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The Impact of NGO on the Ecological Protection

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Abstract

This article studies the impact of non-governmental organizations on the ecological protection of the Serrado grassland. In order to protect the Serrado Grassland and effectively delay climate change, many social groups and enterprises launched an appeal and jointly issued a declaration, trying to prevent the agricultural and fragmentation of the Serrado savanna through the alliance of non-governmental organizations. We predict that such measures are effective and can avoid excessive development of the Serrado grassland. However, after data comparison, it was found that simply signing the declaration did not have a significant impact on the grassland area. It may be necessary to cooperate with financial policies such as bank interest rates and government mandatory intervention in an independent market to effectively play a role.

Keywords: NGO; ecological protection; Serrado grassland; agriculture; supply chain.

1. The Impact of NGO on the Ecological Protection

According to the statistics of the International Union for Conservation of Nature in 2018, the number of threatened species in Brazil ranks second in the world. The main reason for this phenomenon is that agricultural expansion has damaged the ecological environment of the Amazon rainforest and the Serrado grassland. At the same time, Brazil is the second largest food producer in the world. The main reason for the development of Amazon rainforest and Serrado grassland is the expansion of soybean planting and cattle farms. At the beginning of the 21st century, scholars began to pay attention to the overexploitation of the Amazon rainforest, and a series of restrictive policies have played a certain role in protecting the Amazon rainforest. However, the development of the Serrado savannah, the second largest ecological region in Brazil, is showing a rapid expansion. In recent years, more and more scholars have begun to pay attention to the Serrado Grassland. Governments around the world have made efforts to improve climate through mandatory policies or macroeconomic regulation. To some extent, government measures are useful. However, what about non-governmental organizations and social forces? Can non-governmental organizations effectively protect the Serrado grasslands through joint action?

The concept of non-governmental international organizations was first seen in the United Nations Charter. Article 71 of the 1946 United Nations Charter stated the role of non-governmental organizations in international

affairs. In 1968 and 1996, the United Nations Economic and Social Council resolutions recognized the expansion of its scope to non-governmental organizations operating nationwide and in various regions. Non governmental international organizations with a focus on environmental protection include specialized intergovernmental organizations specializing in environmental protection fees, purely academic international legal organizations, and other non-governmental international organizations engaged in environmental protection activities. Non government organizations usually exert pressure on countries or government groups through public speeches, media campaigns, demonstrations, attending meetings, providing advice and information, and participating in international organization projects, in order to change policies. Non government organizations also participate in international litigation proceedings as litigants or legal advisors, in order to participate in dispute resolution.

Brazil is the second largest soybean producing country in the world, with a planting area of 33347 hectares in the 2017/18 crop year, distributed in the Pampa Grassland, Atlantic Forest, Cerrado, and Amazon biomes. Through remote sensing technology, we indicate that the new agricultural frontier of soybeans is no longer in the Amazon region, but in the last contiguous area of Serrado, located in the area known as MATOPIBA. The soybean production chain has been striving to showcase soybeans produced in a sustainable manner to overseas customers without deforestation. Our data challenges its main plan, the Amazon soybean suspension order, and we call for attention to the protection needs of MATOPIBA Cerrado, which is not monitored by the soybean suspension.

Public and private anti deforestation policies have been proven to effectively reduce forest loss, but the conditions for adopting such policies are rarely reviewed (Christoph Nolte., 2017). Targeted investments in Amazon's border supply chain infrastructure can promote intensification and alleviate the pressure of deforestation, but must be combined with substantial long-term negative incentives for deforestation, including more effective public forest governance and private zero deforestation commitments (R. D. Garrett., 2018). We emphasize that any policy that threatens this mentality of "deforestation rights" may lead to erosion of producers' protective behavior, as unnecessary land clearing occurs before such policies are implemented. The implementation of commitments to reduce deforestation is hindered by different perceived financial risks, differences in influence and power levels held by different participants, and a sense of urgency that the perceived rights of deforestation outweigh environmental sustainability (Angela M. Guerrero, 2020). We identified a total of 170 conservation NGOs that were implementing 378 projects at 518 sites across the breadth of the Amazon region As a sector, conservation NGOs have successfully implemented projects throughout the Amazon region and are carefully placed to meet future conservation challenges (Ana C. M. Malhado., 2020). Collective targets set by private, government, and non government organizations to achieve global "zero net defense" by 2020 have been missed Reforming ZD will not solve deforestation, but reflecting on its limitations could support more effective and equitable tropical forest conservation beyond 2020 (Joss Lyons White., 2020), Unnecessary land clearance (Finn Mempel., 2021). All wetlands in Serrado should be unified in the legend of official large-scale maps supporting environmental legislation (Giselda Duriga., 2022). The independent environmental service fee (PES) and independent market exclusion mechanism (MEM) have different advantages and challenges, and it is best to combine them. In the future, soybean deforestation control work focused on the supply chain in Serrado must be complemented by broader jurisdictional methods to address deforestation and sustainable development issues (R. D. Garrett., 2022).

