature, biodiversity and the Sustainable Development Goals (SDG). It is widely agreed that NbS can provide up to 30% of the mitigation required by 2030 to keep the 1.5°C target within reach.

This briefing aims to provide some insights and considerations on the state of play of **Carbon Crediting Mechanisms (CCMs)** for NbS and how these can support the transition to deforestation-free supply chains in SAFE countries for smallholders.

THE MAKING OF CARBON CREDITING MECHANISMS

The situation after 2021 is characterized by several integrity attacks on CCMs, especially with a price decrease for NbS. These credibility questions were raised due to **greenwashing and over-crediting allegations**. Some companies have falsely claimed carbon neutrality by using low-quality NbS carbon credits from projects that failed to deliver real environmental benefits, while in REDD+ projects, baselines have been inflated and thus benefits of avoided deforestation over-credited. This caused a price drop as investors questioned their true value (Guizar-Coutiño et al., 2022; SourceMaterial, 2023; West et al., 2020; West et al., 2023; MSCI, 2024).

DEFINITIONS AND EXPLANATIONS

CCMs are defined by the World Bank Carbon Pricing Dashboard as systems in which tradable credits - each representing the reduction of one tonne of CO₂ equivalent (tCO₂e) - are generated through voluntary emissions reduction activities. These credits are issued to projects that reduce emissions according to specific protocols designed to ensure that each credit represents a legitimate and verifiable emissions reduction. The credits can then be sold to buyers, generating revenue for the project. Importantly, carbon credits can represent emissions reductions achieved through either avoidance (preventing future emissions) or removal (directly capturing and storing CO₂).

CCMs are often referred to as a baseline-and-credit system, where credits are generated from projects that reduce emissions relative to a baseline scenario.

Carbon Crediting Mechanisms

International (voluntary) CCMs

Internationally-governed crediting mechanisms involve a multilaterally agreed framework such as the Kyoto Protocol or Paris Agreement, on which rules the mechanisms are to be implemented, contrary to independent crediting mechanisms, that do not require any international, national, or sub-national government authority to be involved when working with carbon credits. Examples include the Clean Development Mechanism (CDM), Joint Implementation, Articles 6.2 and 6.4 of the Paris Agreement, and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

Governmental (voluntary) CCMs

Governmental carbon crediting mechanisms are national or regional programs established by governments to regulate and incentivize CCM activities within their jurisdictions. Examples include the British Columbia Offset Program and the EU Carbon Removal Certification Framework (CRCF), with the latter being under construction.

Independent (voluntary) CCMs

Unlike international or governmental carbon crediting mechanisms, independent crediting mechanisms do not require a multilaterally agreed framework or government authority involvement to operate. These mechanisms allow private entities, non-governmental organizations, and sub-national governments to engage in CCMs. The credits in independent CCMs represent verified emission reductions that have been certified by independent standards, such as the Verified Carbon Standard (VCS), the Gold Standard or the Architecture for REDD+ Transactions (ART) with The REDD+ Environmental Excellence Standard (TREES).

The figure below shows the cumulative amount of credits issued within the three markets over the last two decades:

