POLICY BRIEF

N. 1 | MAY 2025

COP30 IN BRAZIL
TOWARDS A JUST AND SUSTAINABLE TRANSITION OF THE AGRI-FOOD SYSTEM

UNIVERSIDADE DE SÃO PAULO
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Favareto A., Sanseverino E.C., Nunes-Galbes N.M., Dórea O., Marrocos-Leite F.H. *COP30 in Brazil – Towards a just and sustainable transition of the agri-food system*. São Paulo: Josué de Castro Chair in Healthy and Sustainable Food Systems, FSP/USP; 2025. 25 p.

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KEY MESSAGES

- There will be no satisfactory and sufficient response to climate change without a just and sustainable transition of the agri-food system. Currently, the global agri-food system accounts for a third of greenhouse gas (GHG) emissions. In Brazil, this figure reaches almost three-quarters of total gross emissions, when direct and indirect effects are taken into account.

- Despite its relevance, the agri-food system remains neglected in international climate discussions. Only 50% of countries have included specific targets for the sector in their Nationally Determined Contributions (NDCs).

- After 10 years of the Paris Agreement, international governance is still failing to build an effective transition strategy. 2024 was the hottest year on record, exceeding 1.5°C above pre-industrial levels. GHG emissions reached historic record levels.

- COP30 faces a paradox: while climate urgency demands immediate action, the global political context is unfavorable. The election of Donald Trump, the crisis of multilateralism and the strength of climate denialism make it difficult to formulate ambitious targets, to design effective implementation mechanisms and to provide adequate funding for the transition.

- The Brazilian NDCs are ambiguous and the means of implementation may be insufficient. Brazil has proposed a GHG emissions reduction target by 2035, which environmental leaders consider to be unambitious for the national context. Furthermore, the focus appears to be primarily on reducing deforestation and promoting the bioeconomy, while overlooking the potential for action related to transforming how the agri-food system is organized and operates.

- Despite recent progress in reducing deforestation rates, Brazil's position as a leader in a more ambitious climate agenda is jeopardized by its continued interest in oil exploration at the Amazon River delta and by its failure to adequately address the effects of biofuel expansion on land use and on food and nutrition security.

- In addition to making the just and sustainable transition of the agri-food sector one of the pillars of the climate agenda, Brazil must define a clear pathway to achieve this, with objective and progressive targets that facilitate monitoring and accountability. The strategy should focus on overcoming the triple monotony that characterizes the current agri-food system: agricultural landscapes, which are increasingly susceptible to extreme climatic events; intensive animal production, which is highly dependent on antibiotics; and diets marked by low diversity of fresh and minimally processed foods, alongside a growing reliance on ultra-processed products and meat consumption far exceeding human metabolic needs.

SILENT IMPACT
The agri-food system accounts for a third of global GHG emissions

In the global climate change debate, most attention has been directed toward sectors such as energy, transportation and industry - which indeed account for a substantial share of greenhouse gas (GHG) emissions. Meanwhile, the agri-food system (**Box 1**) — encompassing all stages from food production to consumption or disposal[1] — has remained largely overlooked in international negotiations. By the end of 2021, only about 50% of the countries that signed the Paris Agreement had included specific targets for reducing GHG emissions in the agriculture and livestock sector within their NDCs[2]. This persistent oversight comes at a high cost, both in socio-environmental and economic terms.

BOX 1. Agri-food system

The term "food system" is used by various authors and international organizations to refer to a set of networks and relationships involved in the production, processing, distribution, and consumption of foods. More recently, the incorporation of the prefix "agri-" has become increasingly common, highlighting the role of agricultural activities in linking the different stages that make up this system.

The global agri-food system encompasses diverse forms of organization. The dominant model is characterized by increasing integration across its various stages through global value chains; intensive, large-scale use of chemical inputs; genetic standardization of crops and livestock; corporate control over production processes and the widespread consumption of ultra-processed foods. At the same time, alternative models challenge this paradigm, promoting practices that value biodiversity, foster closer relationships between producers and consumers, and adopt technologies that minimize environmental degradation. Despite this diversity, the use of the singular form — "agri-food system" — underscores the fact that a predominant logic continues to shape how the system is organized globally.

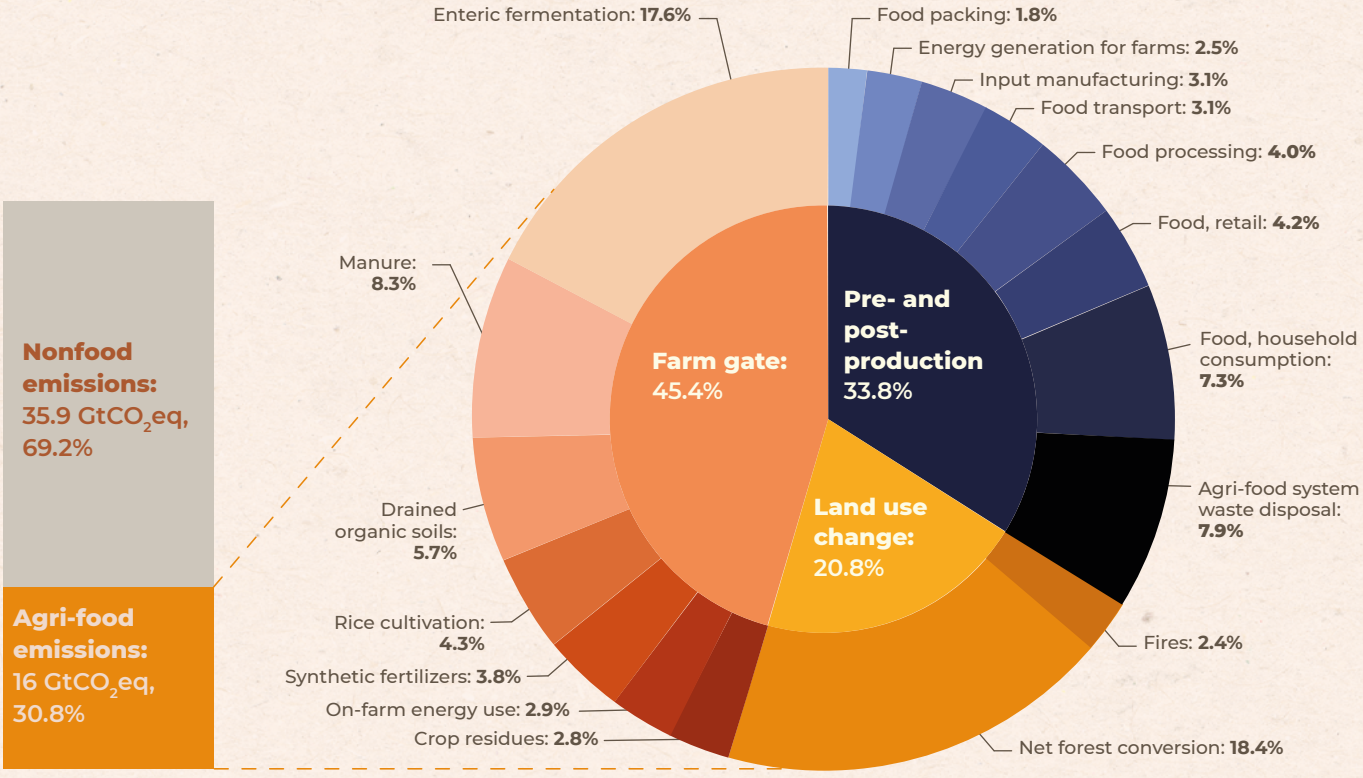
This organizational model of the global agri-food system emerged in the second half of the 20th century as a response to the need to increase food supply for a rapidly growing population. This goal was achieved, but at a significant cost to both human health and the environment: while hunger rates declined, problems related to obesity and malnutrition — tied to the types of foods consumed — rose sharply. The environmental impact has also been immense.

