





Sustainability as added value in the Brazil-China relationship

A sustentabilidade como valor agregado na relação Brasil-China

Olivia Bulla¹  0000-0002-3145-6217

Danielle Mendes Thame Denny²  0000-0002-8964-5205

Heloisa Lee Burnquist²  0000-0001-9856-0118

J. Renato Peneluppi Junior³  0000-0002-9041-3890

Abstract

China's goal of peaking carbon emissions before 2030 and reaching neutrality by 2060 shows the effort to face the tension between environmental pressure and economic growth, which became more evident with the Covid-19 pandemic. Fighting climate change means seeking a new stage of economic and technological development, with sustainability becoming a main issue for the international trade, especially in the relationship between Brazil and China. Brazilian production faces social, environmental and corporate governance challenges to meet the Chinese demands. But Brazil has the natural and technological capacity to become a reference in the sustainable production of bioinputs, including of the agricultural commodities. China, for its part, has growing concern about the sustainability and the resilience of its supply chains. As China is Brazil's main trading partner, orchestrating these interests can be a win-win situation for both countries. However, several political and institutional challenges need to be overcome. This article makes use of a literature review to identify these points of congruence and challenges in order to contribute to a better understanding the context and thus inform decisions and policies on the subject.

Keywords: China-Brazil. Sustainability. Green agenda. ESG. Neutral carbon.

Resumo

A meta da China de passar a decrescer emissões de carbono antes de 2030 e atingir a neutralidade até 2060 mostra o esforço do país em priorizar a agenda ambiental em detrimento ao crescimento econômico. Para combater as mudanças climáticas, a China precisa buscar uma nova etapa de desenvolvimento econômico, com a sustentabilidade se tornando um tema central na perspectiva doméstica e do comércio internacional. Já no Brasil, a capacidade de produção de insumos básicos sofre desafios sociais, ambientais e de governança corporativa para atender à demanda chinesa por

¹ Universidade Federal do ABC, Programa de Pós-Graduação em Economia Política Mundial. São Paulo, SP, Brasil.

² Universidade de São Paulo, Centro de Estudos Avançados em Economia Aplicada, Departamento de Economia, Administração e Sociologia. São Dimas, 13418900, Piracicaba, SP, Brasil. *Correspondência para/Correspondence to:* D. M. T. Denny. E-mail: denny.thame@usp.br

³ Huazhong University of Science and Technology, College of Public Administration. Hubei, Wuhan, Hongshan, China.

abastecimento. O Brasil tem capacidade física e tecnológica para se tornar referência na produção sustentável de bioinsumos, inclusive commodities agropecuárias. A China, por sua vez, expressou crescente preocupação com a sustentabilidade e resiliência de suas cadeias de fornecimento. Como a China é o principal parceiro comercial do Brasil, orquestrar esses interesses pode ser uma situação vantajosa para ambos os países. No entanto, diversos desafios políticos e institucionais precisam ser superados. Este artigo faz uso de revisão bibliográfica para identificar esses pontos de congruência e desafios para contribuir com um melhor entendimento do contexto e assim informar decisões e políticas a respeito do tema.

Palavras-chave: Agenda verde. China-Brasil. ESG. Carbono neutro. Sustentabilidade.

Introduction

The Covid-19 pandemic intensified the discussion around the world about sustainability, which was already guiding the internal and external relations between countries, as human beings became more vulnerable to animal-borne diseases, with serious health and economic consequences. The direct link between environmental and climatic disasters with hyperconsumption forces to rethink the current forms of exploitation of natural resources and makes urgent the implementation of sustainable practices, considering the stage of socioeconomic and technological development in the world in the 21st century.

From the point of view of the interaction between China and Brazil, sustainability takes on peculiar characteristics. In terms of foreign trade, both have faced new barriers to market access, justified by social and environmental issues, there are a competitive coexistence with America (Fung *et al.*, 2015; Albuquerque, 2016) under the risk of primarization especially taking into consideration the Brazilian exports (Thorstensen, 2011; Jenkins, 2012; Medeiros; Cintra, 2015; Barton; Rehner, 2018). Another point is the hidden costs relating to social and environmental aspects of the production (Castilho, 2007; Kim; Tromp, 2021; Mazzero, 2012) and some determinants of the bilateral trade between these two countries (Mortatti, Miranda e Bacchi, 2011).