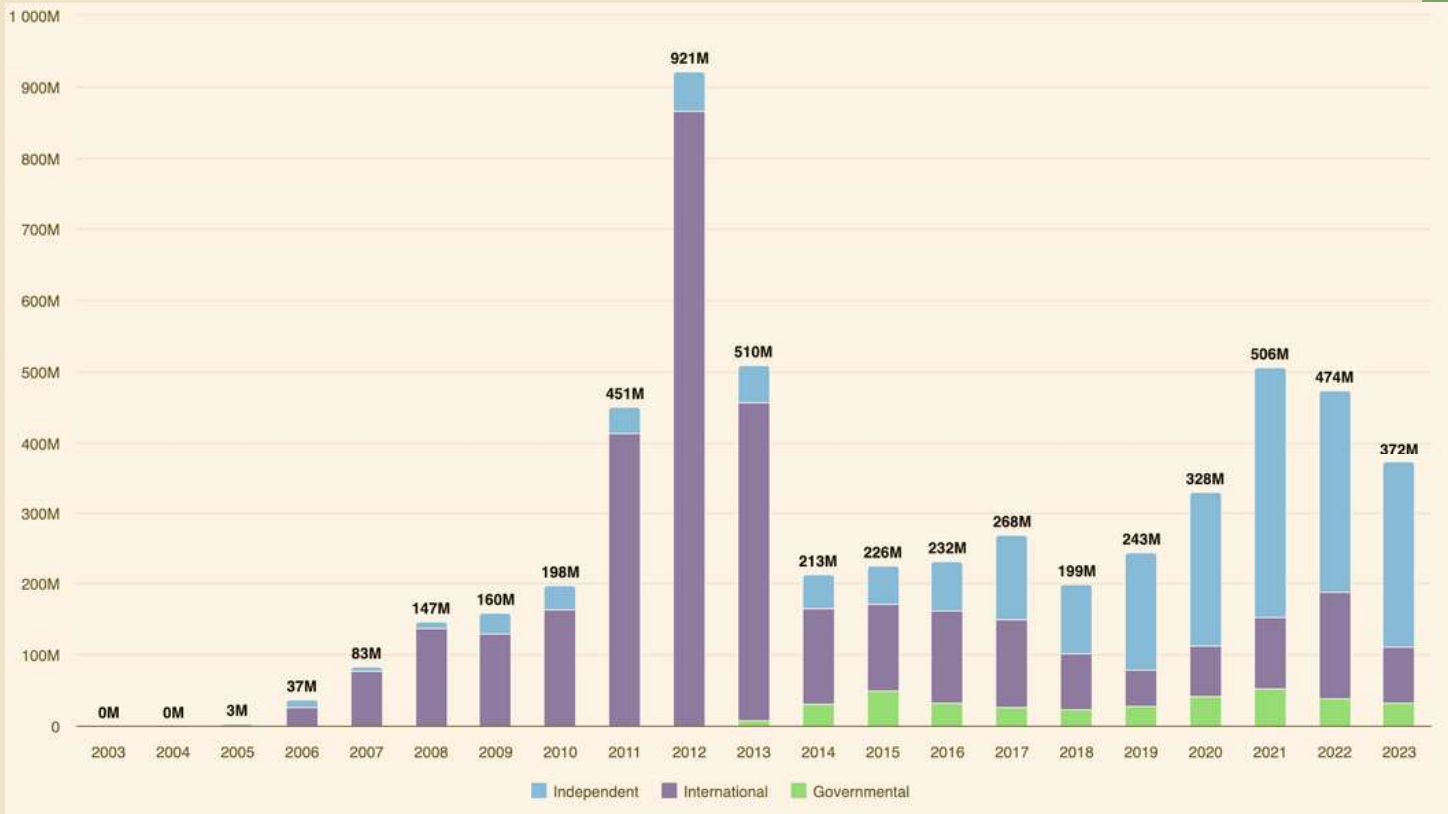


Figure 1 - Trends in carbon credit issuance (World Bank Carbon Pricing Dashboard, 2024)

HOW DO CCMS WORK IN PRACTICE AND WHO ARE THE PLAYERS

A CCM involves generating emission reduction credits from projects that reduce emissions below a pre-set baseline. These credits can then be sold or used by buyers to meet voluntary (e.g. voluntary corporate targets or mitigation contribution claims) or regulatory requirements (e.g. towards complying with a carbon tax or emissions trading compliance scheme as an offset*). Through Article 6 of the Paris Agreement, governments increasingly use CCMs to enhance their climate goals as they are an important tool to meet their Nationally Determined Contributions (NDC). Monitoring, reporting, and verification (MRV) processes aim to ensure the (environmental) integrity of the credits generated. Private and public certification standards, such as the Verified Carbon Standard (VCS) by VERRA, the Gold Standard, the UN-based Clean Development Mechanism (stopped accepting new projects), and the new standards defined by Article 6.4 of the Paris Agreement (CDM successor) through the Article 6.4 Supervisory Body define the criteria for creating, monitoring, and certifying climate action projects that generate carbon credits. There is a variety of existing and new specific standards for NbS in use, such as the TREES - ART Architecture for REDD+ Transactions, Plan Vivo, or the recently launched Abacus Standard of Amazon.

The price paid for carbon credits varies strongly according to the suppliers and buyers. For instance, in REDD+ projects (Redd Early Movers, REM) the German and British governments have paid USD 5/tCO₂e over the last decade; Mercuria has paid less than USD 2/tCO₂e for the REDD+ credits of the state of Tocantins, in Brazil; Amazon, Bayer and others have agreed to pay USD 15 per credit (Redd+) in the Brazilian state of Pará (through the LEAF coalition). According to the latest "State and Trends of Carbon Pricing" by the World Bank (2024), the average global carbon price from NbS reached its peak by the end of 2021, being priced USD 15/tCO₂e, followed by a plunge, going below USD 2/tCO₂e in 2024 (World Bank, 2024). Figure 2 illustrates the market for carbon credits and its actors on the supply and demand side of carbon credits.