This does not mean that hunger is no longer an issue. Where it persists, it is largely explained by problems of access to food rather than its scarcity. More than half a century after the so-called "Green Revolution", which spread the dominant logic behind the current agri-food system, the ethical and normative goals that should now guide governance, financing, regulation, and incentives are different: improving the quality of food consumed, expanding access to nutritious food for all people, and transforming production practices to regenerate the ecosystems upon which human life depends.

Source: Authors (2025), based on Friedland (1984)[3]; McMichel (2009)[4]; Marsden (2022)[5]; Marsden (2024)[6].

The global agri-food system is responsible for a third of the world's GHG emissions, with an average of around 16 gigatonnes of carbon dioxide equivalent per year (CO_2eq/year)[7] (**Figure 1**). These emissions alone would make it impossible to limit global warming to 1.5 °C and even threaten the target of 2 °C by the end of the century — the parameters established in the Paris Agreement of 2015. Maintaining the current logic in the agri-food system means these thresholds would be reached even if fossil fuel emissions were halted immediately and completely[8]. In addition, the agri-food system is the main driver of biodiversity erosion[9], with the conversion of natural habitats into agricultural areas and pasture, standardization of food production, pollution by agrochemicals and overexploitation of natural resources.

FIGURE 1. Greenhouse gas emissions profile of the agri-food system by activities and stages of the food production, distribution and consumption process.

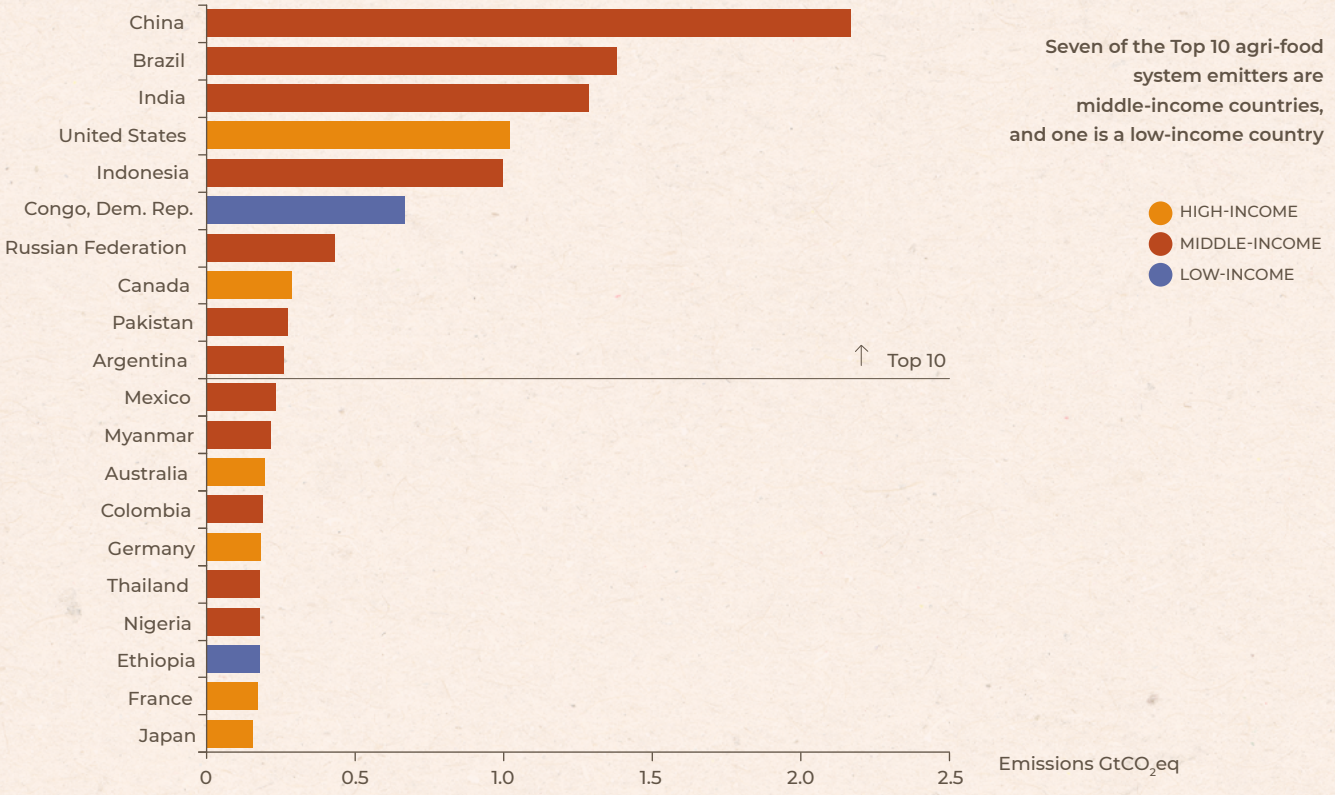


Note: Left (bar): annual average of global GHG emissions from the agri-food system as a share of total GHG emissions, 2018–20.
Right (pie chart): agri-food emissions divided into the three main subcategories (on-farm, supply chain, land use) and their individual components.
$GtCO_2$eq = gigatonnes of carbon dioxide equivalent.

Source: Reproduced from Sutton, Lotsch, and Prasann (2024)[7], p. 30.

Most of the emissions from the global agri-food system come from agriculture, land-use change and forest conversion — especially deforestation[7,8,10], as illustrated in **Figure 1**. These sources are also the main contributors to agri-food emissions in low- and middle-income countries. Eight in ten highest-emitting economies in the agri-food sector belong to this group[7] (**Figure 2**). By contrast, in high-income countries, most agri-food emissions come from energy use in post-production stages, such as food processing, transportation, marketing and waste management[10].

FIGURE 2. GHG emission rates of the twenty largest emitters, by income group.



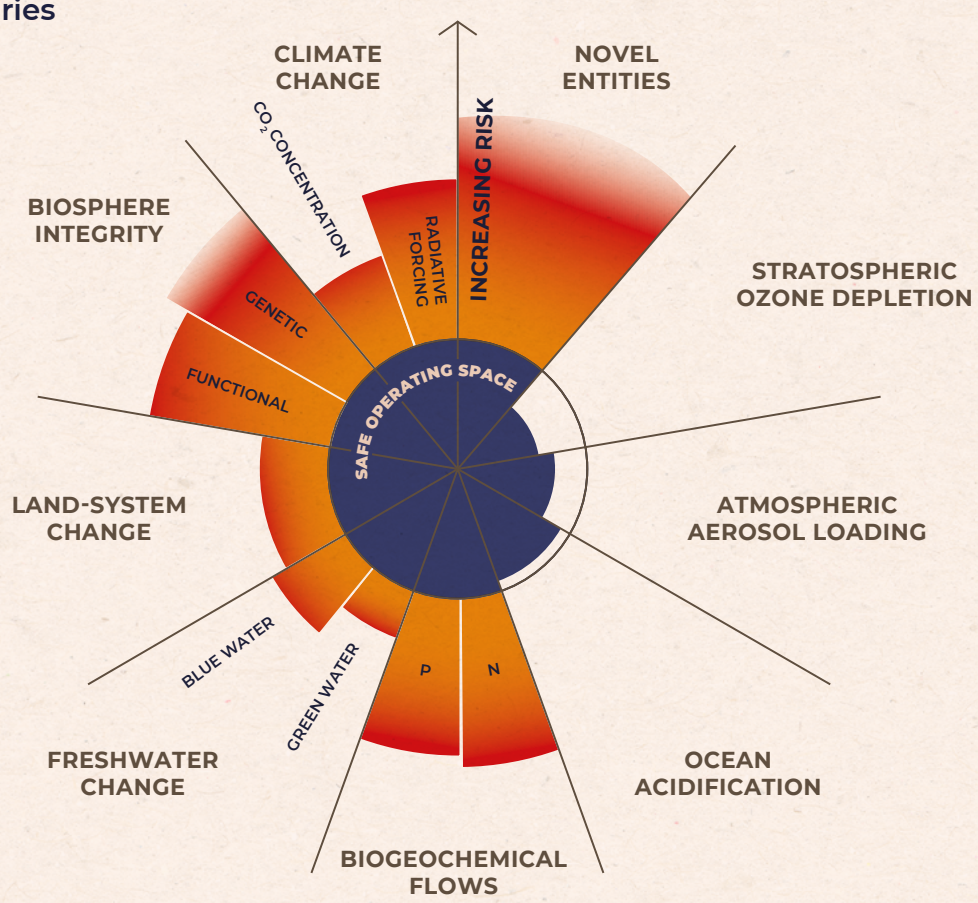
Note: The figure shows average annual agri-food system emissions for 2018–20.
Source: Reproduced from Sutton, Lotsch, and Prasann (2024)[7], p. 6.