The search to produce more with less, especially in terms of biomass to foster bioeconomy (sustainably produced energy, fiber, feed and food), as explained by Keswani (2020), has been important for both countries. When developing agribusiness, this purpose is exemplified by the objective of increasing exports, complying with the Forest Law, in the Brazilian case, and to increase local production for reasons of food security, in the Chinese case.

The regulation of these issues has been largely done through the private sector, with commitments of good business practices, adoption of private sustainability standards, labeling rules and certifications. The increasing importance of aspects known by the acronym ESG (Environmental, Social and Governance) shows the need of convergence among investments, human capital, global trade and global value chains, towards achieving the Sustainable Development Goals (SDG), foreseen in the 2030 United Nations (UN) Agenda.

However, on one side, the model of private self-regulation is faster, more detailed and, in a way, more efficient, as it tries to fill the gaps left by the government; on the other side, these interaction factors have difficulties to be harmonized and transparent, and can therefore be used only to disguise

activities as sustainable, but which, in fact, have no real impact on improving the environment or society. In addition, the adoption of ESG principles by companies and governments represents an expensive tool, making the cost of compliance for the adequacy of the production process many times higher than the final product value with the sustainability seal, whose price is already higher.

New forms of responsible financing, which take into account ESG criteria, such as “green funds”, tend to intensify this race for standards, as investors, banks and development finance institutions will condition their investments to risk mitigation considering its principles, demanding responsibility for the entire supply chain. However, this form of financing can make it difficult, rather than facilitating, long-term projects that enable sustainable practices, given stricter rules and criteria that, if poorly applied, may favor some, obstructing the construction of more comprehensive sustainable alternatives and the large-scale emergence of an economy based on bio-inputs and clean energy.

Therefore, the challenges of fostering sustainability are complex. As a result, themes such as food safety, renewable energies and reducing bottlenecks in export logistics emerge as new frontiers for the exploration of resources used in production, distribution and consumption, leading to environmental sustainability and the use of new technologies capable of instrumentalizing development given the growing uncertainties caused by the Covid-19 pandemic.

In the specific case of bilateral relations between China and Brazil, these themes should also grow, mainly due to the commitments to reduce Greenhouse Gases (GHG) adopted by the Asian country. During a speech at the United Nations General Assembly in September 2020, President Xi Jinping stated that China aims to peak carbon dioxide emissions before 2030 and achieve carbon neutrality by 2060, aligning, thus, with the goals set with what is necessary to fulfill the Paris Agreement, reducing global warming. One year later, at the same forum, Xi also committed to not building new coal-fired power projects abroad, underscoring China’s commitment to more actions on climate change.

Such announcements tend to replace the Chinese relevance of increasing Gross Domestic Product (GDP) as a measure of economic activity by the so-called Gross Product of the Ecosystem (GEP), attributing a value to goods and services produced in a more ecological way, involving governance and social devices, in order to encourage sustainable development practices and reduce local competition for higher growth, in quantitative terms, favoring the qualitative resources’ allocation. Currently, the main challenges for advancing this new methodology for analyzing economic growth includes: insufficient knowledge of which initiatives are truly sustainable, lack of ESG assessment criteria and tools, and unavailability of quality, reliable and consistent ESG data.

Thus, seeking economic development in terms of GEP, China will increase its capacity to seek scientific and technological innovation, in order to face the current bottlenecks that restrict the country’s sustainable development. In areas such as technology, the sustainability agenda is also gaining strength strategically and geopolitically, as is the case with rare earth mining.

Klinger (2018) explains that rare earths refers to a group of seventeen chemically similar

elements sharing certain exceptional magnetic and conductive properties, which is essential for a diverse and expanding array of high-technology applications fundamental to globalized modernity. These metals are considered the essential raw material for the high manufacturing of numerous goods related to clean energy, such as electric cars and photovoltaic batteries, involving the link in the value chain between production and consumption of new sustainable materials and green technologies.

But as Klinger (2018) observes there is no singular “rare earth market”, but rather multiple markets for the seventeen elements with widely divergent availabilities and applications. In the specific case of bilateral relations between China and Brazil, while the Asian country accounts for 97% of the world production of these metals, the Brazilian territory has one of the largest world reserves of rare earths.

Thus, this article purpose is to shed light on the relationship between the ambitious Chinese goal of reducing levels of CO₂ in the atmosphere and the impacts on global economy, especially for Brazil, which has China as it's main trading partner since 2009. However, Chinese purchase is concentrated in Brazilian commodities, which accounted for 66% of the value exported to China in 2020, with emphasis on agricultural (soybeans and meat), according to the country's official data.