Through a series of studies, it has been found that there has been relatively little research on the role and significance of non-governmental organizations in the environmental protection of the Serrado grassland by previous scholars. Prior to 2012, there were few specialized studies on the role of non-governmental organizations in the protection of the Serrado grassland. From 2013 to 2020, scholars gradually began to explore, mainly focusing on research on deforestation policies, and less analysis was conducted from the perspective of the supply chain of enterprises involved in deforestation. After 2021, More scholars have begun to explore the role of non-governmental organizations in the protection of the Serrado grassland, mainly focusing on the interaction with government behavior and the effectiveness of financial policies. However, compared to the research on technical means and institutional policies for protecting the Serrado Grassland, scholars have paid little attention to the effectiveness and mechanism of non-governmental organization actions.

Through literature, it can be found that non-governmental organizations have significant importance in protecting the Serrado Grassland, but there is controversy over their effectiveness. In addition, there is little literature that systematically summarizes the measures taken by non-governmental organizations in protecting the Serrado grasslands. Therefore, a systematic study of the effectiveness of key actions taken by non-governmental organizations in protect-

ing the Serrado Grassland has strong practical significance in exploring how to promote non-governmental organizations to achieve environmental protection goals in an independent market environment.

2. Method

2.1. Study area

The Cerrado (Figure 1.) is the second largest biome in Latin America, covering an area of over 200 million hectares, equivalent to 22 % of Brazilian territory,Larger than the combined land area of Germany, France, Spain, Italy, and the United Kingdom, home to approximately 5% of the world's biodiversity. The biome is a global biodiversity hotspot , containing springs from Latin America's three major watersheds and habitat for endemic species.

Economically, the Cerrado is the largest national soybean producer, accounting for 52 % of Brazilian yield. The area of agriculture in the region grew by 9.5 million hectares between 2000 and 2017 (102 %), 5 million of which between 2007 and 2014 . From this area, 90 % corresponds to soybean crops.

Currently, only 20% of the original vegetation in Serrado remains intact. Currently, approximately 46% of the Serrado savannah has been completely converted into soybean fields or artificial pastures, with only 19.3% remaining in its original vegetation state, of which only 7.5% are officially designated as protected areas (46% in Amazon). According to Brazilian forest laws, 20% of privately owned land in Serrado is designated as protected land (while in Amazon it is 80%). According to WWF's 2019 assessment, the average annual grassland reclamation rate in Serrado over the past four years was 680000 hectares, equivalent to losing an area of grassland the size of London every three

Figure 1. Study area location.

months.

2.2. Important actions

In 1996, the Candier Act of the Brazilian government started the rapid agriculture of the rainforest in the Amazon rainforest region. After that, international non-governmental organizations took a series of actions to save the Amazon rainforest rainforest. However, because the Serrado grassland is adjacent to the Amazon rainforest, the restrictive policy of the Amazon rainforest has affected the vegetation destruction in the Cerrado region to some extent. Therefore, the important actions of non-governmental organizations on the Amazon rainforest and Cerrado Grassland are put together for observation in this paper.

Table 1: Important actions affecting the Brazilian rainforest

Time	Organization	Action	Objective
1996	Brazilian Federal Government	Candier Act	Promote Amazon's agricultural and animal husbandry product trade
2006	Four major multinational grain merchants	Amazon Soy Moratorium	Call for Abandoning Deforestation and Reclamation in the Amazon
2009	Central Bank of Brazil	Resolution No. 3545	Prohibit banks from providing loans to any individual or unit engaged in illegal deforestation in the Amazon region
2017	Brazilian Social Team	Cerrado Declaration	Call on governments, buyers, and investors from all countries to take immediate action to jointly protect Brazil's savannah
2017	23 European companies	Send Cerrado Declaration support statement (grow to 150 companies in 2020)	They hope to work together with other global stakeholders to stop the cultivation of sparse tree vegetation on the Serrado grassland in Brazil
2017	WWF China and China Meat Association, as well as 70 leading Chinese meat industry enterprises, jointly released	China Meat Sustainable Development Declaration	Promise to provide various types of meat produced in a sustainable manner to the Chinese market, while protecting the ecological environment of tropical rainforests and grasslands, by managing the supply chain
2021	COP26	Glasgow Leaders' Declaration on Forests and Land Use	Glasgow Leaders' Declaration on Forests and Land Use
2021	IFACC	Announced investment of 3 billion US dollars	Accelerate deforestation in South America and avoid planting soybeans and raising cattle on land formed through deforestation