Emissions, however, are not the only environmental concern. The intensive use of chemical inputs to control pests and diseases has led to resistance in agricultural systems and livestock production. As a result, input use has increased systematically (while productivity has grown at a much slower rate[11]). This dynamic creates a self-reinforcing spiral, pushing key

biogeochemical cycles, such as phosphorus and nitrogen, beyond natural recycling capacity. In addition to the economic costs, the escalating and often indiscriminate use of these inputs compounds the pressure on planetary boundaries, alongside deforestation (**Box 2**).

BOX 2. Planetary boundaries

The concept of planetary boundaries was proposed in 2009 by a group of researchers from the Stockholm Resilience Center. These boundaries represent safe zones for fundamental processes, i.e. environmental limits within which the Earth's natural systems can operate stably. The original model identified nine fundamental processes for the stability of the planet (see image on the side). **By 2023, six of the nine planetary boundaries had already been crossed.**



Source: Adapted from Stockholm Resilience Center, based on analysis by Richardson *et al.* (2023)[12].

The indirect costs associated with the current organization of the global agri-food system are estimated at approximately $12 trillion per year[13] — equivalent to 10% of global GDP. This figure reflects losses resulting from environmental degradation, water resource depletion, and public health impacts linked to unhealthy diets and biodiversity loss[13].

In a report published by the Food System Economics Commission[14], Johan Rockstrom — one of the world's leading environmental scientists — states that the direct and indirect costs of the global agri-food system already exceed the total value it generates on a global scale. This highlights not only the socio-environmental consequences, but also the economic irrationality embedded in the current model of food production and consumption. These costs persist largely because they

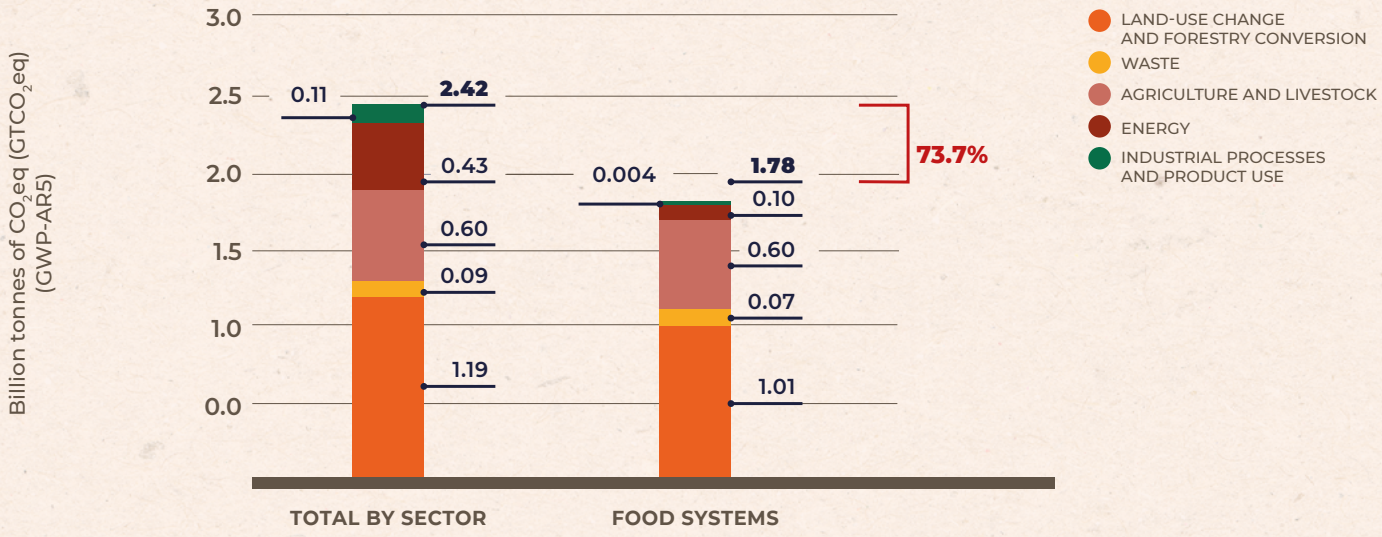
remain hidden, i.e. externalized rather than reflected in food prices, and are ultimately passed on to individuals and governments through expenditures related to environmental degradation, public health and crisis mitigation. In one way or another, these costs, although diffuse, are paid by society as a whole[14].

AN EXPENSIVE FOOD BASKET

Agri-food system accounts for most of the GHG emitted in Brazil

In Brazil, the agri-food system accounts for 73.7% of the country's total gross emissions when both direct (e.g. livestock emissions) and indirect (e.g. deforestation) sources are considered (**Figure 3**). Industry representatives argue that this figure is lower, indicating that most of these emissions result from land-use change and forest conversion (responsible for 49% of emissions), rather than from productive activities (25% of emissions)[15]. However, between 1990 and 2021, 97% of national emissions related to land-use change were directly linked to deforestation or the conversion of natural areas specifically for agricultural activities and pasture. Beef production alone was responsible for 92% of these emissions, with soy cultivation contributing to additional 5%[15].

FIGURE 3. Comparison between total GHG emissions and agri-food system emissions in Brazil (in $GtCO_2eq$), 2021.

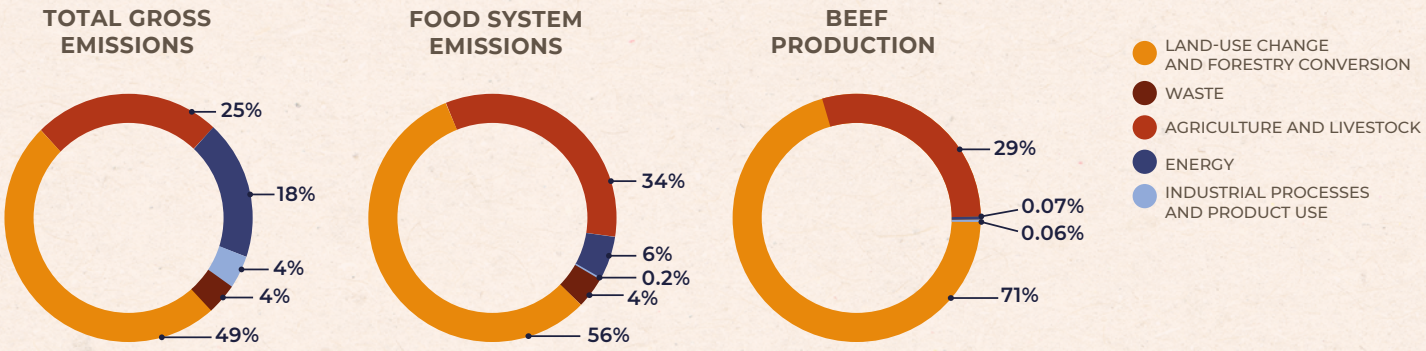


Source: Adapted from Alencar *et al.* (2023)[15], p. 39.