Therefore, our objective is to insert the theme of sustainability in the economic growth and global supply chains discussion as well as in the implementation of new Technologies – such as 5G, Big Data and Artificial Intelligence (AI). In this effort, it also intendeds to show that Brazil has physical and technological capacity to become a reference in the sustainable production of bio-inputs and metallic commodities aimed at the “green industrial revolution”, expanding the current export agenda to China, which accounted for two thirds of the Brazilian trade surplus in 2020.

The combination of these interests aims to respond to the assumption that sustainable development enables the creation of a win-win situation in the relationship between Brazil and China, generating value to products, with a focus on improving quality and returns on economic growth, in search of greater efficiency. However, for this, political and institutional challenges must be overcome in both countries, especially in the Brazilian level.

A sustainable China: method analysis

China's “green ambitions” were known in the 14th Five-Year Plan (2021 to 2025), along with Long-Range Objectives through the Year 2035. In the 14th FYP, the Chinese government makes it clear that the economic growth model based on exports and large infrastructure construction, driven by credit and public investments, must be replaced, given the impacts on the world economy recovery after the new coronavirus impacts on activity. Despite having been the only large economy to register GDP growth in 2020, of 2.3%, according to official data (NBS), the Chinese government knows that the external environment has become more hostile, with Covid-19 pandemic exacerbating the trend of deglobalization and causing many countries to turn “inwards”. Therefore, profound adjustments in the patterns of imports and exports circulation occurred, which is known as one of the Western ways of trying to contain China's rise.

The 14th FYP central objective is self-sufficiency in key areas, in terms of basic resources and technology. Hence, domestic consumption tends to become one of China's economy pillars, which will represent a greater demand, not less, for goods. Technological advances, particularly in strategic areas, are part of a master plan that will allow the country sustained economic growth, developing a technology capable of covering all its own needs. As a result, ascending to the higher rungs of the "tech ladder" will enable the country to dominate export markets in more sectors, particularly cutting-edge.

Thus, China is willing to establish a new economic dynamic, sacrificing GDP expansion rates for the resilience of socio-environmental development with institutional benefits. An indication that high economic growth is no longer important is the absence, for the first time, of an explicit GDP target for the five-year period of the FYP. Although there is a 2021 expansion target of "more than 6%", such a shift is a clear sign of the Chinese Communist Party's (CCP) willingness to conduct adequate reforms to increase productivity through technological innovation and domestic demand expansion.

This strategic advance takes into account more balanced regional developments, reducing a gap between urban and rural areas and between the country's different regions; and also, the acceleration of "green transformations", guaranteeing high quality in the ways of production and life through science and technology, stimulating research and development (R&D). Among the goals brought for the period up to 2025, there are: urbanization rate increase from just over 60.00% to 65.00%; forest cover rate increase from 23.04% to 24.01%; and generation of 20.00% of total energy from non-fossil sources, by reducing consumption by 13.50% and the so-called carbon dioxide per unit of GDP at 18.00%. Nowadays, China is the world's largest emitter of GHG, responsible for 28.80% of carbon dioxide emitted.

The implementation of these goals will take place via the proactive approach of making investments in renewable energy sources which China has competitive advantages, focusing on technological innovation and supply chain security, in order to protect natural inputs, increase agricultural production capacity and adapt industry production to climate change. In other words, such development will allow reaching a degree of manufacturing maturity and a scientific domain capable of making viable the quaternary sector, of the so-called post-industrial era, which includes intellectual practices and services related to information and communication. Together, Industry 4.0, strategically oriented with Artificial Intelligence (AI) and the fifth generation of mobile internet (5G) to enable data storage (Big Data and cloud) and the Internet of Things (IoT) creates an integrated infrastructure around four elements (information, industry, technological application and environment) that allow the execution of "smart cities".

This combination of renewable energy and technology aims to enable the transition from an economy based on fossil fuels to a low carbon economy. China currently accounts for 26% of all renewable energy in the world, but the country's reliance on coal as the country's primary energy source is nearly 60%. Therefore, the new way of calculating the production of wealth by a country, through the GEP, also places China at the forefront in the fight against global warming.

