Brazilian Sustainable Taxonomy: Inputs for Classifying Land Use Activities

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CLIMATE POLICY INITIATIVE

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About Climate Policy Initiative

Climate Policy Initiative (CPI) is an analysis and advisory organization with deep expertise in finance and policy. CPI has six offices around the world. In Brazil, CPI has a partnership with the Pontifical Catholic University of Rio de Janeiro (PUC-Rio). CPI/PUC-Rio supports public policies in Brazil through evidence-based research and strategic partnerships with members of the government and civil society.

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List of Acronyms and Abbreviations

ABC+ Plan Brazilian Agricultural Policy for Climate Adaptation and Low Carbon Emission (*Plano ABC+ – Plano de Adaptação e Baixa Emissão de Carbono na Agricultura*)

ABNT Brazilian Association of Technical Standards (*Associação Brasileira de Normas Técnicas*)

AFS Agroforestry Systems

AMBITEC-AGRO Environmental Impact Assessment System for Agricultural Technological Innovation (*Sistema de Avaliação de Impactos Ambientais de Inovações Tecnológicas Agropecuárias*)

ANBIMA Brazilian Financial and Capital Markets Association (*Associação Brasileira das Entidades dos Mercados Financeiro e de Capitais*)

ANVISA Brazilian Health Regulatory Agency (*Agência Nacional de Vigilância Sanitária*)

APOIA-NOVORURAL Environmental Impact Weighted Assessment of New Rural Activities (*Avaliação Ponderada de Impacto Ambiental de Atividades do Novo Rural*)

APP Permanent Preservation Area (*Área de Preservação Permanente*)

BCB Central Bank of Brazil (*Banco Central do Brasil*)

BNDES Brazilian Development Bank (*Banco Nacional de Desenvolvimento Econômico e Social*)

CAR Rural Environmental Registry (*Cadastro Ambiental Rural*)

Carbon + Green Program National Program for Decarbonized Agriculture Chains (*Programa Nacional de Cadeias Agropecuárias Descarbonizadas - Programa Carbono + Verde*)

CBI Climate Bonds Initiative

CCFI Crop-Cattle-Forest Integration

CEPA Classification of Environmental Protection Activities and Expenditure (*Classificação Estatística das Atividades de Proteção do Ambiente*)

CET Technical Evaluation Criteria (*Criterios de Evaluación Técnica*)

CMN National Monetary Council (*Conselho Monetário Nacional*)

CNAE National Classification of Economic Activities (*Cadastro Nacional de Atividades Econômicas*)

CONAFOR National Forestry Commission (*Comisión Nacional Forestal*)

CPI/PUC-Rio Climate Policy Initiative/ Pontifical Catholic University of Rio de Janeiro

CPR Rural Product Note (*Cédula de Produto Rural*)

CSRD Corporate Sustainability Reporting Directive

CVM Securities and Exchange Commission (*Comissão de Valores Mobiliários*)

DANE National Administrative Department of Statistics (*Departamento Administrativo Nacional de Estadística*)

DNSH Do no significant harm

EMBRAPA Brazilian Agricultural Research Corporation (*Empresa Brasileira de Pesquisa Agropecuária*)

ESG Environmental, Social and Governance

ESRS European Sustainability Reporting Standards

EU European Union

EUDR European Union Deforestation-Free Regulation

FAO Food and Agriculture Organization of the United Nations

FBN Biological Nitrogen Fixation

FEBRABAN Brazilian Federation of Banks (*Federação Brasileira de Bancos*)

FIRA Trust Funds for Rural Development (*Fideicomisos Instituidos en Relación con la Agricultura*)

FP Planted Forests (*Florestas Plantadas*)

FPIC Free Prior and Informed Consent

FSC Forest Stewardship Council

FUNCAFÉ Fund for the Defense of the Coffee Industry (*Fundo de Defesa da Economia Cafeeira*)

gCO_2e CO_2 equivalent emissions

GHG Greenhouse Gas

GTSyT Sectoral and thematic technical groups (*Grupos Técnicos Sectoriales y Temáticos*)

GyCEI Greenhouse Gases and Compounds (*Gases y Compuestos de Efecto Invernadero*)

IBAMA Brazilian Institute of Environment and Renewable Natural Resources (*Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis*)

IBGE Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística*)

ILF Crop-Forest Integration (*Integração Lavoura-Floresta*)

ILO International Labor Organization

ILP Crop-Cattle Integration (*Integração Lavoura-Pecuária*)

INECC National Institute of Ecology and Climate Change (*Instituto Nacional de Ecología y Cambio Climático*)

INMETRO National Institute of Metrology, Quality and Technology (*Instituto Nacional de Metrologia, Qualidade e Tecnologia*)

INOVAGRO Program to Encourage Technological Innovation in Agricultural Production (*Programa de Incentivo à Inovação Tecnológica na Produção Agropecuária*)

IPCA Extended National Consumer Price Index (*Índice Nacional de Preços ao Consumidor Amplo*)

IPCC Intergovernmental Panel on Climate Change

IPF Cattle-Forest Integration (*Integração Pecuária-Floresta*)

ISIC International Standard Industrial Classification

LAB Financial Innovation Lab (*Laboratório de Inovação Financeira*)

LGDFS General Law on Sustainable Forestry Development (*Ley General de Desarrollo Forestal Sustentable*)

MADR Ministry of Crops and Rural Development (*Ministerio de Agricultura y Desarrollo Rural*)

MAPA Ministry of Agriculture and Livestock (*Ministério da Agricultura e Pecuária*)

MAPBIOMAS Brazilian Annual Land Use and Land Cover Mapping Project (*Projeto de Mapeamento Anual do Uso e Cobertura da Terra no Brasil*)

MCR Rural Credit Manual (*Manual de Crédito Rural*)

MDCR Rural Credit Data Matrix (*Matriz de Dados do Crédito Rural*)

MDIC Ministry of Development, Industry and Foreign Trade (*Ministério do Desenvolvimento, Indústria, Comércio e Serviços*)

MF Ministry of Finance (*Ministério da Fazenda*)

MFS Sustainable Forest Management (*Manejo Forestal Sustentable*)

MODERAGRO Program for Modernization of Agriculture and Conservation of Natural Resources (*Programa de Modernização da Agricultura e Conservação de Recursos Naturais*)

MODERFROTA Program for the Modernization of Agricultural Tractors and Related Accessories and Harvesters (*Programa de Modernização da Frota de Tratores Agrícolas e Implementos Associados e Colheitadeiras*)

MOU Memorandum of Understanding

MRPA Management of Animal Production Waste (*Manejo de Resíduos da Produção Animal*)

MTE Ministry of Labor and Employment (*Ministério do Trabalho e Emprego*)

NACE Statistical Classification of Economic Activities in the European Community (*Nomenclature statistique des activités économiques dans la Communauté européenne*)

NACIS North American Industry Classification System

NAMAs Nationally Appropriate Mitigation Actions

NDCs Nationally Determined Contributions

NTFP Non-timber Forest Products

OECD Organization for Economic Co-operation and Development

PCA Program for the Construction and Expansion of Storages (*Programa para Construção e Ampliação de Armazéns*)

PD/SD No-till Farming/Direct Sowing (*Plantio Direto/Semeadura Direta*)

PGN National Cattle Standard (*Padrón Nacional Ganadero*)

PGPM Plant Growth-Promoting Microorganisms

PIGCCT Integral Plan for Territorial Climate Change Management (*Planes Integrales de Gestión del Cambio Climático Territorial*)

POT Land Management Plans (*Planos de Ordenamento Territorial*)

PPA Multi-Year Plan (*Plano Plurianual*)

PROAGRO Agricultural Activity Guarantee Program (*Programa de Garantia da Atividade Agropecuária*)

PROIRRIGA Financing Program for Irrigated Crop and Protected Cultivation (*Programa de Financiamento à Agricultura Irrigada e ao Cultivo Protegido*)

PRONAF National Program for Strengthening Family Farming (*Programa Nacional de Fortalecimento da Agricultura Familiar*)

PRPD Practices for Recovering Degraded Pastures (*Práticas para Recuperação de Pastagens Degradadas*)

RENOVAGRO Program for Financing Sustainable Agricultural Production Systems (*Programa de Financiamento a Sistemas de Produção Agropecuária Sustentáveis*)

RL Legal Reserve (*Reserva Legal*)

SADER Secretariat of Crops and Rural Development (*Secretaría de Agricultura y Desarrollo Rural*)

SBP Social Bond Principles

SCR Credit Information System (*Sistema de Informação de Crédito*)

SDGs Sustainable Development Goals

SDI Secretariat for Innovation, Sustainable Development, Irrigation and Cooperatives (*Secretaria de Inovação, Desenvolvimento Sustentável, Irrigação e Cooperativismo*)

SEEG System for Estimating Greenhouse Gas Emissions (*Sistema de Estimativa de Emissão de Gases*)

SEMARNAT Secretariat of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales*)

SFC Financial Superintendence of Colombia (*Superintendencia Financiera de Colombia*)

SFDR Sustainable Finance Disclosure Regulation

SHCP Secretariat of Finance and Public Credit (*Secretaría de Hacienda y Crédito Público*)

SI Irrigated Systems (*Sistemas Irrigados*)

SICOR Rural Credit and PROAGRO Operations System (*Sistema de Operações do Crédito Rural e do Proagro*)

SLDs Sustainability-Linked Debt Instruments

SPA Secretariat for Agricultural Policy (*Secretaria de Política Agrícola*)

SPAS Environmentally Sustainable Production Systems (*Sistemas Produtivos Ambientalmente Sustentáveis*)

SPD No-tillage System (*Sistema de Plantio Direto*)

SPDG No-tillage System for Grains (*Sistema de Plantio Direto para Grãos*)

SPDH No-tillage System for Vegetables (*Sistema de Plantio Direto para Hortaliças*)

SPO Second Party Opinion

SPS_{ABC} Sustainable Production Systems, Practices, Products, and Processes of ABC+ Plan (*Sistemas, Práticas, Produtos e Processos de Produção Sustentáveis do Plano ABC+*)

TARE Technical Assistance and Rural Extension

TI Intensive Termination (*Terminação Intensiva*)

TVC Colombian Green Taxonomy (*Taxonomia Verde de Colombia*)

UN United Nations

UNEP United Nations Environment Program

UoPs Use of Proceeds

WWF World Wide Fund for Nature

Contents

Introduction

In 2023, the Ministry of Finance (*Ministério da Fazenda* - MF) began drafting the Brazilian Sustainable Taxonomy, an initiative included in the "sustainable finance" axis of the Ecological Transformation Plan. The Taxonomy Action Plan (MF 2023a) was officially launched at COP28 in Dubai in December 2023 (MF 2023b), following a public consultation. The first version of the Taxonomy is expected to be released by November 2024, while its mandatory adoption is scheduled for January 2026.

The Brazilian Sustainable Taxonomy will be applied to various economic sectors. A relevant highlight is the classification of land use activities, which include crop production, cattle, and forestry.[1] Establishing sustainability criteria for these activities is crucial in a country where three quarters of greenhouse gas (GHG) emissions come from agriculture and Land-use change—primarily driven by deforestation (SEEG 2022).

However, the effort to define sustainability for land use is not new. Various national and international initiatives have sought to develop criteria applicable to this sector.[2] While some of these initiatives focus on classification and monitoring, others have the broader objective of directing finance towards sustainable production.

Seeking to contribute to the construction of the Brazilian Sustainable Taxonomy, researchers from Climate Policy Initiative/Pontifical Catholic University of Rio de Janeiro (CPI/PUC-Rio) analyzed the intersections and complementarities between the main initiatives to define land use sustainability in Brazil, as well as international initiatives used as reference for the Brazilian Sustainable Taxonomy.

This analysis provides an overview of the sustainability dimensions of the initiatives (environmental, climate, social, etc.), the stage of implementation, objectives, responsible actor, users, applications, type of adherence, among other relevant aspects. The work emphasizes the criteria for defining sustainable land use activities. In addition, using rural credit data, the study shows that the proportion of credit aligned with sustainability objectives varies significantly—from 1% to 44% for the 2022/23 agricultural year—depending on which classification is chosen as a reference. This report also discusses recommendations, seeking to establish priorities and identify points of attention for structuring and implementing the Brazilian Sustainable Taxonomy.

1 For more details on land use activities, see Chiavari et al. (2023).
2 These initiatives can be taxonomies themselves or other types of classification, whether national or international, public or private. They have different purposes and requirements and are at different stages of implementation.

CPI/PUC-Rio's analysis highlights an urgent need to define harmonized, precise and technical criteria for the sustainability of the land use sector in Brazil. This report calls for a prioritization of efforts, looking for criteria that can be verified and monitored at scale with available data, so that the implementation of the taxonomy takes place quickly and has a greater impact. In addition, it is necessary to recognize the dynamic nature of the taxonomy, whose criteria will have to be revised and expanded over the years. However, this need for refinement and progression should not delay the definition and implementation of the taxonomy. Brazil cannot afford to put off the environmental and climate challenges it faces.

As the country presiding over the G20 in 2024 and COP30 in 2025, Brazil has a unique opportunity to take a leading role in the transition to a sustainable economy. To this end, the establishment of the Brazilian Sustainable Taxonomy is a fundamental tool for directing public policy and financial flows and for preventing greenwashing. The Brazilian experience can serve as a model and reference at international level.

What is a Sustainable Taxonomy?

In the context of sustainable finance, a **taxonomy is a classification system that makes it possible to identify activities, assets or projects that have environmental, climate and/or social objectives**, based on pre-established metrics and/or targets (ICMA 2020). Although environmental and climate objectives are predominant, social aspects have been included in taxonomies, mainly through principles and safeguards (Baccas 2023). Taxonomies can be developed by governments (countries or economic blocs), as well as by other organizations, including private ones. Taxonomies aim to guide financial flows towards activities that have positive impacts, potentially reducing funding for harmful activities. They also serve to guide policies aligned with sustainability objectives. However, there is no globally accepted taxonomy on what is considered sustainable (Ricas and Baccas 2021).

Context: the Brazilian Sustainable Taxonomy

In 2023, the Brazilian government established an action plan for the creation of a Brazilian Sustainable Taxonomy (MF 2023a). The taxonomy aims to establish a standardized, nationwide classification system to determine sustainable investments for different economic activities, financial assets, and projects. The proposal was drawn up using domestic and international sustainable finance initiatives as a reference, as well as international commitments and established national legislation.

Objectives

The Action Plan for the Brazilian Sustainable Taxonomy establishes a series of objectives organized into two main groups: (i) climate and environmental and (ii) socioeconomic, as shown in **Table 1**. Compared to other taxonomies, the selection of objectives is more ambitious both in terms of quantity and the wording itself, which is often broader than what is established by other countries, as is the case with the objectives related to generating decent work and increased income and reducing socioeconomic and regional inequalities. Among the objectives listed, the Ministry of Finance established the objectives of mitigating and adapting to climate change, sustainable use of the soil and conservation, management and sustainable use of forests, and reducing inequalities as priorities for formulating the criteria (MF 2023c).

The climate adaptation objective should be prioritized for the crop sector, considering the potential losses in the sector resulting from climate change (MF 2023d). In fact, this sector, which is fundamental to guaranteeing Brazilian and global food sovereignty, is highly exposed to socio-environmental and climate risks, which affect crop productivity, threatening income and employment.

Principles

The principles that will guide the design of the Brazilian Sustainable Taxonomy are:

- **Scientific basis** (for drawing up the criteria)
- **Technical criteria** (quantitative, where possible)
- Impacts on the **life cycle** of the activity
- **Coherence** (with objectives, legislation and commitments)
- **Consistency** (between methodologies used for different sectors)
- **Proportionality** (different requirements according to the size of the organization)
- **Usability/applicability** (balance between complexity needed for transition and simplicity to ensure viability)
- **Evolving tool** (periodic review of criteria)
- Foreseeing **transitional activities** (for which there are no viable zero-emission alternatives)
- Provision for **enabling activities** (necessary to make eligible activities viable, such as technical assistance)

In addition to these principles, the action plan also emphasizes **interoperability**, i.e., the criteria defined must have equivalence and comparability with international taxonomies.[3]

Criteria

Compliance of an asset, project or investment with the taxonomy will occur, according to the action plan, if the economic activity simultaneously meets the following general criteria:

- **Make a substantial contribution to one or more of the defined objectives;**
- **Do not cause significant damage to any of the other defined objectives; and**
- **Comply with the minimum safeguards listed in the plan**.[4]

Regarding the specific criteria for meeting the objective of sustainable land use and the conservation, management and sustainable use of forests, the action plan mentions that the classification could be non-binary, i.e., with gradations, unlike the other activities. To this end, the action plan highlights the examples of the Colombian and Mexican taxonomies, which define three levels of compliance: basic, intermediate and advanced activities. The plan also suggests using methodologies from the Brazilian Agricultural Research Corporation (*Empresa Brasileira de Pesquisa Agropecuária* - EMBRAPA) to support the definition of sustainability categories applicable to the sector. These initiatives will be presented and discussed in this document.

The economic sectors to which the taxonomy applies are delimited according to the National Classification of Economic Activities *(Cadastro Nacional de Atividades Econômicas* - CNAE), produced by the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística* - IBGE).[5] The action plan provides for the creation of sectoral technical groups composed of government bodies to define the criteria for each sector. Two thematic groups will also be set up: one for tackling inequalities and one for monitoring, reporting and verification. It is important to mention that the latter group is designed to identify best practices in measuring and certifying impact, with the objectives of (i) developing a reporting methodology that facilitates verification, comparability and simple communication and (ii) creating a monitoring platform with information on the resources allocated to sustainable activities and projects, according to a series of aspects such as source of funds, sector, region, among others.

The action plan states that taxonomy verification should first be carried out at the level of individual activities, but in some cases also at the level of the organization, in order to identify possible damage generated by other activities. In the case of land use activities, this can be interpreted as compliance with the taxonomy criteria in the enterprise itself (which can be a project, activity or the purchase of an asset, for example) or the rural property as a whole. The taxonomy will provide for the participation of certifications or audits carried out by other entities in this process.

3 On the importance of international cooperation in this context, see Fronda (2023).

4 Safeguards are criteria that need to be met by all activities in order to be considered eligible for a category in the Taxonomy. According to the action plan (MF 2023a, p. 40), "safeguards will be defined by existing Brazilian legislation and standards, and by international conventions and standards, relating in particular to human and labor rights, as well as transparency".

5 The contribution of this document is part of sector A: Crops, Cattle production, Forestry, Fishing and Aquaculture.

Proposals for the Brazilian Sustainable Taxonomy's Next Steps

The construction of a single, harmonized classification system applicable to a country's entire economy is a necessary, urgent and crucial effort to promote the transition to an economic model more aligned with environmental sustainability. The success of this task will certainly contribute to attracting resources to finance activities that generate a positive impact on the environmental, climate and socio-economic dimensions in Brazil.

The country has taken an important step in this direction by building the Brazilian Sustainable Taxonomy Action Plan (MF 2023a). The task now remains to draw up the criteria for identifying investments in activities, practices or projects aligned with the various objectives set out in the plan.

In this report, CPI/PUC-Rio seeks to build a basis for defining the criteria for the land use sector based on concrete national and international experiences by identifying lessons and areas of consensus, but also by revealing differences. In Brazil, various institutions play a role in defining these criteria, such as the Central Bank of Brazil (*Banco Central do Brasil* - BCB), the Brazilian Federation of Banks (*Federação Brasileira de Bancos* - FEBRABAN), the Brazilian Development Bank (*Banco Nacional de Desenvolvimento Econômico e Social* - BNDES), the Ministry of Agriculture and Livestock (*Ministério da Agricultura e Pecuária* - MAPA), the Brazilian Agricultural Research Corporation (*Empresa Brasileira de Pesquisa Agropecuária* - EMBRAPA), among others.

The Brazilian Sustainable Taxonomy Action Plan foresees that the criteria for each sector will be established over the course of 2024, with the land use sector being one of the priorities. With the aim of contributing to the construction of the taxonomy, this report presents **ten recommendations aimed at emphasizing the applicability and usability of the taxonomy at the scale needed to generate the desired impacts.**

1. The criteria for classifying sustainability need to be drawn up in a technical way, with a scientific basis, and their justifications need to be communicated clearly and simply.

