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Food System
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The Food System Economics Commission is an independent academic commission that equips political and economic decision makers with tools and evidence to shift food and land use systems.

POLICY BRIEF 5

Brazil's Food System Transformation

SUMMARY

The hidden costs of Brazil's food system are estimated at approximately 500 billion USD annually, primarily driven by unsustainable production practices and GHG emissions. The Food System Economics Commission (FSEC) envisions a transformation scenario for Brazil extending up to 2050, with costs potentially being cut by more than 200 billion USD annually. Ending illegal deforestation, incentivizing sustainable resource use, improving access to finance particularly for small farmers and ensuring a fair transition are strategic priorities for transforming Brazil's food system. An integrated strategy tailored to local priorities and circumstances could help address the unavoidable tensions between multiple objectives that transforming food systems entails.

BACKGROUND

The Food System Economics Commission is an independent commission tasked with providing policy makers with a global analysis of the tools and benefits of transforming food systems towards more inclusive, healthier, and environmentally sustainable outcomes.

This brief is intended as a starting point for a country-level dialogue on priorities for transforming food systems, and summarizes some of FSEC's key findings, focusing on Brazil, which faces unique challenges and has significant global relevance.

Brazil, a major food exporter and the world's second largest beef producer, faces multiple challenges and opportunities in its complex food system, given both its role as a global exporter of commodities, and the need to overcome the immediate national challenge of having over half of the population in some degree of food insecurity.

The livestock sector is a good example of the challenges and opportunities Brazil faces. The meat industry, while contributing significantly to the economy as a leading exporter to major markets such as China and Russia, has a large environmental impact, particularly in the Amazon. Increasing international pressure, such as recent EU legislation banning commodities linked to deforestation, is forcing action to address these negative impacts. Failure to do so risks trade repercussions, and exacerbated deforestation would become an economic liability. Climate change is already impacting Brazilian agricultural productivity through more frequent El Niño and La Niña events, higher temperatures, and altering rainfall patterns, particularly in the Cerrado biome. This underscores the pressing need for a shift towards sustainable, low-carbon agriculture, not merely as a response to political pressure, but as an economic imperative. In this context, climate-resilient and low-carbon agriculture is emerging as essential for sustainable development. Despite hurdles, there are opportunities to improve resource efficiency and economic resilience, paving the way for a more sustainable future for Brazilian agriculture.

FSEC has evaluated the results of two science-based pathways designed to assess the potential for long-term food system transformation to achieve (1) consumption of healthy diets by all, (2) strong livelihoods throughout the food system, (3) protection of intact lands and restoration of degraded lands, (4) environmentally sustainable food production, and (5) resilient food systems that maintain food security and nutrition in the short and long term.

The Current Trends (CT) pathway is based on a relatively optimistic set of assumptions about socio-economic development and the implementation of current policy commitments until 2050. Its projected outcomes include a small reduction in the number of underweight people, but also an alarming escalation of obesity and worsening environmental indicators.

The Food System Transformation (FST) pathway outlines changes to global food consumption and production between 2020 and 2050. Despite the predicted outcomes for a sustainable future, challenges may arise at national and sub-national levels due to governance, financial and political constraints. The FST pathway proposes a package of measures to address potential trade-offs, including technological interventions in food production and a shift towards healthier diets by 2050. In the Brazilian beef cattle sector specifically, measures that would help achieve the FST outcomes include biodiversity conservation, nitrogen surplus mitigation, carbon sequestration and adaptation to changing dietary demands, highlighting its role in shaping a sustainable food future. The economic opportunities offered by these pathways are explored through an analysis of how transforming food systems would reduce food systems' hidden costs. These hidden costs are the environmental, health and poverty impacts of food systems that are not reflected in the market price of food today, but are insidiously mortgaging humanities future.

KEY TAKEAWAYS

The hidden costs associated with the current state of Brazil's food system amount to a staggering 500 billion USD 2020 PPP per year, equivalent to 16 percent of Brazil's GDP in 2020 PPP. This exceeds the economic contribution of production in the agriculture, forestry and fisheries sectors, which amounts to about 6 percent of GDP in 2020 PPP for the same year. The Brazilian food system currently impose these costs on other sectors and on future production, which partly or fully subsidize profits of current activities by absorbing their hidden costs.

Transforming Brazil's food system holds the promise of avoiding a significant portion of these hidden costs. FSEC estimates that by 2050, Brazil could avoid an average of about 216 billion USD 2020 PPP per year by implementing FST measures, with cost savings increasing over time. Moreover, the benefits of implementing FST extend beyond the immediate future, with avoided costs increasing in 2050 and continuing to grow thereafter.