Peneluppi Junior and Seesaghur (2016) claim that renewable energy contributes to development, extending sustainability, in the following aspects: (1) social and economic; (2) access to energy; (3) energy security; (4) mitigation of climate change and reduction of environmental and health impacts. Thus, structuring the activity in a clean energy model allows achieving high energy efficiency, seeking a “green GDP” and applying technological innovation to reduce polluting gases emission, promoting energy overproduction and the industrial revolution.

This is where China's new stage of development comes in, based on a new philosophy of development, which replaces the issue of “engines of growth” with harmony between humankind and nature. These elements are applied through the creation of a new economic dynamic, which arises in response to the opportunities and challenges of the 21st century in a post-coronavirus scenario, also taking into account the objective outlined by the CCP, to make China achieve socialist modernization in 2035, becoming a great modern socialist country, prosperous, strong, democratic, culturally advanced, harmonious and beautiful in the middle of this century – at the time of the 100th anniversary of the founding of the People's Republic.

Therefore, President Xi Jinping proposed a new development strategy. The so-called “dual circulation” encompasses double economic cycles (domestic and international) and promotes both ends of the economic process (supply and demand), with production being the starting point and consumption the end point, with circulation and distribution connecting these two points.

Thereby, given China's effectiveness in combating the public health crisis and preventing new outbreaks of coronavirus (Peneluppi Junior; Bulla, 2022), the CCP's focus is on tackling environmental and climate challenges to ensure sustainable socioeconomic development. China's commitment on protecting the environment and combating pollution signed at the peak of the pandemic year, with the announcement of reaching the so-called “3060 Target” in relation to the emission of carbon dioxide, is real evidence of this international role. Also, during the first year of the Covid-19 spread, China met the goal of eliminating extreme poverty, becoming a moderately prosperous society and achieving the first goal of the so-called Two Centenaries⁴.

However, this particularly remarkable achievement must be laid on a solid foundation to march towards the “Chinese dream”. Therefore, its policies, strategies, initiatives and tactics of the new stage of development have to work together to enable a sustainable model capable of encouraging, rather than ignoring, environmental, social and governance improvements. For that reason, ecological progress is fundamental to the sustainable development of Chinese nation.

For China, developing an ecological civilization is a strategic task. Pan (Xiang-Chao, 2018) explains that President Xi's thinking has a guiding meaning and realistic value for building an ecological civilization, achieving socialist modernization and national rejuvenation. This is how China will put into practice mechanisms to safeguard ESG concept, with CCP general leadership

⁴ The Two Centenaries (两个一百年) are a set of goals established by President Xi at the 18th National Congress of the CCP, taken as the basic foundation for achieving the great rejuvenation of the nation, or the Chinese dream (中国梦).

establishing six priority areas in order to maintain a constant legitimacy of management capacity. They are: (1) energy and food security; (2) the smooth functioning of government at all levels; (3) job security; (4) basic needs guarantee; (5) stability in industrial and supply chains; and (6) transactions by market entities.

In the next sessions, the proposal is to discuss themes related to areas 1, 4, 5 and 6, including Brazil and the world in the discussion, in order to point out what a sustainable China means for international foreign trade and also for global finance.

Discussion and Results

Really Sustainable

There are two economic mechanisms to limit the emission of Greenhouse Gases (GHG) in the world: setting rates for low carbon release and/or trading carbon credits in the regulated market. Responsible financing, on the other hand, is through the granting of credit for sustainable investments that meet environmental, social and governance (ESG) criteria.

However, the promotion of a low-carbon economy tends to harm international competitiveness, if not accompanied by gains in efficiency and resources optimization, which ends up leading to irregular and/or protectionist practices. In the specific case of the carbon credit market, the risk is to allow countries and companies to only buy the excess of the emissions targets of others, without effectively adopting measures to mitigate their own emissions and, thus, only reducing their costs with pricing and fines due for being paying user, paying polluter or debtor of convictions (Granziera, 2015)

China's bold announcements to address climate change, namely to peak emissions by 2030 and achieve carbon neutrality by 2060, have been accompanied by several policy measures. One of them is the establishment of a nationwide emission trading scheme (ETS), which was launched in mid-July. An analysis after two months in operation shows the evolution of China's ETS market can have important signaling effects to China's ultimate intentions on the climate change front.

Starting with the performance, since China's national ETS market became the largest globally from the first day of operation, with roughly 4 billion tons of CO₂ emissions that's can be potentially traded, more than twice the size of the carbon allowance in the European Union (EU) ETS, which has been in place for 16 years. However, such a sheer amount is more nominal than real as the market remains illiquid, trading less than US\$ 10/ton compared to over US\$60/ton in the European ETS, and with a rather small number of participants in the scheme, namely 2,225 polluters for the whole China, and covering only one sector, electricity, then gradually extending to petrochemicals, chemicals, building materials, steel, nonferrous metals, paper and aviation sectors.