2.3. Agricultural land and forest area in brazil

Based on the action objectives of non-governmental organizations, we can assess the effectiveness of their actions by taking into account the changes in agricultural and forest land areas in Brazil(Figure.2). At the same time, we can also use carbon dioxide loss indicators(Figure.3) to preliminarily assess the potential climate damage that Brazil's economic policies may bring to the country.

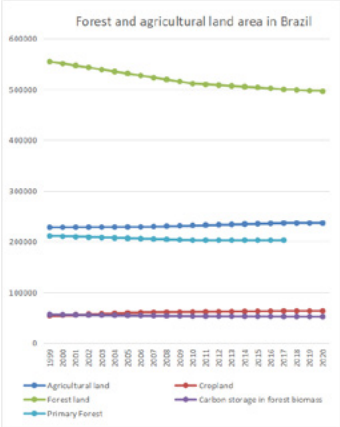

Figure 2. Study area location

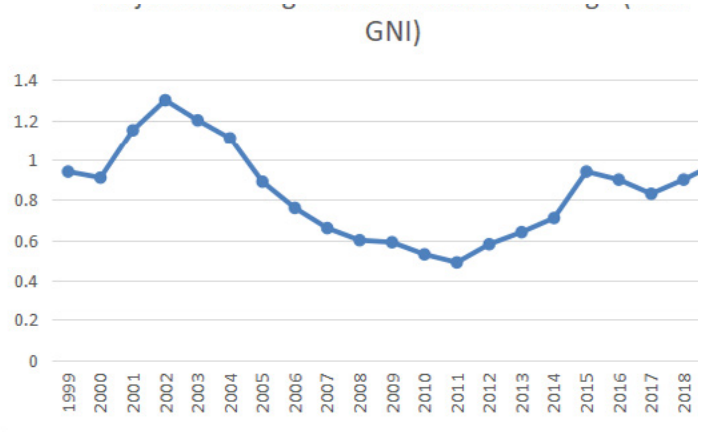

Figure 3. carbon dioxide damage in Brazil

2.4. Agricultural trade of important participating countries

The main reason for the destruction of the Amazon and Serrado grasslands is the expansion of agricultural land, so we can analyze the main influencing factors from the main export targets of Brazilian agricultural products. The European Union, China, and the United States, as the main export targets of Brazilian agricultural products, studying their absolute export value and proportion has certain significance for analyzing the main influencing forces on the Serrado Grassland in the future.