*Carbon markets are often categorized as either 'voluntary' or 'compliance', but these terms are sometimes misapplied when discussing CCMs. The 'voluntary' and 'compliance' labels typically refer to carbon pricing mechanisms such as Emissions Trading Systems (ETs), carbon taxes, and carbon crediting. The first two - ETs and carbon taxes - fall under the 'compliance' category, while carbon crediting is considered 'voluntary.'

The image below illustrates the market for carbon credits and its actors on the supply and demand side of carbon credits.

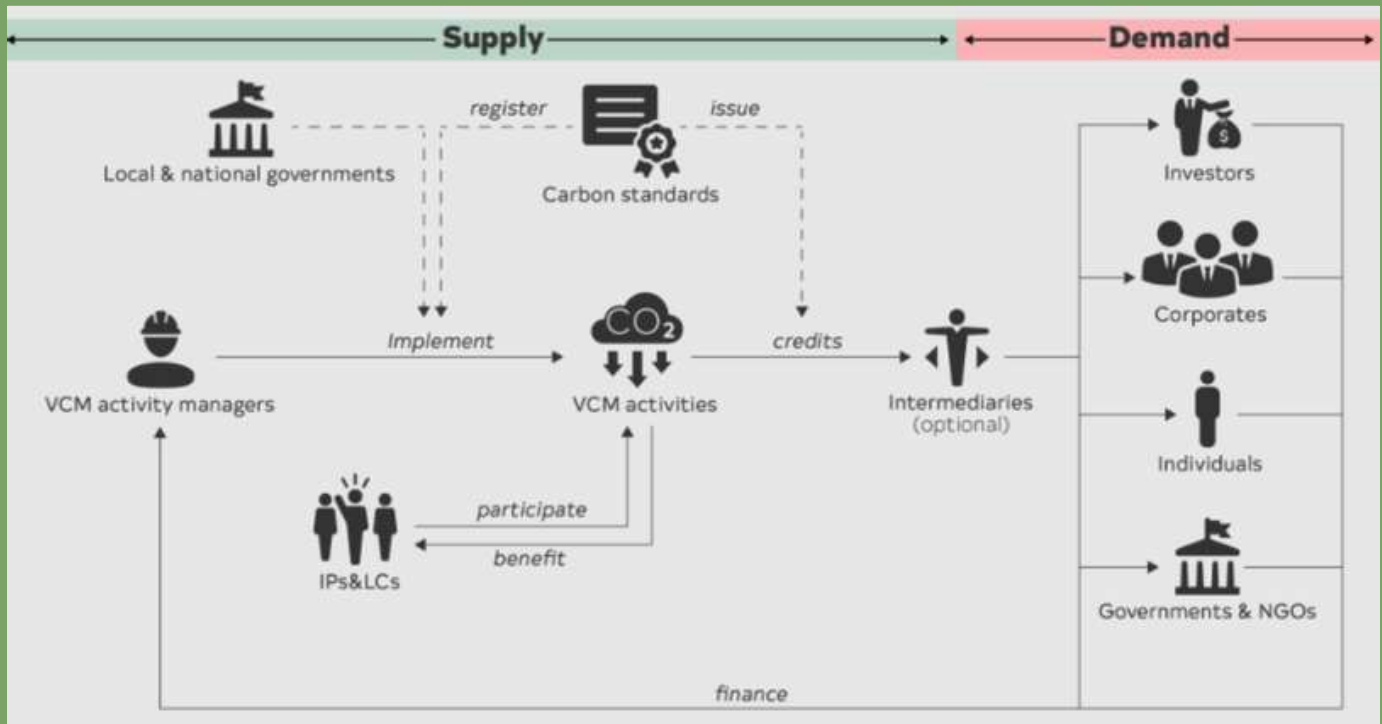


Figure 2 - The market for carbon credits (Climate Focus, 2024).

A BRIEF OVERVIEW ON CCMS AND NBS IN SAFE PARTNER COUNTRIES

CCMs and NbS are being implemented in all 6 SAFE countries, however to a different extent and under different regulatory frameworks and development status.