Among productive activities, cattle farming is the largest contributor to national emissions (**Figure 4**). Brazil holds the world's largest commercial cattle herd[16], with over 238 million head[17]. High emissions levels directly associated with livestock — particularly from manure management and, in the case of ruminants, enteric fermentation — place the country as the world's fifth-largest methane emitter[18]. In 2024, emissions from the sector rose by 2.2%, driven primarily by the growth of the national cattle herd[19].

Regarding its direct link to deforestation, a significant share of pastures established following the removal of native vegetation are highly degraded and extremely unproductive. This often reflects an underlying interest in land control and asset appreciation rather than genuine economic necessity[20]. This is yet another indication that improved natural resource management — which, contrary to what has been argued, does not entail higher costs or reduced competitiveness[20] — could significantly enhance the efficiency of the agri-food system.

FIGURE 4. Comparison between the profile of Brazil's total emissions, agri-food system emissions, and emissions from the beef production sector, 2021.



Source: Adapted from Alencar *et al.* (2023)[15], p. 43.

The second largest source of emissions from agriculture is related to soil management, particularly the use of synthetic nitrogen fertilizers, lime application and cattle manure used as fertilizer[15]. According to the National Fertilizer Plan 2050, Brazil is the world's fourth largest fertilizer consumer (8%), behind China, India and the United States[21]. Over the years, the country's dependence on imported fertilizers has grown significantly, now reaching 80% of total consumption. In just over two decades, fertilizer imports have increased by approximately 445% — from 7.4 million tons in 1998 to 33 million tons in 2020[21].

The agri-food system not only contributes to climate change, but is also increasingly vulnerable to its impacts. The growing frequency of extreme weather events is already affecting food production conditions. Between 2023 and 2024, approximately 60% of Brazil's territory experienced severe droughts[22]. In the same period, devastating floods in southern Brazil destroyed entire towns and caused agricultural losses equivalent to R$5.4 billion[23]. In the Midwest, many regions are producing food at the threshold of water availability. Changes in rainfall patterns could jeopardize the current model of producing up to three harvests per year in some areas or force a greater reliance on irrigation — increasing production costs and undermining competitiveness[24].

INSUFFICIENT REACTIONS

Different actors react to the impacts of the agri-food system, but their efforts remain limited in scale

The data presented so far clearly refutes the narrative that the agricultural sector is inherently sustainable. This discourse, often promoted by industry leaders, relies on arguments such as the adoption of conservation-oriented practices (with no-till farming being the most frequently cited) or the claim that the sector's environmental problems are restricted to illegal deforestation carried out by a small group of landowners[25,26]. However, the reality is quite different: when we examine the relationship between the Brazilian agri-food system and the patterns of nature conservation and resource use, the prevailing trend is one of escalating and intensifying problems — albeit at a slower pace in some regions. A clear example is the recent decline in deforestation: between 2022 and 2023, deforestation in the Amazon fell by 21.8%[27] compared to the previous period (2021-2022). Still, this does not indicate a reversal of deforestation, but rather that it continues at a slower rate.

On the other hand, it would be inaccurate to claim that Brazilian rural producers are indifferent to environmental concerns. Paradoxically, while major organizations representing the agricultural sector insist on climate denialism, they simultaneously advocate for improvements in policy instruments such as the new Rural Insurance Law[28, 29, 30] which implicitly acknowledges the existence of climate-related risks. However, unless these initiatives are embedded within a broader strategy that includes more effective adaptation measures, they risk leading to escalating costs as extreme weather events become increasingly frequent and destructive.

Despite being somewhat ambiguous and insufficient, groups of producers and institutions have experimented with innovative approaches. In livestock production, for instance, systems based on moderate intensification of animal husbandry with increased pasture diversity have emerged[31]. In grain production, the use of bio-inputs is gaining ground[32], partially replacing highly polluting industrial fertilizers and pesticides. This shift has culminated in the recent approval of the Bio-Inputs Law (Law N°. 15.070, enacted on December 23rd, 2024), designed to regulate and facilitate the expansion of these technologies. The Dietary Guidelines for the Brazilian Population and the introduction of new food labeling standards have improved public access to information and fostered the dissemination of practices more aligned with healthy and sustainable diets[33, 34]. In the realm of international trade, environmental criteria have already been incorporated into livestock production standards[35]. Furthermore, although still far from sufficient, financing for regenerative practices, which are expanding rapidly, is expected to continue growing[36].

So why can't we say that these innovations have already set the Brazilian agri-food system on an unequivocal path toward sustainability? Because, at least so far, the cumulative impact of these initiatives has not been sufficient to counterbalance the speed and scale of ongoing ecosystem degradation. These solutions are not yet robust or widespread enough to reach diverse types and sizes of producers, nor are they capable of displacing conventional models of production, distribution and consumption on a meaningful scale. As a result, they remain restricted to niche markets. They exemplify what is being called "and" solutions — where new practices are simply added and diversified within existing systems — rather than "or" solutions, which imply the replacement of harmful practices with more sustainable alternatives.

There is yet another problem. Existing data do not allow for an accurate assessment of the extent to which different groups of producers are adopting these innovations. What is known is that family farming accounts for 76.8% of livestock, agricultural and aquaculture establishments in Brazil, employs 66.3% of the agricultural labor force, yet occupies only 23% of the total production area[37]. This segment is also disproportionately composed of producers with low levels of formal education, a majority of whom self-identify as Black or Brown[37], and who face persistent barriers to accessing financial resources. The inclusion of family farming in the Sectoral Plan for Adaptation and Climate Change - ABC+ Plan faces substantial obstacles[38, 39]. Even financing from the National Program for Strengthening Family Farming (Pronaf) often fails to reach the lowest-income producers, especially those located in the North and Northeast regions of the country[40].

Without targeted instruments for these groups, the range of technological solutions for mitigation and adaptation could, paradoxically, deepen existing inequalities — effectively excluding them from the transition toward

Photo: Juliana and Mariana Amorim in unsplash.com

more sustainable production models. A clear illustration of this risk lies in the substantial investments directed to landscape and forest restoration projects, both through public policies and private funding initiatives. It is essential to monitor how these efforts are affecting land markets and to assess the risks of increased pressure on territories occupied by traditional populations or more vulnerable farmers. Should such dynamics unfold, Brazil squander a unique opportunity to simultaneously achieve three forms of efficiency that are rarely aligned: environmental efficiency (by improving the relationship between the economy and nature), economic efficiency (by reducing the total external costs that the agri-food system imposes on society), and social efficiency (recognizing that at least part of the regenerative solutions can be implemented by small-scale producers, or depend on their participation in business arrangements, often at a relatively lower cost than on large corporate farms).

A just and sustainable transition of the agri-food system (**Box 3**) will require not only valuing the innovations already being developed but also enabling them to scale beyond the niches where they currently remain confined — niches that are still insufficient to displace dominant practices responsible for socio-environmental degradation outlined above. Equally crucial is the need to adapt existing solutions to the diverse realities of different producer groups, ensuring that the transition does not evolve into a new cycle of exclusion. Removing structural barriers and creating the necessary enabling conditions for these two ethical-normative goals to guide the transition must become a central priority in both international negotiations and the formulation of Brazil's strategies to fulfill its climate commitments.

BOX 3. Just and sustainable transition of the agri-food system

For a transition to be **sustainable**, it must be grounded in socio-technical transformations capable of conserving biomes and regenerating ecosystems degraded by current production models. This is essential to ensuring the continuity of ecosystem services that are fundamental to sustaining life and the functioning of the agri-food system.

To be **just**, this transition must explicitly incorporate at least three dimensions of justice: distributive justice, so that the solutions adopted to tackle environmental problems do not deepen existing inequalities; recognition (or cognitive) justice, which acknowledges the diversity of actors, knowledge systems and practices that make up the agri-food system; and procedural justice, aimed at reducing power asymmetries in decision-making processes and guaranteeing inclusive participation.

