Finance, Nature and Food Transitions

Opportunities for the Brazilian agri-food system

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About NATURE FINANCE

NatureFinance is committed to aligning global finance with nature positive, equitable outcomes.

Our work is shaping the many dimensions, actors and change pathways at the nature-finance nexus to thrive and contribute to development.

How we make change:

Nature Markets: shaping principles-based nature markets by increasing awareness, innovations and better governance of nature-linked markets including nature credits and soft commodity markets.

Nature Liability: extending the liabilities of financial institutions for nature outcomes, including the application of anti-money laundering rules to break the links between investment and nature crimes.

Nature Data & Disclosure: Increasing the quality and quantity of nature data, risk assessment and transparency across financial markets to enable integrated assessments of nature-climate risks and impacts.

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NatureFinance is the next phase of impact of the Finance for Biodiversity Initiative (F4B), established with support from the MAVA Foundation. The work also benefits from partnerships with, and support from, the Children's Investment Fund Foundation (CIFF) and the Finance Hub of the Gordon and Betty Moore Foundation.

Our use of Fibonacci sequence imagery is inspired by the association of this unique ratio with the maintenance of balance, and its appearance everywhere in nature- from the arrangement of leaves on a stem to atoms, uncurling ferns, hurricanes and celestial bodies.

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Executive Summary

Agricultural and food systems are encountering growing challenges due to climate change and the imperative to transition towards sustainability and reduce greenhouse gas (GHG) emissions. Additionally, there are consequences stemming from social and economic issues, such as the war resulting from the Russian invasion of Ukraine and the increasing prevalence of hunger worldwide. To confront these profound transformations in agrifood supply chains, it is essential to have well-prepared public and private agents who comprehend what is at stake.

The financial sector is already taking steps to incorporate climate and environmental risks into decision-making processes concerning existing business models. This endeavor can yield positive outcomes for society if adequate knowledge and coordinated actions ensure that these risks are assessed and internalized to mitigate their impact on income, assets, supply chains, and food security. Initiating a well-planned transition guided by policy measures can establish the necessary conditions for an inclusive, sustainable, and equitable relationship between financial institutions and food systems.

However, if financial institutions price these risks in an uncoordinated and isolated manner there is a high chance of disruptions in the systems particularly if this occurs abruptly.

As the fourth-largest food producer in the world, Brazil possesses all the necessary resources to maintain its role as a key player in the global agrifood transition, our main challenges are closely intertwined with environmental and social risks. The alarming rates of deforestation pose a threat to biodiversity and diminish the provision of ecosystem services as well as aggravate the climate change crisis. Moreover, they also impact the Brazilian agricultural sector, rendering it vulnerable to droughts and heatwaves due to its heavy reliance on rainfall – only 10% of the agricultural area in the country is artificially irrigated (Rattis et al., 2021).

Most of the deforested areas in the country, as shown by satellite images, are intended for cattle ranching and expansion of agricultural crops (MapBiomas, 2022). Furthermore, deforestation is closely linked to social conflicts and human rights violations (Comissão Pastoral da Terra - CPT, 2022). These facts impact the risk perception of the financial sector and present a real threat for disruption of finance mechanisms and flows. Indeed, this reality has already caused some disruption, such as the hold on the ratification process of the EU-Mercosur Trade Agreement (European Parliamentary Research Service – EPRS, 2020), with implications for finance flows and investments in Brazil.

This report contains policy proposals, drawn from past and present studies, that aim to facilitate the transition towards a sustainable agrifood system in the country. These recommendations address the emerging risks and opportunities arising from recent global and national trends, as well as highlight key aspects to equip public and private stakeholders in navigating the emerging transition of the food system.

1

Context

As one of the world's largest food producers, particularly in the realm of animal protein, Brazil faces risks due to its negative environmental performance, primarily attributed to the country's high and ongoing deforestation rates. These numbers have become a cause for concern among financial institutions (S&P Global, 2021; Bloomberg, 2022) and pose a threat to the reputation of the Brazilian agrifood sector.

This is even more relevant given that the sector accounts for 27.4% of the country's GDP (CEPEA, 2022) and plays a crucial role in generating products, revenue, exports, and employment, as well as in determining land use patterns.

Brazil is the largest net agri-food exporter globally, with a trade balance of $75.3 billion in 2020 (FAO, 2022). In 2021, Brazil's agri-food system accounted for 43% of the country's exports, with its trade surplus equivalent to 172% of the national total. The value of Brazil's agricultural production in 2020 reached $135.8 billion, according to the Food and Agriculture Organization of the United Nations (FAO).

The sector encompasses 15 million farmers and agricultural producers (IBGE - Censo Agro, 2017), showcasing a vast diversity in terms of farm types, sizes of farms, agricultural products supplied, companies involved in selling to and buying from farmers, institutions and associations, and supply chain structures. These differences contribute to complexities in addressing economic, social, and environmental aspects, as well as in policy-making.