Transitioning towards healthier diets is an important driver of the food system transformation, potentially resulting in around 80 billion USD in avoided hidden costs each year. Interestingly, even if Brazil were not to shift his consumption patterns, demand shifts elsewhere in the world would reduce Brazil's production of animal feed and meat. Due to Brazil's favourable climate and soil conditions, however, the sector would continue to export, albeit on a smaller scale.

Between 2020 and 2050, the largest avoided costs under FST are expected to arise from avoided cropland expansion and forest habitat restoration, carbon sequestration and nitrogen run-off reduction. Residual costs may persist after 2050, particularly related to nitrogen surplus and nutritional impacts.

Looking beyond 2050, the Brazilian economy is expected to benefit significantly from ecosystem services resulting from the return of forest habitat. In addition, reduced methane emissions from reduced livestock production and improved practices, coupled with significant carbon sequestration, are expected to contribute significantly to avoided GHG emissions, with carbon sequestration emerging as a major component.

The Brazilian cattle sector, in particular, has immense potential to drive such a transformation by exploiting its significant untapped environmental potential to increase productivity and free up land for other uses. However, this will require overcoming several socio-economic and political challenges, including access to finance and technical assistance, as well as strengthening environmental governance across the country.

Adopting sustainable intensification practices, such as crop-livestock integration and degraded pasture restoration that are tailored to each natural habitat, will increase farm profitability and reduce land demand. This will help preserve natural vegetation areas and reduce GHG emissions. This shift creates opportunities for alternative land uses, paving the way for a low-carbon, nature-friendly future. In addition, redirecting financial flows towards sustainable agricultural practices, whether through government programmes or private investment, is critical to driving this transformative agenda and future profitability. Integrating sustainable production practices will also be critical for commodities such as beef over the next decade. Ultimately, proactively transitioning Brazil's livestock sector towards sustainability will mitigate risks and position the industry for long-term success in a rapidly changing global landscape.

RECOMMENDATIONS

- **Raising agricultural productivity and profitability** is essential to facilitate the transition to sustainable production methods. For the livestock sector intensification practices require significant initial investments, which pose challenges for financially constrained farmers. While various incentive schemes already exist, such as the Green Beef Stamp and Payment for Ecosystem Services, their effectiveness hinges on successful implementation and the ability to navigate a complex regulatory framework.
 - **Investment in technological innovation and diffusion and process improvement** will be required. Addressing the needs of smaller farmers is central to this agenda. Currently Brazil's rural credit system favors well-capitalized, larger farms and underserves smaller producers. Closing this divide is essential for fostering an equitable and inclusive transition toward sustainable agriculture, particularly in livestock production. Complementary technical assistance is required to ensure that smaller farmers can participate effectively in sustainability initiatives.
 - **Ensuring a fair transition** will be essential to navigate the political economy of transforming food systems. The transformation process might lead to higher food prices due to pressures on commodity prices. Compensatory measures should ensure that the transformation does not affect negatively vulnerable groups. Modernizing agricultural production, and particularly the intensification of livestock production, could exacerbate ongoing trends towards declining agricultural employment. Ensuring access to the new employment opportunities that the conservation and restoration of natural habitats and that the shift to healthier diets offer, should therefore be part of the priorities of a food system transformation strategy.
- Seizing the opportunities that the FST pathway offers, while navigating its challenges, calls for well-designed strategies that reflect local circumstances and seek to ensure coherence in addressing multiple objectives.
- The FSEC global report has identified some principles for the design of such strategies (Box 1).

BOX 1

FSEC CRITERIA FOR THE DESIGN OF INTEGRATED NATIONAL FOOD SYSTEM STRATEGIES

- **Adopting a comprehensive policy framework** to avoid unintended consequences, starting with a thorough assessment of existing policies to identify and rectify inconsistencies, interlinkages, gaps, and inadequacies between sectors.
- **Designing comprehensive and coherent policy bundles to create synergies between individual actions and address trade-offs.**
- **Focusing on key areas with maximum impact**, such as promoting healthy diets for human and environmental benefits.
- **Adopting inclusive and integrated governance mechanisms**, spanning government departments, local governments, community institutions, and stakeholders to ensure a shared vision and minimize trade-offs in pursuing sustainable food system goals.
- **Creating organizational, technical, and financial implementation capacities**, at all levels of government.
- **Adopting an inclusion lens in policy design** to prevent unintended social consequences.



Visit our website to read the Global Policy Report, which maps the impacts of two possible futures for the global food system.