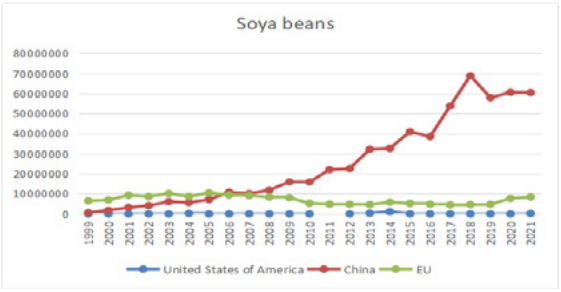

Figure 4. Brazil's soybean exports

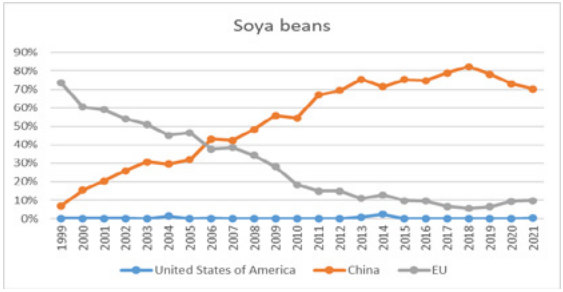

Figure 5. Brazil's soybean export proportion

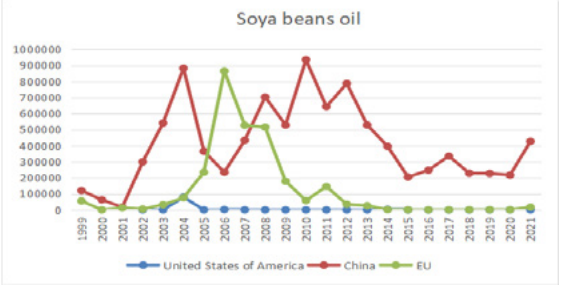

Figure 6. Brazil's soybean oil exports

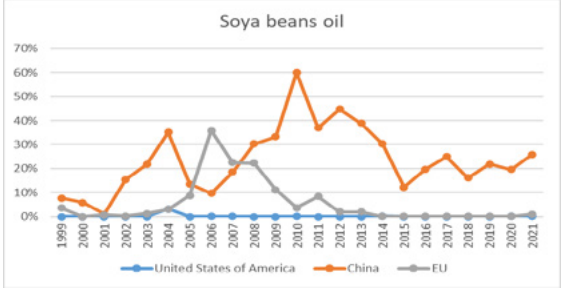

Figure 7. Brazil's soybean oil exports proportion

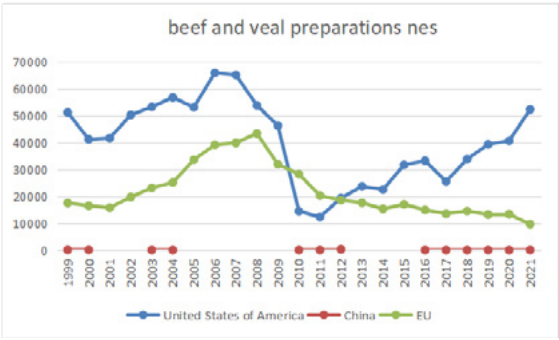

Figure 8. Beef and veal preparations nes exports

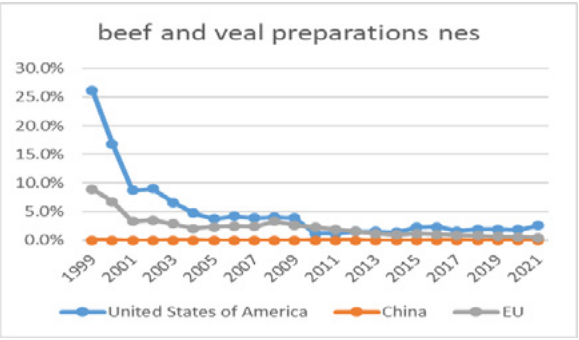

Figure 9. Beef and veal preparations nes exports proportion

3. Results

3.1. Effectiveness of climate action

From Figure 2, it can be seen that there was no significant change in the trend and magnitude of changes in agricultural land and forest area in Brazil from 2006 to 2009, indicating that "Amazon Soy Moratorium" has not yet played an effective role or the effect is not significant at this stage. From 2010 to 2017, agricultural land continued to show an upward trend and forest area continued to show a downward trend, but the changes were gradually flat compared to before 2010. After 2018, the trend of change has further flattened.

3.2. Carbon dioxide loss

Figure 4 shows that from 2002 to 2011, carbon dioxide losses in Brazil gradually decreased. From 2011 to 2020, except for the special value in 2015, the overall trend showed an upward trend.

3.3. The influence of important countries

From Figures 4 and 5, it can be seen that China has the highest proportion of Brazilian soybean exports, but since 2018, the total growth rate has been slow and the proportion has decreased. Since 1999, the proportion of soybeans imported by the European Union into Brazil has continued to decline. Prior to 2006, it was higher than China, and later lower than China. However, there has been a slight increase since 2019. The United States is at a lower level.

It can be seen from Figure 6 and Figure 7 that China still has a high proportion in the export of Brazilian soybean oil, but from the trend, the proportion has declined more since 2015, and it will show an outlier in 2021. The EU has experienced a significant decline since 2006 and has been at a relatively low level since 2010. The United States continues to be at a relatively low level.

From Figures 8 and 9, it can be seen that in terms of beef product exports from Brazil, the United States has long been at a relatively high level, but the proportion has decreased. Since 2008, the EU's imports of Brazilian beef have significantly decreased, and the ratio is also at a relatively low level. China continues to be at a relatively low level. In addition, there are certain special phenomena in the export of beef products, and Brazil's three main agricultural export targets have a relatively small impact on beef products compared to soybeans. Brazil's beef products also have important export targets.