Family farming is responsible for more than 50% of the food items in the Brazilian basic food basket, a significant number of these producers face limited access to social and physical capital, financing, technologies, marketing systems, and opportunities, making them more vulnerable and less resilient to economic and environmental shocks. They are, therefore, key figures in ensuring food security in the country.

In this scenario, besides the economic risks, there are sovereignty issues that become relevant, since Brazil is being pressured to loosen its rules on the acquisition of agricultural land by foreigners. The international community, especially Europe and the United States, is aware of the country's difficulties in addressing and containing deforestation and there is a movement in favor of putting trade with Brazil under scrutiny. Counting on the Chinese appetite for Brazilian beef is a risky strategy, since China can leverage price drops to gain bargaining power. Furthermore, the introduction of the development of lab-grown beef in new China's 14th Five-Year Plan demonstrates the country's intention to become less dependent on animal protein imports.

Changes in precipitation regimes, increases in heat stress, droughts and aridity (Magrin et al., 2014) are the results of climate change already observed in Brazil and impacting on the reduction in agricultural production. There was a 7.5% drop in maize and 4% in soybean production from 1980 to 2008 (Lobell et al., 2011), and decreasing changes in livestock production (Nelson et al. 2014).

Heatwaves present threats to livestock and are increasing in both intensity and frequency, causing losses of cattle in several countries, such as Argentina and the US. These events also pose an increasing threat to livestock production in Brazil. Farms with lower access to human and financial capital will be more vulnerable to changes in historical weather patterns caused by climate change and to declines in ecosystem services from nature loss, posing a significant risk of social unrest stemming from impacted livelihoods and food insecurity.

Following a ‘business-as-usual’ approach neglecting the negative impacts on environmental resources while the world converges on the path of sustainable development, entails substantial material and financial risks.

2

Opportunities, new sectors and innovations

Sustainable practices and products are increasingly becoming a requirement for consumers, food companies, and governments around the world. Buyers and investors seek improved environmental footprints and compliance with nature conservation laws (Azevedo et al., 2015), and there is a growing clamor for funding for nature-positive activities, as well as activities with zero net carbon emissions (Muller & Robbins, 2022; TNFD, 2022).

The demand for sustainable practices and products is on the rise, with consumers, food companies, and governments worldwide making it a necessity. Consumers and the financial sector increasingly demand better environmental footprints and compliance with conservation law (Azevedo et al., 2015) and this is becoming the new norm. Furthermore, there are growing calls for financing nature-positive – in addition to net-zero – activities (Muller and Robbins, 2022; TNFD 2022)

Brazil's natural capital has high potential for this type of investment, providing opportunities for the large areas of native vegetation in the country, which are home to high levels of biodiversity, carbon sequestration potential and water resources. As these new markets for carbon credits and environmental credits develop, this Brazilian natural capital will become more and more attractive to national and international investors.

However, for these markets to effectively function, several essential conditions need to be met. These conditions encompass compliance with laws that safeguard land ownership and contracts, promote equity and inclusion, and establish transparent regulations for verification and monitoring. Additionally, setting clear and ambitious environmental targets is vital. It is these conditions that will contribute to the credibility of the promised results in return for the investments.

Despite receiving financial assistance from public sources, the agri-food sector relies heavily on alternative funding sources that often do not prioritize the enhancement of environmental practices in farming. Questions about inclusive production – which ensures that less-prepared producers are not left behind – also receive no attention.

Beef production in Brazil is an example. Today, it has lower productivity rates than would otherwise be expected. The country has the largest cattle herd in the world – 2.3 times larger than that of the US – but produces 5-10% less meat, leading to higher methane emissions per animal and beef output. Cattle are also a source of diversification and resilience for small and family farmers so policies that aim to address the chronic inefficiency of the sector must include measures to help them prosper in a transition.

On another front, alternative proteins like plant-based proteins, microbial proteins, and cultured meats are emerging as a transformative force in the realm of human consumption. These technologies, which require substantial capital and energy inputs, offer the advantage of having a smaller ecological footprint on land and natural resources. However, their implementation has the potential to disrupt established supply chains and pose a challenge to the livelihoods of numerous farmers who lack access to affordable capital. The successful scaling-up of these innovative technologies will heavily rely on capital investments, placing financial markets at the center of this transition.

The financial sector in Brazil faces structural barriers, such as an unstable macroeconomic environment and limited legal protection for its investments, as well as microeconomic challenges determining unfavorable risk-return ratios in environmental and low-carbon financing opportunities and instruments (Yamahaki et al., 2020)

Good governance and strong institutions can enable policy-driven structural change that minimizes costs and maximizes benefits. Hence, Brazil needs clear land tenure rights and obligations, strong monitoring and enforcement of regulation, and efficient contractual dispute resolution. These aspects would all work together to increase the credibility of environmental outcomes and reduce risk perception of investments.