Drawing up each criteria based on established references—such as the methodologies drawn up by EMBRAPA, for example—with metrics and thresholds that justify it technically, will contribute to the acceptance of these criteria by all the relevant players—producers, financial institutions, certifiers, etc.—and facilitate the applicability of the taxonomy on the scale required.

Brazil's taxonomy plan provides for the criteria to be drawn up in a technical manner. However, it is important to emphasize that these technical justifications must be well communicated, focusing mainly on showing how the flagged practices differ from business-as-usual, generating positive and measurable impacts for at least one of the objectives listed in the action plan, without generating significant damage to any of the other objectives.

2. The taxonomy criteria must be compatible and equivalent with other taxonomies and initiatives—especially international ones—to guarantee their applicability.

The action plan refers to the principle of interoperability, revealing a concern on the part of policymakers. This issue is key to signaling to the world which land use activities in Brazil follow sustainability standards and provide transparency to attract international investments with a positive impact.

On the other hand, the Brazilian case is full of particularities. Brazil is one of the world's leading food producers and applies a series of technologies and practices developed domestically, but which are not necessarily used in other countries. Drawing up the taxonomy presents an opportunity to outline these criteria clearly, highlighting the part of Brazilian primary production that takes place on a sustainable basis, and could even establish itself as an international benchmark in a range of crop, cattle, and forestry practices.

3. The creation of a thematic group dedicated to monitoring, reporting and verification is crucial to ensure the successful implementation of the taxonomy and keep up with market developments.

The criteria established need to be verifiable on the scale and frequency required to assess whether the different profiles of producers at the top adopt the sustainable practices defined by the taxonomy over time. The classification itself may need periodic revisions, a process that benefits greatly from a well-defined and implemented monitoring methodology. The action plan also recognizes the importance of mechanisms to ensure transparency and the consistent disclosure of information about the financial flows aligned with the taxonomy, mentioning the creation of a centralized platform with the aim of guaranteeing the integrity of the information. This is key to assessing the effectiveness of this tool for the transition to a sustainable economy.

4. The requirements and criteria for activities related to land use should follow the same standard in order to allow for comparability.

The plan mentions that the categories for land use can follow a non-binary format, with gradations of practices, from the most conventional to the most transformative from the point of view of the taxonomy's objectives. This differentiated treatment of land use in the taxonomy is something that finds support in the experiences analyzed in this report, given the complexity of assigning criteria not only to the activities themselves, but to the practices adopted at the top, within a rural property. However, it is important that the structure of the requirements and criteria of the different activities for the land use sector follow the same standard, which allow for comparability and assessment of the degree of alignment of investments between different sectors.

5. Regulatory compliance requirements should be seen as the first step in defining activities and projects eligible for the taxonomy criteria.

The action plan makes reference to some national commitments and regulations that would be linked to the taxonomy.[6] In the case of land use activities, the social, environmental and climate impediments outlined for rural credit in Resolution no. 5,081/2023 of the National Monetary Council (*Conselho Monetário Nacional* - CMN) provides a good starting point.[7] In addition to establishing the standards, the resolution also indicates the databases that can be used to assess and monitor compliance.

6. The level of application of the taxonomy criteria should be more granular than economic activity.

The use of the National Classification of Economic Activities (*Cadastro Nacional de Atividades Econômicas* - CNAE) to assign classifications at the level of economic activity proves to be insufficient in the case of land use, something that was recognized, for example, by FEBRABAN[8] Green Taxonomy when it proposed a complementary module for agricultural activities at the level of rural credit programs. Other taxonomy experiences analyzed in this report almost always go down to a more granular level, either to the finance operation itself or to the rural property.

6 Among these, it is worth highlighting the exclusion criteria set out in the Brazil's Sovereign Sustainable Bonds Framework (MF 2023e), which provides for activities for which the funds raised through these bonds cannot be used.

7 The impediments cited by the regulations refer mainly to the compliance of the rural credit borrower and the property associated with the financed enterprise with environmental, land, labor, etc. legislation, as shown in the section on the BCB Public Consultation no. 82/2021.

8 FEBRABAN even proposes updating and revising some of CNAE's codes as a way of improving the information needed to build a taxonomy (FEBRABAN 2023).

7. Verification and monitoring procedures need to be cost-effective and adapted to the necessary scale of taxonomy implementation.

In this case, this report recommends proceeding in stages and establishing different types of application of the classifications to reduce the need for visits to production units, which can have a high financial cost. For example, classified units could be divided into three types:

- **Automatically eligible**: projects that need to submit technical information for evaluation before receiving funds. If this information adheres to the criteria established by the taxonomy, it can be classified as sustainable, without additional checks.
- **Need remote checking**: projects that may require some kind of additional checking, but which can be done remotely, for example through remote sensing tools.[9]
- **Require on-site verification**: in some cases, remote verification will not be sufficient. It will then be necessary to assess the application of certain practices on site by means of a technical visit.[10]

Each of these possibilities gives rise to specific recommendations. For example, in the case of automatically eligible operations, the Rural Credit and PROAGRO Operations System (*Sistema de Operações do Crédito Rural e do Proagro* - SICOR) can be used, since it already records a large amount of information on rural credit borrowers. In this case, it is necessary to **improve the way the system's fields are filled in and address concerns**—checks that the BCB makes on the basis of the information filled in by financial institutions to verify the veracity of the information. The system can even be used as a register for other purposes since it has a history of rural credit contracts for various individuals and rural properties.

In the case of operations that require remote checking, it is important to incorporate existing remote sensing tools into the process of checking taxonomy criteria, as well as investing in the constant improvement of these tools. In addition, these technologies can be used as a first line of action to even map cases that require additional, more precise checks.

On-site verifications can take place in a variety of ways. One example would be to register certifying institutions to apply protocols defined by the taxonomy. These protocols could, for example, use EMBRAPA methodologies for the land use sector, which are already widespread and technically recognized. In addition, programs that seek to award certification seals for certain practices, such as the Carbon + Green Program (National Program for Decarbonized Agriculture Chains - *Programa Nacional de Cadeias Agropecuárias Descarbonizadas)* of MAPA and the Green Seal and Amazon Seal Programs (Ministry of Development, Industry and Foreign Trade - *Ministério do Desenvolvimento, Indústria, Comércio e Serviços* - MDIC), should be aligned with these criteria and protocols, in order to avoid confusion and insecurity among taxonomy users.

9 An example would be checking the vigor of pastures for a project involving the recovery of degraded pastures. From a certain size of property, remote sensing data from the pasture module of the MAPBIOMAS Platform can be used as a first line of action in this case.

10 One way of making this verification more cost-effective could be to prioritize larger properties for on-site verifications, as a larger portion of the territory is covered with fewer visits.

8. Technical Assistance and Rural Extension (TARE) should be included in the category of enabling activities.

In many cases, it may be necessary to specify technical assistance activities to guarantee the implementation of a practice. The action plan provides for the possibility of enabling activities—which do not generate an impact on the objectives directly but enable another sustainable taxonomy-eligible activity—which would be applicable in this case.[11]

9. The implementation of the taxonomy should be gradual, dynamic and participatory.

It is important to reiterate the gradual, dynamic and participatory nature of the taxonomy criteria development process. **Gradual**, because it is impossible to develop all the criteria at once; it will be necessary to prioritize. In this case, starting with what is most consensual and verifiable is a way to start. **Dynamic**, because a classification will not be definitive; it can be continually revised and improved as new evidence emerges. And **participatory**, as it will involve various public policy bodies, regulators, civil society, academia and the private sector.

Covering the entire economy or even an entire sector with all the objectives listed in the action plan is a very ambitious task. In this sense, CPI/PUC-Rio recommends establishing a roadmap, defining stages with different levels of demand and a timetable for the implementation of each stage. For example, the implementation of the taxonomy could be piloted first in the banking sector, following the example of Colombia. Financial institutions already operate with good practices at the strategic, operational and technical levels, and there are already regulations and self-regulations that can be harmonized with the taxonomy. Next, an implementation plan will be established for the capital market, which is more dispersed.[12]

10. The actors involved in the taxonomy need to act in a coordinated manner and guide its users.

In this sense, it is crucial to clearly define the obligations and responsibilities of financial institutions, capital market structurers, regulators—such as the BCB and the Securities and Exchange Commission (*Comissão de Valores Mobiliários* - CVM)—self-regulators, and policymakers with regard to taxonomy. In this case, the experience of the European Union is particularly relevant, as it clearly establishes a series of links with other regulations. In the case of Colombia, for example, the taxonomy is a guide document with no clear regulatory links. Legal frameworks and domestic regulations related to sustainable investments, whether new or existing, should be based on the taxonomy, adopting the same principle of harmonization and interoperability at the domestic level as is thought of in relation to other countries' taxonomies.

11 CPI/PUC-Rio study shows that technical assistance was a crucial factor in implementing techniques to recover degraded pastures for small producers in the case of ABC CERRADO (Souza et al. 2022).

12 The obligation to register and deposit Rural Product Notes (*Cédulas de Produto Rural* - CPRs) can be used as a reference for operationalizing taxonomy. For this measure, CMN Resolution no. 4,870/2020 established a timetable for implementation to provide a deadline for market agents to adapt to the requirements of the regulation, including the development of electronic infrastructure systems. In addition, in defining the criteria for mandatory registration of CPRs, the regulation was designed for rural producers of different sizes—small, medium and large (Vote of BCB no. 321/2020).

Points of Attention

The establishment of the taxonomy criteria, although based on scientific grounds, will have to involve various discussions between public and private agents in order to reach a consensus. This box highlights some points of attention from CPI/PUC-Rio's analysis. In order to find a solution for these challenges, a participatory and ongoing process of developing taxonomy criteria in Brazil must take these into consideration.

i. **Clearly define the scope of the *do no significant harm* (DNSH) principle within the taxonomy**. In theory, any activity that has a negative impact on any of the taxonomy's objectives could not be given a sustainable classification, even if it has positive impacts on one of the dimensions. However, in some cases, the measure of harm may contradict current regulations.

Suppose, for example, a soybean crop that uses low-carbon practices, such as no-till farming, but uses pesticides, which can cause damage in other dimensions, such as water quality. The use of this pesticide; however, may be in line with Brazilian health regulations, which stipulate types and limits of use in the country (ANVISA 2020).

Another example of a possible conflict between the DNSH principle and regulatory compliance is the issue of deforestation. In Brazil, the Forest Code (Law no. 12,651/2012) provides for legal deforestation margins. However, strictly speaking, an activity that generates a positive impact, but at the same time generates deforestation, may violate the DNSH principle, even if it is within the law.

In such cases, it is not entirely clear how the taxonomy should deal with the existence of negative impacts that appear to be sufficient to trigger the DNSH principle, but which may be in regulatory compliance. Defining what the scope of DNSH will be in the Brazilian Sustainable Taxonomy is an ongoing challenge and will be a central point in the elaboration of the taxonomy's eligibility criteria.

ii. **Define exactly which sustainable practices are considered when drawing up the criteria.** The case study of rural credit, presented later in this report, revealed how sensitive the measurement of flows aligned with sustainability objectives can be, depending on the classification used.

Taking the example of no-till farming, according to the Brazilian Agricultural Policy for Climate Adaptation and Low Carbon Emission - ABC+ Plan (*Plano de Adaptação e Baixa Emissão de Carbono na Agricultura* - Plano ABC+), in order to be considered a low-carbon crop, No-tillage System (*Sistema de Plantio Direto* - SPD) requires the combination of three practices: minimum tillage, use of straw, and crop rotation. However, only 15% of the crops "eligible" for SPD in Brazil use the system in its entirety (MAPA 2021). On the other hand, the Environmentally Sustainable Production Systems (*Sistemas Produtivos Ambientalmente Sustentáveis* - SPAS) criteria (MAPA 2022) states that 78% of all soybean production in the country uses no-till farming and should therefore be considered sustainable. It is possible that part of this production may be using an incomplete version of SPD. In this case, one could think of categories of suitability for the practice using a non-binary classification, in which incomplete adoption of SPD would be an intermediate stage and complete adoption of SPD a

more advanced stage. However, the process of discussing and drawing up the criteria needs to reach a consensus on this type of issue.

iii. **Define the level of application of the taxonomy.** The action plan (MF 2023a) speaks of "assets, projects or investments" as being the unit classified as sustainable. In the case of land use activities, these projects typically take place on rural properties that may have several different activities taking place simultaneously. One possibility would be to assign a classification to the productive unit (rural property) in addition to the projects.

On the one hand, failing to look at the property when evaluating a project runs the risk of classifying it as sustainable, while the same property operates with unsustainable techniques on other plots of land. On the other hand, assessing the property as a singe unit can be difficult, as it requires constant revalidation of this classification over time. It is not entirely clear which unit should be preferred, but it is certainly important that taxonomy looks at these two levels of classification when analyzing criteria applicable to land use.[13]

13 It is worth noting that the action plan already takes into account this possibility by stating that "in addition to classifying individual activities, some measures associated with the taxonomy can consider to incorporate information at the organizational level. Not considering the organization's full sustainability profile can increase the risk of greenwashing if, for example, an organization issues a green bond to finance specific activities without changing its net impact on the climate, environmental or social objective in question" (MF 2023a, p. 61).

Mapping Initiatives for Classifying Sustainable Land Use Activities

The effort to build criteria for classifying land use activities within the scope of the Brazilian Sustainable Taxonomy **can benefit enormously from analyzing existing initiatives or those in the development phase with similar objectives. With the aim of establishing a basis for discussing sustainability criteria associated with land use activities**, this section presents a survey of these initiatives to put together a landscape of references and identify their complementarities and differences.[14]

Initiatives were selected to classify land use activities according to their climate/environmental or socioeconomic impact.[15] The selection was based mainly on references used as inspiration for the construction of the Brazilian Sustainable Taxonomy, as well as national public policy programs and proposals that impact the sustainability of the land use sector. The analysis also includes initiatives with similar objectives, but which are still in the development stage, to assess how these initiatives can be harmonized with the taxonomy under construction.

These initiatives have been organized into two groups. The first group encompasses taxonomies for broader economic sectors, which include specific criteria for land use. This group includes the international taxonomies used as the basis for the Brazilian Sustainable Taxonomy Action Plan, as well as national taxonomies that have criteria for land use. The second group is made up of other initiatives that seek in some way to establish criteria for sustainable practices, without necessarily constituting a taxonomy.

This section presents these initiatives according to their respective groups in chronological order of the year they were launched:

14 Other organizations have undertaken efforts along these lines, most notably the report by the Financial Innovation Laboratory (*Laboratório de Inovação Financeira* - LAB) (Baccas 2023). This report seeks to add value by presenting inputs for the definition and implementation of Taxonomy criteria with a focus on the land use sector.

15 There are initiatives that analyze, for example, the degree of exposure of activities to the risk of climate change, such as the FEBRABAN Green Taxonomy. Although this aspect is relevant from the point of view of adaptation, the focus of this document is on the impact generated (potentially positive in the case of activities classified with some degree of sustainability), since most of the existing initiatives focus on this point.

International Taxonomies

- Climate Bonds Taxonomy
- European Union (EU) Taxonomy
- Colombian Green Taxonomy (TVC)
- Mexican Sustainable Taxonomy

Domestic Taxonomies

- FEBRABAN Green Taxonomy
- BNDES Sustainable Taxonomy

Other (domestic) initiatives

- EMBRAPA's Environmental Impact Assessment System for Agricultural Technological Innovation (*Sistema de Avaliação de Impactos Ambientais de Inovações Tecnológicas Agropecuárias* - AMBITEC-AGRO)
- EMBRAPA's Weighted Environmental Impact Assessment of New Rural Activities (*Avaliação Ponderada de Impacto Ambiental de Atividades do Novo Rural* - APOIA-NOVORURAL)
- Technologies from the ABC+ Plan (Sustainable Production Systems, Practices, Products and Processes - *Sistemas, Práticas, Produtos e Processos de Produção Sustentáveis do Plano ABC+* - SPS_{ABC}) of MAPA
- BCB Public Consultation no. 82/2021
- SPAS of the Agricultural Plan, a MAPA initiative
- Carbon + Green Program
- Green Seal Program
- Amazon Seal Program

Each initiative will be the subject of a specific analysis that seeks to understand and compare similarities and differences with regard to the criteria used. Understanding the elements and objectives of these initiatives is important so that those still under construction can develop harmonized criteria based on initiatives that have already been consolidated. This report analyzes the most up-to-date version of each initiative according to the following aspects:

- Responsible actor
- Responsible actor type
- Stage of implementation
- Type of use
- Legal mechanisms

- Criteria for land use sectors[16]
- Objectives
- Scope (including definition of sustainability used)

Figure 1 summarizes the presentation of these aspects for each initiative and their main characteristics using a timeline.[17] This information will be detailed in the description of each initiative.

In some cases, the initiatives report specific criteria that can be used to categorize financial flows directed at land use in Brazil.[18] After describing the initiatives, this report presents a case study of the application of these criteria in the universe of rural credit in Brazil, the main financing policy for the agricultural sector in order to assess the sensitivity of using one classification or another to measure the magnitude of sustainable activities.

This report **does not present an exhaustive list** of all the initiatives that should be considered both to provide input for the Brazilian Sustainable Taxonomy criteria and to have their own criteria harmonized with the new taxonomy.[19]

With regard to taxonomies, which are classification systems applicable to various sectors under the initiative of countries or other public or private institutions, **Table 1** presents a comparison of their stated objectives with those envisaged for the Brazilian Sustainable Taxonomy. **Table 2** provides additional information on these taxonomies, focusing on the criteria applicable to land use activities.[20]

16 The list of technical criteria for economic activities in each taxonomy is quite extensive and complex. Therefore, for the purposes of the analysis in this report, a simplified version of these criteria is presented, which can be consulted when drawing up the criteria for the Brazilian Sustainable Taxonomy.

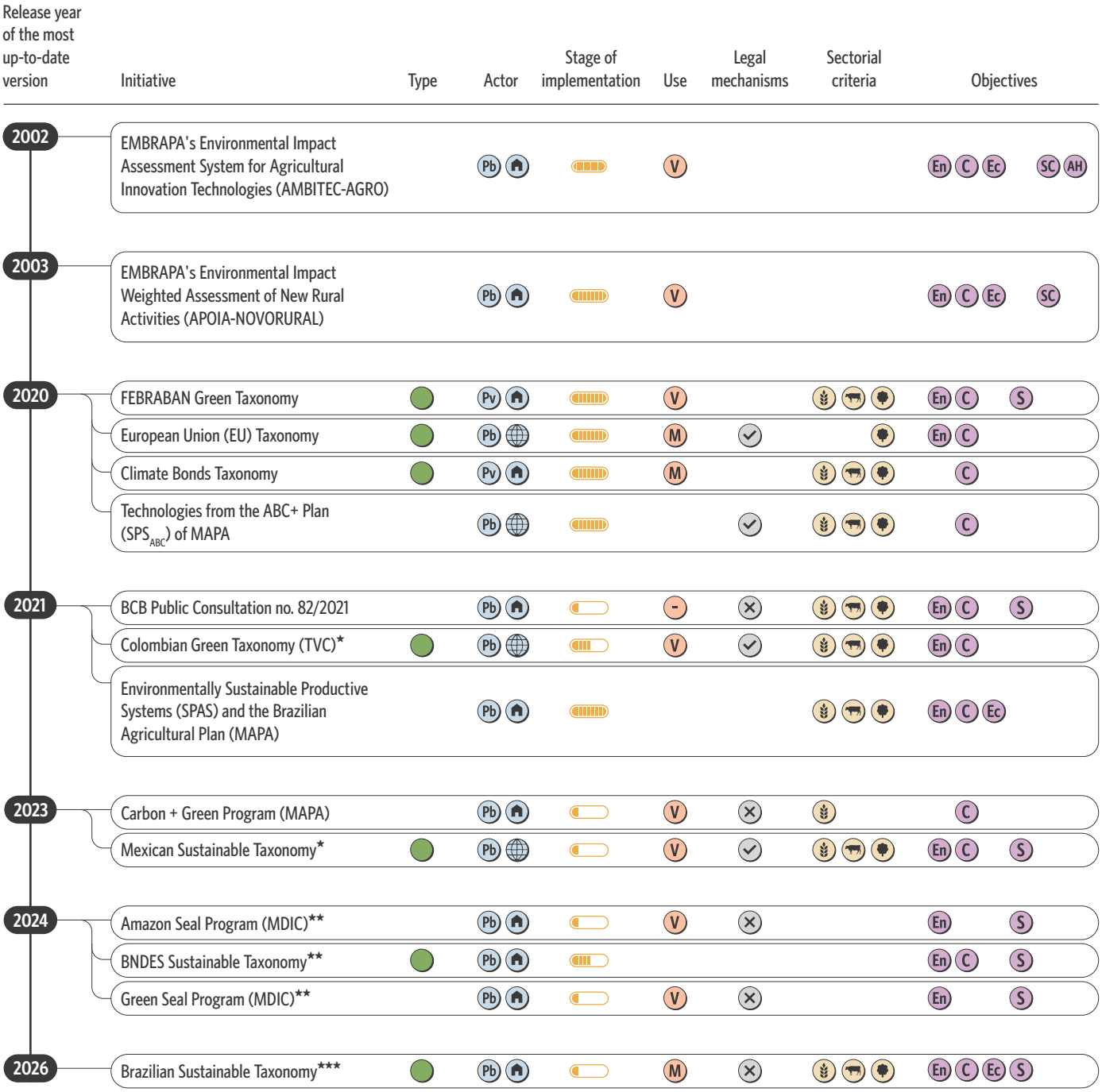
17 This document compares the latest versions of each initiative as of January 2023, when the report was developed. However, initiatives may update their technical criteria before the report is published.

