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**SOLVING THE GREAT FOOD PUZZLE:
SCALING FOOD SYSTEMS
TRANSFORMATION IN BRAZIL**

SUMMARY OF KEY FINDINGS

1 Given its environmental specificities, Brazil is considered an **Ecological Food System Hotspot**, which means it's a country that has some of the richest and the most threatened reservoirs of carbon, plant and animal life on earth, and faces significant levels of food production at the expense of these natural resources.

- a. Although all countries must transform their food system, these “hotspots” represent countries that are uniquely important for achieving global climate and biodiversity goals yet continue to face increasing rates of nature conversion for food production.

2 Brazil needs an integrated food system outlook to both significantly reduce the impact of food production for local and external consumption, while simultaneously tackling national food access inequality and food insecurity.

3 As with other countries assessed, Brazil would highly benefit from strengthening national level commitments on food systems. There is high potential for transformation by harmonizing programmes and actions across the country to create national-level commitments, and this will also help deliver global climate, biodiversity and health goals.

4 Some of the levers for impact that could have the most positive impact if implemented in Brazil are optimizing land use and decoupling agricultural production to deforestation and conversion of natural ecosystems, restoring biodiversity, supporting smallholder farmers, and redirecting subsidies to improve production.

5 When leveraging food system transformation, trade-offs must be carefully considered. When producers are shifting production practices and making changes on their farms and in their supply chains, for instance to restore biodiversity, or are receiving subsidies to produce different foods, there could be adverse impacts on short-term food availability or jobs and livelihoods. As such, Brazil should consider providing financial incentives and taxes to improve consumption to ease any adverse impacts.

6 All food system types can learn from each other – in spite of the many differences, there are several transformation levers which all three food system types can apply with similar effect. In some instances, it is possible for countries with very different characteristics to share knowledge and collaborate.

SOLVING THE GREAT FOOD PUZZLE

Solving the Great Food Puzzle adds to a critical conversation around how food system transformations may vary at the country level by putting the spotlight on four countries (Brazil, Colombia, Kenya, UAE) as illustrative examples, to demonstrate the myriad ways in which food system transformations might be similar or vary between countries.

While this is not the first report on food system transformations at the national level, this report is novel in that it:

- 1) assesses food systems from a conservation lens to highlight important environmental dimensions and provide insights for organizations working on the ground;
- 2) uses a typology of food systems to reduce the complexity of analysis;
- 3) identifies a handful of transformation levers that can be assessed across all countries and;
- 4) uses a local context analysis to assess the potential of levers to transform a particular food system type and test the validity and usefulness of the typology.

Six variables informed the typology because they may have a disproportionate impact on a country's ability to achieve climate and biodiversity goals and can also influence the trade-offs that a country must contend with when implementing policy. These variables were then used to construct three food system types from the four countries studied. Finally, 20 transformation levers were used to analyse the similarities and differences in actions, and their potential impacts, across the three food system types.

BRAZIL OVERVIEW

Brazil is a large upper-middle income tropical country in South America, and home to 213 million people. Brazil contains multiple biomes - including the Amazon, Cerrado, and Atlantic Forest - that are globally significant in terms of their carbon, biodiversity, and role in supporting the livelihoods of indigenous and traditional people. The country has the most diverse flora in the world, with 55,000 species (22% of the world total) identified to date. With its vast carbon reserves, it is also of central importance to achieving global climate goals. Brazilian agriculture is predominantly run by large industrial agribusiness who occupy 75% of the land and generate 62% of agricultural output.

In contrast, there are 4.4 million family farms that occupy 25% of the land but produce 70% of the food consumed in the country. Brazil is one of the largest producers of food and agricultural products in the world including beef, soy, coffee and sugarcane. It has the potential to meet domestic food demand and many of the foods produced in Brazil are consumed domestically including 80% of beef, 70% of poultry and 82% of pork, helping to make per capita consumption of animal source foods very high. Brazil currently has the third largest per capita GHG emissions from food consumption. Despite this, hunger and malnutrition are still present and increasing.



ANALYSIS OF THE BRAZILIAN FOOD SYSTEM FROM A CONSERVATION LENS

In order to address the complexity of making national food system analyses, and to better identify key-levers and facilitate the correlation between them, as well as to identify trade-offs, WWF has developed a typology that can be used to identify similarities and differences amongst food systems.

Based on this typology, Brazil is assessed as a Type I country, alongside Colombia, given the macro food system characteristics identified in the table below.

Table 1. Overview of the characteristics of a TYPE I food systems (of which Brazil is an example)

Variables	Type I Brazil
Production System	Most of the land/waters are dominated by industrial food production with a smaller share farmed/fished by smallholders and artisans.
Self-Sufficiency	Sufficient land and water resources exist to produce enough food to meet domestic demand. Food may still be imported but this is not driven by land and resource constraints.
Food Security	Although enough food can be produced domestically, a large percentage of the population remain food insecure due to internal problems related to access, availability, and affordability of food.
Consumption Patterns	Although a high level of food insecurity exists, the per capita impacts from food consumption are above planetary boundaries, mainly driven by high levels of per capita intake of animal-source foods.
Biodiversity Hotspot	High levels of biodiversity richness are found in much of the country, with large areas considered biodiversity hotspots.
Irrecoverable Carbon	High levels of carbon reserves can be found in the country with large areas containing high density reserves of irrecoverable carbon.

Brazil is considered an Ecological Food System Hotspot, which is a country that has some of the richest and the most threatened reservoirs of carbon, plant, and animal life on earth. Although all countries must transform their food system, these “hotspots” represent countries that are uniquely important for achieving global climate and biodiversity goals yet continue to face increasing rates of nature conversion for food production.