A just and sustainable transition requires the alignment of these transformations across **multiple scales** — regional, national and global — while recognizing the interdependencies, complementarities and tensions among different actors. No single scale, in isolation, can sustain the structural changes required, as the organization of the agri-food system inherently integrates dynamics across all these levels. Localized innovations, tailored to specific contexts, must move beyond their niche status to achieve broader impact. This can only occur if they are coupled with systematic changes in the institutional environment, including public policies, financing mechanisms and regulatory frameworks. Meanwhile, international negotiations and agreements have the power to either catalyze or legitimize local and national transformations.

Source: Authors (2025) based on Ostrom (2010)[41]; Favareto and Caron (2022)[42]; Maluf *et al.* (2022)[43], Maluf *et al.* (2022)[44]; Nunes-Galbes, Favareto and Abramovay (2025)[45].

OPACITY IN GLOBAL AGRI-FOOD SYSTEM GOVERNANCE

In international governance arenas, the transition of the agri-food system is a relatively new topic and, so far, has been addressed only in a superficial and fragmented manner

A clear example of how insufficiently this issue is incorporated into global governance is the peripheral treatment it receives within the United Nations Conferences of the Parties (COPs). The COPs are the main negotiating and decision-making bodies under three key international treaties: the United Nations Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD) and the United Nations Convention to Combat Desertification (UNCCD). Each COP seeks to define coordinated actions between countries to address the climate crisis, halt biodiversity loss and combat land degradation — all of which are intrinsically linked to the ways in which food is produced, distributed and consumed globally.

At the climate COPs, discussions around food and agriculture have traditionally been limited to side events, with little to no influence on the core negotiation processes. Since COP27 (held in 2022), the issue has gained some visibility through decision 3/CP.27, which established the Sharm el-Sheikh Joint Work on the Implementation of Climate Action on Agriculture and Food Security[46]. This initiative builds on the earlier Koronivia Joint Work on Agriculture, created at COP23 (2017), and formally acknowledges the need to promote food security and eradicate hunger by strengthening agricultural systems that are sustainable, resilient and inclusive — while also addressing the social and economic vulnerabilities exacerbated by climate change. Despite this progress on paper, the Sharm el-Sheikh Joint Work has entered its third year with no concrete outcomes to date.

At COP28 (2023), 134 countries, including Brazil, endorsed the United Arab Emirates Declaration on Sustainable Agriculture, Resilient Food Systems and Climate Action. The Declaration explicitly recognized the critical role of food production in climate debates and affirmed the need for countries to make the links between the food system and climate explicit in their commitments to the NDCs[47]. However, the declaration is voluntary, and its principles and goals were not substantively advanced in the negotiations at COP29 (2024) in Baku, Azerbaijan.

A similar pattern holds true for Biodiversity COPs. In COP16 (2024), held in Cali, Colombia, expectations were high that countries would submit their National Biodiversity Strategies and Action Plans (NBSAPs) aligned with the targets set by the Kunming-Montreal Global Biodiversity Framework (KMGBF), adopted in 2022. The KMGBF comprises 23 global targets to be urgently implemented by 2030. Among them, targets 10 and 16 highlight, respectively, the need to ensure sustainable agricultural practices and food patterns in line with biodiversity conservation. Additionally, targets 18 and 19 focus, respectively, on the gradual elimination and reform of incentives harmful to biodiversity and on achieving a substantial and progressive increase in financial resources, aiming to mobilize at least $200 billion per year by 2030[48] to support biodiversity actions at the national levels.

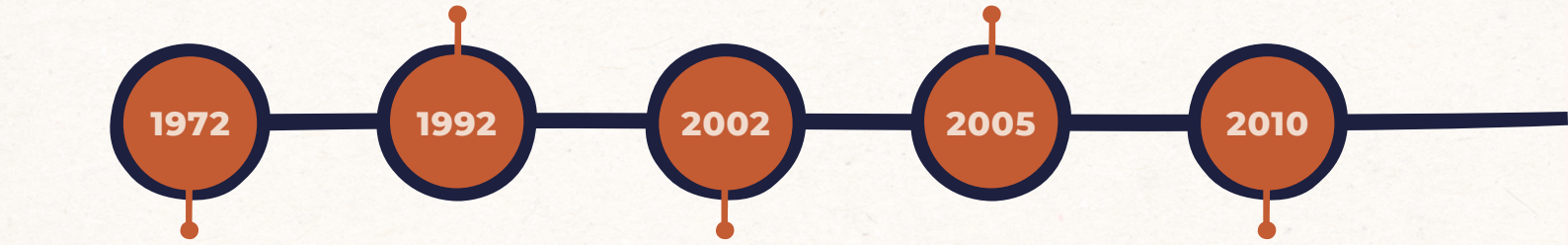
At the end of COP16, however, the overall outcome was more negative than positive[49]. Despite 119 countries having submitted national biodiversity targets aligned with the 23 targets of the KMGBF, only 44 of them — Brazil not among them — formally presented their NBSAP, raising concerns about the means of implementation for the targets announced. The obstacles to securing adequate funding continued to outweigh the progress achieved. Although the Cali Fund was established to support biodiversity conservation and ensure benefit-sharing with indigenous peoples and local communities, the target of mobilizing $20 billion for the Global Biodiversity Fund by 2025 remained far from being met. Additional agreements aimed at closing this gap were subsequently reached during the Rome-Cali Conference[50], held in February 2025, which sought to address the shortcomings and unresolved issues left by the negotiations in Cali.


Photo from aleksanderlittlewolf in freepik.com

With regard to the COP to Combat Desertification (also COP16), held in December 2024 in Riyadh, Saudi Arabia, some progress was made on issues related to agriculture and food systems. For the first time, a COP dedicated an entire day — the Agri-food Systems Day — to explicitly recognize the central role of agriculture and livestock in both driving land degradation and contributing to land restoration[51]. The event highlighted the urgent need to scale up sustainable agricultural practices to safeguard food security and ecosystem health. A major announcement was also made: global commitment to invest more than $12 billion in land restoration and drought resilience initiatives, coordinated through the Riyadh Global Drought Resilience Partnership. These funds are intended to support projects that promote agricultural sustainability and enhance food and water security. While this reflects greater recognition of the critical links between agri-food systems for land restoration, progress remains limited by the absence of binding agreements and by the persistent fragmentation between agriculture, land and climate agendas. The current scenario indicates that there is still a long way to go to meet the challenges of desertification and ensuring global food and nutrition security.

The role of the agri-food system in global governance, however, extends beyond the COPs. At the most recent United Nations Food Systems Summit (UNFSS+2), held in Rome in 2023, the Convergence Initiative between Food Systems and Climate Action[52] was launched. Its primary objective is to align national policies for transforming agri-food systems with the climate goals set out in the Paris Agreement and the Sustainable Development Goals (SDGs). Nevertheless, the initiative has faced significant criticism. Key concerns include the lack of clear, measurable targets for tracking progress in the integration of food and climate policies; the absence of an in-depth discussion on the need for profound shifts in food consumption patterns (particularly the urgent reduction in the consumption of animal-based products and ultra-processed products, both of which are associated with negative impacts on human health and the environment), and persistent issues related to corporate capture and greenwashing.

