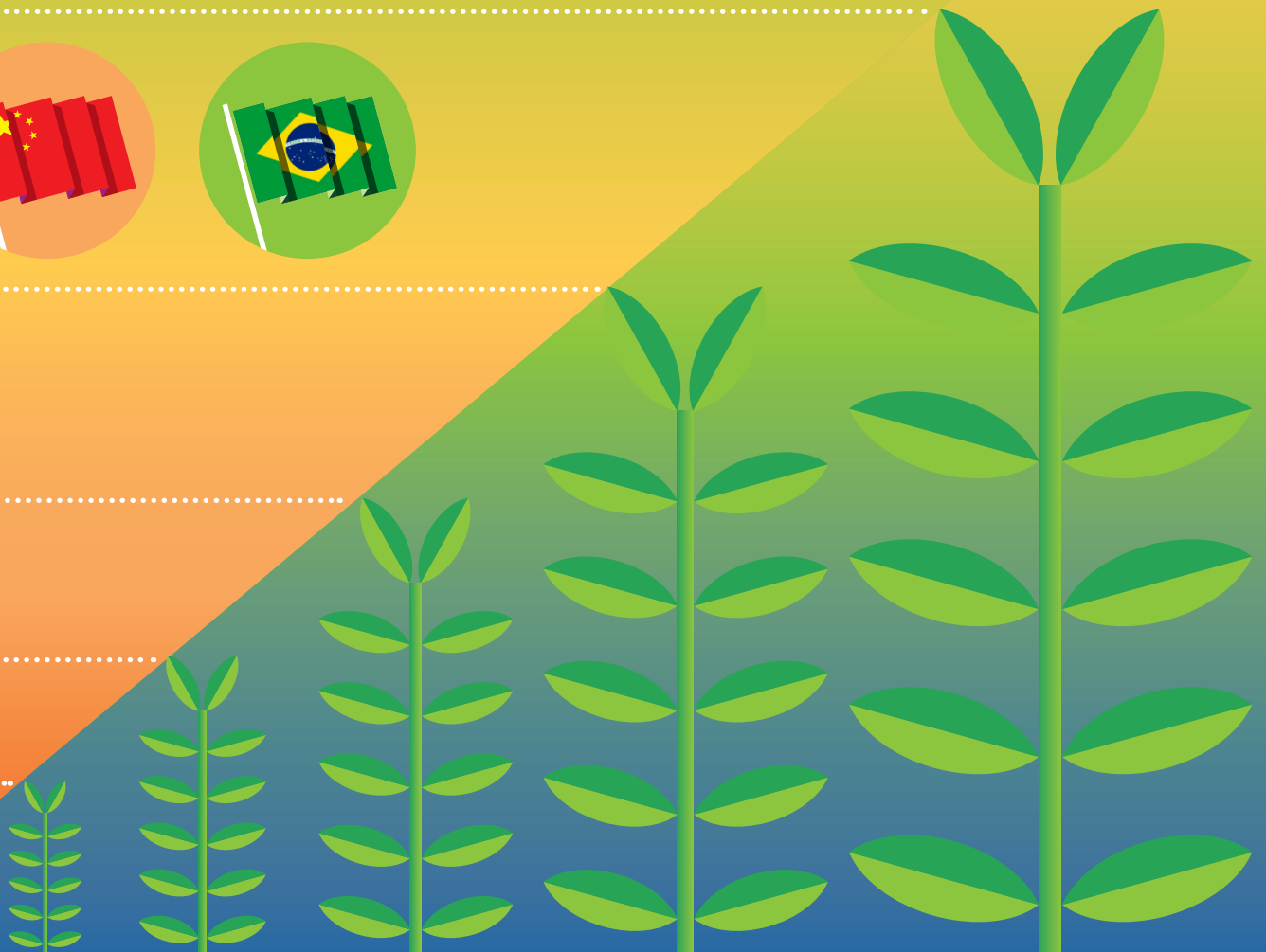


Comparison study of Chinese and Brazilian Agriculture Criteria

Harmonising green
standards in the
agricultural sector



1. Report summary

Contents

1. Report summary	2
2. Green agriculture in China and Brazil	3
Chinese and Brazilian low-carbon and green agricultural trade	3
Chinese and Brazilian low-carbon agricultural policies	4
Chinese and Brazilian green finance markets	6
3. Criteria for green agriculture	7
Motivation for developing harmonised criteria for green agriculture	7
Overview of green agriculture criteria	7
Comparison of green agriculture activities in China and Brazil	7
4. Policy Recommendations	8
Guidance for Brazil's green agriculture criteria development	8
Recommendations for China-Brazil harmonised green standards in agriculture	8
Appendix	10
Endnotes	15

The purpose of this report is to cross reference agriculture standards and taxonomy requirements between China and Brazil, highlight best practice, and suggest policy and market measures to scale sustainable agriculture finance.

China and Brazil are among the world's top five producers and exporters of agricultural products with a significant portion of their population working in agriculture.¹ The two countries have developed a robust collaborative relationship including strategic partnerships in agricultural trade, with Brazil being a major exporter of agricultural products to China.

Agriculture contributes about 30% of greenhouse gases (GHG) emissions, which is one of the primary contributors, and remains highly vulnerable to climate-related risks.² Given the economic importance of agriculture in both countries, China and Brazil have prioritised agriculture in the creation of policies to support sustainable development.

Key messages:

- 1.** The information presented in this report can inform the design of the Brazilian taxonomy, with particular emphasis on agriculture, elements of which could be modelled on the Chinese taxonomy.
- 2.** Simultaneously, it provides a foundation on which both China and Brazil could collaborate on a harmonised taxonomy for green agriculture in the future. This shared taxonomy would scale green financial flows between both markets and build a common understanding of the benefits of purchasing from sustainable production chains.
- 3.** Using the China-Brazil collaboration in green agriculture, this study also seeks to bolster connectivity across international taxonomies for green agriculture.

2. Green agriculture in China and Brazil

China has maintained its position as the primary importer of Brazilian agricultural products for several consecutive years, and the collaboration between the two nations in the agricultural sector continues to intensify. In 2022, the value of Brazil's agricultural exports to China reached USD50.8bn,³ and mainly included soy products, meat, forest products, sugar and alcohol, fibers and textiles. Soybeans and beef as the most traded commodities, are also closely associated with Brazil's agricultural emissions.

In the context of global trade, agricultural activities linking producing and consuming nations present a common challenge: the need to optimise the use of agricultural resources and advance supply chain sustainability. This challenge has emerged as a central focus of collaboration between China and Brazil in their efforts to establish a sustainable green agriculture supply chain. Through their partnership, China and Brazil aim to accelerate the development of green agricultural technologies and promote eco-friendly agricultural products, thereby making a valuable contribution to global initiatives to address climate change.