18 For a comprehensive study on financial flows directed towards land use in Brazil according to climate mitigation and adaptation objectives, see Chiavari et al. (2023).

19 Some examples of initiatives that have not been analyzed, but which should certainly be considered in this process are: (i) the Brazil's Sovereign Sustainable Bond Framework (MF 2023e), which presents criteria for public expenditure eligible for earmarking sustainable debt bond resources; (ii) the Transversal Environmental Agenda of the Multi-Year Plan (*Plano Plurianual* - PPA) 2024-2027, which systematizes federal commitments to the environmental area for planning and budgeting (MPO 2024); (iii) the resolutions of the Brazilian Securities and Exchange Commission (CVM) presenting information requirements on Environmental, Social and Governance (ESG) and related aspects, including the labeling of sustainable funds (CVM 2023); and (iv) the rules and procedures for investments in sustainable assets published by the Brazilian Financial and Capital Markets Association (*Associação Brasileira das Entidades dos Mercados Financeiro e de Capitais* - ANBIMA 2023).

20 The BNDES SustainableTaxonomy is the only one not included in the tables, since the criteria for the new methodology have not yet been published. The BNDES has been monitoring disbursements related to the Green Economy and Social Development since 2011 (BNDES 2022). A process to revise the methodology is underway and the BNDES Sustainable Taxonomy is expected to be launched in 2024 (Maia 2023).

Figure 1. Timeline and Main Characteristics of the Initiatives Analyzed



*Initiatives have not been implemented as regulations, but other regulations based on them exist or are being developed.

**Expected launch date.

***The Brazilian Sustainable Taxonomy Action Plan developed in 2023 foresees the mandatory use of the Taxonomy from January 2026.

Source: *CPI/PUC-Rio with data from MF (2023a); MDIC (2023a; 2023b); BNDES (2022; 2023); Maia (2023); MAPA (2022; 2023a; 2023d); SHCP (2023); BCB (2021a); Gobierno de Colombia (2022); FEBRABAN (2021); EU Regulation no. 2020/852; CBI (2023a) e EMBRAPA (2015a; 2015b), 2024*

Table 1. Objectives of the Analyzed Taxonomies

Objective	Type of objective	Taxonomy					
		Brazil (action plan)	CBI	EU*	Colombia	Mexico	FEBRABAN
Climate change mitigation	En C	✓	✓	✓	✓	✓	
Climate change adaptation	En C	✓	✓	✓	✓	✓	
Conservation/Protection and restoration of biodiversity and ecosystems	En C	✓		✓	✓	✓	
Sustainable use of soil and conservation, management and sustainable use of forests/ Soil management	En C	✓			✓		
Sustainable use and protection of water and marine resources/ Water management	En C	✓		✓	✓	✓	
Transition to a circular economy	En C	✓		✓	✓	✓	
Contamination/pollution prevention and control	En C	✓		✓	✓	✓	
Generating decent work and raising incomes	Ec S	✓					
Reduction of socioeconomic inequalities, considering racial and gender aspects	Ec S	✓				✓**	
Reduction of regional and territorial inequalities in the country	Ec S	✓					
Promotion of quality of life by increasing access to basic social services	Ec S	✓				✓***	
Health	S					✓	
Education	S					✓	
Financial inclusion	S					✓	
Human well-being and social equality with reduced environmental risks and ecological scarcity	En C Ec S						✓****

Notes

*The EU has a separate taxonomy for socioeconomic objectives

**Only considers contributions to gender equality

***Basic social services related to sustainable cities

****United Nations Environment Program (UNEP) Green Economy Concept

Legend:

- ✓ Includes the objective
- Does not include the objective
- En Environmental
- C Climate
- Ec Economic
- S Social

Source: *CPI/PUC-Rio with data from MF (2023a); CBI (2023a); EU Regulation no. 2020/852; Gobierno de Colombia (2022); SHCP (2023), and FEBRABAN (2021), 2024*

Table 2. Scope of the Land Use Criteria of the Analyzed Taxonomies

Taxonomy	Sectoral criteria	Level of application of criteria
Brazil (action plan)	Crop, Cattle, Forestry	Asset, project or investment
CBI	Crop, Cattle, Forestry	Assets, debt instruments and projects
European Union	Forestry	Financial products and services, large companies and listed companies
Colombia	Crop, Cattle, Forestry	Companies (not yet implemented), projects and rural production units
Mexico	Crop, Cattle, Forestry	Investment project and rural property
FEBRABAN	Crop, Cattle, Forestry	Banking operations

Legend:

Crop

Cattle

Forestry

Source: *CPI/PUC-Rio with data from MF (2023a); CBI (2023a); EU Regulation no. 2020/852; Gobierno de Colombia (2022); SHCP (2023), and FEBRABAN (2021), 2024*

International Taxonomies

Climate Bonds Taxonomy

The Climate Bonds Taxonomy was initially launched in 2013, with the aim of guiding market agents to identify projects and assets that promote investments in line with the objective of limiting the increase in global temperature to 1.5°C above pre-industrial levels in accordance with the Paris Agreement. Grouping together sectors that are crucial to decarbonizing the economy, the Climate Bonds Taxonomy establishes sectoral criteria with specific limits, metrics and good practices that define an investment's eligibility for financing certified by the Climate Bonds Standard.[21] These criteria, which are fundamental for certification, outline quantitative and qualitative indicators related to climate mitigation, adaptation and resilience that the issuance of the instrument must meet (CBI 2021). The Climate Bonds Standard currently offers two types of certification (CBI 2023a):

21 Second Party Opinion (SPO) providers use the criteria of the Climate Bonds Standard as a reference to label financial operations as green or sustainable, even if the issue is not certified by CBI.

Level 1 - Aligned: non-financial corporate entities, Use of Proceeds (UoPs)[22] or assets that are aligned with the 1.5°C warming limit established in the Paris Agreement.

Level 2 - Transition: non-financial corporate entities or Sustainability-linked Debt Instruments (SLDs) whose transition plans foresee them being aligned with the 1.5°C trajectory by 2030.

Thus, an agriculture or forestry asset or project becomes eligible for the Climate Bonds Standard when all applicable sectoral and CBI standard criteria are met. It should be noted that an external assessment by an independent verifier is required to assess the alignment of the asset or project with the CBI standard.

CBI and MAPA Partnership

In 2022, CBI published the report "Brazilian Agricultural Plan: alignment of sustainability parameters and allocation of credit line resources to the Climate Bonds Initiative Taxonomy" (CBI 2022). The aim of the report was to analyze the volume of resources contracted in the 2020/2021 harvest for some rural credit lines and their alignment with the Climate Bonds Taxonomy.[23]

In the report, CBI informs that the selection of the lines analyzed (sub-programs) was based on the work of the Environmentally Sustainable Productive Systems (SPAS), prepared by MAPA—analyzed in this document below. In addition, CBI presents a comparison between the eligibility criteria for access to rural credit and the Climate Bonds Taxonomy. For this analysis, the organization adopted a "traffic light system" with four categories that classify the level of alignment of credit lines with the Climate Bonds Taxonomy, as shown in **Table 3** below. However, this analysis was used for information purposes only and was not included in the quantitative exercise published by CBI.

Table 3. Categories of Alignment of Rural Credit Lines with the Climate Bonds Taxonomy

Category	Description
100% aligned	Indicates additionality parameters that are compatible with a low-carbon economy and must not meet any additional qualitative requirements, being aligned with the Climate Bonds Taxonomy.
Partially aligned	Indicates additionality parameters compatible with a low-carbon economy, if they meet certain requirements, being partially aligned with the Climate Bonds Taxonomy.
Not aligned	Indicates additionality parameters that are not compatible with a low carbon economy and are at odds with the Climate Bonds Taxonomy.
Not included	Indicates additionality parameters not included in the Climate Bonds Taxonomy.

Source: *CPI/PUC-Rio adapted from CBI (2022), 2024*

22 "Use of Proceeds (UoPs) debt instruments: The proceeds of such instruments are allocated to specific projects, assets, activities, or expenditures which align with the Climate Bonds Sector Specific Criteria; Certification of the environmental credentials of specific debt instruments, assets, or a portfolio of assets, in accordance with the Climate Bonds Sector Specific Criteria" (CBI 2023b, p. 6).

23 MAPA and CBI have a Memorandum of Understanding (MOU), signed in 2019 and renewed in 2022, which aims to strengthen actions to promote the sustainability of Brazilian agriculture (CBI 2022).

Of the 21 rural credit sub-programs analyzed, 15 were identified as being aligned with the Climate Bonds Taxonomy and agriculture and forestry criteria at the activity level (allocation of resources), while six are partially aligned. The sub-programs considered in CBI analysis can be found in **Table 10**.

It is important to note that, regardless of the level of alignment of the lines analyzed, a producer who obtains financing through these rural credit lines is not automatically eligible for CBI certification. Furthermore, the alignment of the sustainability parameters of the rural credit lines does not replace the external evaluation process. In order to raise funds according to the CBI criteria, an external assessment by an independent verifier is required, which can take the form of a second-party opinion (an independent expert confirming eligibility) or in the form of CBI certification (through a guarantee given by an external verifier, approved by the organization, which confirms alignment with the Climate Bonds Standard).

Criteria for Agricultural Activities

The crop and cattle sectors are covered by the Climate Bonds Taxonomy.[24] The criteria for agriculture established in 2020 apply to crop production (perennial and non-perennial crops, including agroforestry systems where plantations account for more than 50% of the area), cattle production and mixed production (crops and cattle).[25]

Crop production in controlled environments (protected crop), aquaculture and fish farming and the supply chain are outside the scope of the crop criteria. In addition, crop projects and assets covering other sectors, such as forestry, bioenergy, water resources, infrastructure, transportation, renewable energy and solid waste, must also meet the requirements of the respective sector criteria. For example, for Crop-Cattle-Forest Integration (CCFI) projects, compliance with both the crop and forestry criteria will be required.

The criteria for agriculture apply to projects and assets in production units—an entire unit, or a component, or a specific intervention in the unit—as well as non-production units. The most common production unit is the farm. Non-production units refer to support activities outside the unit with the aim of (i) reducing GHG emissions/increasing carbon sequestration, or (ii) improving adaptation and resilience.[26]

For each type of production and use of resources, criteria are determined that can be applied and assessed in the components of (i) mitigation and (ii) adaptation and resilience.

24 Only resource or asset use debt instruments are eligible for the Climate Bonds Standard (certification) based on the criteria for agriculture and forestry. According to CBI, certification for non-financial corporate entities and Sustainability-linked Debt Instruments (SLDs) for agriculture is under development.

25 For this type of crop, CBI only has criteria for Mexico. More information is available at: CBI (2019).

26 Unit of production includes inputs; capital goods; production; products; waste management; primary processing or storage before the point of sale; and associated conservation areas. Outside the production unit are the eligible activities (and the products and services related to them) to be used in third-party production units for the purposes mentioned (CBI 2023c).

The **mitigation** component contains the following eligibility criteria:

i. No conversion of land with a high carbon stock.

ii. No clearing of woody vegetation over three meters in height after 2020.

iii. Percentage reduction in GHG emissions during the investment period compared to the beginning of the period.

iv. Proof that the unit adopts best practices for low emissions agriculture.

- Fertilizer use management plan
- Soil management for net carbon sequestration
- Biomass management for net carbon sequestration
- Energy (efficiency and use of renewables)
- Residue management
- Prevent food loss
- Reduced flooding time (in the case of irrigated rice)
- Peatland restoration (a type of soil)
- Manure management
- Animal management

v. If the unit includes livestock in intensive production systems, animal welfare criteria will be included, as well as the purchase of feed from sustainable sources and from areas that have not been recently converted from natural habitats.

In relation to the **adaptation and resilience** compliance requirements, the criteria of a checklist consisting of the following activities must be met:

i. Identification of clear boundaries and critical interdependencies between the farm and/or intervention and the system in which it operates.

ii. Assessment of the main physical climate risks to which the production unit or intervention will be exposed and vulnerable throughout its useful life.

iii. The measures that have been or will be taken to deal with these risks are capable of mitigating them so that the production unit(s) are suitable for climate change throughout their useful life.

iv. The measures that have been or will be taken do not undermine the resilience of the system in which they operate, as indicated by the boundaries and critical interdependencies with that system.

v. Continuous monitoring and evaluation of the relevance of resilience and risk containment measures and that adjustments related to such measures will be made as necessary.

Criteria for Forestry

The CBI's forestry criteria, established in 2018, apply to assets and projects related to plantation forestry, sustainable forest management, the production of Non-Timber Forest Products (NTFP), forest restoration and conservation, and conservation and restoration of non-forested lands.[27]

To ensure compliance with the forestry criteria, it is crucial that projects and assets with overlaps to different sectors are assessed against the specific criteria. For example, forest restoration for watershed management must meet the water criteria, while vehicles and vessels within forest concessions are covered by the forest criteria themselves. Agroforestry, palm oil production and integrated cattle and forest activities must follow the agriculture criteria, while bioenergy facilities or plants must comply with the bioenergy criteria. Finally, the generation of raw materials for bioenergy derived from wood and planted forests intended for bioenergy must comply with the forestry criteria (CBI 2018).

For each type of forest and use of resources, certain criteria are applied and evaluated in the components of (i) mitigation, (ii) adaptation and resilience, and (iii) Free, Prior and Informed Consent (FPIC).[28] The requirements to comply with the components vary depending on the project and type of forestry activity practiced. In addition, the CBI specifies requirements and evidence that must be provided to prove compliance assessment (CBI ndb).

The mitigation component contains the following eligibility criteria:[29]

i. No conversion of natural landscape.

ii. Carbon stocks of forests or other habitats must be maintained through good management practices.

Regarding adaptation and resilience compliance requirements, all types of projects and assets must meet the requirements of the adaptation and resilience checklist:

i. Verify, understand and mitigate the impacts that climate change can have on the resilience of the adjacent forest, land or ecosystem.

ii. Maintain the general condition of forests (forest health) or other habitats through good management practices.

27 The criteria indicate the uses of resources in automatic compliance, conditional compliance with CBI certification requirements and those that are not eligible. The restoration, reforestation or rehabilitation of areas, upgrading or maintenance of fertilizer production infrastructure and the costs of acquiring, upgrading, maintaining or operating aircraft used in the forest concession are not eligible for certification under any circumstances (CBI 2018).

28 Free Prior and Informed Consent (FPIC) is applied when property rights are potentially affected or projects may lead to the removal or relocation of housing or activities. FPIC must be carried out in accordance with the references indicated by the CBI, such as International Labor Organization (ILO) Convention no. 169 on Indigenous and Tribal Peoples, Forest Stewardship Council (FSC) certification, among others. More information is available at CBI (2018).

29 These criteria may vary according to the type of forest between applicable requirement, non-applicable requirement or applicable requirement in some scenarios. More information is available at CBI (2018).

With the aim of promoting equity and inclusion in access to markets and recognizing the financial limitations of small producers in obtaining external certification, the CBI accepts adaptations to the requirements of the criteria for proving compliance in these cases. The definition of smallholders and the requirements for this profile for each type of forest are available in the sector criteria for forests (CBI 2018).

In 2024, CBI will publish new sectoral criteria for deforestation and conversion free sourcing. These criteria establish cut-off dates for linked products from deforested areas in global chains and guidelines for traceability, in line with recent policy regulations aimed at the EU market.[30] These criteria prioritize climate and biodiversity, but also address just transition and social issues such as human and indigenous rights. These criteria will be applied to companies operating in the food production chain and obtaining agricultural commodities from land use, as well as to entities, Use of Proceeds or Sustainability-Linked Debt instruments, which aim to obtain products free from deforestation and the conversion of natural ecosystems (CBI nda).

European Union (EU) Taxonomy

The EU Taxonomy is the regulation that establishes the framework for promoting sustainable investment in its member countries, based on a set of rules that determine whether an economic activity is environmentally sustainable (EU Regulation 2020/852). The taxonomy identifies sectors and activities that are relevant to decarbonization, given their substantial contribution to climate change mitigation and other broader environmental objectives. This regime is applied to the entire financial system of the bloc, including for policymaking and regulation in the banking sector, asset management, pension funds, and other financial services (Jena and Purkayastha 2020). The regulation came into force in 2020 after a long negotiation process (Ricas and Baccas 2021).

The EU Taxonomy defines sustainable investment as investment made in accordance with the principles of the regulation for economic activities aligned with climate and environmental objectives, as shown in **Table 1**:

- Climate change mitigation
- Climate change adaptation
- Sustainable use and protection of water and marine resources
- Transition to a circular economy
- Pollution prevention and control
- Protecting and restoration of biodiversity and ecosystems

30 The criteria are being developed in consistency with the regulation for Deforestation-Free Products, known as the European Union Deforestation-Free Regulation (EUDR).

Compliance with the EU Taxonomy occurs if the economic activity:

- Makes a substantial contribution to at least one of the objectives;
- Does not significantly harm (DNSH) the other objectives;
- Meets the minimum safeguards set out in the regulations; and[31]
- Meets the technical screening criteria established by the European Commission in delegated acts.[32]

To ensure that an economic activity contributes substantially to the objectives of the taxonomy, without significantly harming any of the other objectives, the EU establishes performance criteria, the so-called "technical screening criteria", in delegated acts, which complement the guidelines established by the taxonomy. Initially, criteria were developed only for certain economic sectors, from a non-exhaustive list of economic activities that contribute to mitigation and adaptation objectives.[33]

New criteria have recently been published for some activities that contribute to some of the taxonomy's other environmental objectives (EU Delegated Regulation no. 2023/2486). For the land use sectors, only the forestry sector and activities linked to "environmental protection and restoration"[34] have specific technical screening criteria already regulated—detailed in **Table 10**. As for crops and cattle, no criteria have yet been established.[35]

For each economic activity, the EU Taxonomy describes the assessed activity in detail, defines the criteria for determining its substantial contribution to one or more of the taxonomy's objectives, as well as criteria for not causing significant harm (DNSH) to other objectives. In addition, minimum safeguards are defined to avoid social or environmental damage, including compliance with labor regulations and respect for human rights.

The EU Taxonomy is part of a regulatory framework that complements other regulations for reporting and monitoring financial flows. In terms of usability, the European regulation establishes a common language, standardizes and determines transparency rules, as well as imposing obligations on the main players in the market (Green Finance Platform 2021):

31 Including alignment with the Organization for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises and the United Nations (UN) Guiding Principles on Business and Human Rights, as well as the eight fundamental conventions identified in the International Labor Organization (ILO) Declaration on Fundamental Principles and Rights at Work and the International Bill of Human Rights (EY 2023). There is also a proposal to create a taxonomy with emission-intensive economic activities that are significantly harmful to the environment (grey/dirty taxonomy).