This ecosystemic abundancy is directly related to why the country is considered to be self-sufficient in terms of land and water. However, because the Brazilian production system causes significant deforestation and conversion of natural ecosystems, and a portion of the population overconsume animal-based proteins, Brazil’s ecology is part of the reason the country has high greenhouse gas (GHG) emissions and biodiversity loss associated with food consumption.

IDENTIFICATION OF KEY LEVERS FOR TRANSFORMATION OF THE BRAZILIAN FOOD SYSTEM

To allow for meaningful identification of policy actions required to transform the country’s food system, 20 transformation levers were identified. The transformation levers were developed through an in-depth analysis which included interviews with stakeholders across each of the national food systems studied, consultation with food systems experts and an extensive literature review. The 20 levers were clustered in six thematic areas, and were used to effectively analyse the similarities and differences in actions needed across all three action areas (nutrition and diets, food loss and waste, and production).

Based on these major clusters and on the country’s profile, a few levers have been pointed out as having the potential to be more impactful when choosing actions to reduce or mitigate negative food system related impacts in Brazil:

- **Natural resources governance:** Given its status as an Ecological Food System Hotspot, Brazil needs to optimize land-use and decouple food production with deforestation and conversion of natural ecosystems; Directly related to this is the opportunity to restore biodiversity – even considering productive restoration focusing on specific crops and biomes – and increase carbon storage;

- **Governance and institutions:** Brazil needs to strengthen its national-level commitments, mostly in relation to food-based GHG emissions, as well as to commit to strategies for climate change mitigation and adaptation related to food systems. Additionally, considering the importance of smallholder farming for local consumption and food security, and the challenges these farmers face in accessing and maintaining land, and accessing credit and markets, supporting smallholders and improving land tenure rights are considered a priority for the country.
- **Education and Knowledge:** Improving data collection and measurement of impacts are essential to Brazil, especially in terms of food loss and waste tracking and mitigation. Increasing public awareness of food-related issues, and their correlation to ecosystemic degradation or human rights issues is a critical issue for the country as well.
- **Technology:** Brazil needs to better design and develop infrastructure to reduce losses and waste throughout the supply chain, as well as to mitigate and adapt to immediate and future climate changes.
- **Trade:** Given Brazil is one of the biggest food / agricultural products exporters in the world, focusing on establishing and following protocols for deforestation- conversion- and human rights violation-free trade is a priority.
- **Finance:** Redirecting subsidies to improve production is an important lever to reduce impact in Brazil's food production, both for low-carbon agriculture as well as to directly support smallholders. Additionally, there is high opportunity in providing incentives and taxes to improve consumption, most importantly to tackle food access inequality and food insecurity.

Even though the report focuses on prioritizing a few levers for each type of food system, a transversal analysis of levers show that all countries must strengthen national-level commitments – there is high potential for transformation by harmonizing programmes and actions across the country to create national-level commitments. This will also help deliver global climate, biodiversity and health goals.

Also, all food system types can learn from each other – in spite of the many differences, there are several transformation levers which all three food system types can apply with similar effect. In some instances, it is possible for countries with very different characteristics to share knowledge and collaborate.

TRADE-OFFS

Given the report shows a multifaceted analysis of food system transformations, it is necessary to analyse the possibility of having trade-offs related to the implementation of a few levers in a systemic way. Even if some levers advance nature, climate and health goals, there could be trade-offs in areas including culture, tradition, food security, jobs, livelihoods, equity, and wellbeing.

Where producers are shifting production practices and making changes on their farms and in their supply chains, for instance to restore biodiversity, or are receiving subsidies to produce different foods, there could be adverse impacts on short-term food availability. Yields could be reduced and the quantity, affordability and accessibility of food could be affected, with supplies being concentrated in wealthier countries or communities who can afford to pay more. As such, food-producing countries – in particular Type I food systems such as Brazil, where these levers have high potential - should consider providing financial incentives and taxes to improve consumption to ease any adverse impacts.

STAKEHOLDERS SUPPORT

A full range of stakeholders will be required to implement national-level food systems transformation - including policymakers, the private sector, scientists, non-governmental organisations, the private sector, and individuals. Explicitly, smallholder farmers, women, youth, indigenous people, local communities and other historically-marginalized and vulnerable people need to be involved in shaping transformations. Specific action that different stakeholders can take include:

- **Policy Makers:** Feature food system transformation prominently in national climate, biodiversity, and health plans. This includes embracing a food systems approach that incorporates all parts of the food system in Nationally Determined Contributions (NDC), National Adaptation Plans (NAPs), National Biodiversity Strategy and Action Plans (NBSAPs) and any other relevant national climate and biodiversity policies.
- **Private Sector:** Ensure that investments are made in higher potential transformation levers in the countries they are present. This will ensure that investments are strategically targeted to deliver the most impact in the shortest time possible.

- **Scientists:** Scale research on the cultural, political and social elements of food system transformation. In addition, research on how systems thinking can be applied in the national context is needed to ensure feasibility of implementation of actions.
- **Non-Governmental Organizations:** Integrate food systems into all climate and biodiversity conservation targets and goals in countries where the NGO is present. This includes more alignment on how conservation goals (e.g. wildlife conservation) are connected to action on food systems.
- **Individuals:** Advocate for policies that have the most impact in their country. This report can serve as a guide for identifying key levers of action depending on a country's food system type. This will help to ensure that mobilized action will have the most impact depending on local context.



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