Brazil-China Joint Statement on combatting climate change

In April 2023, Presidents Xi Jinping and Lula da Silva collaborated on a Joint Statement on combatting climate change (Statement) acknowledging the severity of climate change and the urgent need to address it through action.¹² The Statement stressed the need to combine urgent climate response with nature conservation to achieve the Sustainable Development Goals (SDGs) including the eradication of poverty and hunger while leaving no one behind. The two countries also reiterated their commitment to promote policy dialogues and sharing on climate investment and finance.



Agricultural GHG emissions in China and Brazil

	Share of global GHG emissions	Agri-food share of national GHG emissions	Agri-food share of global GHG emissions
China	31%	14%	4%
Brazil	3%	75%	2%

Chinese and Brazilian low-carbon and green agricultural trade

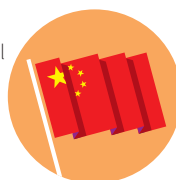
China-Brazil agricultural trade partnership

The 30-year strategic partnership and the deepening economic and trade collaboration between China and Brazil have laid a solid foundation for fostering green agricultural trade. In 2022, China and Brazil published two documents on intergovernmental collaboration, the China-Brazil Strategic Plan 2022-2031 and the China-Brazil Implementation Plan 2022-2026.⁴ These documents explicitly outlined the commitment to collaborate on boosting the trade of agricultural products and investing in low-carbon and clean technologies. In 2023, Brazil's President Lula da Silva of Brazil made a state visit to China, leading to the establishment of several collaborative agreements between the two nations. Among these agreements was a pivotal accord that enabled the use of local currencies in bilateral trade and financing activities.⁵ The visit also saw the release of a joint statement on deepening the comprehensive strategic partnership and the Brazil-China joint statement on combatting climate change (see box). Collectively, these have established a robust strategic framework for advancing green agricultural trade and investment.



China

As both a major producer and consumer of agricultural products, China places a strong emphasis on agricultural development and food security. It produces approximately 25% of the world's grain supply on less than 9% of global farmland, which means that on an annual grain planting area of 118.33m ha, 686.53m tonnes of grain are produced in 2022. By 2032, China's grain output is expected to reach 767 million tons with average annual growth of 1.2%.⁶ The total agricultural output in 2022 reached RMB8,443.9bn (USD1,158bn), and China's total import and export of agricultural products reached USD334.32bn^{7,8}.



Brazil

Brazil is the largest exporter of beef, poultry, soybeans, coffee, orange juice, sugar, and corn. In 2022, the agricultural sector contributed 25% to Brazil's Gross



Domestic Product (GDP). Since the 1950s, Brazil has transformed from a food importer to a major food supplier. As global demand for food and agricultural products grows, Brazil will play an increasingly important role in meeting such demand.⁹

Since 2009, China has been the largest importer of agricultural products from Brazil. In 2022, bilateral trade between China and Brazil amounted to USD171.49bn, of which USD50.8bn accounted for agricultural products imported by China from Brazil a 43% increase compared to the previous year.¹⁰ Rising food standards, driven by China's growing middle class, are expected to continue fostering the growth of agricultural trade between the two nations.¹¹ This underscores the strategic importance of maintaining sustainability within the supply chain.

According to Faostat, livestock enteric fermentation, synthetic fertilisers, and crop residues are all significant sources of agricultural emissions in the two countries but the proportions differ.

Although Brazil's global GHG emissions constitute only 3%, agriculture, forestry, and other land use (AFOLU) account for a substantial 63% of those. Deforestation, in addition to increasing GHG emissions and harming biodiversity, poses a direct threat to food security and results in notable economic losses. Studies indicate that an increase in soybean cultivation and cattle breeding in the Amazon region could trigger reduced rainfall in Brazil's soy belt, impacting the country's soybean production. These economic losses could reach approximately 10%, equivalent to USD700m annually. In the context of agricultural trade between China and Brazil, deforestation is one of the most pressing climate change risks.

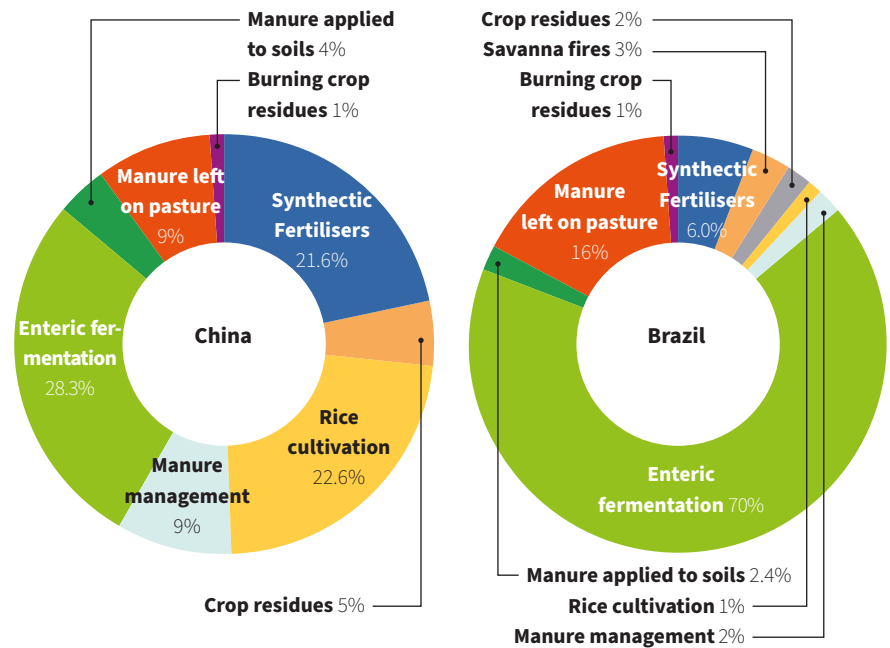
Core commodities in the low-carbon and green agricultural trade between China and Brazil

Soybeans and beef have the highest-emitting value chains with the most significant risk of deforestation. Soybean and beef production are not only driving over two-thirds of the recorded habitat loss in Brazil's Amazon and Cerrado regions and Argentina and Paraguay's Gran Chaco region, but also in 2021.¹³

Soybeans and beef also represent the core commodities between China and Brazil, based on volume, value, and climate-related and deforestation risks. In 2022, the soybean trade between China and Brazil alone reached 54.39m tonnes, accounting for 60% of China's total soybean imports and 31% of Brazilian exports to China. This was followed by frozen beef.¹⁴ Given that soybeans and beef represent the most significant commodities in the agricultural transition between China and Brazil.

Agricultural products imported to China from Brazil in 2022 ²⁷	
Product	Volume (10,000 tonnes)
Soybeans	5439
Beef and by-products	110
Chicken and by-products	55
Cotton	57
Sugar	417
Pork and by-products	44

Share in IPCC Agriculture total



Source: FAOSTAT

Chinese and Brazilian low-carbon agricultural policies

The transition of agricultural production will be key to realising climate goals in both China and Brazil. Since each country is tackling different sources of emissions, their green agriculture policies focus on different areas.