3.4. Summarize

It can be seen from this that the "Amazon Soy Moratorium" launched by the EU in 2006, a mechanism that gradually transmits pressure from the lower reaches of the soybean supply chain to most of the upstream producers,

had no obvious effect on the Amazon rainforest at the initial stage, but it promoted the change of government behavior. After the Brazilian central bank banned loans for deforestation, the climate action initiated by the European Union had a significant effect.

However, because the Amazon rainforest is adjacent to the Serrado Grassland, focusing only on the Amazon rainforest cannot eradicate the ecological protection of Brazil, but in a sense, it has intensified the development of the Serrado Grassland. Since 2010, the protection of the Serrado Grassland has gradually received attention. In 2017, the Cerrado Declaration initiated by Brazilian social groups was of crucial significance. The Cerrado Declaration has prompted the participation of the European Union and China. During this period, as a major exporter of soybeans, China's declaration on sustainable development of meat had little impact on beef products, but the import of soybeans, an important source of feed, was greatly affected, thus playing a certain role in promoting the protection of Brazil's rainforest and grasslands. The EU is in a state of continuous improvement.

From the above summary, it is not difficult to find that the climate action of non-governmental organizations has a certain positive significance, but its indirect effect on the protection of the Serrado grassland may be greater than its direct effect. The climate action of non-governmental organizations is likely to require government involvement to enhance its effectiveness. At the same time, the initiators of climate action have stronger action power, which also indicates that in future ecological protection, non-governmental organizations need to take various measures to attract more individuals and organizations to participate in non-governmental organization climate action, or form more climate action non-governmental organizations.

4. Discussion

The purpose of this study is to explore whether non-governmental organizations' climate action on the Serrado Grassland is effective and how it may have an impact on the ecological protection of the Serrado Grassland.

We predict that non-governmental organizations can influence Brazilian rainforest and grassland developers through consumers or downstream enterprises in the agricultural supply chain, while the initiators of climate action have stronger action capabilities. In this study, we found that the European Union, as the initiator of climate action, plays a crucial role in Brazil's ecological protection, and its effectiveness is long-lasting. As a developing country, after issuing the China Meat Sustainable Development Declaration in 2017, China quickly adjusted its agricultural supply chain, changed the structure of livestock feed products, and reduced the import ratio of soybeans. However, due to the strong consumption inertia of Chinese consumers towards soybean oil, the impact of this declaration on soybean oil imports is significantly lower than that of soybeans. In our research, it is rare to see the United States actively initiating climate action. Therefore, the impact of climate action by non-governmental organizations on the United States is relatively weak, with a decrease in the proportion of imports of Brazilian beef, but the absolute value is still on the rise. In addition, once the ecological environment is destroyed, the difficulty of repairing its carbon sequestration capacity is often high. Although the rate of forest destruction tends to stabilize, carbon dioxide loss in Brazil is still rapidly increasing. In addition, in the early stages of climate action by non-governmental organizations, due to their non mandatory nature, the number of participants is relatively small, and their influence is not significant. However, as the number of participants gradually increases, it will gradually encourage the government to participate. Through legislation or financial policies, it will be more effective to influence directly participating enterprises or individuals in ecological destruction to change their behavior. Therefore, the initial ban on soybean deforestation initiated by the European Union did not have a significant effect, But after two to three years, its social influence has significantly improved.

Therefore, our conclusions and assumptions are basically consistent, and non-governmental organizations contribute to the ecological protection of the Serrado grassland, but their pathways of action are slightly different. Due to the controversial research results of previous scholars, this conclusion differs from some scholars' views that non-governmental organizations have not effectively promoted ecological protection, and is similar to some scholars' views that ecological protection in Serrado requires the cooperation of non-governmental organizations, governments, and financial institutions. In fact, based on the literature and the conclusions of this study, we can find that in independent markets, relying solely on non-governmental organizations to take climate action has limited influence

and requires effective promotion of government participation in order to better achieve the goal of ecological protection.

This study helps to reveal how non-governmental organizations (NGOs) use the supply chain for ecological protection, and also helps to further clarify the role paths of NGOs, government organizations, and financial institutions in ecological protection, providing reference for how to improve the effectiveness of NGO climate action in the future.

Due to the significant differences in data disclosure among different countries in international exchanges, I have insufficient knowledge of agricultural land and pasture data in the Serrado region, as well as feedback data from local businesses and consumers on international non-governmental organization climate action. Therefore, this article lacks quantitative analysis of the interrelationships between direct and indirect participants in non-governmental organization climate action, and further research and exploration are needed.

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