Ecuador

The carbon market in Ecuador is regulated under the [ACUERDO No. MAATE-2023-053](#), which establishes guidelines for GHG compensation. However, Ecuador's Constitution, specifically Article 71, recognizes the Rights of Nature, granting its legal protection. Any action or law that would compromise these rights could potentially be in conflict with the Constitution. Discussions to amend the constitutional text are ongoing, aiming to leave no margin for interpretation and scaling the carbon market in the country. Several REDD+ projects are already being implemented in Ecuador. Since 2016, [Ecuador has received more than USD 200 million](#) to support REDD+ projects.



Brazil

In December 2024, the Brazilian Government approved the [law 15,042/24](#), that establishes the [Brazilian Greenhouse Gas Emissions Trading System](#). It establishes provisions that contemplate using compliance units for the VCM and Article 6, which includes guidelines for REDD+ projects and guaranteeing safeguards for credit issuance. The law also contemplates Indigenous and traditional communities. After China and India, Brazil was the third biggest project implementer within the CDM, with NbS representing the most important approach. Currently 7,6 % of the volume of carbon credits in circulation worldwide are sourced from Brazil (almost 68% from NbS avoidance). It is estimated that Brazil can offer between 22.3 and 48.7% of global demand in the voluntary market by 2030 and that the country concentrates 15% of the global potential for carbon capture by natural means ([McKinsey & Company, 2022](#); [WayCarbon, 2022](#); [Latin America Carbon Initiative, 2023](#)).



Democratic Republic of
Congo

Despite the large areas of rainforest in the country, with a lot of potential for NbS projects, there is no structured regulatory framework regarding carbon markets in DRC yet. In 2023 an amendment was made to Law No. 11/009 of July 9, 2011, on “Fundamental Principles of Environmental Protection” to include carbon markets and taxes. Clear guidelines still need to be developed. The DRC’s government signed a Memorandum of Understanding with the startup dClimatex, securing carbon credits in a price range of USD 7 to USD 10.



Zambia

Zambia is one of the African country leaders in fostering the implementation of CCMs, serving previously as chair of the African negotiating group to the UNFCCC and hosting the first regional High Level Policy Dialogue on Carbon Markets in Sub-Saharan Africa in 2024. In 2023 the country has approved the guidelines for the submission and evaluation of proposed mitigation activities under article 6 of the Paris Agreement, the first pillar of the country’s regulatory CCM framework. These guidelines were supported by the SPAR6C project and aim at providing guidance to first-movers, setting the stage for more NbS projects in the country.



Vietnam

In September 2023, the ASEAN Carbon Credit Exchange Joint Stock Company (CCTPA) was launched, a voluntary carbon emissions exchange in an attempt to respond to international trade policies. Vietnam’s government plans to set up a regulated market and the official carbon trade exchange environment until 2028. There is a focus on and experience with REDD+ projects in the country. According to estimates by the Department of Forestry, the country has the potential to generate USD 200 million per year, expecting to come from the selling of 40 million of carbon credits¹². Last year, Vietnam received from the World Bank USD 51.5 million for the equivalent of 10.3 million tons of sequestered CO₂ through REDD+ projects.



Indonesia

Indonesia has a well-established carbon market, being ruled by recent policies and having the country’s stock exchange as the marketplace for companies trading carbon in the regulated and voluntary market (IDXCarbon), created in late 2023. The country has been setting the conditions to foster not only REDD+, but broader NbS projects, with many already seizing this opportunity. Despite the IDXCarbon has only reached USD 2.2 million of transactions up to Jun/24, the country has deals with international organizations and countries that sum up to USD 440 million in REDD+ projects.

HOW CAN SMALLHOLDERS AND COMMUNITIES PARTICIPATE IN CARBON MARKETS?

Smallholders are integral to the success of NbS and CCMs contribution to sustainable development, and their involvement is a central criteria to key CCMs such as Article 6 and high-quality independent CCMs (e.g. Plan Vivo). However, smallholders participation in carbon markets faces substantial challenges, such as high transaction costs and technical barriers, resulting in low carbon revenues (Tamba et al., 2021). Small-scale projects often encounter difficulties due to the significant costs associated with meeting methodological requirements, including third-party verification and investor thresholds. Additionally, they lack capacity building for developing (high) quality projects.

Solutions include smaller-scale carbon project initiatives bundling together to create new programmatic approaches or join existing programs to meet the required carbon reduction thresholds.