China's strategies for mitigating agricultural emissions primarily revolve around the technical aspects of agricultural production. They prioritise the adoption of green and low-carbon agricultural technologies, encompassing measures such as reducing and enhancing the efficiency of fertiliser use, methane reduction in rice fields, managing livestock manure, optimising the utilisation of straw, improving the energy efficiency of agricultural machinery, and promoting the development of agricultural carbon sinks.

The Brazilian strategy prioritises changing land use and livestock breeding to address climate change. Despite existing legislation, illegal deforestation and land conversion for agricultural purposes persist. Brazil is also focused on improving the efficiency of agricultural production increasing the output from current agricultural land. This is achieved through methods such as land rehabilitation, the support of intensive livestock management, the establishment of a crop-livestock-forest farming system, and the research and development of tropical cultivation techniques. These measures enable the efficient utilisation of existing land and help mitigate the need for expanding agricultural production onto new territories.

	NDC commitments (Will be updated)
China	Peaking carbon emissions before 2030, and carbon neutrality by 2060
Brazil	Carbon neutrality by 2050 and carbon emissions reduced by 37% by 2025, and 50% by 2030.

Chinese green agriculture policies

China incorporated sustainability into its agricultural development planning in 2015. Since then, several policies and plans have been developed to promote green agricultural development, including the National Sustainable Agricultural Development Plan (2015–2030), the Technical Guidelines for Green Agricultural Development (2018–2030), the Plan for the Green Development of China's Agricultural Sector During the 14th Five-Year Plan Period, and the Implementation Plan for Carbon Reduction and Sequestration in Agriculture and Rural Areas. These policies are designed to optimise development layout, safeguard arable land resources, improve water efficiency, control environmental pollution, and restore the agroecosystem. They focus on fostering sustainable agricultural development by addressing resource utilisation, environmental management, agroecosystems, the supply of green agricultural products, and the capacity for carbon sequestration. The plans are focused on supporting green inputs, production technologies, and post-production value-added technologies, while also promoting green and low-carbon farming structures and technology models. Attention is

Low-carbon Agriculture Programme	Implementation time	Total Budget	Main Activities	Implementation
Phase I (ABC)	2010—2020	USD1.5bn	<ul style="list-style-type: none"> Rehabilitation of degraded rangelands Promotion of integrated crop-livestock-forest farming systems Agroforestry complex ecosystems Biological nitrogen fixation Reforestation and animal waste treatment 	<p>Targets met: establishment of nearly 6m hectares of integrated farming systems, 10m hectares of no-till production; and treatment of 4.5m cubic meters of animal manure.</p> <p>Target not met: only about one third of the targeted degraded rangelands have been rehabilitated with respect to the targets for rehabilitation of degraded rangelands and reforestation.</p>
Phase I-II (ABC+ Renovagro)	2020—2030	About USD1.27bn in the 22/23 budget	<ul style="list-style-type: none"> Specific actions for adaptation to climate change 	<p>Target: 72.6m hectares covered and 1.1bn tonnes of CO₂ equivalent emissions reduced</p>

switching to strengthening green criteria and reducing the intensity of GHG emissions from major agricultural products. While specific emission reduction and carbon sequestration targets are not currently outlined in agricultural planning, it is anticipated that relevant metrics will be further integrated into existing plans to align with the development of green agriculture.¹⁵

A list of China's major green agriculture policies can be found in the Appendix (Table 1).

Brazilian green agriculture policies

The Brazilian Ministry of Agriculture, Livestock and Food Supply (MAPA) has adopted a series of initiatives to promote sustainable agricultural production and reduce GHG emissions. Firstly, Brazil has introduced the Agricultural Plan (Plano Safra), which provides funding and support for farmers to promote the adoption of sustainable agricultural practices.¹⁶ The objective is to boost environmentally sustainable production systems for pasture recovery with lower interest rates and awards for producers with sustainable practices. According to MAPA, Brazil's green agriculture is centred around technological innovation, environmental legislation (with the Forest Code as the core), and public governance of agri-environmental sustainability.¹⁷

A list of Brazil's major green agriculture policies can be found in the Appendix (Table 2).

Several initiatives that Brazil has adopted for sustainability in the agriculture sector deserve to be highlighted:

1. The Plano Safra;

2. The Forest Code; and

3. The Low-carbon Agriculture Plan and subsidised line of credit (ABC Plan and ABC+ Plan), currently sitting under the Agricultural Plan and renamed as Renovagro.¹⁸

The Brazilian Sustainable Agriculture Strategy includes layers of incremental policies that complement and strengthen one other. The ABC Plan is part of Brazil's first commitment made at the Conference of the Parties 15

(COP15) in 2009, which has since then become Brazil's core policy to incentivise green and low-carbon agriculture. Its strength is that it supports emission reduction technologies and adaptation initiatives in the agricultural sector and encourages farms to adopt sustainable agricultural practices with preferential loans.

Brazil's overall agricultural planning

Land governance and environmental compliance are prioritised in Brazil's environmental governance and green agriculture planning. Specifically, this includes strengthening the identification and management of land, ensuring the legality of land use. It also ensures the implementation of the Forestry Code and the application of environmental compliance tools, such as the Certificate of Rural Environmental Registration (CAR).¹⁹ This accelerates the analysis and certification of the more than six million rural properties registered in the CAR and advancing the use of the Payment for Environmental Services (PES) instrument proposed in the Forestry Code.

According to the Sector Plan for Adaptation to Climate Change and Low Carbon Emissions in Agriculture with a view to Sustainable Development (ABC Plan and ABC+) and Plano Safra (Harvest Plan), Brazil emphasises:

- Fostering and strengthening technological innovations that ensure the sustainability of Brazilian agricultural and livestock production;
- The development of low-carbon tropical science and technology to increase production capacity, raise incomes, increase climate resilience, and reduce greenhouse gas emissions;
- Development of a bioeconomy, including fibre production, renewable energy, environmental and ecosystem services, and biological inputs; and
- The development of the Biofuels Programme (Renovabio), the world largest programme to support the decarbonisation of an economic sector.

To finance agricultural production in Brazil, the Harvest Plan proposes expanding agricultural credit, promoting the participation of the private market in the financing of rural credit, and designing new financing instruments, such as green bonds and sustainably linked bonds (SLBs). It also revises agricultural subsidy policies to prioritise social development for poor rural producers, ensuring that agricultural subsidy activities integrate rural producers into policies and plans to promote social development.

The plan includes accompanying measures such as infrastructure for trade facilitation, the restructuring of technical assistance policies at the national level, and the enhancement of the connection between technical assistance and rural development, particularly focusing on sustainable tropical technologies. These policies aim to promote climate-smart agriculture, ensure environmental compliance, and promote sustainable agricultural practices.