32 The technical criteria are defined for a specific description of an economic activity, and whenever possible, include references to the codes in the Statistical Classification of Economic Activities in the European Community (*Nomenclature statistique des activités économiques dans la Communauté européenne* - NACE) that can be associated with it. These references are understood to be indicative and cannot prevail over the specific definition of the activity contained in its description in the taxonomy (OECD 2020). This system works in a similar way to the CNAE in Brazil.

33 In its first stage, the European Union Taxonomy defined its general framework and moved on to detail through delegated acts, i.e., criteria applied to specific topics, the first two of which focus on climate change mitigation and adaptation (Ricas and Baccas 2021). Initially, nine economic sectors were prioritized for the establishment of criteria due to the relevance of these sectors for climate mitigation, including the NACE macro-sector of crop, forestry and fisheries, which includes forestry activities (OECD 2020).

34 The activities in this sector have no code references in NACE.

35 Although the criteria for activities in the agricultural sector have not yet been regulated, in 2022, the Sustainable Finance Platform provided recommendations for criteria for this sector, with a view to making a substantial contribution to protecting biodiversity and ecosystems. In 2019, prior to the taxonomy's regulation, the Technical Expert Group published mitigation criteria recommendations for these sectors (WWF 2023). The documents can be consulted on the Sustainable Finance Platform (2022).

- EU member states should apply the taxonomy when regulating how financial products and corporate bonds are made available as environmentally sustainable.
- Market participants offering financial products must report the alignment of their products with the taxonomy.
- Large companies obliged to disclose non-financial statements must inform how their economic activities align with the taxonomy (Comissão Europeia 2021b).[36]

To inform and support investors in making sustainable investment decisions, transparency standards for financial and non-financial institutions have been established by additional regulations to the taxonomy (Comissão Europeia 2021b), such as:

- European Sustainability Reporting Standards (ESRS) and Corporate Sustainability Reporting Directive (CSRD): reporting rules for large companies and publicly traded companies on the impact of their business on climate and social issues and the risk of climate change to their operations (Deloitte 2023). Mandatory rule from July 2024.
- Sustainable Finance Disclosure Regulation (SFDR): governs sustainability labeling for financial products and services marketed in the EU and sets the standard for demonstrating their alignment with the taxonomy (Mayer and Beaser 2023). The regulation was implemented in mid-2021.

Criteria for Forestry

For the forestry sector, the technical criteria establish whether an economic activity contributes substantially to mitigating or adapting to climate change without jeopardizing other environmental objectives, making it an enabling activity for climate adaptation.[37] The forestry economic activities regulated by the European Union Taxonomy are rehabilitation and restoration of forests, including reforestation and natural forest regeneration after an extreme event, forest management and conservation forestry.[38]

36 Large companies pursuant to Article 3 of the management report and pursuant to Article 19-A or Article 29-A, respectively, of Directive 2013/34/EU of the European Parliament and of the Council. Large companies defined in this way and listed companies must report the share of their current and future revenues (capital expenditure) from activities aligned with the taxonomy.

37 According to Article 16 of the taxonomy regulation, an enabling activity is an economic activity that directly enables other activities to contribute substantially to one or more taxonomy objectives, provided that such economic activity: (a) does not result in the immobilization of assets that compromises long-term environmental objectives, taking into account the economic useful life of these assets; and (b) has a substantial positive environmental impact, based on life-cycle considerations (EU Regulation no. 2020/852, Art. 16).

38 Forestry activities are described respectively as: establishment of forests through planting, deliberate seeding or natural regeneration on land that was previously under different use or unused; rehabilitation and restoration of forests as defined by national legislation; forest management activities as defined by national legislation, with the aim of preserving one or more habitats or species. If national legislation does not establish these definitions, the taxonomy criteria describe the correspondence of the activity (Comissão Europeia nd).

To mitigate climate change, the technical evaluation criteria for forestry economic activities are made up of the following elements:[39]

i. **Reforestation plan, forest management plan or equivalent instrument**: contains detailed information about the area, management objectives, strategies, preservation measures, social considerations and assessment of associated risks. In addition, it is crucial to ensure that the activity does not cause degradation in areas with a high carbon content and that it complies with all environmental and legal regulations. Monitoring measures are necessary to ensure the accuracy of the information contained in the forest management plan.

ii. **Climate benefit analysis**: for forest areas that meet the carbon conservation requirements, the activity must show that its GHG emissions are lower than a reference value over 30 years and demonstrate long-term climate benefits.[40] For areas that do not meet these requirements, it is necessary to demonstrate that emissions over 30 years are lower than a reference value and that, in the long term, emissions are lower than the reference scenario. The analysis must follow the guidelines of the Intergovernmental Panel on Climate Change (IPCC).[41]

iii. **Guarantee of permanence**: based on European legislation which states that the area must be classified as a permanent forest estate, as defined by the Food and Agriculture Organization of the United Nations (FAO), or as a protected area or through a legal or contractual guarantee of forest conservation.[42]

iv. **Audit**: verification of compliance must be carried out every two years after the start of the activity and every ten years thereafter. Compliance is verified by competent authorities or independent certifiers.[43]

v. **Group assessment**: compliance can be assessed at the level of the area of forest origin or in a group of homogeneous companies.

vi. **DNSH criteria**: establishes criteria to ensure that the activity does not cause significant environmental damage to the different categories of objectives: adaptation to climate change, sustainable use of water, circular economy, pollution prevention, and protection of biodiversity. For example, the activity complies with applicable regulations, contributes to reducing the use of pesticides and fertilizers, has the objectives of conservation and increase of biodiversity and promotes biodiversity-friendly practices, among others.

In order to adapt to climate change, the technical screening criteria for forestry economic activities are made up of the following elements:[44]

39 For more information, see European Commission Delegated Regulation 2021/2139/EU.
40 Comply with requirements in the area of forest procurement to ensure the long-term maintenance and enhancement of forest carbon reserves and sinks in accordance with Article 29, no. 7, item b of Directive 2018/2001/EU.
41 Companies with less than 13 hectares are exempt from this obligation.
42 Economic operators must commit to keeping forest plans up to date in order to seek climate benefits, as required by law, and to compensate for any reduction with equivalent activities specified in the regulations.
43 Audits can be carried out in conjunction with other forestry or climate certifications to reduce costs.
44 For more information, see European Commission Delegated Regulation 2021/2139/EU.

i. **Adoption of adaptation solutions**: implementing solutions to reduce the physical risks associated with climate. Adaptation solutions are the set of all measures, actions, adjustments, changes, applications, products, services, etc. that contribute to adapting to climate change (EU Technical Expert Group on Sustainable Finance 2020).

ii. **Identifying and assessing climate risks**: identify climate risks relevant to economic activity.[45] Assess climate vulnerability and risks, considering the scale and life expectancy of the activity and based on climate projections.

iii. **Scientific basis and methodologies**: climate projections and impact assessments must be based on good practice and up-to-date scientific knowledge, such as the IPCC.

iv. **Guidelines for adaptation**: the adaptation solutions adopted do not negatively affect the adaptation efforts of other people or activities. They promote nature-based solutions, are consistent with local, sectoral, regional or national adaptation plans and strategies, are monitored and evaluated on the basis of predefined indicators, and corrective measures are considered in the event of failure to meet targets.

v. **Enabling activity**: demonstrates through assessment of present and future climate risks that the activity contributes to increasing the resilience or adaptation efforts of other people or economic activities.

vi. **DNSH criteria**: establishes criteria to ensure that the activity does not cause significant environmental damage to the different categories of objectives: climate change mitigation, sustainable water use, circular economy, pollution prevention, and biodiversity protection. For example , the activity complies with applicable regulations, contributes to reducing the use of pesticides and fertilizers, adopts measures to prevent water and soil pollution, has objectives to conserve and increase biodiversity, promotes practices that are favorable to biodiversity, among others.

Criteria for Environmental Protection and Restoration Activities

In addition to the forestry sector, the European Union Taxonomy has specific technical criteria for another sector related to land use within the scope of the European regulation: environmental protection and restoration activities.[46] Although with a smaller number of economic activities, criteria are available for substantial contribution to mitigation, adaptation and the protection and restoration of biodiversity and ecosystems, with wetland restoration being the economic activity covered for mitigation and adaptation.[47] For biodiversity criteria, the activity covered is conservation, including restoration of habitats, ecosystems and species.[48]

45 The physical risks associated with the climate that are relevant to the activity have been identified from the list in the appendix to the European Commission's Delegated Regulation 2021/2139/EU.

46 For more information, see Delegated Regulation 2021/2139/EU and Delegated Regulation 2023/2486/EU of the European Commission.

47 Wetland restoration encompasses economic activities that seek to restore these areas to their original condition or reinforce their functions, without necessarily restoring them completely. The term "wetlands" refers to areas defined internationally as "wetlands" or "peatlands" by the Ramsar Convention. The activity does not have specific NACE codes, but is included in category 6 of the Classification of Environmental Protection Activities and Expenditure (CEPA).

48 Economic activity is defined as the development and execution of conservation activities, including restoration, to improve terrestrial, freshwater and marine habitats, ecosystems and populations of fauna and flora. It does not include *ex situ* conservation, such as in botanical gardens or seed banks. It has no specific NACE codes, but is partly covered by code R91.04.

To mitigate climate change, the technical screening criteria for economic activities to restore wetlands are made up of the following elements:

- **Restoration plan**: contains detailed information for the restoration and management of wetlands based on the guidelines of the Ramsar Convention and takes into account local hydrological and soil conditions. Monitoring measures are necessary to ensure the accuracy of the information contained in the plan.
- **Climate benefit analysis**: demonstrating a net balance of GHG emissions lower than the reference values over 30 years. In addition, the calculation of climate benefits follows up-to-date guidelines, considering accurate and complete information, covering all affected carbon pools and associated risks. The analysis also includes projections for coastal wetlands and takes into account normal practices and natural disturbances, as long as they are consistent with the established guidelines.
- **Guarantee of permanence**: based on European legislation, which states that the area must be designated (i) for conservation as a wetland, so that its land use cannot be changed, (ii) as a protected area or (iii) through a legal or contractual guarantee of wetland conservation.[49]
- **Audit**: verification of compliance must be carried out every two years after the start of the activity and every ten years thereafter. Compliance is verified by competent authorities or independent certifiers.[50]
- **Group assessment**: compliance can be assessed at the level of the area of forest origin or in a group of homogeneous companies.
- **DNSH criteria**: establishes criteria to ensure that the activity does not cause significant environmental damage to the different categories of objectives: adaptation to climate change, sustainable use of water, circular economy, pollution prevention and protection of biodiversity. For example, the activity complies with applicable regulations and also contributes to reducing the use of pesticides and fertilizers. In addition, it avoids the conversion of sensitive habitats and follows specific recovery plans for the conservation and increase of biodiversity, among other guidelines.

For adaptation to climate change, the technical assessment criteria for this sector follow the same structure as the forestry criteria. Finally, the EU Commission recently published a Delegated Regulation (2023/2486) with **criteria for the protection and restoration of biodiversity and ecosystems for environmental protection and restoration activities**, which have the following elements:

- **Contribution to the objective**: the activity must contribute to maintaining or restoring ecosystems, species or habitats. Applies to any operator, regardless of their main area of activity.

49 Economic operators must commit to keeping recovery plans up to date in order to seek climate benefits, as required by law, and also to compensate for any reduction with equivalent activities specified in the regulations.

50 Audits can be carried out in conjunction with other forestry or climate certifications to reduce costs.

- **Conservation zone**: describes the area of the activity by mapping and presenting the current state of the habitats, characterizing the importance of the zone for regional, national or international conservation. It can present the potential for improvements and connectivity between habitats.
- **Management plan**: defines contributions to conservation objectives, lists species and habitats benefiting from the activity, establishes conservation and monitoring measures, provides for funding and partnerships needed to carry out the restoration plan.
- **Audit**: verifies the effectiveness of the management plan and compliance with the DNSH criteria and objectives established at the beginning of the plan's implementation. Compliance checks must be carried out at the end of the management plan and every 10 years. Compliance is verified by competent authorities or independent certifiers.
- **Guarantee of permanence**: the area where the activity is carried out must be designated as a protected zone in accordance with the legislation, adopt a land or water use plan approved by the competent authorities or have a contractual agreement, public or private, with conservation objectives. In addition, the operator undertakes to draw up a new management plan compatible with the conservation objectives before the current plan expires.
- **Additional minimum requirements**: The activity is not intended to compensate for the impacts of other economic activities.[51] It must also prevent the introduction of invasive species, in accordance with specific regulations.
- **DNSH criteria**: establishes criteria to ensure that the activity does not cause significant environmental damage to the different categories of objectives: mitigation and adaptation to climate change, sustainable use of water and pollution prevention. For example, the activity causes degradation in areas with a high carbon content in the soil or in the marine environment and adopts measures to minimize the use of pesticides, fertilizers and dangerous chemical substances, following regulations and good agricultural practices.

Colombian Green Taxonomy (TVC)

The TVC aims to support the identification and evaluation of investments that are considered green or environmentally sustainable, i.e., that can contribute substantially to meeting environmental and climate objectives.[52] Published in 2022 by the Ministry of Finance and Public Credit (*Ministerio de Hacienda y Crédito Público*) in partnership with the Financial Superintendence of Colombia (*Superintendencia Financiera de Colombia* - SFC), it is the first sustainable finance taxonomy in South America. It was designed based on the country's environmental priorities and Colombia's regulations, commitments, strategies and policies, including at an international level.

51 Only net biodiversity gains resulting from conservation or restoration can be counted as a substantial contribution from this activity.
52 Substantial contribution is the potential of an asset or economic activity to contribute directly to climate change mitigation or to enable the substantial contribution of other activities (Gobierno de Colombia 2022).

The Colombian Green Taxonomy is not a regulation, although the SFC has published several regulations that refer to the Green Taxonomy.[53] The tool was based on the EU Taxonomy, but with its own methodology for land use sectors, with no criteria yet published in full by the EU (Baccas et al. 2023).[54]

The TVC is a general framework and establishes a common language for different actors in the public and private sector, such as: bond issuers, investors, financial institutions, public entities, among others. This language makes it possible to identify, classify and differentiate environmentally sustainable economic assets and activities (Gobierno de Colombia 2022).[55] The TVC defines seven objectives for the country:

- Climate change mitigation
- Climate change adaptation
- Conservation of ecosystems and biodiversity
- Water management
- Soil management
- Circular economy
- Pollution prevention and control.

TVC is being developed in stages, starting with criteria for climate change mitigation, followed by criteria for climate adaptation and conservation of ecosystems and biodiversity. These criteria have been developed for two groups of economic activities: one covers various sectors, from the perspective of climate mitigation; the other focuses only on land use, from the cross-cutting perspective of the taxonomy's environmental and climate objectives, presented above. The two groups together represent 10 economic sectors, which have 50 categories of activities or economic assets[56] , considered environmentally sustainable for the purposes of the TVC. Each group has its own structure, requirements and system for assessing alignment with the taxonomy.

53 The SFC's regulations aim to increase the transparency of the capital markets and minimize the risk of greenwashing in green bond issues, the appointment of voluntary pension funds, portfolios, and the disclosure of social, environmental and climate information by the market. For more information see SFC External Circular no. 005/2022.

54 The methodology for land use is based on international taxonomies and the World Bank's experience in emerging countries. The criteria reflect Colombia's environmental goals, including those of international agreements, in line with national legislation and compliance schedules. Changes related to land use are the main source of greenhouse gas emissions in Colombia (59%), followed by energy (31%), waste (7%) and industrial processes (3%).

55 For actors in the financial system, the taxonomy will be used to identify financing and investment opportunities and mobilize resources to support the transition to a sustainable economy, measure the alignment of their portfolios with green assets and activities, structure green products and solutions; strengthen disclosure and transparency practices on capital mobilized for environmental objectives, among other purposes. Supervised entities and securities issuers are considered market players.

56 "The assets produced are the result of economic production and therefore constitute products at the time of creation" (Gobierno de Colombia 2022, p. 28, as translated by the authors).
Original text: "Los activos producidos son el resultado de la producción económica y constituyen por lo tanto productos al momento de la creación".

The first group corresponds to economically relevant sectors that contribute substantially to climate change mitigation in the country's national context, namely: energy, construction, waste and CO_2 capture, water supply and treatment, transportation, information and communication technologies, and manufacturing.[57]

The second group is made up of sectors related to land use—crops, cattle and forestry. Practices were identified that contribute not only to climate change mitigation, but also to other environmental objectives prioritized in the taxonomy—adaptation, conservation of ecosystems and biodiversity, soil, and water management. This structure is based on the recognition that land use activities are transversally related to various environmental challenges that are closely codependent.

Criteria for Land Use

For the land use sectors—crops, cattle and forestry—alignment with the Colombian Green Taxonomy is assessed based on the project or production unit[58] for each economic activity. Activities related to land use are limited to primary production with a focus on actions within the rural property.

The categories of economic activities considered environmentally sustainable for the taxonomy were developed for the main land uses in Colombia for these sectors. The process of compliance with the taxonomy is based on general requirements for land use and eligibility criteria, including sector-specific criteria.[59]

The categories of eligible activities can be applied in combination when the production units integrate activities related to more than one of these sectors. In addition, technical assistance, training, and knowledge generation are essential inputs for adopting sustainable practices. Although not explicitly mentioned in all the tables, these activities are eligible as part of the taxonomy-aligned funding in all categories.

The eligibility of an investment proposal begins with compliance with the minimum qualification requirements contained in current regulations. The mechanisms for verifying the criteria, as well as the compliance requirements, are defined and agreed upon by the different parties involved in the investment. In addition, it is necessary to adopt an environmental management plan for the property and comply with the applicable Colombian regulations. The process is detailed below:

57 This group represents seven sectors and 47 economic activities and assets with a substantial contribution to the environmental objective of mitigating climate change. Although there is an initial list with the equivalence of the taxonomy's activities to the International Standard Industrial Classification (ISIC) codes, in order to meet its specificities and objectives, the Colombian tool adopts its own classifications and descriptions for economic activities. By its nature, the ISIC classification categorizes economic activities without discriminating specific products, methods or processes for preparing or obtaining them, and therefore does not provide all of the taxonomy's needs. As part of the taxonomy update, more specificity in the identification of economic activities will be worked on to improve correspondence with statistical classifications in partnership with Colombia's official statistics agency—the National Administrative Department of Statistics (*Departamento Administrativo Nacional de Estadística* - DANE).

58 According to the Gobierno de Colombia (2022, p. 32, as translated by the authors), "Productive unit: farm, property, plot, production area or establishment where agricultural production activities are carried out".
Original text: "Unidad productiva: Finca, predio, parcela, zona de producción o establecimiento donde se llevan a cabo actividades de producción agropecuaria".

59 Compliance requirements have a similar function to safeguards: to avoid and prevent possible damage caused by the project or activities of the production unit.

Compliance requirements:

- **Regulatory**: these are the enabling minimums, i.e., you must comply with the minimum Colombian regulations applicable to land use and environmental care, such as: the location of the enterprise must respect the limits of the agricultural frontier[60] established in regulation; comply with the Land Management Plans (*Planos de Ordenamento Territorial* - POT) determined by environmental authorities—federal or sub-national—for production and environmental issues; respect environmental legislation; and make rational use of fertilizers and pesticides permitted in Colombia.

- **Environmental management**: the environmental management plan must include specific data on the property, its location and production context, along with the modifications or improvements the applicant wishes to make.[61] An environmental management plan is an important tool for measuring and monitoring productivity indicators, efficiency and the use of natural resources. It generates metrics and information for evaluating and monitoring the evolution of the production unit. Taxonomy users must use this plan to determine compliance with the requirements and eligibility criteria. The plan must also include measures for two elements:

  - **Productive transition planning**: eligible practices and technologies are established for each sector—crops, cattle and forestry—and are specified in the sectoral eligibility criteria of the TVC. The planning is developed in stages, and the transition is built with three levels of sequential interventions over time: basic, intermediate and advanced or transformative; each with its respective complexity and impact, and supporting a gradual transformation process.[62]

  - **Prevention of damage to natural resources**: environmental management and natural resource protection guidelines must be followed for the conservation of ecosystems and biodiversity, soil and water management. The plan must include preventive measures, even if they are not explicitly included in the regulatory compliance requirements.

