

Local and International Governance: challenges and opportunities to encourage structural adaptation actions for the Brazilian agricultural sector

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Climate change, as well as many other crises that have afflicted humanity throughout our brief existence on this planet provides opportunities for nations who invested in developing technologies and a scientific framework adjusted to the domestic reality, which have sufficiently qualified human resources and whose societies are able to understand and adjust their behavior dynamically.

In order to face these challenges, the United Nations Framework Convention on Climate Change (UNFCCC), universally accepted by all countries that are United Nations (UN) signatories, established the following fundamental principles: the climate system must be protected for the benefit of present and future generations; the specific needs and special circumstances of developing Countries must be fully considered; Parties should take measures to prevent, avoid or minimize the causes of climate change and mitigate its negative effects; Parties have the right to sustainable development and must promote it, considering economic development as essential for the adoption of measures to face the present and inevitable impacts of climate change, which are already being felt by this generation.

However, the reality and practice of political processes, which govern both international diplomacy and the intricacies of domestic politics, are laden with peculiarities. There are several political and economic interests that influence this dynamic. The reality imposed by international politics tends to emphasize, for developing nations, actions focused on mitigating greenhouse gases but do not support or prioritize an equal level of investments towards fostering resilience and adaptive capacity. International climate change governance, and even the UNFCCC's Subsidiary Implementation Body (SIB), has shown little effectiveness in promoting investments that result in systemic gains in developing countries' adaptive capacity, as opposed to the flow of resources available for projects and initiatives that aim to promote actions for reducing greenhouse gas emissions (mitigation).

For developing countries, effective investments in adaptation, besides being scarce, are also rarely connected or integrated with national governance. In these countries, even investments to systematize indicators are not prevalent, causing them to sometimes be confused with actions aimed at the preservation and conservation of natural resources, and sometimes with those aimed at sustainable development.

Despite the global and temporal dimension of climate change problems, it is necessary to emphasize that the solutions to this issue must be thought out and adopted locally, on a scale and timeline compatible with a few human generations (RAYNER; MALONE, 1998). Particularly exposed to the dynamics of the climate and its fluctuations, the agricultural sector has inherent political challenges that involve the design of specific policies capable of promoting gains in terms of resilience, profitability, and sustainability in the field, in a consistent manner.

The fifth report on impacts, adaptation, and vulnerability from Working Group II of the Intergovernmental Panel on Climate Change (IPCC) indicates that humanity is on a path of reducing aptitude and worsening the productive capacity of several crops that are key to both food production and bioproducts (IPCC, 2014). The kinetics of the processes associated with climate change are in a planetary scale and result in inertia, where its order of magnitude can be more than fifty years. Therefore, with the awareness that we are still on an upward path of greenhouse gas emissions, the construction of domestic policies must contemplate and prioritize the development of scientific knowledge and production strategies compatible with the predicated level of planetary entropy.

According to the IPCC's special earth report, food products face challenges of institutional fragmentation and, nevertheless, suffer from the lack of communication and engagement between players at different levels, which results in policies with shallow and obtuse objectives (IPCC, 2019). In a scenario of high international competitiveness and considering the potential disruptive role that the negative effects of climate change may have on poorly adapted economies, the special report on land use indicates that intersectoral coordination between public health, transport, environment, water, energy, and infrastructure is strategic to ensuring the positive results of domestic policies with social, environmental, and economic benefits.

Thus, planning and risk assessment tools must start to incorporate models and scenarios in a structural way, in order to ensure that the horizon of debate and problematization is not overshadowed by the immediate nature of the present reality. For agriculture, the design of sectoral climate change governance necessarily involves: the translation of a delicate balance between the dimension of multilateral governance, particularly in the context of the United Nations and its conventions; the dimension of the dynamics and commercial relations between exporting countries and consumer markets; and, finally, the domestic dimension, dependent on sectoral policies engaged in producing tangible and measurable results that can, in the final analysis, add value to agricultural products.