Comparison of Chinese and Brazilian green agricultural policies

Securing agricultural production under the multiple constraints of land degradation, pollution, and climate change is a shared challenge for China and Brazil. The two countries share similar priorities for green agricultural policies, including:

- Enhancing the efficient use of resources
- Improving the efficacy of agricultural productivity
- Addressing climate change adaptation
- Modernising agriculture.

These common policy priorities can be further strengthened by increased international collaboration and technology exchange.

There are also differences in green agriculture policies between China and Brazil.

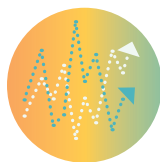
Curbing deforestation and land-use change are priorities in the development of green agriculture in Brazil. Brazil's green agriculture policy proposes the adoption of various

forms of crop-animal husbandry, focuses on the coordination and integration of different agricultural production systems, and strengthens the effective use of existing land resources while protecting forests.

China's green agriculture policy centres on the modernisation of agriculture, the enhancement of production technology and efficiency, the reduction of chemical inputs, and the support of eco-friendly farming practices. Key focal points include pollution control and the efficient recycling of resources. Policy and financial subsidies serve as the primary tools guiding the transition to green agriculture, which prioritises the green certification of imported products. China has established organic agriculture certification, the green agriculture label, and additional market certification systems, which aim to raise awareness and recognition of green agriculture within the market.

Chinese and Brazilian green finance markets

China is one of the countries with the most comprehensive green finance policy frameworks in the world.¹⁵ China's green loan balance has achieved the largest in the world.²⁰ As of the end of 2022, China's green credit scale reached RMB22tn.²¹ In 2022, China became the world's largest green bond market, with issuance of RMB575.2bn (USD85.4bn).²²



According to the data from Climate Bonds, Brazil stands as one of the largest green bond markets in Latin America. By the end of 2022, USD31bn of green, social, sustainability, sustainability-linked, and transition bonds had originated from Brazil, with agriculture being among the sectors receiving the most substantial green bond financing.²³ Moreover, the Brazilian government has embarked on the development of a sustainable taxonomy aimed at addressing the significant environmental and social challenges faced by the country, with a particular emphasis on the agricultural sector. As per the Brazilian government's plan, the sustainable taxonomy for Brazil is slated to be unveiled in November 2024 and is set to be compulsory from January 2026. The establishment of a credible green investment criteria is a top priority for advancing green agricultural development.

Brazil is the largest destination for Chinese investment in Latin America, accounting for 47% of Chinese direct investment in the region.²⁴ Over the past decade, Chinese investment in Brazil has exhibited substantial growth, averaging an annual rate of 30%. In 2022, China was one of the leading foreign investors in Brazil channelling USD67.5bn into oil and gas, mining, telecommunications, automotive manufacturing, infrastructure, and agriculture.²⁵

Total loans and underwriting (2010-2022) attributable to the soybean and beef supply chain in Brazil²⁸

Instrument type	Amount (USD millions)	% of total
Bond issuance	2378	72%
Corporate loan	572	17.3%
Revolving credit facility	284	8.6%
Share issuance	66	2%
Shareholding	3	0.1%
Bondholding	2	0.06%

The Chinese state prioritises investment in the Brazilian agriculture sector. This is channelled through large state-owned enterprises and financial institutions with a primary focus on supporting national strategies and ensuring food security. Currently, most of China's agricultural investments in Brazil support the processing and storage segments of the soybean industry chain. Additional investments are directed toward Brazil's infrastructure development to enhance the agricultural logistics system. China's financial collaborations in Brazil are primarily dominated by loans and bonds. Loans are typically extended by policy banks. For instance, the Special Loan Programme for China-Latin America Infrastructure Project, totalling USD20bn, is a government loan issued by the China Development Bank, aimed at supporting projects in agriculture and other sectors.²⁶ Bonds are mostly from Chinese financial institutions, providing financial support to businesses in the soybean and beef sectors.

Agricultural investment in Brazil is more market-oriented, centred on large traders and farmers and drawing on finance from a wide range of sources. This includes participation from national financial institutions, sovereign funds, global commercial financial institutions, and investors. Brazil's green finance practices in agriculture are aimed at promoting sustainable agricultural development. The country actively encourages agricultural producers to adopt eco-friendly agricultural practices by providing favourable financing terms to those

who embrace sustainability. Additionally, the Central Bank of Brazil has implemented specific sustainability due diligence requirements for the financial sector. This includes a prohibition on lending to areas associated with illegal deforestation and ensuring that sustainability factors are taken into account by financial institutions when granting loans.

As China's green soft commodity value chain continues to improve, Chinese investments and trade in Brazilian agriculture will amplify the regulations and requirements surrounding deforestation and land conversion to mitigate risks within the agricultural value chain. Furthermore, Chinese investors might encounter physical risks and transition risks associated with climate change, if they do not take adequate measures to enhance climate adaptation and mitigation.

The introduction of policies such as the EU regulation on deforestation-free products has spurred international investors to place greater emphasis on sustainable supply chains in agriculture. There is a growing recognition of the pivotal role that agriculture and food supply chains play in relation to environmental damage, climate change, and the associated risks and opportunities. Enhanced environmental and climate risk management in agriculture and food investment and financing by international investors will provide further external impetus.

Examples of climate change risks for agriculture

Physical risks	Transition risks
Droughts and unstable rainfall pattern	Costs of adoption of new practices
Inundation	Access to technical assistance
Hail damage	Availability of technology
Wind damage	Employment and other social issues
Excessive heat	Regulation and compliance
Pests and pathogens	Reputation
Salinisation	

3. Criteria for green agriculture

Motivation for developing harmonised criteria for green agriculture

The sustainable or green taxonomy is a classification system that relies on a set of criteria to outline economic activities and assets that align with environmental and sustainability objectives. Existing sustainable/green taxonomies provide market players with clear guidelines and help investors and businesses prioritise green activities.



The absence of clear and universally accepted official definitions has resulted in a lack of comparability, credibility, and accountability while driving up transaction costs.²⁹ The development of well-defined criteria for green agriculture can instil greater coherence and credibility within the agricultural sector's green development. This can help reduce the risk of greenwashing by issuers and enhance capital liquidity. Robust criteria for green agriculture can also assist central banks and regulators in creating more precise incentives. At the local government level, such criteria can support the compilation of databases for green agriculture projects, thereby determining the orientation of policy support and facilitating bank-business matchmaking.

With the guidance of a clear taxonomy, financial institutions can establish the direction for capital investment and assess the Use of Proceeds (UoP). Based on such a taxonomy, they can launch innovative financial products, improve the information disclosure system, and enhance disclosure transparency. This is conducive for businesses to determine the alignment for sustainable development of the green agricultural industry and define their path of industrial transition.