60 "The boundary of the agricultural frontier is the limit of the rural land that separates the areas where agricultural activities are carried out, the conditioned areas and protected areas, those of special ecological importance and the other areas in which agricultural activities are excluded by mandate of the law." (Gobierno de Colombia 2022, p. 147, as translated by the authors).
Original text: "La Frontera Agropecuaria Nacional está definida como 'el límite del suelo rural que separa las áreas donde se desarrollan las actividades agropecuarias, las áreas condicionadas y las áreas protegidas, las de especial importancia ecológica, y las demás áreas en las que las actividades agropecuarias están excluidas por mandato de la ley'".

61 The plan can also be a business plan or another instrument for planning the changes to be adopted in the production unit where environmental management is integrated. The plan should contain the diagnosis of the property, objective of the intervention, environmental situation, definition of the transition, compliance requirements and expected results, such as increased productivity and efficiency in the use of natural resources. In addition, guidelines in the taxonomy implementation guide recommend that the plan include characteristics of the property, such as area and environmental situation, a disease and pest control plan, measures to control contamination of water bodies, measures to control the use of agrochemicals, measures to prevent habitat fragmentation, and demonstration of evidence of articulation with the applicable Integral Plan for Territorial Climate Change Management *(Planes Integrales de Gestión del Cambio Climático Territorial* - PIGCCT).

62 Through the three levels of intervention measures—basic, intermediate, and advanced—the taxonomy establishes non-binary criteria for the land use sector. This type of approach can contribute to more universal access to the taxonomy for the different types of productive units in the sector. The majority of farms in Colombia are small and medium-sized, located in very diverse territories.

Eligibility criteria:

- **General**: guidelines that can be introduced generally in all land use sectors, related to three components: restoration, rehabilitation and/or recovery of natural systems; climate adaptation and mitigation. For each component, principles and measures are specified for three aspects of environmental management related to the objectives of the taxonomy: conservation of ecosystems and biodiversity, soil management and water management.
- **Sectoral**: these are the eligible categories of investment, practices and technologies specific to each land use sector, organized into the three levels of intervention—basic, intermediate, and advanced—from the least to the most complex/costly. The interventions are the improvements that can be adopted and which contribute to a process of gradual transformation in the country's cattle, crop, and forestry sectors. These interventions reflect successful experiences in Colombia and are aligned with the country's sustainability policies. It is understood that these categories can be applied in combination when production units integrate activities in more than one of these sectors.

Below, the sectoral criteria are detailed separately for crops, cattle and forestry.

Criteria for Crops

In the case of crops, the sectoral eligibility criteria apply to all types of crops. The general categories, description of crop practices, including agroforestry, and inputs eligible for the taxonomy are defined.[63] For an investment proposal to be eligible, the project or enterprise must adopt at least one of the intervention levels, with the basic practices level being the first step if no improvement on the baseline has been implemented. The intermediate and advanced levels are expected to complement the basic practices. The criteria also include two types of complementary technologies related to the use of biodigesters and energy management, which can be adopted depending on the type of production, scale, and other factors.

In addition to the eligibility criteria presented above, the taxonomy presents specific criteria for four crop cultures: coffee, rainfed rice, fruit, and cocoa.[64] For each of these crops, following the model of the transition criteria for ecological agriculture,[65] eligible investments, practices and inputs are defined for the three levels of intervention for productive transition, as shown in **Table 4**.

63 The inputs specify what can be financed for each practice.
64 These four crops occupy 41% of the area cultivated in Colombia.
65 According to the Ministry of Crops and Rural Development (*Ministerio de Agricultura y Desarrollo Rural* - MADR) Resolution no. 187 of 2006, "ecological production is a production process that considers soil fertility as a key factor in food production, drastically reduces the use of external inputs in the production unit and promotes practices that guarantee quality and safety throughout the ecological food production chain" (Gobierno de Colombia 2022, p. 158, as translated by the authors).
Original text: "La producción ecológica es un proceso productivo que considera la fertilidad del suelo como factor clave para la producción de alimentos, reduce en forma drástica el uso de insumos externos en la unidad productiva y promueve prácticas que garantizan la calidad e inocuidad en toda la cadena productiva de alimentos ecológicos".

Table 4. Sectoral Eligibility Criteria for Crops, according to TVC

Category of intervention	Practices	Ecological crop*	Coffee	Rice	Fruit trees	Cocoa
Basic practices	Crop rotation	✓				
	Efficient fertilizer management	✓	✓			✓
	Pest and disease control	✓	✓			✓
	Soil conservation	✓	✓	✓	✓	✓
	Water resource management	✓		✓	✓	
Intermediate practices	Waste management and treatment of contaminated water	✓	✓			✓
	Use of organic or green fertilizers	✓	✓			
	Transition to agroforestry systems	✓				
	Polycultures		✓		✓	✓
	Genetic improvement			✓	✓	✓
	Protection of water bodies			✓	✓	
	Pest and disease control			✓		
Advanced practices	Biodigesters		✓	✓	✓	✓
	Energy efficiency (energy saving) with clean energies		✓	✓	✓	✓
	Organic fertilizers and biofertilizers			✓	✓	✓
Complementary technological adoptions	Biodigesters	✓				
	Energy efficiency (energy saving) with clean energies	✓				

Note

*The ecological crop criteria is valid for all other crops.

✓ The practice is included in the sectoral criteria

The practice is not included in the sectoral criteria

Source: *CPI/PUC-Rio with data from the Gobierno de Colombia (2022), 2024*

Criteria for Cattle

For cattle, which occupies around 77% of the area used for agricultural production in Colombia,[66] the taxonomy defines investments, practices and their respective inputs for the transition to sustainable cattle production as eligible,[67] prioritizing primary production.[68] These practices, like the other land use sectors, are divided into basic, intermediate and advanced, allowing for combinations and scaling in the transition plan.

66 The cattle sector occupies 39 of Colombia's 51 million hectares of agricultural production area (Gobierno de Colombia 2022 apud DANE 2019).

67 The concept of sustainable cattle production is based on the definition given by the *Mesa de Ganadería Sostenible* initiative (2019): "it is the development of cattle production, in which the impacts and benefits of the production function are fully recognized, within the concept of the production chain; based on this, the aim is to improve productivity, profitability, product quality, competitiveness, ecosystem conservation, generation of ecosystem services, reduction of the carbon footprint and adaptation to climate change, for the benefit of cattle farmers and society in general" (Gobierno de Colombia 2022, p. 149, as translated by the authors).
Original text: "Ganadería sostenible: es el desarrollo de la actividad ganadera, en el cual son reconocidos integralmente los impactos y beneficios en la función de producción enmarcados en el concepto de cadena productiva; a partir de la cual, se busca un mejoramiento de la productividad, la rentabilidad, la calidad de los productos, la competitividad, la conservación de los ecosistemas, la generación de servicios ecosistémicos, la reducción de la huella de carbono y la adaptación al cambio climático para el beneficio de los ganaderos y la sociedad en general".

68 Future versions of the taxonomy may integrate secondary cattle farming activities.

For an investment proposal to be eligible, the project or production unit in the cattle sector must adopt at least one of these levels of intervention. The taxonomy's recommendation to its users is that eligible practices and technologies should be considered appropriately, on a case-by-case basis, with a view to achieving the quantitative and qualitative goals established in the investment's environmental management plan. In addition, taxonomy's eligible cattle practices contribute to restoring soil fertility, improving water quality and quantity, reducing dependence on agrochemical inputs and enabling ecosystem services. The eligibility criteria for investments and practices in the transition to sustainable cattle are presented in **Table 5.**

Table 5. Sectoral Eligibility Criteria for Cattle, according to TVC

Intervention category	Practices/Investments
Basic practices	Pasture division and rotation
	Efficient water management
	Soil protection
Intermediate practices	Pasture management
	Use of organic and green fertilizers
Advanced practices	Cattle-Forest* Integration System
Complementary technological adoptions	Biodigesters
	Clean energy
	Energy efficiency

*TVC uses the term silvopastoral systems. The term has been translated by the authors and adapted to the Brazilian context.[69]

Source: *CPI/PUC-Rio with data from the Gobierno de Colombia (2022), 2024*

Criteria for Forestry

Native forests occupy more than half[70] of Colombia's territory, 63% of which is occupied by indigenous, Afro-Colombian and peasant communities. Colombian Green Taxonomy therefore addresses forests, their conservation and sustainable forest use as fundamental to the country's development (Gobierno de Colombia 2022).

In the taxonomy, the forestry sector is made up of economic activities related to the management, conservation and proper management of natural forests, as well as the sustainable exploitation of forest plantations for commercial purposes, from primary production to industrial value addition. Eligible investment categories are defined as sustainable forest management.[71]

For this sector, activities are organized into two groups of eligible investments. The first, aimed at strengthening the sustainability of the forestry sector, focuses mainly on public sector actions and government strategies to guide the development of the sector, improve the business environment and overcome the main environmental challenges. The second group focuses on direct investments in native or planted forest management activities,

69 Original text: "Los sistemas silvopastoriles son arreglos agroforestales en los que interactúan en forma simultánea plantas leñosas perenes (árboles o arbustos), plantas herbáceas o volubles (pastos, leguminosas herbáceas y arvenses) y animales domésticos".
70 59 million hectares of the country's 114 million hectares.
71 The definition of sustainable forest management is consistent with the principles and definitions of Decrees no. 1791/1996 and no. 1076/2015 of the Colombian Executive Branch.

carried out by private, public, non-governmental or mixed actors. This group is made up of three categories of activities: (i) restoration of degraded forest soils; (ii) conservation, management and sustainable use of native forests; and (iii) reforestation for commercial purposes. The eligibility criteria for investments and practices for the two groups of forestry sector activities are listed in **Tables 6** and **7**, respectively.

Table 6. Sectoral Eligibility Criteria for Investments to Strengthen the Sustainable Forestry Sector, according to TVC

Objective	Investment category/current expense
Reducing deforestation, natural forest degradation and other forest risks	Risk management and forest control
	Systems for monitoring and controlling forest coverage including via satellites
	Integration of ecosystem services
	Development of forest nurseries according to the area to be implemented
	Introducing native species to forest plantations
Technology development, technical assistance and basic infrastructure	Development of production bases for marketing non-timber products and forest services
	Improving legal frameworks and governance in the forestry sector
	Sustainable forestry models and training of qualified personnel (including non-timber forest products)
	Basic infrastructure for sustainable extraction
	Use of renewable energies and production of fertilizers and fuels from organic waste

Source: *CPI/PUC-Rio with data from the Gobierno de Colombia (2022), 2024*

For the second group of activities in the forestry sector (**Table 7**), a Forest Enterprise Plan[72] must be adopted that incorporates the environmental management principles of the taxonomy and demonstrates a series of technical requirements based on the following elements:

- **Introduction and objectives of the Plan**
- **Description of the project area**: includes geographical location, available natural resources, socio-economic context and legal requirements
- **Forest inventory**: identifies species, forest volume, forest characteristics of the area
- **Technical justification of species and volume of forest utilization**: presents criteria and evaluation parameters used
- **Forest census**: details the location, species, volumes, quantity and use of the products to be harvested
- **Forest utilization plan**: includes management guidelines, felling planning, silviculture plan, environmental and social management, as well as measures for monitoring the area

72 This model is based on the requirements established for forest plantations by the following Colombian laws: Law no. 139/1994 and Decree no. 1791/1996.

For an investment proposal in this group of forestry activities to be eligible, at least one of the intervention levels shown in **Table 7** must be adopted.

Table 7. Sectoral Eligibility Criteria for Productive Transition in the Forestry Sector, according to the TVC

Category of intervention	Practices	Restoring degraded forest soils	Conservation, forest management and sustainable use of natural forests	Reforestation for commercial purposes
Basic practices	Recovering and managing the soil	✓		
	Soil conservation and water management			✓
	Ecological restoration (if this is the main objective)	✓		
	Management of natural forests		✓	
	Systems for monitoring and controlling forest coverage, including via satellites		✓	
Intermediate practices	Conservation of water resources and water management	✓		
	Development of nurseries and pest control to maintain natural forest species		✓	
	Nursery development and planting services	✓		
	Fertilizer management, pest and disease control			✓
	Systems for monitoring and controlling forest coverage, including via satellites	✓		
	Integration of ecosystem services		✓	
	Windbreaks, living fences, firebreaks	✓		
Advanced or transformative practices	Windbreaks, firebreaks, frost barriers and living fences			✓
	Forest roads or trails			✓
	Systems for monitoring and controlling forest coverage, including via satellites			✓
	Integration of ecosystem services	✓		✓
	Introduction of native species to forest plantations	✓		
	Introduction of native species to forest plantations with biological corridors or in polycultures			✓
	Production of non-timber products and related services	✓	✓	
	Organic or green fertilizers (use of mulch)			✓
Complementary technological adoptions	Biodigesters	✓	✓	✓
	Energy efficiency with clean energy	✓	✓	✓

✓ The practice is included in the sectoral criteria

The practice is not included in the sectoral criteria

Note: *The productive transition of the forest sector, according to the TVC, includes the restoration of degraded forest soils, conservation, management and sustainable use of native forests, and reforestation for commercial purposes.*
Source: *CPI/PUC-Rio with data from the Gobierno de Colombia (2022), 2024*

Reflections on the Implementation of the Colombian Green Taxonomy

The TVC is understood to be a dynamic document which, as the tool evolves, will need to undergo updates and expansion of the assets and economic activities eligible as green, as well as the eligibility criteria and both general and specific compliance requirements. Criteria and requirements for other sectors, such as coastal and marine resources, as well as pending environmental development objectives, including the conservation of ecosystems and biodiversity, and adaptation for sectors other than land use, will be developed progressively for new versions of the taxonomy. Although the current version of the taxonomy only partially addresses the adaptation objective, this is a priority topic to be further developed in the short term.

The taxonomy mentions the importance of metrics for evaluating and monitoring investments. However, for land use sector, the tool does not define which metrics should be used to evaluate eligible activities. Recently, in an implementation guide prepared by CBI, some indicators were proposed for this monitoring (Vásquez et al. 2023a). These general indicators cover key areas of environmental monitoring and crop productivity to measure the reduction of GHG emissions, use of areas for regeneration, reduction of agrochemicals, water consumption, soil and water quality, and biodiversity.

Although it is not a regulation in itself, but a guide for identifying sustainable activities and practices, the taxonomy presents and organizes the country's main medium- and long-term goals for the land use sector related to the taxonomy's objectives.[73] In addition, the taxonomy organizes the implementation instruments used, provides some examples in the land use sectors, and establishes metrics to monitor progress towards these goals.

The TVC does not provide specific guidelines or require the incorporation of sustainability strategies, risks and/or governance schemes for its implementation. However, the compliance requirements of the TVC specifically request that the executors of economic activities and assets that may be aligned with the TVC have a management system, according to the magnitude of the investment and the scale of the project/financing executing entity that allows them to deal with the possible significant damage that the project may generate (Vásquez et al. 2023b).

73 "Nationally Appropriate Mitigation Actions (NAMAs) are policies, regulations, programs or other types of actions that reduce GHG emissions relative to their trend levels and that, in turn, contribute to achieving the sustainable development goals of the implementing countries, which are mainly developing countries" (MADS nd, as translated by the authors).
Original text: "Las Acciones de Mitigación Nacionalmente Apropiadas (NAMAs por su sigla en inglés) son políticas, regulaciones, programas u otro tipo de acciones que reducen las emisiones de Gases Efecto Invernadero de sus niveles tendenciales, y que a su vez, contribuyen a alcanzar los objetivos de desarrollo sostenible de los países que las implementan, que son principalmente países en desarrollo".

Mexican Sustainable Taxonomy

Mexican Sustainable Taxonomy aims to guide and mobilize sustainable financing in the country and increase the integrity of the financial system by improving the quality of information available to investors and other stakeholders.[74] Published in 2023 by the Secretariat of Finance and Public Credit (*Secretaría de Hacienda y Crédito Público* - SHCP) and currently in its experimental phase, the taxonomy is voluntary and is not considered a regulation. Despite this, the financial authorities are analyzing the development of regulatory proposals related to the disclosure of information associated with alignment with the taxonomy for the definition of financial instruments called Environmental, Social and Governance (ESG).

The Mexican tool proposes a national reference framework to clearly and scientifically classify economic activities and investment projects that meet sustainability criteria, defined from a broad approach of environmental, climate and social objectives:

Environmental/Climate:

- Climate change mitigation
- Climate change adaptation
- Management of water and marine resources
- Conservation of ecosystems and biodiversity
- Pollution prevention and control
- Promoting the circular economy

Social:

- Contribution to gender equality
- Access to basic services related to sustainable cities
- Health
- Education
- Financial inclusion

The objectives of the Mexican taxonomy reflect the country's domestic priorities and international commitments related to sustainability, taking into account both the state of technological development and the country's productive capacities, as well as its Nationally Determined Contributions (NDCs) and the Sustainable Development Goals (SDGs) of the 2030 Agenda.

74 Original text: "Financial integrity describes the characteristics of a financial system that operates in a clean, transparent and accountable way" (Transparency International nd).

Compliance with the taxonomy occurs if the economic activity:

- Is an eligible activity provided for by the taxonomy;
- Satisfies the Technical Evaluation Criteria (*Criterios de Evaluación Técnica* - CET);
- Complies with DNSH criteria; and
- Meets the minimum safeguards.[75]

In its first implementation phase, starting in 2023, the taxonomy presents criteria and guidelines for four of the seven objectives, namely objectives specified above.[76]

CETs are a set of rules for evaluating economic activities and determining whether they are sustainable within the framework of the taxonomy. The taxonomy identifies potential users, the applicability and contribution of the tool to the activities of these users. By meeting the four compliance requirements, companies can disclose the percentage that these activities represent in terms of sales, capital expenditures and operations aligned with the taxonomy, facilitating access to the sustainable finance market through the issuance of bonds and other thematic instruments. Similarly, financial institutions and institutional investors[77] will be able to measure the alignment of their portfolios and develop taxonomy-aligned financial products. Finally, government agencies will be able to align budget spending with taxonomy objectives to guide sustainable public investment projects.

In order to mitigate climate change, CETs were developed with specific parameters for 124 economic activities in six sectors: agriculture and silviculture, energy, manufacturing, transportation, construction and waste management.[78] For each activity, a climate mitigation criteria fact sheet was drawn up with four sections:

- **Description of the sector and activity**: indicates eligible economic activities and products, as well as excluded activities using the North American Industry Classification System (NACIS) Code—a classification system similar to the Brazilian CNAE.
- **Main parameter**: element or thematic criteria on which the sustainability of an economic activity is assessed.
- **Substantial contribution**: metrics and thresholds established to assess and measure the environmental or social performance of an economic activity. It determines the minimum criteria for defining whether the economic activity is considered sustainable and, therefore, which demonstrate the economic activity's contribution to meeting the main parameter.
- **DNSH assessment**: set of guidelines to ensure that an economic activity does not negatively impact any of the other objectives of the taxonomy—water, adaptation, biodiversity, pollution prevention, and control and circular economy.

75 The minimum safeguards aim to cover issues related to human rights, as well as international good practices in labor and governance, such as Mexico's current laws and regulations, and international conventions and guidelines, such as: the OECD guidelines for multinational companies, the ILO Declaration on Fundamental Principles and Rights at Work and the UN Guiding Principles on Business and Human Rights, without prejudice to compliance with Mexico's current laws and regulations.

76 The Taxonomy presents a methodological summary for drawing up the CETs for the four prioritized objectives, which can be found in Table 1.7 of the taxonomy document (SHCP 2023). For each objective, a main parameter is defined, from which various metrics are selected and thresholds established to assess compliance with the taxonomy. Subsequently, the CETs will be developed for the sustainable cities objective and then for the other social objectives.

77 Bank and non-bank credit institutions and institutional investors such as pension funds and insurance companies.

78 These criteria were drawn up by the Sectoral and Thematic Technical Groups (*Grupos Técnicos Setoriais e Temáticos* - GTSyT), made up of public and private actors, whose mandate is to create CETs.