- One notable example is the KliK Foundation, which has lowered its threshold to 100,000 tonnes of CO₂ per program, facilitating collaboration among smaller projects for its Article 6 activities ([KliK Ghana, 2024](#)). Ghana, a leader in Article 6 implementation, has further lowered transaction costs by reducing government royalties for these projects ([Ghana CMO, 2022](#)).
- In 2020, Rabobank established [ACORN](#) to help smallholder farmers access carbon markets. By adopting sustainable practices and high carbon stock agroforestry systems, farmers can offer sequestered carbon as carbon removal units (CRUs), receiving 80% of the revenue. The program uses remote sensing technology to measure stored carbon and reduced monitoring costs. It is certified by [Plan Vivo](#) and [Solidaridad](#) provides trainings and support integrating ACORN into coffee value chains in East Africa and Latin America, including SAFE countries such as Brazil and Zambia.

Finally, safeguard mechanisms play a crucial role in ensuring a fair participation of smallholders and local communities in these projects. These mechanisms, such as those outlined in the [ART TREES](#) standard and the [Article 6.4 methodological standards](#), provide guidelines to protect vulnerable groups. They establish grievance and appeal processes to ensure that all stakeholders are treated fairly and that project benefits are shared equitably promoting sustainable development

HOW DO CARBON MARKETS RELATE TO DEFORESTATION-FREE SUPPLY CHAINS?

From a perspective of forest owners, CCMs, especially REDD+ approaches and further NbS, can be important economic alternatives to deforestation. However, CCMs/NbS do not yet present guaranteed income opportunities for everybody who keeps their forests standing. In addition, small farmers and communities still face significant challenges in accessing this market, necessitating a comprehensive and multi-faceted approach to overcome these barriers. However, it is expected that carbon markets will gain increasingly importance and carbon credits based on deforestation avoidance will become a more important potential source of income for smallholders and communities in the future.

On a policy level, the “Carbon Crediting sphere” is yet little connected to Deforestation-free supply chain approaches and regulatory measures on Due Diligence, such as the European Union Deforestation Regulation (EUDR). Furthermore, sustainability frameworks, such as Corporate Sustainability Reporting, Sustainable Finance Taxonomies, or Green Claims directives, increasingly limit the use of carbon credits to offset emissions to incentivize more corporate efforts to decarbonize operations and supply chains. As a general recommendation, we want to stress the need to jointly work on Due Diligence regulatory measures that are coupled with revenue-generating and re-investment mechanisms upstream. For example, taxes on imports of commodities that have significant negative impacts on forests could generate revenues to be earmarked for reinvestment in tropical forests in producing countries through NbS and other forms of payments for environmental services (PES).

Further avenues to investigate include [policy crediting schemes](#), e.g. linking successful policies fostering deforestation-free supply chain approaches and regulatory measures on Due Diligence in partner countries with carbon credits. While offsetting emissions needs limits, carbon markets can be enhanced through mitigation contribution claims, as outlined in Paris Art. 6.4.* In conclusion, CCMs offer several opportunities for forests and people; we need to tackle the implementation challenges together.

*For further information on contribution claims, see [A guide to implementing the contribution claim model](#), 2024

FURTHER READING & TRAINING

➤➤➤ READING

- Climate Focus (2023). [The Voluntary Carbon Market Explained](#).
- Climate Focus (2024). [Voluntary Carbon Market Dashboard](#). [Link](#).
- [Voluntary Carbon Markets Global Dialogue](#).
- [UNEP Copenhagen Climate Centre - UNEP CCC](#)
- [Paris Agreement Article 6 Implementation Partnership](#)
- Wuppertal Institute (2024). [A guide to implementing the contribution claim model](#)
- World Bank (2024). [State and Trends of Carbon Markets](#)
- World Bank (2023). [State and Trends of Carbon Pricing Dashboard](#)
- CIFOR (2021). [A Review of the Participation of Smallholder Farmers in Land-based Carbon Payment Schemes](#)

➤➤➤ TRAINING

- UNFCCC. [Article 6 Capacity Building Online Course](#)

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Its contents are the sole responsibility of Climate & Company and do not necessarily reflect the views of the EU, the Federal Ministry for Economic Cooperation and Development (BMZ) and the Dutch Ministry of Foreign Affairs. To learn more visit: [SAFE - Team Europe Initiative on Deforestation-free Value Chains](#) and [Climate and Company's dedicated project page](#).