In interoperable markets, a green taxonomy can expedite the flow of capital across borders. This is achieved by, for instance, diminishing due diligence costs. In cross-border activities, incongruent green definitions may result in ambiguous delineations for economic activities and projects associated with green agriculture, consequently elevating investment costs for both businesses and investors. In contrast, the harmonisation of green taxonomies for agriculture can alleviate market fragmentation and streamline the movement of green capital to bolster sustainable agriculture.

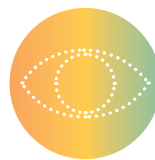
Furthermore, given that a taxonomy can support the setting of baselines, labels, and other instruments, establishing interoperable green taxonomies can facilitate consistency across finance instruments.

Coordination in green finance contributes to the sustainable socio-economic partnership between China and Brazil. This is particularly evident in their joint efforts to bolster green

agricultural development, where green finance can serve as a driver for the country's green agriculture initiatives. Conversely, by intensifying collaboration and fostering synergies in areas of mutual interest, the two countries can more effectively leverage resources.

Overview of green agriculture criteria

Criteria for green agricultural investment and financing helps lenders to recognise green agriculture activities and evaluate and address environmental and climate-related risks associated with agriculture. This contributes to bolstering the sustainability, climate adaptation, and resilience of agricultural production, as well as helping to direct capital flows to appropriate projects.



In China, the Green Bond Endorsed Projects Catalogue (2021 Edition), commonly referred to as the Green Bond Catalogue, and the Green Industry Guidance Catalogue (2019 Edition) established by financial market regulators, include agriculture as a key sector. They include a series of green agricultural activities eligible for the green bond market in the form of a whitelist.

In 2020, Climate Bonds set agriculture criteria for market stakeholders. The full set of agriculture criteria for Climate Bonds Certification was released in 2021, adding Criteria for livestock. The Criteria delineate and evaluate the green characteristics of agricultural projects concerning climate change mitigation, climate adaptation, and resilience. Additionally, they specify the requirements that agricultural assets or projects must satisfy, further refining the scope and categories of the UoP.

China's Green Bond Catalogue does not categorise activities by sector but instead encompasses green activities across six areas (the economic sectors of energy conservation and environmental protection, clean production, clean energy, ecological environment, green upgrading of infrastructure, and green services). As a result, agricultural activities are included within each sector. In contrast, Climate Bonds has formulated a systematic approach to identifying green activities by establishing technical screening criteria and unified principles and objectives.

The China-EU Common Ground Taxonomy for Sustainable Activities enhances the comparability of criteria for green finance across countries. It offers valuable support and streamlines the interoperability of taxonomies to support the international bond markets, facilitating cross-border green investment and

financing. This taxonomy stands as a vital point of reference for benchmarking agricultural criteria between China and Brazil. A comparison of activities across the Green Bond Endorsed Projects Catalogue (2021 Edition), the Climate Bonds Taxonomy, and the China-EU Common Ground Taxonomy for Sustainable Activities is included in the Appendix (Table 3).

Comparison of green agriculture activities in China and Brazil

This section provides a comparison and analysis of the agriculture-related section of China's Green Bond Catalogue and Brazil's financial incentives for green and low-carbon agriculture. A summary of the comparison can be found in the Appendix (Table 4). The primary objective is to evaluate specific green agricultural activities supported by the policies of both countries. Collation and analysis reveal the comparability, commonalities, and differences between the two countries' policies in green agricultural activities, as well as their shortcomings.

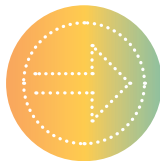


While both China and Brazil's agriculture criteria encompass several activities that comply with green agriculture, the two countries share common challenges related to environmental and climate concerns that require further clarification and resolution. To develop China-Brazil harmonised criteria, several key issues require special attention, including the DNSH principle, climate goals, climate resilience, and biodiversity conservation. Agriculture criteria should uphold the DNSH principle, which emphasises minimising negative impacts on the environment and ecosystems during agricultural production. Additionally, climate adaptation and resilience are important considerations for agricultural financing. These criteria should provide guidance on technologies and measures for bolstering agricultural adaptation and resilience.

4. Policy Recommendations

Guidance for Brazil's green agriculture criteria development

The development of a taxonomy should begin with the establishment of principles and objectives, which should then be followed by the identification and clarification of green assets and activities. These assets and activities should draw from national plans, policies, and other sources. They can contribute to the achievement of defined goals and address priorities.



Taxonomy design

Climate Bonds suggests five elements that should be considered in the design of a national taxonomy.

1. Selecting the correct approach

A green taxonomy not only addresses climate change but also streamlines the process of national environmental governance. To date, taxonomy design has been approached in two ways: the whitelist approach, and the technical screening approach. China adopted the whitelist approach by listing the green activities that needed financial support. This approach is straightforward and relatively easy to execute; however, because of unclear screening criteria, it can lead to difficulties in measuring the contribution of economic activities to the environment. Globally recognised criteria, such as those established by Climate Bonds, take a technical screening approach with a set of sectoral screening criteria based on environmental and climate objectives. These criteria define green activities by delineating the range of activities and the UoP, thereby ensuring that each activity contributes to emission reduction targets. However, this approach requires issuers to identify eligible projects, thereby increasing operational costs.

Brazil's taxonomy could combine the two approaches. During the taxonomy's development, Brazil could list activities in accordance with its green agriculture planning. To guarantee that all activities made meaningful contributions to emission reduction, Brazil should formulate plans based on the final emissions goal, set a baseline year for emissions levels, and conduct regular monitoring. Brazil should develop clear and measurable criteria for sustainable agriculture based on scientific evidence and best practices. These criteria should exhibit the flexibility to adapt to diverse agricultural systems and regions.

2. Establish principles

To ensure uniformity, coherence, and effectiveness in the criteria's application, the Brazilian Government should propose a framework of principles. This framework, while offering clear direction for green agriculture, should embed flexibility in the criteria's implementation and serve as the foundational basis for any potential necessary adjustments. It should consist primarily of overarching guiding principles, such as the DNSH principle, which is observed by China, the EU, and Climate Bonds. Brazil may also contemplate more focused principles concerning critical subjects, such as the principles of no deforestation and biodiversity conservation. Principles should include rules to be followed during implementation, including openness, science-basis, ensuring the engagement of small and medium-sized farmers, and guaranteeing equity. They may also include restrictive principles, such as prohibiting the purchase, processing, or transportation of products of an illicit origin.

3. Set targets and prioritise them.

During the development of green criteria, it is necessary to establish well-defined emission reduction targets and standards and to identify activities that contribute to the achievement of the targets and categorise them as eligible for the green agriculture criteria. Prioritising activities based on their contributions ensures the effective allocation of resources. For activities that make a substantial contribution to emissions, separate emission reduction targets may be set. For example, emissions stemming from the production and trade of commodities such as soybeans and beef should be a priority. Moreover, it is essential to specify environmental objectives for critical matters such as forest conservation, soil restoration, biodiversity preservation, and rural area development.