Furthermore, the market is not yet open for third-party traders, such as carbon trading companies, financial institutions, and individual investors. As for China, it has over eight years of experience in operating regional carbon trading pilot programs before launching the national carbon trading market. From 2013-2014, seven pilot carbon markets were launched in five cities (Beijing,

Chongqing, Shanghai, Tianjin, and Shenzhen) and two provinces (Guangdong and Hubei). Then, in 2016, the Fujian province also set up an ETS. “The absence of both financial institutions and related products underscores [China] policymakers’ wariness of admitting speculative activities to bolster the market. This is bound to remain the case for quite some time given the ongoing crackdown on excessive financial risks” (Herrero, 2021) In the “green finance” world, the greatest danger is the so-called “greenwashing”, a term used when companies or governments try to show a sustainable facet without actually being. The most common example is related to “green bonds” or “climate bonds”, which condition the investment to the achievement of certain goals in the ESG scope.

However, the established objectives are not always relevant and/or challenging, or else the punishment in case of non-compliance with the commitments is not so onerous. In the year of 2018, green investment corresponded to less than a tenth of the market, while in the first half of 2021 it reached US\$ 227.8 billion, compared to US\$ 297 billion in the whole year of 2020. This is an encouraging result towards the US\$1 trillion mark in “green bonds” by 2023.

Although the “green market” is accelerating, amid the release of resources for projects that provide environmental, climate or social benefits, the existing transition is still not being carried out on a sufficient scale to meet the goals of Paris Agreement, with only a small number of economic activities classified as low carbon. Therefore, there is the risk of losing the “green seal”, which turned out that strength of the “green bonds” market has been accompanied by rampant “greenwashing”.

An analysis of the portfolio of the 20 largest “green funds” in the world found that, on average, each holds investments in companies that produce fossil fuels, in addition to companies linked to gambling, drinking and tobacco. In other words, they are the antithesis of what one would expect from sustainable investments. Therefore, there is still a long way to go before the world of finance and the carbon credit market can avoid irregularities related to sustainability and ESG aspects, since good governance, social integrity and monitoring of sustainable practices lack well-defined rules capable of guaranteeing a transparent, regulated and mandatory system. However, only from understanding the entire production chain (from “cradle to grave”) it is possible to consider whether the process is carried out in accordance with the ESG criteria.

Currently, the market is voluntary, which facilitates the production of corporate and government reports full of problems, with exaggerations or dissimulations, whether in relation to social and environmental risks or management. As long as there is informational asymmetry and discrepancy between the evaluation metrics, it will be impossible for the ESG concept to be a differential, encouraging the allocation of capital in truly sustainable companies and that countries can make a difference in the energy transition to a low-carbon economy. Among mechanisms that can be adopted to understand impacts, cross-media analysis and life cycle analysis should be taken into account, generating environmental impact assessments (EIR, in the acronym in English).

According to this, when investigating in a technical and multidisciplinary way the environmental impacts or benefits of different projects, based on various criteria, an audit from the perspective of ESG criteria should propose measures to mitigate directly associated impacts and compile the

systemic set attributable to the operation of a product or service, generating a net positive or negative balance across the entire chain. But as long as it is not applied, these distortions within the financial market will have international impacts.

In other words, the climate and social integrity of “green finance” and carbon credit practices was raised to an international political level, evidencing the role of global leaders to develop objective and uniform criteria that allow companies and countries to achieve neutrality of carbon in the middle of this century. In this regard, China is inserted in the global context through the second aspect of the “dual circulation” dynamic, in which the international cycle of trade flow will be fostered by the greater importance of the Belt and Road Initiative (BRI) via the supply of productive capacity for the economic development of other countries, through Chinese state-owned companies and long-term financing. In essence, “dual circulation” is a plan to make China self-sufficient, in terms of basic resources and technology, while fostering the market in emerging countries by stimulating Chinese demand.

Thus, in times when access to markets is scarce, China takes advantage of this great competitive advantage, which is domestic consumption itself, ensuring the opening of its consumer market, while contributing to the development of countries with economies less mature. By placing the criterion of “green investment”, BRI proposes to increase cooperation among member countries in the construction of infrastructure aimed at sustainable economic growth, aiming at energy and environmental efficiency.