For the adaptation objective, criteria were developed to determine whether the economic activity contributes substantially to climate adaptation.[79] Subsequently, the activity is classified as an adapted or facilitating activity. The former refers to activities adapted to physical and material risks, which integrate measures to reduce risks and solutions to maintain their operation in the event of climate change. Facilitating activities are those that promote adaptation by enabling the reduction of climate risks and vulnerabilities, using technology to create specialized products or services. The taxonomy presents a guide with recommendations for identifying climate risks, based on the EU Taxonomy, and also includes risks and vulnerabilities specific to the Mexican context, based on a survey by the National Institute of Ecology and Climate Change (*Instituto Nacional de Ecología y Cambio Climático* - INECC). There are specific adaptation measures described for crops and cattle.[80] In addition, adaptation activities are obliged to comply with the DNSH and minimum safeguard criteria.

With regard to the goal of sustainable cities, themes were identified that contribute significantly to services related to sustainable cities, such as: adequate housing, safe and sustainable public transport, waste management, land use and pollution control, and comprehensive water management.

Finally, in this first phase of the taxonomy, as a cross-cutting issue for the economic sectors, a gender equality index was developed for which a minimum score must be achieved for a company or investment project to be considered aligned with the Mexican tool.[81]

The Mexican Taxonomy will continue to be refined through the development of criteria and guidelines for the taxonomy's other objectives, including the completion of the CETs for the other objectives. As the market evolves and learns from the implementation of the taxonomy, criteria for new economic activities can be developed, and metrics and thresholds can be updated.

Criteria for Land Use

Mexican Sustainable Taxonomy incorporated the land use sector—crop, cattle and forestry—as a priority and established mitigation criteria to determine sustainable economic activities in the sector, a trend throughout Latin America, as can also be seen in Colombia's taxonomy. A total of 64 economic activities were selected from the NACIS code that contribute to mitigation and have the potential to contribute substantially to adaptation to climate change, 53 of which are in the crop subsector, seven in cattle and four in forestry.

Following the general structure of the CETs, the taxonomy establishes a specific climate mitigation criteria fact sheet for each sector. For each sectoral economic activity, the eligible activities, excluded activities and eligible products are indicated, identified by NACIS code whenever possible. The main parameter—Greenhouse Gases and Compounds (*Gases y Compuestos de Efecto Invernadero* - GyCEI) Mitigation Contribution—is applied to the

79 This identification is carried out by evaluating the CETs of the 124 economic activities that contribute to mitigation, on the understanding that they have the potential to contribute substantially to adaptation to climate change.

80 In addition to the guidelines and principles mentioned for climate adaptation, activities in these subsectors must adopt at least two of the practices in table 2.5. "*Prácticas con impacto sobre la adaptación al cambio climático para los subsectores Agrícola y Cría y Explotación de Animales*" of the Taxonomy (SHCP 2023).

81 The index is obtained from a questionnaire organized into three pillars—decent work (66 points), well-being (54 points) and social inclusion (54 points)—totaling 174 points. An economic activity is eligible for the taxonomy from a minimum score of 72 points (Souza and Gasparotto 2023).

activities of the three land use sectors. To assess the substantial contribution, the crop and cattle sectors use the reduction of CO_2 equivalent emissions (gCO_2e) and carbon capture and storage as reference metrics, while for forests, the metric applied is the increase in forest carbon stocks (in gCO_2e). The minimum requirements or criteria for determining whether an activity is considered sustainable under the taxonomy and the DNSH assessment guidelines are specific and differ for each land use sector.

Criteria for Crops

The following items must be included in the technical sheet for agricultural activities:

- **Main parameter**: GyCEI Mitigation Contribution.
- **Metrics**: (i) gCO_2e reduction, (ii) carbon capture and storage.
- **Minimum criteria**: applied at the level of the rural property and the activity carried out, based on compliance with the following guidelines and obligations:
    i. **Boundaries of the crop frontier**: respect the federal boundaries of the agricultural frontier. It is advisable to submit geospatial information for proof.[82]
    ii. **Disposal of inorganic waste**: have a site for the temporary disposal of inorganic waste, verifiable by photograph.
    iii. **Transition plan**: establish a transition plan with at least two basic or advanced improvement practices, allocating resources according to the practices and investments described in the taxonomy factsheet.[83]

Following the model adopted in the Colombian Green Taxonomy, the improvement practices in the transition plan for agricultural activities are organized into two categories: basic practices and advanced or transformative practices. The specific eligible investments for crops defined in the taxonomy do not take the form of categories. The eligibility criteria for investments and practices in the transition to sustainable crops are listed in **Table 8**.

82 The crop frontier is the set of lands that currently have crop activity plus those that had it in the previous five crop years and are now resting or abandoned due to migration, land regularization or fertility problems (Agreement published in Mexico's Diario Oficial de la Federación 2019).

83 The Mexican taxonomy does not provide a conceptual definition for basic practices and advanced or transformative practices. Characterization is carried out only by describing and allocating practices to each of these two categories.

Table 8. Sectoral Eligibility Criteria for Crops, according to the Mexican Taxonomy

Intervention category	Practices
Basic practices	Conservation of native vegetation
	Integration of agroforestry systems
	Increasing the presence of tree species in agricultural production areas
	Soil conservation works
	Crop rotation
	Integration of coverage crops
	Soil analysis for efficient fertilizer use
	Planning fertilizer application
	Replacing synthetic fertilizers with organic ones
	Incorporating organic matter
	Productive reconversion, changing the crop grown on the property to increase productivity
	Reducing the burning of crop waste
Advanced or transformative practices	Restoration of degraded soils
	Installation of protected agriculture with recyclable materials
	Private certifications for sustainable production that assess GHG mitigation, such as certification by the United States Department of Agriculture (USDA), the *Servicio Nacional de Sanidad, Inocuidad y Calidad Agroalimentaria* (SENASICA), the Rainforest Alliance, the ISO 14001, among others.

Eligible investments
Strengthening organizations with sustainable practices
Measurement for energy efficiency and clean energy sources, such as cogeneration, LEDs, solar and wind energy
Production of biofuels
Advanced agricultural technologies such as drones and precision seeders
Equipment for protected crop and efficient systems
Living fences
Conservation tillage
Cattle-forest, crop-forest or crop-cattle-forest integration systems
Establishment and maintenance of planted forests

Source: *CPI/PUC-Rio with data from SHCP (2023), 2024*

Finally, the section presents a set of guidelines for assessing DNSH, which are specific to each objective and which must be followed to ensure that crop economic activities do not negatively impact any of these other objectives: water, adaptation, biodiversity, pollution prevention and control, and the circular economy.

Criteria for Cattle[84]

The main parameter and metrics for the cattle sector are the same as those for the crop sector. In addition to the items that must be included in the technical sheet for crop activities, the taxonomy also establishes ineligibility criteria for cattle activities. The activities cannot

84 Sector defined in the taxonomy as "animal breeding and exploitation".

be considered sustainable and therefore neither the main parameter nor the substantial contribution can be considered met if they are carried out under the following criteria: activity carried out on rural property outside the crop frontier, on land with recent land use changes, for example from forest to cattle or crop, as well as from cattle to crop, protected natural areas, among others.

Minimum criteria: applied at the level of the rural property and the activity carried out, based on compliance with at least two of the guidelines below:

- Avoiding or reducing GHG emissions by implementing good practices and mobilizing resources for specific taxonomy-eligible investments.[85]
- Demonstrate a reduction of at least 8% in GHG emissions by 2030 compared to 2020 emissions for the agriculture sector.
- Maintain and increase carbon reserves for a period of 20 years or more through the application of good practices defined in the taxonomy.
- Demonstrate evidence of soil carbon sequestration potential over time through appropriate management practices or by establishing a verified baseline for carbon capture.
- Have national or international animal welfare certifications or practices that reduce or compensate for methane emissions in relation to a verified baseline.
- Have national and international seals or recognized certifications for organic production, agroecology, conservation and sustainability.
- Report information from the National Cattle Standard (*Padrón Nacional Ganadero* - PGN) of the Secretariat of Crops and Rural Development (*Secretaría de Agricultura y Desarrollo Rural* - SADER).
- Making payments for environmental services through the National Forestry Commission (*Comisión Nacional Forestal* - CONAFOR).
- Dedicate a portion of the property to regeneration or conservation.
- Promote and protect rural and ecological reserves and areas voluntarily set aside for conservation, as well as the management of a greater diversity of native forage species.

The good practices mentioned in the criteria guidelines are organized into a set of categories including their descriptions and examples of eligible actions. The eligibility criteria for investments and practices for cattle are listed in **Table 9**.

85 "Agricultural management practices include those indicated in the taxonomy, surveyed with experts in the construction of the taxonomy, as well as projects certified by the Climate Bonds Initiative (CBI), and sustainable investment concepts from the Trust Funds for Rural Development (*Fideicomisos Instituidos en Relación con la Agricultura* - FIRA)" (*Secretaría de Hacienda y Crédito Público* 2023, p. 85, as translated by the authors). Original text: "Las buenas prácticas agrícolas y la aplicación de conceptos de inversión, acciones y prácticas de manejo incluyen aquellas previamente identificadas por iniciativas para el desarrollo de economías bajas en carbono, como los proyectos certificados por el Climate Bonds Initiative (CBI), y los conceptos de inversión sostenibles de los Fideicomisos instituidos en Relación con la Agricultura (FIRA), o bien por aquellas para las que existe suficiente conocimiento científico y consenso de expertos sobre sus efectos de mitigación y las interacciones com otros objetivos medioambientales y de seguridad alimentaria".

Table 9. Sectoral Eligibility Criteria for Cattle, according to the Mexican Taxonomy

Best practices
Conservation and maintenance of forest areas.
Implementation of agroforestry systems, including the creation of nurseries for local species and the establishment of easy-to-manage cover crops.
Diversification of production activities with cattle and agroforestry technologies, with integration systems.
Pasture management and cattle breeding in multi-species systems.
Managing cattle feed by using high proportion of digestible dry matter and avoiding the use of hormones during fattening.
Waste management, such as the use of compost, biofertilizers, biodigesters, temporary storage of agricultural waste, and practices to reduce CH_4 and N_2O by 20%.
Recovering degraded soils with cover crops and green manures, rehabilitating pastures, using organic coverage, avoiding pasture in degraded areas, implementing water conservation practices.

Eligible investments
Measurement for energy production and efficiency, such as cogeneration, LED, solar, and wind energy
Biofuels: crops and machinery for biofuel production
Use of biodigesters
Forest plantations, including compensation actions
Establishment of nurseries

Source: *CPI/PUC-Rio with data from SHCP (2023), 2024*

Finally, as with crops, the section presents a set of guidelines for assessing DNSH for cattle, which are specific to each objective and which must be followed to ensure that economic activities do not negatively impact any of the other objectives.

Criteria for Forestry[86]

The main parameter for the forestry sector is the same as that applied to the crop and cattle sectors. However, the substantial contribution metric is specific to the sector and is defined as an increase in forest carbon stocks (gCO_2e). The minimum criteria for considering forestry activities as sustainable must be demonstrated by two elements:

- **Sustainable Forest Management** *(Manejo Forestal Sustentable* - MFS) as defined by Mexico's General Law on Sustainable Forest Development (*Ley General de Desarrollo Forestal Sustentable* - LGDFS). The economic activity[87] is consistent with MFS if it is carried out in accordance with the applicable legal framework and the technical planning instrument (Forest Management Program) authorized or the opinion issued by the Secretariat of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales* - SEMARNAT).

86 In the Mexican taxonomy, the forestry sector refers to the subcategory "*Aprovechamiento Forestal*".
87 The forestry economic activities for which the compliance criteria presented apply are: forestry, utilization of non-timber forest resources (collection of forest products according to NACIS), and utilization of timber forest resources ("logging" in NACIS).

- **Forest management certification**: the Mexican government, through SEMARNAT and CONAFOR, actively promotes forest certification as part of the social criteria of the national forestry policy. The forest management certification process strengthens the guarantee of sustainability of forest ecosystems under management that meet the minimum criteria established. The taxonomy specifies the government's instruments for certifying forest management to meet the minimum sectoral criteria.

In addition to the minimum criteria, the forestry sector factsheet establishes criteria for demonstrating compliance with the main parameter and the substantial contribution of the economic activity. These compliance criteria are specific to each economic activity and must be proven by documentary evidence of voluntary forest certifications, domestic or international, or official documents issued by SEMARNAT. For both cases, the technical sheet specifies which documentary evidence must be presented. If the economic activity does not meet these criteria, it will not be considered sustainable by the taxonomy.

It is worth mentioning that the economic activity of forest nurseries is treated differently by the Mexican taxonomy, having its own minimum criteria with specific objectives and documentary evidence that must be demonstrated. Furthermore, for this activity, there are no criteria for demonstrating compliance with the main parameter. Finally, the sector factsheet presents a set of guidelines for assessing DNSH for the forestry sector, which are specific to each objective and which must be followed to ensure that economic activities do not negatively impact any of the other objectives.

Domestic Taxonomies

FEBRABAN Green Taxonomy

The most recent version of FEBRABAN Green Taxonomy, the association that represents the banking sector in Brazil, was launched in 2020, including three ways of classifying economic activities: "green economy", "exposure to environmental risk" and "exposure to climate change" (FEBRABAN 2020; 2021). Prior to this, FEBRABAN had already been measuring the volume of bank credit allocated to environmentally responsible activities since 2015, based on voluntary reports from financial institutions and, since 2019, based on data from the BCB's Credit Information System (*Sistema de Informação de Crédito* - SCR). Applying this methodology to SCR data makes it possible to measure the evolution of flows and the alignment of the entire universe of bank credit for legal entities in Brazil with FEBRABAN's definition of economic sectors in the green economy.

In the case of the classification of green economy sectors,[88] which selects economic activities that generate socio-environmental benefits, the categories mix two aspects: the scale of the contribution (moderate or high) and the type of contribution (environmental, social or socioenvironmental), resulting in six categories. There is no category for negative impacts. When an economic activity is not recognized in one of these categories, it is simply left blank.

88 The concept of Green Economy used is that of the United Nations Environment Program (UNEP), and is one that "improves human well-being and builds social equity while reducing environmental risks and scarcities" (UNEP apud FEBRARAN 2021, p. 4). In this sense, the definition is not just climate or environmental, but also incorporates a social justice dimension.

The taxonomy is based on three other initiatives: the Climate Bonds Taxonomy, the EU Taxonomy and the Social Bond Principles (SBP). The taxonomies used as references present eligibility requirements to be verified at the operation level (use of resources). However, these requirements and criteria are not used by the FEBRABAN Green Taxonomy, which classifies financial flows only at the level of economic activity, with the purpose of measuring the balances of financial institutions' active credit portfolios.

The other classifications in the FEBRABAN Green Taxonomy relate to the degree of exposure to environmental risk or climate change of financial institutions, and not to the impact generated by the economic activities they finance. However, the degree of exposure to environmental risk is one of the criteria used to define the level of an activity's contribution to the green economy. Activities with high exposure to environmental risk can, at most, be categorized as having a moderate contribution to the green economy objective.

The current methodology (FEBRABAN 2021) assigns categories of high, moderate or no contribution to economic activities at the CNAE subclass level. Using the CNAE to assign green economy categories has the advantage of being applicable to all economic activities, since this is the official standardization of economic activities in the country. However, it has limitations, since it does not allow different activities to be differentiated from the point of view of environmental impact within the same subclass, which is already the most granular level of the CNAE. For example, the same CNAE subclass encompasses both the production of renewable energy and fossil fuels. In addition, the use of the CNAE does not allow us to assess how much of the credit for individuals can be considered aligned with the green economy. This type of credit is particularly relevant for agriculture activities.

To minimize these limitations, the taxonomy includes a complementary module on federal financing lines for crops and renewable energy, including rural credit, constitutional funds and BNDES financing. These lines and programs were selected based on their alignment with socio-environmental criteria—available in the Rural Credit Manual (*Manual de Crédito Rural* - MCR)—with the FEBRABAN Green Taxonomy definition of green economy. This module includes financing programs that can be monitored and verified through the BCB's Rural Credit and PROAGRO Operations System (SICOR). The lines considered for agricultural activities are described in **Table 10**.

BNDES Sustainable Taxonomy

The BNDES has worked on several fronts to promote the sustainable finance agenda in Brazil, and the climate agenda is a strategic part of the bank's work. The BNDES has established guidelines and a set of actions to tackle climate change, which include biodiversity, loss and damage, mitigation and adaptation (BNDES 2022; 2023). The bank already has methodologies for categorizing its disbursements since at least 2011, but is undergoing a review process for a new taxonomy to support the management of its portfolio to achieve the goals set out in its guidelines (Maia 2023). This taxonomy will be applied to measure the alignment of the bank's project portfolio in direct and indirect operations.[89]

89 At the time of publication of this report, the BNDES had not yet publicly disclosed the criteria of the new taxonomy, which is why there is not a more detailed analysis of this initiative in the current report.

Other Initiatives

This section presents other initiatives for classifying land use activities that are not considered taxonomies, as they do not constitute complete classification systems for various economic sectors. In fact, these are domestic initiatives focusing on agriculture or forestry activities, with various objectives, but which, to a greater or lesser degree of detail, establish sustainability criteria that are directly applicable to the Brazilian case. These initiatives therefore serve as an important basis for discussing the criteria of the Brazilian Sustainable Taxonomy.

AMBITEC-AGRO (EMBRAPA)

The Environmental Impact Assessment System for Agricultural Technological Innovation (*Sistema de Avaliação de Impactos Ambientais de Inovações Tecnológicas Agropecuárias* - AMBITEC-AGRO*)* is an EMBRAPA initiative (Rodrigues, Campanhola, and Kitamur 2003). The initiative is cited in the Brazilian Sustainable Taxonomy Action Plan as one of the references for thinking about criteria for land use activities (MF 2023a). It consists of a set of 148 socio-environmental performance indicators (grouped into 27 criteria) to **assess the impact on rural properties of adopting agriculture technologies and management practices**. Technologies are considered to be any crop innovation, such as new types of management, machinery, crop or production system. The impact of adoption is assessed in the following dimensions:

- Use of inputs and resources
- Environmental quality
- Respect for the consumer
- Employment
- Income
- Health
- Management

The data used to formulate the indicators is obtained in the field from the farm manager, without the need for an instrumental or laboratory approach. The producer, in possession of the results, can assess which practices have the greatest impact on the performance of his activity in each of the seven dimensions.[90] However, the initiative does not aim to assess the environmental quality or sustainability of the rural enterprise.

The result depends on the state of the rural establishment before the adoption of a particular practice. In this sense, **it does not establish criteria for evaluating the sustainability of an establishment according to an established standard, and cannot be used for certification or inspection purposes**. The APOIA-NOVORURAL method, which will be presented below, was designed more precisely for this assessment of the sustainability of the enterprise, compared to AMBITEC-AGRO.

90 The spreadsheet for entering the information and generating the indicators can be downloaded from EMBRAPA (2015a).

AMBITEC-AGRO also does not present a list of criteria considered sustainable according to any definition, but rather **a multi-criteria evaluation aimed at assessing the impact of adopting a technology on a series of dimensions**. Some examples of aspects considered are: change in land use, use of crop inputs, energy and water consumption, emissions to the atmosphere, soil and water quality, biodiversity conservation, income generation, food security, among others.

APOIA-NOVORURAL (EMBRAPA)

EMBRAPA's Environmental Impact Weighted Assessment of New Rural Activities (*Avaliação Ponderada de Impacto Ambiental de Atividades do Novo Rural* - APOIA-NOVORURAL) tool is also cited in the Brazilian Sustainable Taxonomy Action Plan as one of the references for thinking about criteria for land use activities (MF 2023a). It provides a quantitative analysis of the sustainability of rural activities, with the aim of assessing the environmental performance of an agriculture enterprise. It consists of 62 indicators distributed across five dimensions of sustainability:

- Landscape ecology
- Environmental quality
- Economic values
- Socio-cultural values
- Management and administration

These indicators are verified with technical data from rural establishments, requiring field inspections, data collection and soil samples, laboratory analysis and information gathering from the producers/managers of the property.

The result of this process is an overall index that reflects the contributions of the activities to the sustainability of the rural establishment analyzed. Each resulting indicator needs to be compared with a baseline value in order to assess environmental performance. When the value of a given indicator is above the baseline, it is said that there is stability in the performance of the activity in relation to the aspect measured by the sustainability indicator.[91]

Unlike other initiatives, the tool does not propose a prior classification applicable to broadly defined activities, lines of financing or agriculture practices. **It generates specific indicators for each enterprise and serves mainly to reorient processes within rural activity management, with a focus on environmental aspects**. In this sense, an establishment will have good socioenvironmental performance if the indicators measured are above a predefined benchmark for each indicator (baseline).