4. Ensure the taxonomy is complete, practical, and effective.

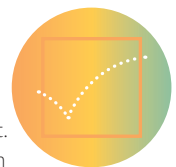
The scope of activities should be set as comprehensively as possible. It should encompass not only activities directly tied to agricultural production but also extend to encompass supporting facilities, including infrastructure development. The demand for infrastructure to support agri-food systems is rising, and it requires substantial financial investments to construct infrastructure that is resilient to disasters and climate change while enhancing transportation efficiency. Consequently, the construction of infrastructure that supports green agriculture should be considered in the criteria. In addition, the implementation of the taxonomy should undergo regular monitoring and evaluation to guarantee its effectiveness in propelling sustainable agricultural practices and attaining its environmental, social, and economic objectives.

5. Connect the taxonomies of different countries in relevant areas

Connecting the Brazilian taxonomy to that of other countries in relevant areas would amplify the influence of green agricultural product supply chains, enticing more international capital to participate, and giving a boost to trade and economic growth. The establishment and alignment of green agriculture taxonomies between Brazil and China could enhance Brazil's agricultural trade interoperability with China, leveraging synergies and saving resources. For instance, the unification of criteria for sustainable soybean and beef production between China and Brazil will enable eligible products to receive more financial support in production, procurement, and marketing, thereby bolstering their competitiveness in the market.

Recommendations for China-Brazil harmonised green standards in agriculture

China and Brazil have substantial opportunities for future collaboration in pursuing a green transition and sustainable development. Climate Bonds suggests seven actions to propel the partnership forwards.



1. Establish a Brazilian green agriculture criteria to facilitate interoperability between China and Brazil.

This would provide a clear framework for green agriculture practices, and investment. Building upon this foundation, the two countries could collaborate on developing a harmonised taxonomy that would expedite the transition to low-carbon and climate-adaptive agriculture while strengthening trade and cooperation in sustainable agriculture. The following are suggested actions for establishing China-Brazil green agriculture criteria. 1. The central banks of both countries should work in tandem to coordinate various sectors and establish a harmonised taxonomy. 2. Particular focus should be placed on key topics such as decarbonising soil use, harnessing the potential of forest carbon sinks, agricultural carbon sequestration, the role of the carbon trading system, ensuring traceability within the agricultural value chain, and biodiversity conservation. 3. Infrastructure development should be incorporated into the green agriculture criteria. Infrastructure inputs, which have not yet been included in sub-programmes for low-carbon agriculture in China and Brazil, are indispensable for promoting low-carbon and green agriculture in both countries. Climate-adaptive and climate-friendly infrastructure is conducive to resilient and adaptive agriculture and provides a critical foundation for efficient and high-quality agricultural production.

2. Prioritise key areas of green agricultural development. China and Brazil should identify areas of symbiosis in the agricultural sector. Both countries should bolster investment and collaboration in agricultural sectors that hold mutual interest, including the eight agricultural activities identified in the Appendix (Table 5), which are agricultural productivity, resource efficiency, agroecosystem construction, livestock and poultry manure treatment and application, crop residue management, land restoration and conservation, energy, including energy contained in inputs and sustainable agriculture training. Both countries should intensify their focus on innovation and R&D in relevant agricultural science and technology. For example, they could build intensive farms specialising in supplying beef that meets sustainable production standards. Second, as both China and Brazil grapple with shared challenges and complexities in the pursuit of low-carbon green agriculture, which includes conserving biodiversity, fortifying climate resilience in agriculture, and curbing deforestation across the supply chain, the two nations should prioritise discussions and partnerships in these domains to set common goals and action guidelines to shape a sustainable commodity value chain.

3. Establish bilateral trade agreements to support investment and financing for sustainable agriculture. Such agreements should delineate shared objectives and principles that underpin collaboration in this critical area. At the same time, both countries may designate or establish agencies to support investments in sustainable agriculture. Such agencies could provide potential investors with one-stop services for information, guidance, and assistance, streamlining the investment process.

4. Direct capital flows to areas such as low-carbon agriculture and climate-adaptive and resilient agriculture. Incentives, such as a China-Brazil special fund for green agriculture, loans and subsidies, and tax concessions and redemption, would create a conducive financial environment for investments in green agriculture. In addition, financial institutions should prioritise green lending and aggregation to bring more large deals to the green bond market. This would encourage more investors to back green investment strategies supporting sustainable agriculture.

5. Reduce transaction costs and create risk-appropriate investment conditions for investors. Green financial innovation can be achieved by 1. introducing public-sector funds such as sovereign loans, guarantees, and other tools to reduce investors' capital costs and investment risks; 2. encouraging green financial products and programmes, such as green or sustainability bonds, sustainability-linked bonds and loans, and other loans; 3. issuing special panda bonds to support the establishment of a

sustainable value chain between China and Brazil; and 4. examining a green financing model that integrates stocks and bonds has the potential to decrease investment costs while attaining value.

6. Establish partnership platforms with financial institutions. These could facilitate investors' collaboration in matching projects, identifying and assessing climate-related risks, reducing investment research costs, and exploring investment opportunities in low-carbon agriculture, and ensure investors' comprehensive understanding of and easier access to available investment and financing instruments.

7. Enhance dialogue. China and Brazil could establish long-term and stable communication channels through platforms such as the BRICS and the South-South Cooperation. This would encourage offline interaction opportunities, the regular exchange of information on technology, finance, and business, and enhanced coordination in business, policies, and investment. Exchange programmes should be launched to facilitate visits by agricultural experts, researchers, and policymakers. These programmes would allow for the sharing of best practices, and knowledge, and the promotion of cooperation on sustainable agriculture projects.