With that, the confrontation of the sanitary crisis provoked by Covid-19 transformed the socio-environmental governance as a strategic guideline. Herrero (2021) explains that BRI should be seen as an important economic policy complementary to “dual circulation”, with China developing standards and establishing organizational methods, as it promotes its own technological development.

Hence, China is now proposing to create a new technological-productive axis and a new financial structure, through a new economic policy that combines capital market instruments and infrastructure projects, based on sustainable investments, under the public coordination and with private participation. With these spheres, China shows that value is produced from socially embodied labor, through the use of energy resources capable of replacing the human workforce through technology and data sharing, but which will never replace the material basis of production.

Benanav (2019) explains that the cause of the decline in the demand for work is not technology, but the continuous slowdown in economic growth and de-industrialization that has occurred since the 1970s, with the economies financialization. According to him, the digital transformation will result in less employment depending on how much the production of goods and services also increases.

Since that, Chinese proposal has two dimensions. Internally, a policy of intelligent urbanization (smart cities) that aims to create megalopolises as part of the national integration strategy, comprising several cities located close to each other, uniting the city’s infrastructure with technology and optimizing operations and services to connect with citizens and business. There are currently 19 city clusters in China. On the external side, the BRI is already underway to accelerate the pace of

economic growth, developing an infrastructure capable of connecting the world, redefining the legacy of the Ancient China's Silk Roads to build a prosperous and common future.

Peneluppi Junior *et al.* (2018) claim that China has emerged as a global leader in the initiative to bring sustainable development based on the economic paradigm of renewable energy. "This is evident from recent developments in the form of BRI and efforts to bring the world together on sustainable energy resource and economic fronts" (Peneluppi Junior *et al.*, 2018, p. 147). According to the authors, Chinese support for the creation of institutions capable of financing projects is essential to make these goals possible, "[...] re-rooting the global economy in renewable energy sources".

Among the corporations created, the Asian Infrastructure Investment Bank (AIIB) stands out, created to meet the financing needs of large-scale infrastructure works at BRI, investing in high-quality infrastructure, financially viable and ecologically correct projects. "The strategy is consistent with the bank's 'Lean, Clean and Green' core values and its institutional objectives, encompassing three thematic priorities: sustainable infrastructure, connectivity between countries and private capital mobilization" (Peneluppi Junior *et al.*, 2018, p. 145).

The strategy adopted is guided by the same principles of UN's 2030 Agenda, establishing the necessary financial structure to support member countries to develop and improve energy infrastructure; increase access to energy; facilitate the transition to lower carbon-intensive energy consumption; and fulfilling global commitments under these initiatives. Therefore, China created AIIB as a way to facilitate "green financing", since the strict criteria adopted by private investors and financial institutions to mitigate risks can make it difficult to offer resources, making long-term projects unfeasible to build a low-carbon future.

Opportunity for Brazil

ESG Agenda and Chinese commitment to peak and subsequent carbon neutrality until the middle of this century create opportunities for Brazil to expand the trade flow and the volume of goods and services transacted with its main trading partner, taking advantage beyond significant progress in relation to "3060 Target". However, in an effectively sustainable world, Brazilian challenge is to institutionalize economic activity that respects nature, human rights, laws, social justice *etc.*

Although Brazil has much to gain from sustainable development, it is first necessary to coordinate public policies, planning actions and establishing guidelines in all spheres of society, in order to communicate medium and long-term strategies in its diplomacy. Programmatic public policies have played a crucial role in China, while economic instruments have gained momentum in Brazil. Even so, the convergence of tools that enable a new pattern of interaction in Sino-Brazilian relations towards the UN's SDGs would make it possible to combine technologies sharing and develop the national industry with sustainable agriculture.

In fact, Brazilian agribusiness is one of the activities that most face environmental and governance problems, with the mismatch between ruralist interests and those of climate protection

causing “agrocide” (Leite-Filho *et al.*, 2021). Despite being a minority, around 2% of properties in the Amazon and Cerrado areas are responsible for 60% of illegal deforestation in the country, accounting for 20% of soybean exports and 17% of beef exports from these biomes. Data on the global chain of these commodities shows that these products mostly go to China.

However, this illegality, with which the national government has shown itself to be colluding, compromises the future of Brazil and China relationship. In addition, it is a practice that goes against the sustainable cultivation that has been stimulated, with low carbon techniques that have been a success for more than a decade, in addition to forms of crop-livestock-forest integration and the development of special products using bio-inputs.