91 The spreadsheet for entering the information and generating the indicators can be downloaded from EMBRAPA (2015b).

Examples of aspects considered are: compliance with the Permanent Preservation Area (*Área de Preservação Permanente* - APP) and Legal Reserve (*Reserva Legal* - RL) requirements, agricultural production management conditions, production diversity, regeneration of degraded areas, incidence of endemic diseases, risk of fire, air quality indicators (e.g. presence of smoke particles), water quality indicators (e.g. fecal coliforms) and soil quality indicators (e.g. organic matter and erosion), access to basic services, net income of the establishment, marketing conditions and waste disposal, among others.

The tool covers a broad spectrum of information about rural property, which is in line with the multi-objective approach of the Brazilian Sustainable Taxonomy, which is thought of in both climate and environmental and socioeconomic terms. The applicability of EMBRAPA's methodology within the taxonomy can be related to the foundation of protocols for certifying properties and practices based on criteria defined in the taxonomy. There is an open challenge as to how to operationalize this type of certification on the scale needed to guide funding for land use activities in Brazil.

Sustainable Production Systems, Practices, Products and Processes of the ABC+ Plan (SPS_{ABC}), MAPA

The Brazilian Agricultural Policy for Climate Adaptation and Low Carbon Emission (*Plano de Adaptação e Baixa Emissão de Carbono na Agricultura* - ABC+ Plan) is the main government initiative to reduce emissions in Brazilian agriculture. The plan includes a series of guidelines on technologies considered to be low-carbon, consolidated every two years, based on public consultations and the systematization of technical knowledge on the subject.

The scope for including a technology in the list of those recommended by the ABC+ Plan is that it has "proven capacity to adapt to climate change and mitigate GHGs, based on scientific criteria" (MAPA 2021, as translated by the authors). In other words, it is a classification with a specific focus on climate change, not necessarily taking into account other environmental and social aspects that are part of a broader definition of sustainability.

In the most recent version (MAPA 2023d), which underpins the plan for 2020 to 2030, the plan includes the following technologies:

- **Practices for Recovering Degraded Pastures** (*Práticas para Recuperação de Pastagens Degradadas* - PRPD), including pasture renovation (with the introduction of a new forage species);
- **No-tillage System** (SPD), which consists of the joint adoption of: minimal soil disturbance,[92] permanent cover with live plants or straw, and plant diversification in crop rotation. The ABC+ Plan recognizes the use of SPD for grains (No-tillage System for Grains - *Sistema de Plantio Direto para Grãos* - SPDG) and for vegetables (No-tillage System for Vegetables - *Sistema de Plantio Direto para Hortaliças* - SPDH);

92 The practice of minimal soil disturbance alone, called "No-till farming" or "Direct Sowing" (*Plantio Direto/ Semeadura Direta* - PD/SD), does not guarantee the adoption of SPD, which must follow the three principles of conservation cropping. According to MAPA (2021), less than 15% of the crop area that adopts PD/SD fully adopts the SPD concept.

- **Integration systems**, which can be any variation of consortium, rotation or succession systems between crops, cattle and forest—Crop-Forest Integration (*Integração Lavoura-Floresta* - ILF), Cattle-Forest Integration (*Integração Pecuária-Floresta* - IPF), Crop-Cattle Integration (*Integração Lavoura-Pecuária* - ILP) or Crop-Cattle-Forest Integration (CCFI)—or Agroforestry Systems (AFS), which usually incorporate a more explicit ecological and biodiversity component;
- **Use of biofertilizers** instead of chemical fertilizers (especially nitrogen), including Biological Nitrogen Fixation (BNF) and other Plant Growth-Promoting Microorganisms (PGPM);
- **Irrigated Systems** (*Sistemas Irrigados - SI*), which consist of planting systems that use irrigation in a sustainable way, with correct soil management, crop rotation and legal water collection. The use of irrigation alone does not characterize the adoption of SI;
- **Planted Forests** (*Florestas Plantadas* - FP) for commercial production or the recovery of environmental areas;
- **Management of Animal Production Waste** (*Manejo de Resíduos da Produção Animal* - MRPA), including all types of waste from animal production. The main technologies are biodigestion and composting; and
- **Intensive Termination** (*Terminação Intensiva* - TI), which consists of adopting confinement, semi-confinement and pasture supplementation regimes in the final phase of the production of cattle destined for slaughter.

This set of techniques is already used as the basis for specific rural credit programs for investment in the transition to low-carbon agriculture, such as the Program for Financing Sustainable Agricultural Production Systems (*Programa de Financiamento a Sistemas de Produção Agropecuária Sustentáveis* - RENOVAGRO, formerly the ABC+ Program) and some lines of the National Program for Strengthening Family Farming (*Programa Nacional de Fortalecimento da Agricultura Familiar* - PRONAF) focused on Agroecology, Bioeconomics and Forests. **Table 10** takes into consideration those programs and sub-programs explicitly related to the ABC+ Plan to be aligned with the SPS_{ABC} for the purposes of measuring the alignment of rural credit with sustainability according to this initiative.

It is worth noting that some of these practices can already be visualized and monitored via satellite, which can facilitate the application of the taxonomy criteria, as well as acting as a prioritization criteria when defining the criteria. In particular, the platform of the MAPBIOMAS (Brazilian Annual Land Use and Land Cover Mapping Project - *Projeto de Mapeamento Anual do Uso e Cobertura da Terra no Brasil*) (2023) has information on pasture vigor classes (for recovering degraded pastures), planted forests and irrigation systems.[93] Progress in monitoring other practices is a challenge for large-scale use of the SPS_{ABC} as a basis for defining the taxonomy criteria.

93 The platform still has limitations for analysis at the property level, since in some cases the unit of analysis (pixel) of the satellite image corresponds to an area larger than many rural properties.

Sustainability Criteria Applicable to the Granting of Rural Credit from BCB Public Consultation no. 82/2021

The BCB is the government body responsible for supervising the financial institutions that operate rural credit lines. The specific conditions for the credit lines are subject to approval by the National Monetary Council *(Conselho Monetário Nacional* - CMN) and are registered annually in the MCR by the BCB (BCB 2023; Souza, Herschmann, and Assunção 2020).

In September 2020, the Central Bank launched the Sustainability dimension of its BC# Agenda. Two initiatives should be highlighted: (i) the announcement of the Green Bureau (today called the Rural Credit Bureau), associated with the rural credit system with information of an environmental nature on borrowers; and (ii) the aim of generating incentives to make rural credit greener (Souza, Herschmann, and Assunção 2020; BCB 2023).

Initially, one of the actions planned by the Rural Credit Bureau was to define sustainability criteria for rural credit operations (BCB 2021c). One of the BCB's actions was Public Consultation no. 82/2021 (BCB 2021a), which proposes a regulation to define sustainability criteria applicable to rural credit operations. According to the proposed resolution, these operations can be classified as sustainable rural credit if the information recorded on SICOR[94] is equivalent to the Annex to the resolution (BCB 2021b). However, currently, this definition of criteria is no longer provided for under the bureau (BCB 2023).

In addition, according to the proposed regulation of the consultation, the classification of operations as sustainable would be conditional on compliance with a series of legal or infra-legal provisions relating to social, environmental and climate issues. The list of impediments of this nature provided for in the MCR has expanded considerably since the proposal was announced. Currently, the definition of sustainable activities must be in line with the impediments provided for in the "Social, Environmental and Climate Impediments" chapter of the MCR (2-9), created by BCB Resolution no. 140/2021 and whose most current version includes the requirements of CMN Resolution no. 5081/2023. The resolution indicates not only the requirements for rural properties associated with rural credit operations, but also which databases can be consulted for verification and monitoring. Following this resolution, the MCR was updated to prevent the granting of rural credit to enterprises located on rural properties that are:

- With suspended or canceled Rural Environmental Registry (*Cadastro Ambiental Rural* - CAR);
- Overlapping with a protected area;
- Overlapping with Indigenous Lands;
- Overlapping with *quilombola* community lands;
- Where there is a federal or state embargo on the economic use of illegally deforested areas;

94 Fields reported: sub-program, production systems (type of crop, type of integration/consortium, type of cultivation/farming, type of irrigation), modality, product financed and variety.

- Overlapping with Type B Public Forests (undesignated); and
- The borrower cannot appear on the register of employers who have kept workers in conditions analogous to slavery.[95]

The proposed standard presented for public consultation is restricted to identifying fields in SICOR in which information can be identified about the operation's alignment with sustainable practices. However, it does not specify a list of Annex criteria that would need to be met for a given operation to be classified as sustainable. Nor does the proposal determine an objective, benefit or use for sustainable operations, either for the financial institution or for the rural credit borrower.[96] The public consultation did not result in an actual regulation, nor is there any expectation of publishing a standard along these lines. The criteria included in the public consultation document are presented in **Table 10**.

Environmentally Sustainable Productive Systems (SPAS) and the Brazilian Agricultural Plan (MAPA)

The Secretariat for Agricultural Policy (*Secretaria de Política Agrícola* - SPA) is responsible for conducting the Brazilian Agricultural Plan at MAPA, and the preparation of studies and diagnoses is one of its competencies (Decree no. 11,332/2023). In the last three harvests, the SPA has released a series of publications entitled "Environmentally Sustainable Productive Systems (*Sistemas Produtivos Ambientalmente Sustentáveis* - SPAS)", which aims to analyze the volume of rural credit financing for sustainable systems based on the Rural Credit Data Matrix (*Matriz de Dados do Crédito Rural* - MDCR) (MAPA 2022).[97]

The Secretariat defines SPAS as productive systems that generate benefits such as:

- Increased productivity (land-saving effect)
- Reducing greenhouse gas emissions
- Prevention and recovery of losses in agricultural production
- Rationalization of the use of natural resources and inputs
- Soil recovery and conservation
- Improving the quality and health of agricultural production
- Treatment of manure and crop waste
- Reforestation and restoration of native vegetation
- Clean energy generation on farms (MAPA 2022)

The SPAS use a broader definition of sustainability, which goes beyond ABC+ practices, climate issues and forest protection, but does not explicitly include social issues. In its publications, SPA/MAPA identifies rural credit operations granted on the basis of the SPAS

95 List provided by the Ministry of Labor and Employment (*Ministério do Trabalho e Emprego* - MTE) (MTE 2023).
96 Recently, the announcement of the 2023/24 Brazilian Agricultural Plan provided for a 0.5 percentage point discount on the interest rate for credit operations that prove the use of sustainable practices (MAPA 2023c). Although this is a possible way of using the definition of criteria, based on the SICOR fields, to identify such practices, the announcement has not yet become a de facto regulation.
97 The data collected refers to rural credit granted for working capital and investment purposes.

using the criteria below, presented separately according to the purpose of the credit.[98] These criteria are detailed in **Table 10**:[99]

Investment purpose

i. **Lines of support for low-carbon crops**:

- RENOVAGRO (ABC+ Program)
- PRONAF: Forest (ABC+), Agroecology (ABC+), Semiarid (ABC+) and Bioeconomy (ABC+) sub-programs

ii. **Lines of support for sustainable practices**:

- Program for Financing Irrigated Crops and Protected Cultivation (*Programa de Financiamento à Agricultura Irrigada e ao Cultivo Protegido* - PROIRRIGA)
- Program for Modernization of Agriculture and Conservation of Natural Resources (*Programa de Modernização da Agricultura e Conservação de Recursos Naturais* - MODERAGRO): Soil Recovery subprogram
- Program for the Modernization of Agricultural Tractors and Related Accessories and Harvesters (*Programa de Modernização da Frota de Tratores Agrícolas e Implementos Associados e Colheitadeiras* - MODERFROTA)
- Program to Encourage Technological Innovation in Agricultural Production (*Programa de Incentivo à Inovação Tecnológica na Produção Agropecuária* - INOVAGRO)
- Program for the Construction and Expansion of Warehouses (*Programa para Construção e Ampliação de Armazéns* - PCA)
- Fund for the Defense of the Coffee Industry (*Fundo de Defesa da Economia Cafeeira* - FUNCAFÉ): subprogram Recovery of Damaged Coffee Plantations

Investment and working capital purposes

iii. **Other environmentally sustainable contracts** : products that could have been financed through the lines mentioned in categories i and ii. These products are selected from the list of products registered in SICOR, based on their greater affinity with the programs/ sub-programs indicated in categories i and ii.

The selection of the lines of support for low-carbon agriculture is aligned with climate criteria, as they are lines established with the aim of supporting the agriculture sector in achieving the climate targets of the NDCs. However, for the other two selection criteria (ii and iii), there is no specification of what the benefits would be from the list of SPAS generated by contracting rural credit.

With regard to point ii, it is important to note that not all of the programs listed were designed to promote environmental sustainability. For example, PROIRRIGA includes funding for items inherent to irrigation systems in general, without considering whether the practice of irrigation contributes to efforts to mitigate or adapt to the climate/maintain carbon stocks or whether the use of irrigation generates negative effects on water availability. Even for

98 Rural credit has four purposes: working capital, investment, industrialization and commercialization.
99 Survey based on the most recent version of the publication (MAPA 2022).

programs such as MODERFROTA and PCA, although they may generate positive effects from an environmental point of view, there is no *a priori* guarantee that this will be the case, since they are not programs designed specifically for this purpose.

Furthermore, even though operations associated with sustainable practices can be financed from credit lines that do not explicitly have this purpose, there are some risks in adopting this affinity criteria based on products. The criteria used by SPAS considers fixed parameters to measure this affinity. Consider the example of crops such as soybeans and corn: according to this criteria, 78.9% of all rural credit contracts for these products are considered SPAS due to their affinity with the ABC - Direct Planting subprogram.[100] This parameter is calculated based on the ratio between the no-till area of 33.1 million hectares (surveyed in IBGE's 2017 Agricultural Census) and the total agricultural planting area of 41.9 million hectares.[101] This parameter is the same for all years, which means that, for each harvest analyzed, more than three quarters of all credit operations for these products will always be considered sustainable for the SPAS methodology.

It's worth noting that these products account for a very significant part of rural credit in Brazil. To give you an idea, costing and investment financing for soybeans and corn represent 27% of the total value of rural credit granted in the 2022/23 harvest.[102] In addition, the same products within RENOVAGRO contracts, former ABC+ Program, for example, must be produced according to a series of criteria that must be included in a technical project, something that will not necessarily be demanded in other lines of financing.

Carbon + Green Program (MAPA)

The National Program for Decarbonized Agriculture Chains (Carbon + Green Program) is run by MAPA's Secretariat for Innovation, Sustainable Development, Irrigation and Cooperatives (*Secretaria de Inovação, Desenvolvimento Sustentável, Irrigação e Cooperativismo* - SDI). The program presents guidelines, orientations, concepts, requirements, and criteria for granting the Carbon + Green Seal. The seal is a voluntary certification which, through a conformity assessment, establishes criteria for the production and marketing of carbon credits for primary agricultural products (food, grains, fibers, and energy). The program is aimed at products that use systems or technologies that are scientifically recognized and validated as mitigating and reducing their GHG emissions.

The program's main objectives are to promote sustainability in the agriculture sector, ensure competitiveness and facilitate access for certified products to national and global markets, and provide guidance to the market on the subject. In its first cycle, it will prioritize 13 production chains: açaí, cotton, rice, rubber, cocoa, coffee, beef cattle, yerba mate, milk, corn, soy, wheat and grapes (MAPA 2023b).

100 The products considered to be related to the "ABC - Direct Planting" subprogram are: cotton, peanuts, rice, oats, ryegrass, canola, rye, barley, beans, sunflower, millet, corn, soybeans, sorghum, wheat, buckwheat, and triticale.

101 The figure only considered first-crop crops, since second and third crops and winter crops, which total around 19.7 million hectares, are planted in first-crop areas.

102 The amount of rural credit earmarked for working capital (and investment) purposes for corn and soybeans increased from 24.7% in the 2015/16 harvest to 26.9% in the 2022/23 harvest.

The development of this initiative is participatory. The criteria for assessing compliance, qualification and eligibility must take into account the production systems and low carbon emission technologies of the ABC+ Plan, as well as the peculiarities of each agricultural production chain included in the initiative. These criteria and the management tools for monitoring and evaluating the program will be established by MAPA based on three dimensions:

- Environmental
- Transparency
- Social and labor

In 2023, MAPA held a public consultation to receive contributions from society for the Carbon + Green Program. However, no additional information on the operationalization of the program has yet been published (MAPA 2023a). To come into force, it is necessary to publish regulations that formally establish it.

Despite covering a similar scope to the Brazilian Sustainable Taxonomy, including environmental, economic and social aspects, the program was not explicitly mentioned in the Taxonomy Action Plan. It is important that the certification provided by the program is in line with future taxonomy criteria.

Green Seal and Amazon Seal Programs (MDIC)

In 2023, the federal government, through the MDIC, released proposals to establish certification programs for Brazilian products and services with a focus on environmental and social sustainability: (i) the Green Seal Program; and (ii) the Amazon Seal Program. The proposed decrees establishing the initiatives were put out for public consultation by the MDIC's Secretariat for Green Economy, Decarbonization and Bioindustry. To come into force, it is necessary to publish a normative act establishing the program.

The two programs establish voluntary certification seals with the aim of promoting environmental sustainability, ensuring competitiveness and facilitating access for certified products to the national and global markets.

The Green Seal Program aims to "establish and develop a national certification strategy for the recognition of Brazilian products and services that are proven to have a socio-environmentally responsible life cycle and that meet the sustainability requirements demanded by the main global markets" (MDIC 2023a, as translated by the authors). According to the MDIC, the program aims to unify and harmonize, in the Green Seal certification, the proof that Brazilian exporters comply with environmental norms, standards and regulations of the main international markets. The program aims to act as a "passport to export", simplifying the process for Brazilian exporters, who would now have the Green Seal Brazil, a voluntary third-party certification.

The Amazon Seal Program aims to develop a national standardization and conformity assessment strategy for the recognition and promotion of bioproducts and services from the Legal Amazon produced or provided in a socio-economically and environmentally sustainable manner (MDIC 2023b). This program will also establish voluntary third-party certification. This program will also have the function of contributing to the development of criteria and minimum requirements for the technical standardization of bioproducts and services from the Amazon.

The development of each of the programs will be participatory. Each program will have a management committee, made up of public and private institutions, to support the development of Brazilian technical standard criteria for certifying the products and services under consideration. The companies certifying the Green Seal and the Amazon Seal must be accredited by the National Institute of Metrology, Quality and Technology (*Instituto Nacional de Metrologia, Qualidade e Tecnologia* - INMETRO) and follow the technical standards set for the seals by the Brazilian Association of Technical Standards (*Associação Brasileira de Normas Técnicas* - ABNT).

The public consultations to submit contributions to the text of the decree to establish the programs were closed in December 2023 and, according to the MDIC, the criteria should be established in 2024 (MDIC 2023c). In the draft decrees, there is no explicit mention of the Brazilian Sustainable Taxonomy, nor does the action plan mention these two initiatives. It is important that these certifications are also in line with the future taxonomy criteria.

Case Study: Rural Credit

Methodology

Based on the taxonomies and other initiatives for classifying land use activities according to sustainability criteria, the aim of this section is to carry out a case study for aligning financial flows with the analyzed initiatives. The idea is to test what happens when applying different classifications to real data on financing for the agriculture sector, in order to understand the sensitivity of using one framework over another. To do this, a specific set of these initiatives is applied to rural credit, the main agriculture policy in Brazil.