4. Appendix

Table 1: Major green Agriculture policies of China

Date of Issuance	Issuer(s)	Policy	Summary
May 2015	Ministry of Agriculture and Rural Affairs, National Development and Reform Commission, Ministry of Science and Technology, Ministry of Finance, Ministry of Land and Resources, Ministry of Environmental Protection, Ministry of Water Resources, and National Forestry Administration	National Sustainable Agricultural Development Plan (2015-2030) ³⁰	Five key tasks are proposed to promote sustainable agricultural development: (1) optimising the development layout and steadily enhancing agricultural production capacity; (2) protecting arable land resources and promoting the sustainable use of farmland; (3) saving and efficiently using water and securing agricultural water use; (4) combating environmental pollution and improving the agricultural and rural environments; and (5) rehabilitating the agricultural ecology and upgrading ecological functions.
August 2018	Ministry of Agriculture and Rural Affairs	Technical Guidelines for Green Agricultural Development (2018-2030) ³¹	The main tasks are (1) developing green inputs, (2) researching and developing green production technologies, (3) developing green post-production value-added technologies, (4) innovating in green and low-carbon farming structures and technology models, (5) developing integrated development technologies and models for green villages, and (6) strengthening of the basic research on green agricultural development and improving the green criterion system.
September 2021	Ministry of Agriculture and Rural Affairs, National Development and Reform Commission, Ministry of Science and Technology, Ministry of Natural Resources, Ministry of Ecology and Environment, and National Forestry and Grassland Administration	Plan for the Green development of China's Agricultural Sector During the 14th Five-Year Plan Period ³²	As China's first specialised plan for green development, it sets out five development goals for intensifying green agricultural development: 1) resource utilisation; 2) environment of the place of origin; 3) agroecosystems; 4) supply of green agricultural products; and 5) emission reduction and carbon sequestration capacity and relevant key tasks and measures. It makes systematic arrangements for green agricultural development during the 14th Five-Year Plan period. Under the carbon neutrality policy, it sets new targets, calling for (1) a significant reduction in the intensity of GHG emissions from major agricultural products; (2) an enhanced capacity for agricultural emission reduction, carbon sequestration, and response to climate change; and (3) an effective improvement in agricultural energy efficiency.
July 2022	Ministry of Agriculture and Rural Affairs and National Development and Reform Commission	Implementation Plan for Carbon Reduction and Sequestration in Agriculture and Rural Areas ³³	This sets out some key tasks to peak carbon dioxide emissions and achieve carbon neutrality, including fertiliser reduction and efficiency; reduction of rice-field methane, GHG from animal husbandry, fishery and agricultural machinery; farmland carbon sinks; and comprehensive utilisation of straw.

Table 2: Brazil's major green Agriculture policies

Date of Issuance	Issuer(s)	Policy	Summary
2023	Federal Government of Brazil	Agricultural Plan (Plano Safra)	Plano Safra, created by the federal government, is the main Brazilian agricultural policy instrument. It allocates funds for investment or for costing, industrialisation, and commercialisation of agricultural products. In 2023, the fund's value reached a historical high of BRL 364bn (USD73bn), 26.8% up from the previous year. The government's goal in the Agricultural Plan is to boost environmentally sustainable production systems, with lower interest rates for pasture recovery and awards for producers with sustainable practices. The Plano Safra has 13 programmes in the financing line for investments, including the new Renovagro, the former ABC+ Plan.
2012	Federal Government of Brazil	Forest Code	The Brazilian Forest Code is a federal law that requires rural landowners to designate and maintain a percentage of their property area under forest cover to preserve remnants of native vegetation on rural lands and to conserve biodiversity. In addition, the Forest Code requires all landowners to restore deforested areas on their properties. The Forest Code has two implementation instruments. The first is the Rural Environmental Registry (CAR11), which provides georeferenced data of rural properties, including boundaries of the land and the location of Permanent Preservation Areas (APP), Legal Forest Reserves, restricted areas, and agricultural production areas. The second is the Environmental Regularisation Programme (PRA), an instrument designated for landowners that are not in compliance with the Legal Forest Reserve and APP under the Forest Code.
2011	Federal Government of Brazil	Low-carbon Agriculture Plan (ABC) (2010—2020)	Brazil created the ABC Plan under the National Policy on Climate Change to reduce carbon dioxide emissions from human activities. Its objective is to foster the implementation of technologies and the use of low-carbon agricultural practices to restore degraded forest areas, as well as the management of natural forests and the development of integrated crop-livestock-forest farming systems. The ABC Plan was created by Brazil to address the dilemma of the world's largest agricultural exporter in the face of limited agricultural resources and the impact of climate change. By providing government loans to producers, the plan's objective is to improve efficiency in the use of natural resources, restore, recover, and conserve ecological reserves, increase the resilience of productive systems and rural communities, and enable the sector to adapt agriculture to climate change, thereby promoting the reduction of GHG emissions in agriculture.
2020	Federal Government of Brazil	Low-carbon Agriculture Plan (ABC+) (2020-2030) / <i>Renovagro</i>	<p>The ABC+ Plan, created in 2020, is a continuation of Brazil's Low-carbon Agriculture Programme. It aims to build a more sustainable and resilient agricultural production system based on technological innovation.</p> <p>One of the new programmes of the Plano Safra launched in 2023 is Renovagro, the former ABC+ plan subsidised line of credit. Renovagro is a programme for financing sustainable agricultural production systems with the objective of encouraging adaptation to climate change and low-carbon emissions in agriculture and livestock.</p> <p>It finances practices such as the recovery of degraded areas and pastures, the implementation and expansion of integrated crop-livestock-forestry systems, the adoption of conservation practices for use and the management and protection of natural resources. The implementation of organic agriculture, restoration of permanent preservation areas or legal reserves, the production of bioinputs and biofertilisers, systems for generating renewable energy and other practices that involve sustainable production and culminate in low emission of greenhouse gases can also be financed.</p> <p>The programme has three modes:</p> <ul style="list-style-type: none"> • Environmental Renovagro, to finance the restoration of legal reserves and permanent protection areas (APP) on properties. • Renovagro Recovery of Pastures, for investments in the recovery of degraded pastures, such as systems of integrated farming, livestock, forestry (ILPF), alternative energies and direct planting systems in straw, and • RenovAgro - Other Investments in Sustainable Systems and Practices, which will finance all other sustainable agricultural practices.
2023	Federal Government of Brazil	Incentive Programme for Technological Innovation in Agricultural Production (<i>Inovagro</i>)	Another important investment incentive programme launched in the Plano Safra. It aims to support investments in technological innovation in rural properties, aiming at increasing productivity and the adoption of good agricultural practices.

Table 3. A comparison of activities across the Green Bond Endorsed Projects Catalogue (2021 Edition), the Climate Bonds Taxonomy, and the China-EU Common Ground Taxonomy for Sustainable Activities