In the area of energy transition, Brazil also has a lot to contribute. Besides being a source of raw material for photovoltaic and wind energy, the country is also a reference in the production of biomass fuels, such as ethanol. Renovabio, the biofuels policy that created the decarbonization credit (Cbio), provides for the issuance of carbon credits by producers and plants that follow sustainability criteria in the production chain to be traded on the Brazilian stock market's over-the-counter market.

An example of this type of methodology “from cradle to grave” is the one developed by the Brazilian Agricultural Research Corporation (Embrapa) for renewable fuels, Renovacalc, which supports Cbio emissions and also the certification of Carbon Neutral Beef, a seal developed to be parameterizable and auditable, attesting that beef produced in crop-livestock-forest integration systems had their enteric methane emissions offset during the cattle raising process through planting and growing trees.

It can be seen, then, that the recent deforestation in the Legal Amazon, to make forest pasture with assured jurisprudence, as well as the burnings both in Pantanal and in Amazon region are, in fact, practices out of step with what has been for decades the Brazilian protagonism in building several international legal regimes in favor of the climate agenda, biodiversity, food systems, among others. It is through this action that Brazil seeks to enable projects in low-carbon transport infrastructure, renewable energies, reforestation, strategic and clean agricultural productions.

Conclusions

Given the above, the challenges facing humanity remain immense. No matter how much the world wants the Covid-19 pandemic to end, the fact is that contagion of the coronavirus, and its more infectious and faster-spreading variants, remains a dominant factor in global economic prospects. Therefore, it is essential that the millions of cases and deaths from the disease in the world provoke deep reflections on the relationship between man and nature in the context of society.

In this sense, health crisis management in China is an example of public policy action (Peneluppi Junior; Bulla, 2021) based on administrative mechanisms and organizational structures, whose applications in the new digital age can now be used for other purposes, due to the disruptive nature of these processes. By overcoming the challenges posed by the pandemic, China is at the

forefront of this century's transformations, with an increasingly technologically advanced economy.

On the other side, Brazil should seek, for sovereign and multilateral interests, to join efforts with China to build an ecological civilization, collaborating with international green trade and transnational socio-environmental governance, fostering a strategic partnership in the South-South axis, through a relationship of mutual benefit (win-win), in favor of the planet. Thus, both countries need to carry out sustainable development of economic construction and environmental protection, promoting prosperous growth.

References

- Albuquerque, J. A. G. Brazil/China partnership and the United States. *Revista Tempo do Mundo*, v. 2, n. 2, 2016. Available from: <http://repositorio.ipea.gov.br/handle/11058/6541>. Cited: May 2, 2021.
- Barton, J. R.; Rehner, J. Neostructuralism Through strategic transaction: The geopolitics of China's dragon doctrine for Latin America. *Political Geography*, v. 65, p. 77-87, 2018. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S096262981730197x>. Cited: May 16, 2021.
- Benanav, A. Automation and the future of work - I. *New Left Review*, 2019.
- Castilho, M. R. Impactos distributivos do comércio Brasil-China: efeitos da intensificação do comércio bilateral sobre o mercado de trabalho brasileiro. *Revista Brasileira de Comércio Exterior* v. 91, p. 16, 2007. Available from: [Http://Files.Alexandrefa.Webnode.Com/200000018-8e4029037f/Impactos%20distributivos%20do%20comercio%20brasil-China%20-%20efeitos%20da%20intensificacao%20do%20comercio%20bilateral%20sobre%20o%20mercado%20de%20trabalho%20brasileiro.Pdf](http://Files.Alexandrefa.Webnode.Com/200000018-8e4029037f/Impactos%20distributivos%20do%20comercio%20brasil-China%20-%20efeitos%20da%20intensificacao%20do%20comercio%20bilateral%20sobre%20o%20mercado%20de%20trabalho%20brasileiro.Pdf). Cited: May 16, 2021.
- Fung, K.C. *et al.* Production networks and international trade: China, Brazil and Mexico. *The North American Journal of Economics and Finance*, v. 34, p. 421-429, 2015. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S1062940815000728>. Cited: May 16, 2021.
- Granziera, M. L. M. *Direito ambiental*. São Paulo: Atlas, 2015.
- Herrero, A. G. What is behind China's dual circulation strategy. *China Leadership Monitor*, 2021. Available from: <https://www.prcleader.org/herrero>. Cited: Aug. 8, 2022.
- Jenkins, R. China and Brazil: economic impacts of a growing relationship. *Journal of Current Chinese Affairs*, v. 41, n. 1, p. 21-47, 2012. Doi: <https://doi.org/10.1177/186810261204100102>.
- Keswani, C. *Bioeconomy for sustainable development*. [S.l.]: Springer, 2020.
- Kim, T.-J.; Tromp, N. Carbon emissions embodied in China-Brazil trade: trends and driving factors. *Journal Of Cleaner Production*, v. 293, p. 126206, 2021. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0959652621004261>. Cited: May 16, 2021.
- Klinger, J. M. Rare earth elements: development, sustainability and policy issues. *The Extractive Industries And Society*, v. 5, n. 1, p. 1-7, 2018. Available from: <https://www.sciencedirect.com/science/article/pii/S2214790X17302472>. Cited: Aug. 8, 2022.
- Leite-Filho, A. T. *et al.* Deforestation reduces rainfall and agricultural revenues in the Brazilian Amazon. *Nature Communications*, v. 12, n. 1, p. 2591, 2021. Available from: <https://www.nature.com/articles/s41467-021-22840-7>. Cited: Sept. 6, 2021.
- Mazzerro, M. F. *Análise ambiental do comércio bilateral Brasil-China*. 2012. Trabalho de Conclusão de curso (Bacharelado em Ciências Econômicas) – Unesp, Araraquara, 2012.
- Medeiros, C. A.; Cintra, M. R. V. P. Impacto da ascensão chinesa sobre os países latino-americanos. *Brazilian Journal Of Political Economy*, v. 35, n. 1, p. 28-42, 2015. Available from: http://www.scielo.br/scielo.php?script=sci_abstract&pid=S0101-31572015000100028&lng=en&nrm=iso&tlng=pt. Cited: May 22, 2021.