TIMELINE. The Agri-Food System in Multilateral Governance



1972

- UNITED NATIONS CONFERENCE ON THE HUMAN ENVIRONMENT
Stockholm, Sweden
The first meeting to address environmental concerns at the global level

1992

- RIO-92
Rio de Janeiro, Brazil
'Earth Summit' marked the dissemination of the concept of sustainable development

2002

- WORLD SUMMIT ON SUSTAINABLE DEVELOPMENT
Johannesburg, South Africa
Rio+10, assessed the progress made on the agreements established at the 1992 Earth Summit

2005

- COP11 ON CLIMATE CHANGE
Montreal, Canada
The first meeting since the Kyoto Protocol entered into force. For the first time, deforestation and land use were included in the discussions

2010

- COP10 ON BIODIVERSITY
Nagoya, Japan
Adoption of the Strategic Plan for Biodiversity 2011–2020 and the 20 Aichi Biodiversity Targets. 193 Parties, including Brazil, committed to working collaboratively to implement the targets by 2020

2012

- RIO+20
Rio de Janeiro, Brazil
The United Nations Conference on Sustainable Development renews political commitments to sustainable development

2015

- COP21 ON CLIMATE CHANGE
Paris, France
The Paris Agreement is adopted as a global landmark for tackling climate change, setting the goal to limit warming to between 1.5°C and 2°C. The 2030 Agenda and the Sustainable Development Goals are launched

2017

- COP23 ON CLIMATE CHANGE
Bonn, Germany
Establishment of the Koronivia Joint Work on Agriculture

2018

- COP14 SOBRE BIODIVERSIDADE
Sharm El-Sheikh, Egypt
Adoption of Decision 14/3, which establishes guidelines for integrating biodiversity into productive sectors such as agriculture, forestry, fisheries, and aquaculture

2021

- UN FOOD SYSTEMS SUMMIT (UNFSS)
New York, USA

COP26 ON CLIMATE CHANGE
Glasgow, Scotland
Agricultural Innovation Mission for Climate

2022

- COP27 ON CLIMATE CHANGE
Sharm El-Sheikh, Egypt
The COP27 Final Declaration incorporates the Sharm el-Sheikh Joint Work on Implementation of Climate Action on Agriculture and Food Security

- COP15 ON BIODIVERSITY
Montreal, Canada
Adoption of the Kunming-Montreal Global Biodiversity Framework

2023

- UN FOOD SYSTEMS SUMMIT (UNFSS+2)
Roma, Italy
Highlighted by the launch of the Food Systems and Climate Action Convergence Initiative

- COP28 ON CLIMATE CHANGE
Dubai, United Arab Emirates
The first Global Stocktake of the Paris Agreement assessed collective progress toward climate goals

UAE Declaration on Sustainable Agriculture, Resilient Food Systems and Climate Action

Launch of Alliance of Champions for Food Systems Transformation (ACF), a coalition composed of Brazil, Cambodia, Norway, Rwanda, and Sierra Leone.

2024

- COP29 ON CLIMATE CHANGE
Baku, Azerbaijan
Launch of Brazil's NDC

- COP16 ON BIODIVERSITY
Cali, Colombia
119 countries presented their national biodiversity targets, but only 44 submitted complete National Biodiversity Strategies and Action Plans

- COP16 TO COMBAT DESERTIFICATION
Riyadh, Saudi Arabia
For the first time, a specific day was designated for discussions on agri-food systems (Agri-food Systems Day)

- G20 LEADERS' SUMMIT
Rio de Janeiro, Brazil
Launch of the Global Alliance Against Hunger and Poverty

Source: Authors (2025).

WHAT TO EXPECT FROM BELÉM

Host of COP30, Brazil faces valuable opportunities and substantial challenges

For the first time, Brazil will host the Conference of the Parties (COP30) to the UNFCCC. Taking place in the heart of the Brazilian Amazon, this landmark event marks a decade since the adoption of the Paris Agreement, signed at COP21. However, the outlook is concerning — 2024 was the hottest year on record globally and the first time the average global temperature surpassed 1.5°C above pre-industrial levels[53]. Additionally, greenhouse gas emissions reached a record high in 2023, with concentrations of carbon dioxide (CO_2) and methane (CH_4) also hitting their highest levels ever recorded[53].

The challenges to be faced by Brazilian diplomacy during COP30 are numerous, with four standing out in particular. The first is ensuring that countries commit to more ambitious targets, aligning their pledges with the goal of limiting global temperature rise to 1.5°C. A key factor in this process will be the Global Stocktake of the Paris Agreement[54] — which took place during COP28 in Dubai, aimed to evaluate countries' progress — or setbacks — toward meeting their commitments. The assessment underscored the urgent need to reduce GHG emissions by 43% by 2030 and 60% by 2035, using 2019 levels as a benchmark. However, a UN report published ahead of the Conference revealed that even if all the presented NDCs were fully implemented, GHG emissions would drop by only 5% by 2030 — far short of the necessary 43%. Unsurprisingly, COP30 President Ambassador André Corrêa do Lago emphasized the need for a 'global effort' to confront the climate crisis in his first official letter[55], published in March 2025.

The second major challenge is advancing actions to expand climate finance. During COP29 in Baku (2024), countries agreed to allocate $300 billion annually to support the energy transition in lower-income nations. However, at least $1.3 trillion per year will be required by 2035. The COP30 presidency plans to conduct a survey of strategies and economic models to achieve this goal. A significant obstacle is the United States' withdrawal from the Paris Agreement, as announced by the U.S. president — a concerning move given that the country is the world's largest economy and the second-largest emitter of GHGs.

This brings us to the third major challenge: the crisis of confidence in multilateralism, the global rise of the far right, and the surge in climate denialism. There is growing concern that funds initially intended to support the climate transition may instead be redirected toward ongoing conflicts and a renewed arms race[56].

The fourth major challenge concerns the climate adaptation agenda, including the development of indicators for the Global Goal on Adaptation and progress on the National Adaptation Plans by the signatory countries. Historically, international climate governance has prioritized mitigation, especially by high-income nations, as the key strategy for limiting global warming. As a result, funding for adaptation remains scarce. Between 2021 and 2022, global climate finance flows reached nearly $1.3 trillion annually, yet only 5% ($63 billion) was allocated to adaptation efforts[57]. Lower-income countries — many of which are most vulnerable to climate impacts — have long championed the adaptation agenda, emphasizing the need for urgent and equitable action. Despite its strong ties to climate justice, adaptation was noticeably absent from the COP30 Presidency's first official letter, sparking concern among non-governmental organizations and social movement activists.

Brazil's ambitions (and ambiguities)

Brazil's official climate plan to reduce GHG emissions and adapt to climate change presents an ambitious vision on the international stage, yet has faced domestic criticism. According to Brazil's updated 2024 NDC, the country's vision for 2035 is rooted in climate justice, with commitments to biodiversity protection and active citizen participation in a new paradigm of prosperity. However, under its proposed mitigation target, Brazil has committed to reducing net GHG emissions to between 59% and 67% of 2005 levels by 2035. In absolute terms, this equates to emissions ranging from 1.05 to 0.85 $GtCO_2eq$, based on the most recent inventory data[58]. This gap is significant — between the lower and upper limits, there is a difference of approximately 200 million tonnes, allowing mitigation efforts to gravitate toward the lower target. Moreover, within the framework of Article 4.4 of the Paris Agreement, this target is not particularly ambitious in Brazil's national context and is misaligned with the goal of achieving zero deforestation by 2050. In response, the Climate Observatory has put forward a proposal for Brazil's second NDC (2030-2035)[59], which, for example, proposes a more ambitious target: limiting net GHG emissions to 0.2 $GtCO_2eq$ by 2035, representing a 92% reduction from 2005 levels.

One concern regarding Brazil's leadership of the climate agenda is the potential narrowing of its commitments to the forest and the bioeconomy, with strong focus on biofuels and deforestation reduction. Meanwhile, the country maintains interest in oil exploration near the Amazon River delta — a contradiction that has fueled debate. Additionally, there is limited discussion on the broader impacts of biofuels expansion, particularly in three critical areas: land use, food prices and biodiversity conservation. These challenges are unavoidable given that biofuels feedstocks —

primarily sugarcane, soybeans and increasingly corn — are largely produced through large-scale monoculture systems.