In the international arena, and especially since 2009, the Empresa Brasileira de Pesquisa Agropecuária (Embrapa) has collaborated with the Ministry of Agriculture, Livestock and Food Supply (MAPA) and the Ministry of Foreign Affairs (MRE), in strategic negotiations with the UNFCCC. Starting in 2020 and spanning over the next decade, the great political challenge posed by climate change will result from the implementation of the Paris Agreement¹ and, in the context of the UNFCCC, the promotion of an economic model that values production systems that are less and less intensive in fossil carbon. For Brazil, the primary objective of a strategy for adapting to the impacts of climate change must include improving the understanding of tropical agricultural systems and their agronomic, environmental, and social differential and potential. It is fundamentally relevant that a solid monitoring and communication strategy will allow us to forge, alongside society, a positive perception about the multiple benefits resulting from the tropical and sustainable agricultural model developed in Brazil, in addition to the relevant role of this sector as a provider of bioproducts, food security and energy - the main tripod of the agricultural bioeconomy.

¹ Available at: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>.

Once other economic variables are isolated, such as distance traveled to reach the consumer market or market reserve barriers, the trend in coming years is that environmental predicates and other social qualities will be increasingly relevant according to the metrics by which the products are valued and, consequently, penetrate and access international markets. When the Paris Agreement entered into force in 2020, a new cycle began towards increasing the Convention's transparency mechanism by reducing the current differences between monitoring obligations for Annex I and Non-Annex I Countries. The Paris Agreement will provide a single model for reviewing national inventories and a single database, thus fostering comparability. This new instrument will certainly represent a challenge for developing countries, but also an incredible opportunity for the dissemination of technological predicates and differentials. This entirely new structure developed under the Paris Agreement has the objective of feeding the global evaluation process (GST) which aims to periodically make the Agreement more ambitious, imposing, through the revision of the nationally designated contributions (NDCs), dynamism in a continuous process to increase domestic efforts.

In this context, building the image of the agricultural product is certainly something intrinsically related to a long-term strategy and that adheres to the process that will come into force with the Paris Agreement. It is natural, therefore, that this environment will be used as a showcase by those capable of demonstrating sustainability in their domestic actions and who wish to positively impact the image of their production systems and technologies.

Along these lines, it will be up to the Brazilian agricultural sector to systematize and clearly characterize how policies and technologies, including those already incorporated by the ABC Plan, present benefits quantified in a robust way to society, particularly with regard to their contributions to adapt to the potential negative impacts of climate change, to the conservation and improvement of the resilience of productive systems, food security, integrated landscape management and in controlling GHG emissions.

We believe that, with regards to sustainability and resilience under the perspective of food and nutritional security, that so depends on the action of the components of biodiversity and environmental services, other topics should integrate the list of challenges of those responsible for the design and support of the related public policies. We can highlight a few of these topics: increased promotion of the genetic variability of species and crops, both in fields of crops and in areas of environmental recovery, avoiding genetic bottlenecks and homogeneous landscapes; prioritization and fostering of planting honey and fruit species in programs for the recovery of degraded areas for the benefit of pollinating animals and seed dispersers; support for integrated pest management and the concomitant application of good practices in using pesticides; increased use of bioproducts that improve soil and plant resilience to stress and that increase the soil carbon content; and monitoring the reduction of the groundwater tables, enabling adequate management of the water used in irrigation.

For example, more information acquired from modeling the buffering effect of different percentages of forests, wetlands, and other natural ecosystems in reducing extreme climatic impacts in productive landscapes, will greatly assist the country's chances in keeping its position as a major long term competitive food producer, thanks to national adaptation efforts.

Adding to the effort of the last decades, and especially after the decision to implement the ABC Plan, the development of actions focused on aggregating the quality and productive capacity of Brazilian soils has been gaining kinetics. Under the auspices of the National Soil Survey and Interpretation Program (Pronasolos), from 2018, a series of attributes will be analyzed, which will enable the development of a whole new set of conservation and management technologies, that are better adapted to constant climatic variations. Throughout the chapters of this publication, other relevant initiatives will be presented in greater detail, including examples of projects developed with the aim of improving the adaptive capacity of productive systems to the potential negative impacts of climate change and with potential co-benefits in the control of emissions, increasing removals or mitigating GHGs.

These policies and innovations generated by projects and programs will improve the food production system (SCHMIDT-TRAUB et al., 2019) and, at the same time, develop appropriate indicators that also give visibility to the socio-economic and environmental efforts towards sustainability built during the last decades by Brazilian agriculture.

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