	Green Bond Endorsed Projects Catalogue (2021 Edition)	Climate Bonds Taxonomy	China-EU Common Ground Taxonomy for Sustainable Activities
General Comparison			
Applicability	Green bond issuers, investors, administrators	Green bond issuers and investors	Investors, administrators, and decision-makers
Standard-setter	People's Bank of China	Climate Bonds	International Platform on Sustainable Finance (IPSF)
UoP	Green industries, green economic activities, and other green projects in line with the taxonomy, including the construction, operation, acquisition, accompanying working capital replenishment, and repayment of interest-bearing debts of green projects	Eligible agricultural production operations and capital expenditures	Green industries, green economic activities, and other green projects in line with the taxonomy
Principle	Do No Significant Harm (DNSH) principle: Principles for implementing the criteria include compliance with national policies and alignment with international criteria.	Alignment with the Paris Agreement. Activities must support climate change mitigation. Principles are in place for equity, effectiveness, and inclusiveness.	DNSH principle
Screening Criteria	Activities set out in the taxonomy	Climate change mitigation threshold set: net reduction in GHG emissions upon the base year	The more stringent criteria between the EU Taxonomy and China's Green Bond Catalogue
Green Agriculture Criteria			
Goal	No separate sectoral goals have been set. The overall goals are resource conservation and recycling, ecological conservation, and adaptation to climate change.	Supporting low-carbon agriculture and developing agriculture that is adaptive and resilient to climate change without undermining the climate resilience of the systems in which it operates	Mitigating climate change, without separate sectoral goals
Categories and features	The agriculture criteria are focused on pollution control (primarily water resources and soil resources), green production inputs and waste, and technological upgrading for the use of pesticides, livestock and poultry breeding waste, and the treatment of waste agricultural films. No unified green agriculture criteria have been set. The certification of activities follows existing national certification systems or rules.	Certification criteria have been set for emission reduction and climate adaptation for crop and livestock production.	Mitigating climate change
Agriculture activities	In terms of agricultural production inputs, it is focused on pollution control, including water and soil pollution as well as pesticide inputs. In terms of outputs, it is focused on the treatment and utilisation of production by-products and waste, green warehousing, and the production, consumption, and trade activities of organic and green agricultural products.	1) Perennial and non-perennial crop production and 2) livestock production	The taxonomy for sustainable activities adopted by the EU and China's green finance catalogue are compared and evaluated, and commonly recognised economic activities are included in the Common Ground Taxonomy.

Table 3. A comparison of activities across the Green Bond Endorsed Projects Catalogue (2021 Edition), the Climate Bonds Taxonomy, and the China-EU Common Ground Taxonomy for Sustainable Activities

	Green Bond Endorsed Projects Catalogue (2021 Edition)	Climate Bonds Taxonomy	China-EU Common Ground Taxonomy for Sustainable Activities
Green agriculture criteria			
Requirements	No base year has been set, nor a requirement for emission reduction or adaptation to climate change.	<p>Projects or economic activities within the scope will be screened on two dimensions: 1) GHG emission reduction; and 2) climate adaptation and resilience.</p> <p>Conditions for mitigation: net reduction in GHG emissions or increase in carbon sequestration, measured in tCO₂e, based on the starting year of the investment (known as the base year). Agricultural mitigation includes activities that reduce absolute emissions or emissions intensity (defined as emissions/unit of production) or GHG efficiency against the base year or “business as usual” baseline projection. Mitigation also includes activities that store carbon in soil or biomass (trees, shrubs, crop, and grass).</p> <p>All bond issues shall contribute to climate change mitigation and increasing asset resilience, reducing absolute emissions, or increasing carbon sequestration.</p> <p>Issues involving livestock shall meet minimum standards of animal welfare.</p>	<p>Forests</p> <ul style="list-style-type: none"> • Tree planting • Forest rehabilitation and restoration • Forest management • Forest resource conservation

Table 4. comparison and analysis of the agriculture-related section of China’s Green Bond Catalogue and Brazil’s financial incentives for green and low-carbon agriculture

Agriculture Activities in China’s Green Bond Catalogue	Alignment with Brazil Green Agriculture Policy
<p>Comprehensive governance of agricultural and rural environment</p> <ul style="list-style-type: none"> • Prevention and control of surface pollution in agriculture, forestry, and grassland; and green approaches to prevention and control of crop pests and diseases 	<p>Integrated Landscape Approach (ILA)</p> <ul style="list-style-type: none"> • Environmental compliance framework • Landscape value • Restoration and conservation of soil quality, water, and biodiversity
<p>Comprehensive utilisation of biomass resources and clean energy</p> <ul style="list-style-type: none"> • Recycling of agricultural waste: facilities for recycling agricultural waste and their applications, such as facilities for the production of material fuels from crop residues and facilities for the production of biogas from livestock and poultry pollution, and support for the manufacturing of biomass energy utilisation equipment 	<p>Interconnection between adaptation and mitigation</p> <p>Reduce or limit soil rotation</p> <p>Maintain crop residues on the soil surface</p> <ul style="list-style-type: none"> • Reduce or limit uninterrupted tillage • Maintain crop residues on the soil surface • Maintain species diversification through crop rotation, intercropping and/or continuous cropping • Operate effective emergency response systems, including prevention, control, and combat through the integrated risk management system, weather forecasting and early warning, and regional zoning • Socio-economic and environmental performance analysis system • Knowledge and technology transfer
<p>Cleaner agricultural production</p> <ul style="list-style-type: none"> • Production of efficient pesticides with low-toxicity and residue as substitutes • Control of livestock and poultry waste and pollution: clean farming retrofitting; construction of facilities for farm wastewater, manure collection, and hazardous materials treatment; air pollution control retrofitting and construction, etc. 	<p>Adoption and maintenance of Sustainable Production Systems, Practices, Products and Processes (SPSABC)</p> <ul style="list-style-type: none"> • Rehabilitate degraded pastures • No-tillage system • Agroforestry system • Commercial forestation • Biological nitrogen fixation • Irrigation system • Animal manure treatment • Intensive cattle finishing <p>Confined cattle slaughter</p> <p>Other specific actions for climate change adaptation</p>
<p>Green agriculture:</p> <ul style="list-style-type: none"> • Agricultural resource conservation: modernised seed industry and qualified conservation of animal and plant species, construction and operation of protected areas and reserves for agricultural crop cultivation, prevention and control of pests and biological disasters, and comprehensive rural land treatment • Green agricultural supply: green organic agriculture, green livestock, and green fishery 	

Table 5. Common green agriculture activities

Common Agriculture Activity	Description
Agricultural productivity	Reduce emissions and improve efficiency by upgrading of agricultural production technologies to increase the efficiency of agricultural production, including innovations in seeds, fertilisers and machinery, digital technologies, and farm management practices.
Resource efficiency	Enhance efficiency and sustainability of agricultural production by means of water-saving irrigation techniques, improved soil water retention capacity, etc.
Agroecosystem construction	Improve ecosystem stability and climate resilience of agricultural production by conserving and restoring agroecosystems.
Livestock and poultry manure treatment and application	Treat and utilise livestock and poultry manure in a science-based way, including constructing manure treatment facilities such as bio-gasification and biogas power generation, to reduce environmental pollution, improve resource efficiency, and enhance the sustainability of agricultural production.
Crop residue management	Collect crop residues for sustainable use, including recycling straws.
Land restoration and conservation	Adopt land conservation policies to prevent land degradation and over-cultivation of land resources; increase net soil carbon sequestration.
Energy, including energy contained in inputs	Promote the development and utilisation of renewable energy in agriculture.
Sustainable agriculture training	Education, promotion, and improvement of good agricultural practices.

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