All of this raises concern that the agri-food system may remain sidelined in COP30 discussions and Brazil's broader climate agenda. Internationally, the predominant focus on energy transition, coupled with the domestic emphasis on deforestation, risks reinforcing homogenized agricultural models — ones that could compete for land with systems designed to regenerate ecosystems and produce sustainable, healthy food. If this risk materializes, Brazil could miss a pivotal opportunity to position itself at the heart of an essential global transformation. Unlike recent COP host nations, which largely depend on oil production, Brazil's agri-food sector is highly significant — not only due its role in driving climate change but, more importantly, because of its vast potential for mitigation and adaptation. Recognizing and harnessing this potential is crucial for a just and sustainable transition, for the long-term viability of the sector, and, ultimately, for Brazil's external image and leadership aspirations in the global climate agenda.

Photo: Cop30 Brasil Amazônia www.flickr.com/photos/cop30amazonia

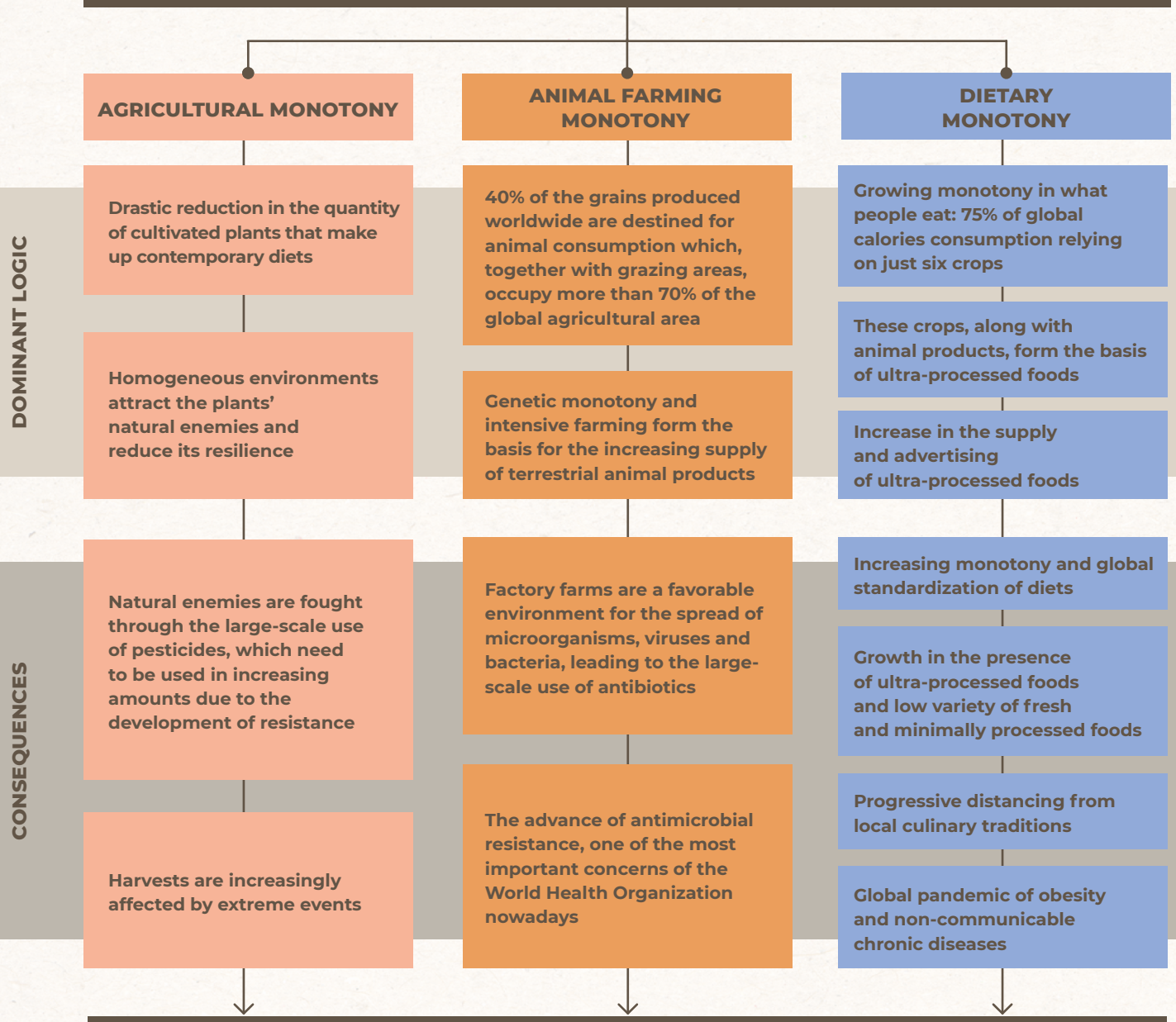
Brazil can lead the transition in the agri-food system

The consequences of the current global agri-food system highlight the urgent need for a just and sustainable transition in food production. Without this shift, both Brazil's and the world's climate ambitions risk faltering, leading to even greater human, economic and environmental costs. It is essential to challenge the notion that feeding the global population is inherently at odds with environmental conservation — especially given that the current food supply is already sufficient to meet global demand[60]. Hunger and malnutrition stem primarily from challenges related to food access and quality. Furthermore, the very sustainability of production systems is at risk due to the environmental impacts of agricultural sector organization and methods used for food processing and distribution.

To ensure the agri-food system receives the attention it deserves in climate change strategies, **at least five key conditions must be met** (**Table 1**). **The first is to elevate it in the public debate to the same level as other essential systems that provide goods and services.** A useful parallel is the debate on energy transition — just as the need for a decisive, gradual reduction in fossil fuel use is widely acknowledged, similar thinking must be applied for the global agri-food system. The term 'phase out', commonly used in the energy transition agenda, serves as a relevant example. The term is used to describe the gradual elimination of technologies, practices, infrastructures, or systems deemed unsustainable, obsolete, or incompatible with the desired path of socio-environmental transformation — in this case, the phase-out of oil and fossil energy sources. It's not merely about developing innovations that can coexist with the conventional model we aim to replace. Rather, it involves actively promoting new practices while simultaneously discouraging outdated ones. The same principle applies to the agri-food system — we must 'phase out' conventional approaches to food production, distribution, and consumption.

The second essential condition for a just and sustainable transition is a clear and well-defined focus — moving beyond the mere generalized sense that change is necessary. This aligns with the objectives set by the COP30 Presidency, as emphasized by Ambassador André Corrêa do Lago, who stated: 'With the urgency of climate change, the complexity of our task ahead is to strengthen climate governance and provide agility, preparedness and anticipation in both decision-making and implementation'. In other words, we need to move from negotiation to concrete action. A defining characteristic of the global agri-food system is its reliance on a 'triple monotony' (**Figure 5**), and overcoming this condition must be central to any transition strategy.

FIGURE 5. TRIPLE MONOTONY OF THE AGRI-FOOD SYSTEM



$12 trillion annually (10% of global GDP) is the indirect economic cost of the agri-food system

Such costs include environmental degradation, depletion of water resources, loss of biodiversity, and impacts on public health

This value exceeds the market prices of what contemporary societies pay for what they eat

The costs are largely externalized, falling on society through spending on environmental restoration, health treatments and climate change mitigation

Source: Authors (2025), based on Abramovay *et al.*, 2024[61]; Albernaz-Gonçalves *et al.*, 2024[62]; Abramovay *et al.*, 2025[63].

This transformation requires a diversified agenda that reshapes interconnected subsystems — not simply a long list of scattered measures or proposals. This brings us to the **third condition**, where, once again, the international debate on oil serves as a useful comparison. Just as global discussions focus on setting targets to reduce emissions and phase out fossil energy sources, **we must also establish a progressive timeline to concretely implement the transition within each key subsystem of the global agri-food system**. Strict limits must be established on antibiotic use in animal husbandry, alongside clear targets for replacing synthetic fertilizers and agrochemicals with bio-inputs and advancing landscape and ecosystem regeneration. Additionally, concrete measures are needed to drive the transition toward more diverse, healthy, and sustainable food systems. Two key priorities stand out: expanding access to and consumption of fresh, minimally processed foods — especially plant-based foods — and implementing initiatives to significantly reduce the intake of ultra-processed products.