The rural credit instrument finances rural producers (individuals or companies) and their cooperatives, under the conditions established annually in the BCB's MCR. All credit operations are registered in the BCB's SICOR. This makes it possible to access information on the value of credit operations contracted with financial institutions. The study uses SICOR as a reference for the period from July 2015 to June 2023, in order to capture information for the 2015/16 to 2022/23 agricultural years, considering that rural credit policy is defined for each agricultural year.[103]

This paper develops a methodology to quantify and compare the amount of rural credit that has sustainability components for agriculture and land use, according to different classifications. For this analysis, only taxonomies and other initiatives with specific criteria applicable to rural credit in Brazil were considered:

- BCB Public Consultation no. 82/2021 - sustainability criteria applicable when granting rural credit (BCB 2021a)
- Criteria for crop of the Climate Bonds Taxonomy, based on the CBI-MAPA study, considering only 100% aligned practices (CBI 2022)
- SPAS of the Brazilian Agicultural Plan (MAPA 2022)
- FEBRABAN Green Taxonomy - federal financing lines and programs for sustainable crop (FEBRABAN 2021)
- SPS_{ABC} - ABC+ Plan Technologies (MAPA 2023d)

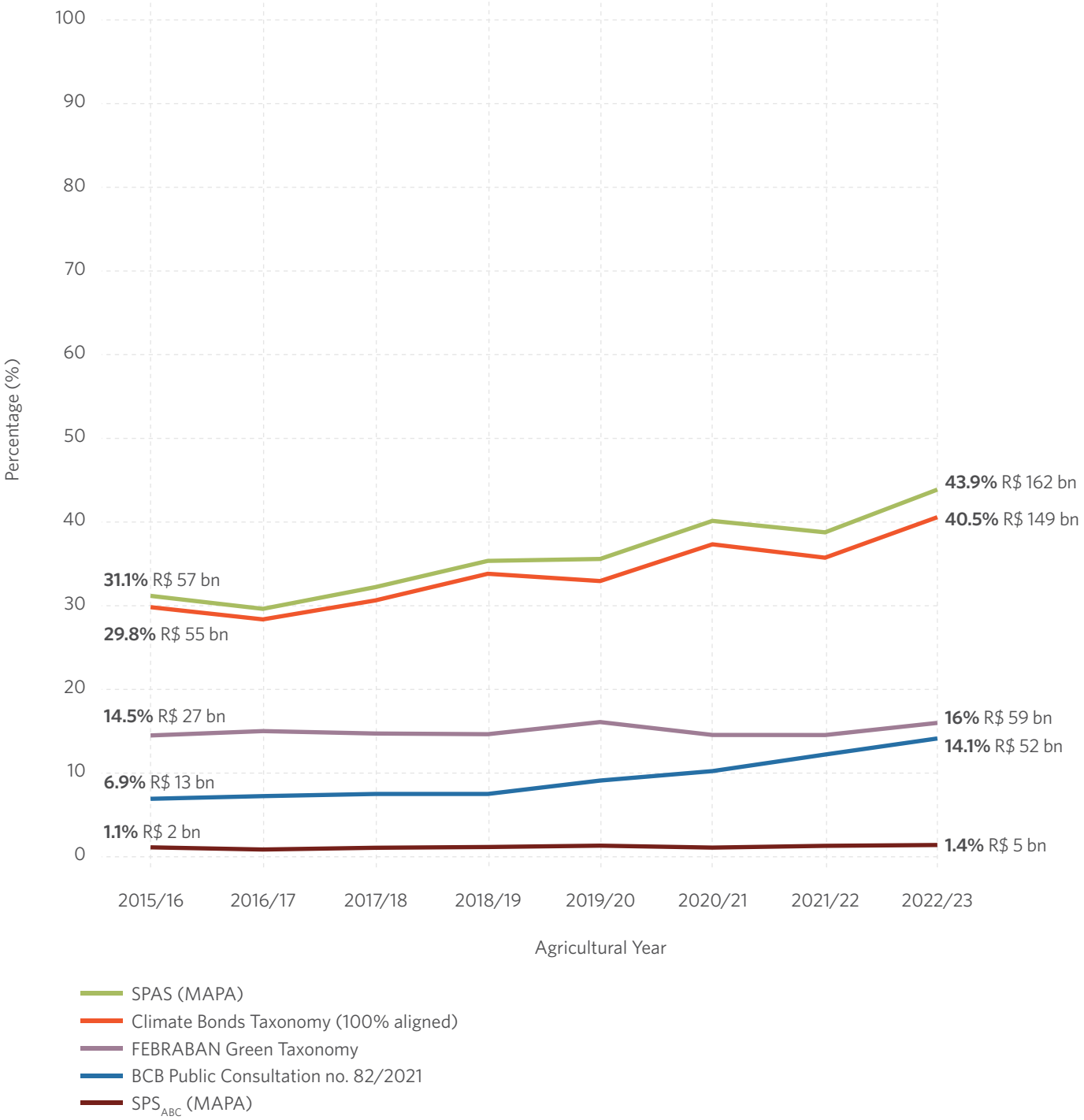
103 SICOR has contained information since 2013, but the subprogram field wasn't filled in completely until the 2015/16 harvest. For this reason, the first two agricultural years were not included in the study.

Table 10 presents a detailed list of the criteria used to define which rural credit lines are considered to be aligned with sustainable objectives, according to the definition of each of the five initiatives analyzed. The criteria are divided into the following SICOR fields: Program/Subprogram, Product, Type of Irrigation, Type of Cultivation, Modality, Purpose, Type of Crop, Type of Integration/Consortium, and Variety. The application of each list of criteria in SICOR generates credit amounts in line with the sustainability objectives declared by each initiative in the 2015/2016 to 2022/2023 historical series. These amounts were adjusted by the Extended National Consumer Price Index (*Índice Nacional de Preços ao Consumidor Amplo* - IPCA), with July 2023 as the reference.

Results

The volume of rural credit in Brazil channeled to sustainable activities depends on the definition of sustainability used and the criteria adopted to classify such activities. **Figure 2** shows how much credit released in each agricultural year could be classified as sustainable, according to each of the initiatives listed above. It can be seen that there is a wide variation between each initiative. Based on the most recent agricultural year analyzed (2022/23), the values vary from 1% (considering only the subprograms explicitly associated with the SPS_{ABC}) to 44% (considering MAPA's SPAS).

Figure 2. Proportion of the Amount of Rural Credit Released in Line with Different Definitions of Sustainability in Relation to the Total Amount of Rural Credit Released by Agricultural Year, 2015/16 to 2022/23



Note: *Absolute values are in R$ billion at July 2023 prices. With regard to the criteria of the BCB Public Consultation no. 82/2021, the increase observed in the series from 2019/2020 onwards is mainly due to credit operations that started reporting "Direct Planting" in the "Type of Crop" field and "Minimum Cultivation" in the "Type of Cultivation" field in SICOR.*

Source: *CPI/PUC-Rio with data from BCB (2021a); MAPA (2022); FEBRABAN (2021); CBI (2022) and MAPA (2023d) and data from SICOR/BCB, 2024*

Another important fact observed in the graph is the increase in the proportion of operations in activities considered sustainable in the period, according to at least three of the mapped initiatives: MAPA's SPAS, activities 100% aligned with the Climate Bonds Taxonomy and the BCB Public Consultation no. 82/2021 criteria. This increase has been particularly significant

since 2019/20, a period in which there has been a major expansion of rural credit policy in Brazil. Total financing went from R$173.19 billion in the 2018/19 agricultural year to R$ 358.67 billion in the 2022/23 agricultural year. This means an increase of 64% in real terms (discounting inflation for the period). The amounts aligned with MAPA's SPAS, the Climate Bonds Taxonomy and the BCB Public Consultation no. 82/2021 saw real increases of 103%, 96% and 209% respectively in the period. In other words, they increased more than proportionally in relation to total credit granted.

In the case of the SPAS classification (MAPA 2022), the increase observed in the period is due to contracts classified as sustainable based on products with an affinity to one of the ABC+ Plan's subprograms. In particular, there was a significant increase in soybean costing contracts in the period. As the SPAS methodology adopts a fixed parameter to consider the percentage of soybean operations associated with no-till farming, the increase in soybean contracts in the period considerably increased the percentage of credit aligned with this definition of sustainability. There was also considerable growth in products such as corn and wheat, as well as equipment and implements such as harvesters, starters, tractors and practices such as intensive soil correction. The CBI's classification follows criteria very close to those of the SPAS, which explains the similar behavior.[104]

In the case of the BCB's criteria, the increase observed in the series from 2019/20 onwards is essentially due to the fact that a significant and growing portion of credit operations began to report "Direct Planting" in the "Type of Crop" field in SICOR, in addition to a smaller volume of operations that began to report "Minimum Cultivation" in the "Type of Cultivation" field.

In summary, the exercise shows how the criteria defined by different initiatives can generate very different results, reflecting more or less conservative ways of understanding which financing can be considered sustainable. The most conservative exercise, which only considers programs and subprograms explicitly related to the transition to the use of ABC+ practices, leaves out all the costing contracts that may be adopting such practices, without necessarily having a linked investment contract. On the other hand, the more flexible SPAS exercise makes some strong assumptions about what can be considered sustainable, as is the case with products such as soybeans.

The case of no-till farming exemplifies the need for a careful definition of what will be considered sustainable, or whether this classification will take into account the different stages of implementation, according to the capacity to reduce or remove carbon emissions. Although no-till farming has recognized benefits for the climate issue, the SPD considered by the ABC+ Plan brings together various techniques that need to be implemented simultaneously.

In addition, it is necessary to evaluate possible negative externalities generated by this form of soybean planting on other environmental issues (not necessarily climate), such as the use of glyphosate and possible negative impacts on water quality (Dias, Rocha and Soares 2023). This could violate the DNSH principle mentioned in the Brazilian Sustainable Taxonomy Action Plan.

104 If operations that are 100% aligned with CBI's taxonomy and operations that are partially aligned are taken into consideration, the figure is very close to that of the SPAS. There remains a small difference explained by two subprograms of the ABC+ Program considered by the SPAS, but not considered by CBI, namely financing with resources from the constitutional funds and financing with resources from rural savings.

Table 10. Criteria Used by each Initiative to Align Rural Credit with Sustainability

Programs and Subprograms		Initiatives					
		BCB Public Consultation no. 82/2021	SPS_{ABC} (MAPA)	SPAS (MAPA)	Climate Bonds[3] Taxonomy		FEBRABAN Green Taxonomy
					100%	Partial	
ABC+ [2]							
	ABC + Environmental	✓	✓	✓	✓		✓
	ABC + Bio-fertilizers		✓	✓	✓		
	ABC + Palm Oil	✓	✓	✓	✓		✓
	ABC + Biological Nitrogen Fixation [1]	✓	✓	✓	✓		✓
	ABC + Forest	✓	✓	✓		✓	✓
	ABC + Integration	✓	✓	✓	✓		✓
	ABC + Waste Management	✓	✓	✓	✓		✓
	ABC + Soil Management		✓	✓	✓		
	ABC + Organic	✓	✓	✓	✓		✓
	ABC + No-tillage System	✓	✓	✓	✓		✓
	ABC + Recovery	✓	✓	✓	✓		✓
	Açaí, Cocoa, Olive, Walnut [1]		✓	✓	✓		✓
FUNCAFÉ							
	Recovering damaged coffee plantations			✓*	✓*		
INOVAGRO				✓		✓	✓
MODERAGRO							
	Soil recovery	✓		✓	✓		✓
MODERFROTA				✓	✓		
PCA				✓		✓	
PROIRRIGA				✓	✓		

Legend:

[1] Subprogram closed in agricultural year 2022/23

[2] Includes operations with resources from Constitutional Funds for Rural Financing and Savings

[3] The definitions of the "100% aligned" and "partially aligned" categories are described in Table 3

✓ Considered sustainable by the initiative

Not considered sustainable by the initiative

* This criteria takes into account the purposes of rural credit: working capital and investment.

Table 10 continues on the next page.

Programs and Subprograms		Initiatives					
		BCB Public Consultation no. 82/2021	SPS_{ABC} (MAPA)	SPAS (MAPA)	Climate Bonds[3] Taxonomy		FEBRABAN Green Taxonomy
					100%	Partial	
PRONAF							
	PRONAF ABC+ Agroecology	✓	✓	✓		✓	✓
	PRONAF ABC+ Bioeconomy	✓	✓	✓		✓	✓
	PRONAF ABC+ Forest	✓	✓	✓		✓	✓
	PRONAF ABC+ Semiarid		✓	✓	✓		✓
	PRONAF Agroindustry						✓
	PRONAF Quota Shares						✓
	PRONAF Working Capital						✓
	PRONAF Youth						✓
	PRONAF More Food						✓
	PRONAF Rural Productive Microcredit						✓
	PRONAF Women						✓
	PRONAF Productive Oriented						✓
	PRONAF Agrarian Reform						✓
	PRONAF Agrarian Reform Beneficiaries PNCF, PNRA, PCRF						✓

Table 10 continues on the next page.

Legend:

✓ Considered sustainable by the initiative

Not considered sustainable by the initiative

[3] The definitions of the "100% aligned" and "partially aligned" categories are described in Table 3.

Products	Initiatives					
	BCB Public Consultation no. 82/2021	SPS_{ABC} (MAPA)	SPAS (MAPA)	Climate Bonds[3] Taxonomy		FEBRABAN Green Taxonomy
				100%	Partial	
Black acacia	○	○	✓★	○	✓★	○
Açaí	✓*	○	✓★	✓★	○	○
Environmental sustainability and renewable energy actions	✓★	○	○	○	○	○
Intensive soil fertilization	✓★	○	✓★	✓★	○	○
Organic/mineral fertilization, liming, inert substrates (stone, sand, vermiculite, silt, clay, etc.)	✓★	○	✓★	✓★	○	○
Cotton	○	○	✓★	✓★	○	○
Peanuts	○	○	✓★	✓★	○	○
Andiroba	✓*	○	○	○	○	○
Purchase of topographical equipment(s)	○	○	✓★	○	✓★	○
Purchase of computer and telecommunications equipment, including software	○	○	✓★	○	✓★	○
Acquisition of cattle and buffalo traceability systems	✓★	○	✓★	○	✓★	○
Warehouse, storage, silo, shed, storeroom, greenhouse and similar installations	○	○	✓★	○	✓★	○
Rice	○	○	✓★	✓★	○	○
Rice Oats	○	○	✓★	✓★	○	○
Bluegrass	○	○	✓★	✓★	○	○
Biodigester, manure plant, biological oxidation tanks, and water and sewage treatment	✓★	○	✓★	✓★	○	○
Cocoa	✓*	○	✓★	✓★	○	○
Sugarcane	✓*★	○	○	○	○	○
Canola	○	○	✓★	✓★	○	○
Grass	✓★	○	✓★	✓★	○	○
Brazil nut	✓*	○	○	○	○	○
Cedar	✓*	○	✓★	○	✓★	○
Rye	○	○	✓★	✓★	○	○

Table 10 continues on the next page.

Legend:

✓ Considered sustainable by the initiative

○ Not considered sustainable by the initiative

* Only for perennial crops

★ This criteria takes into account the purposes of rural credit: working capital, investment and industrialization.

★ This criteria takes into account the purposes of rural credit: working capital and investment

[3] The definitions of the "100% aligned" and "partially aligned" categories are described in Table 3.

Products	Initiatives					
	BCB Public Consultation no. 82/2021	SPS_{ABC} (MAPA)	SPAS (MAPA)	Climate Bonds[3] Taxonomy		FEBRABAN Green Taxonomy
				100%	Partial	
Barley	○	○	✓★	✓★	○	○
Citronela (*cymbopogon nardus*)	✓★	○	○	○	○	○
Soil covers (plastic, TNT, fabrics, sawdust, grass and grain straw, etc.)	○	○	✓★	✓★	○	○
Harvesters, harvesters and grubbers	○	○	✓★	✓★	○	○
Construction/recovery of dams/tanks, water collection systems	✓★	○	○	○	○	○
Intensive soil correction	✓★	○	✓★	✓★	○	○
Cultivator	○	○	✓★	✓★	○	○
Cupuaçu	✓★	○	○	○	○	○
Dendê	✓★	○	✓★	✓★	○	○
Equipment and tools for precision crop	✓★	○	✓★	○	✓★	○
Yerba mate	✓★	○	○	○	○	○
Greenhouses/nurseries (artificial lighting, seedlings, seeds, bags, trays, pots)	✓★	○	○	○	○	○
Eucalyptus	○	○	✓★	○	✓★	○
Beans	○	○	✓★	✓★		○
Afforestation - cultural treatments	○	○	✓★	○	✓★	○
Afforestation and reforestation	○	○	✓★	○	✓★	○
Sunflower	○	○	✓★	✓★	○	○
Implementation of renewable energy technologies, environmental and small hydropower applications	✓★	○	✓★	✓★	○	○
Irrigation	○	○	✓★	✓★	○	○
Irrigation/leaching (dripper, sprinkler, nebulizer, exhaust, fan, hoses, channels, etc.)	○	○	✓★	✓★	○	○
Jatobá	✓★	○	○	○	○	○
Wood	✓★★	○	✓★	○	✓★	○
Machines and implements	○	○	✓★	✓★	○	○
Millet	○	○	✓★	✓★	○	○

Legend:

✓ Considered sustainable by the initiative

○ Not considered sustainable by the initiative

★ Only for perennial crops

★ This criteria takes into account the purposes of rural credit: working capital, investment and industrialization.

★ This criteria takes into account the purposes of rural credit: working capital and investment.

[3] The definitions of the "100% aligned" and "partially aligned" categories are described in Table 3.

Table 10 continues on the next page.

Products	Initiatives					
	BCB Public Consultation no. 82/2021	SPS_{ABC} (MAPA)	SPAS (MAPA)	Climate Bonds[3] Taxonomy		FEBRABAN Green Taxonomy
				100%	Partial	
Corn	○	○	✓★	✓★	○	○
Walnut	✓★	○	✓★	✓★	○	○
Olives	✓★	○	✓★	✓★	○	○
Pasture	✓★	○	✓★	✓★	○	○
Pine	○	○	✓★	○	✓★	○
Soil protection	○	○	✓★	✓★	○	○
Recovery of coffee plantations	○	○	✓★	✓★	○	○
Rubber trees	✓★★	○	✓★	○	✓★	○
Water collection, retention and utilization systems	✓★	○	○	○	○	○
Soybean	○	○	✓★	✓★	○	○
Sorghum	○	○	✓★	✓★	○	○
Taperebá	✓★	○	○	○	○	○
Tractor	○	○	✓★	✓★	○	○
Wheat	○	○	✓★	✓★	○	○
Buckwheat	○	○	✓★	✓★	○	○
Triticale	○	○	✓★	✓★	○	○
Unmanned aerial vehicle (drone)	○	○	✓★	○	✓★	○

Table 10 continues on the next page.

Legend:

- ✓ Considered sustainable by the initiative
- ○ Not considered sustainable by the initiative
- ★ Only for perennial crop formation
- ★ This criteria takes into account the purposes of rural credit: working capital, investment and industrialization.
- ★ This criteria takes into account the purposes of rural credit: working capital and investment.
- [3] The definitions of the "100% aligned" and "partially aligned" categories are described in Table 3.

Variable	Initiatives					
	Public consultation no. 82/2021 of the BCB	SPS_{ABC} (MAPA)	SPAS (MAPA)	CBI[3] Taxonomy		Green Taxonomy Febraban
				100%	Partial	
Irrigation						
Drip	✓	○	○	○	○	○
Type of cultivation						
Minimum cultivation	✓	○	○	○	○	○
Protected cultivation	✓	○	○	○	○	○
Modality						
Afforestation and reforestation (except "afforestation - cultural treatments")	✓	○	○	○	○	○
Type of crop						
Agroecological	✓	○	○	○	○	○
Organic	✓	○	○	○	○	○
Direct planting	✓	○	○	○	○	○
Variety						
Alcohol for fuel purposes	✓	○	○	○	○	○
Protected cultivation	✓	○	○	○	○	○
Environmental recovery	✓	○	○	○	○	○
Type of Integration/Consortium						
Crop-forest integration	✓	○	○	○	○	○
Crop-cattle integration	✓	○	○	○	○	○
Crop-Cattle-Forest Integration/ Agro-Silvo-Pastoral System	✓	○	○	○	○	○
Cattle-Forest Integration	✓	○	○	○	○	○
Agroforestry Systems	✓	○	○	○	○	○

Legend:

✓ Considered sustainable by the initiative

○ Not considered sustainable by the initiative

[3] The definitions of the "100% aligned" and "partially aligned" categories are described in Table 3.

Source: *CPI/PUC-Rio with data from BCB (2021a); MAPA (2022); FEBRABAN (2021); CBI (2022), and MAPA (2023d), 2024*

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