Mortatti, C. M.; Miranda, S. H. G.; Bacchi, M. R. P. Determinantes do comércio Brasil-China de commodities e produtos industriais: uma aplicação Vecm. *Economia Aplicada*, v. 15, n. 2, p. 311–335, 2011. Available from: http://www.scielo.br/scielo.php?script=sci_abstract&pid=s1413-80502011000200007&lng=en&nrm=iso&tlng=pt. Cited: May 24, 2021.

Peneluppi Junior, J. R.; Seesaghur, H. N. Renewable energy to low carbon economy: a critical study on sustainable development policy of China. *Public Policy And Administration Research*, v. 6, n. 4, p. 88, 2016. Available from: <https://www.iiste.org/journals/index.php/ppar/article/view/30265>. Cited: Jun. 15, 2021.

Peneluppi Junior, J. *et al.* China's initiative of One Belt One Road (Obor) provides a platform for sustainable economica development: redeeming old silk route for new economic era. *Nzaar*, p. 141–153, 2018.

Peneluppi Junior, J. R.; Bulla, O. Socialismo de mercado: eficácia da resposta da China à pandemia da Covid-19. *Revista de Ciências Humanas*, v. 1, n. 22, 2022. Available from: <https://periodicos.ufv.br/rch/article/view/13755>. Cited: Aug. 8, 2022.

Thorstensen, V. Brasil e China no reordenamento das relações internacionais: oportunidades e desafios. Rio de Janeiro, em 16 e 17 de junho de 2011. p. 62. Available from: <https://Bibliotecadigital.Fgv.Br/Dspace/Bitstream/Handle/10438/15779/Brasil%20e%20china%20-%20de%20conflitos%20de%20interesse%20a%20busca%20de%20uma%20agenda%20comum.Pdf?Sequence=1&lsallowed=Y>. Cited: Aug. 8, 2022.

Xiang-Chao, P. Research on xi jinping's thought of ecological civilization and environment sustainable development. *Iop Conference Series: Earth and Environmental Science*, v. 153, p. 062067, 2018. Available from: <https://doi.org/10.1088/1755-1315/153/6/062067>. Cited: Aug. 8, 2022.

Bulla, O. *et al.* Sustainability as added value in the Brazil-China relationship. *Sustentabilidade: Diálogos Interdisciplinares*, v. 3, e225568, 2022. <https://doi.org/10.24220/2675-7885v3e2022a5568>

Recebido em 1 de janeiro de 2022, versão final em 11 de abril de 2022, aprovado em 2 de maio de 2022.