Changes of this scale are unlikely to happen solely through the voluntary compliance of economic actors. **A structural shift in the global agri-food system is necessary — one that addresses key factors such as financing, trade agreements, incentive mechanisms, and regulatory frameworks.** This brings us to the **fourth condition**: redefining the fundamental 'rules of the game' that stabilize and govern interactions between key stakeholders. These rules dictate how costs and benefits are distributed across different technological pathways and business models. To ensure a smooth and effective transition, it is crucial to establish clear parameters that allow major governance instruments to operate under progressive, agreed-upon targets. A practical approach would be to adopt a set of shared guiding principles for the global agri-food system, aligned with the three United Nations Framework Conventions on natural resources — climate, biodiversity, and desertification.

The fifth condition involves implementing positive measures to help countries and producer groups adapt to new regulations. Without such measures, there is a risk of reinforcing inequalities that contradict the principles of justice. Small-scale farmers and countries with limited investment capacity may struggle to meet new requirements, while large producers and wealthier economies capitalize on the resources mobilized for this transition. To prevent this imbalance, it is crucial to establish differentiated financing mechanisms, accessible credit, and international funds to support the transition. Additionally, non-tariff barriers tied to environmental clauses must be accompanied by transition rules that provide adaptation periods for the most vulnerable. Without these safeguards, the shift toward sustainability could deepen disparities and undermine its legitimacy. Global governance must carefully balance environmental imperatives with social justice, ensuring that sustainability does not become yet another factor of exclusion.

Ultimately, transition agendas are not merely a collection of coherent ideas or proposals — they emerge from agreements, pacts, and shared objectives that must be driven and sustained by social forces powerful enough to reshape the 'rules of the game' governing the agri-food system. A key challenge is that much of the public and scientific debate has been framed in rigid dichotomies, oversimplifying the diverse forces shaping discussions on the future of the agri-food system. The good news is that across science, government, business, and civil society, there are already actors pioneering specific innovations. These efforts could form the foundation for a broader transformation — provided they can move beyond their current status as isolated initiatives and become integrated into systemic change.

Critical moments, such as the climate emergency, are creating conditions that demand alignment and cooperation. Strong leadership will be essential to bringing diverse voices together and responding boldly to the challenges shaping global governance expectations. The obstacles are significant, but Brazil can — and must — embrace this role. Positioning the transition of the agri-food system as a cornerstone of the fight against climate change is a powerful starting point. Defining a clear vision and consistent pathways for this transition could mark a pivotal milestone in the long-term evolution of this agenda.

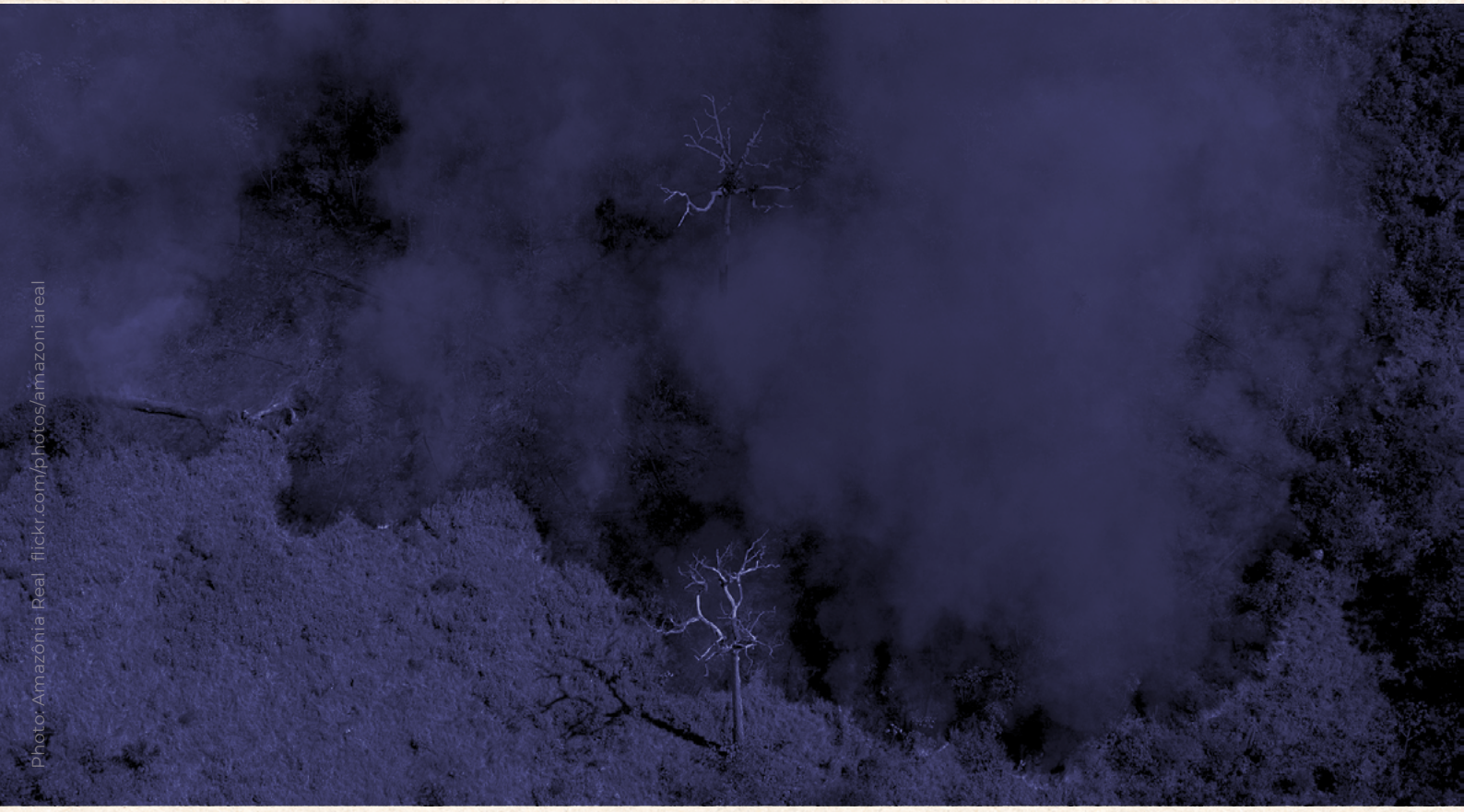


Photo: Amazônia Real flickr.com/photos/amazoniareal

TABLE 1. Conditions to highlight the importance of the agri-food system in tackling the climate crisis

01. Place the topic at the center of public debate	Recognize the need to reshape the global agri-food system through a transition that goes beyond current frameworks — much like the calls to 'phase out' or 'transition away' from fossil fuels in the energy sector.
02. Clearly define what a just and sustainable transition means	A general sense that change is necessary is not enough to drive action. A clear strategic timeline is required to overcome the triple monotony that defines the current agri-food system.
03. Guide the transition pathway through progressive targets	The transition must be guided by progressive targets that drive transformation across the three critical domains of the triple monotony: crop systems, livestock production, and food distribution and consumption.
04. Reshape Financing, Regulation, and Incentives	Voluntary adherence by actors within the agri-food system cannot be assumed. Innovations that already indicate viable pathways toward a just and sustainable transition must be supported through a redefinition of the governance frameworks that structure the agri-food system — expanding the space for emerging practices while progressively disincentivizing conventional ones.
05. Embrace diversity and adaptation to different contexts	The global agri-food system is shaped by deep-seated inequalities. A truly just and sustainable transition must acknowledge and accommodate this diversity, ensuring that strategies are tailored to the unique profiles of countries, producers, and consumers.

Source: Authors (2025).

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