In addition to improving the effectiveness and coordination of existing financial regulations, new laws and regulations are needed to keep pace with international financial innovation for emerging nature credit markets and carbon markets.

Many types of financial instruments currently exist around the world that facilitate private investment in nature, including green bonds, sustainability-linked bonds, conservation easements and blended finance using public and/or philanthropic capital to de-risk private investments (Holtedahl, Köberle and Wilkins, 2022). Some of these instruments exist in Brazil but many do not; these could help strengthen the nature asset class and make it more attractive to mainstream investors.

Holtedahl, Koberle and Wilkins (2022) identify conditions that must be in place to enable the scaling up of nature markets. These include projects that generate returns (through revenue streams or cost reductions), markets with credible exchange mechanisms, demand signals, enforceable property rights and sizeable deals that justify transaction costs. Safeguards are needed to ensure legitimacy and equity – key ingredients for a stable and lasting market, along with local stakeholder participation and profit sharing.

The right level of impact metrics needs to strike a balance: it should not be overly burdensome for project managers, but it must be strong enough to provide comfort for investors. Importantly, nature conservation entails opportunity costs for agriculture, which means that projects need to generate enough return to be attractive to landowners and decision makers (Koberle et al., 2021).

A growing number of frameworks provide guidance on how markets can operate to enable opportunities for investment while ensuring real change on the ground, bringing positive benefits for nature and people. Emerging nature credit markets can learn from climate initiatives.

For example, the Voluntary Carbon Markets Integrity Initiative (VCMI) is developing a code of practice that advises corporations on how carbon credits can be used in a credible and impactful manner. Likewise, the Taskforce on Nature-related Financial Disclosure (TNFD) provides guidance on disclosing corporate nature-related risks to inform investors' decisions.

Markets alone will not save nature. In fact, the results presented in this report and in the global-level report point to the dangers of leaving it to the financial sector to price nature-related risks on its own. These dangers are explored in more detail in the F4B report describing the Food Finance Nexus (F4B, 2021).

3

Past, present and transition policies

A policy-driven transition can create the enabling conditions for nature markets to function as intended. This kind of transition needs to be developed in Brazil for the Brazilian context to realise its potential as a prime destination for future investments in nature.

The financial sector is increasingly aware of the trends and challenges listed above and is busy developing and implementing frameworks to price the risks that emerge from them. In the absence of clear policy to address these issues, the financial sector will unilaterally price these risks in an uncoordinated manner, potentially leading to a disorderly transition. Such a finance-led transition could be disastrous for the Brazilian agri-food system, raising the possibility of disruptive consequences like higher capital cost, lack of finance and even loss of access to key markets.

There are past and current policies that can be reinstated or strengthened, leveraging lessons learned to improve their performance, as follows:

- Improve and reactivate policies to combat deforestation that have shown favourable results in the past (PPCDAm, PPCerrado and the Amazon Fund).

- Accelerate and guarantee the implementation of the Forest Code. To this end, we recommend (i) banning further changes to the final implementation of the Rural Environmental Registry (CAR) date and setting minimum thresholds for the share of verified and validated CAR in each state by the final CAR implementation date; (ii) providing assistance (expertise, human and public resources) to the states lagging behind in these processes; and (iii) setting firm goals and due dates for farmers' adoption of the Environmental Regularization Program (Programa de Regularização Ambiental – PRA).

- Expand rural credit resources associated with the adoption of sustainable practices in agriculture (such as the ABC+) and impose conditions to the other existing rural credit programs to require environmental good practices, such as the net decrease of GHG emissions in the financed activities (monitoring or carbon accounting systems need to be in place for verification purposes).

- Improve governance and institutional coordination of the various policies in progress in order to take advantage of the existing synergies between them and avoid overlaps and potential contradictions and conflicts. The PNMC (National Policy on Climate Change) sets the governance of this transversal and multi-sectorial development priority, as linked to an Interministerial Committee of Climate Change chaired by the Presidential Office. The actual legal framework is clear in seeking to coordinate climate policies to the highest levels of the executive power; it is preferable that those policies are aligned with decisions from legislative and judiciary power.

We recommend introducing policies and regulation to improve the operational environment of private investors to de-risk investments in environmentally friendly agriculture. Specifically,

- Engage with the financial sector to encourage the private sector's participation in financing agriculture. At the same time, expand and encourage the creation and adoption of financial instruments associated with sustainable practices (such as green bonds and climate bonds) in agriculture.

- Implement macroeconomic policies and structural reforms that improve the stability of the macroeconomic environment and reduce the uncertainties and risks of the financial sector associated with the business environment, regulatory environment and validity of contracts; this will involve reviewing and restructuring norms, rules, laws and the functioning of judicial services.

Policy recommendations

The following policies can foster an enabling environment to lead to climate resilient, nature-positive, and equitable outcomes. The proposals may also foster the engagement of the finance community as well as civil society, academia, and the private sector. Compliance with the law is also important, with no tolerance for illegality in land and natural resource use practices. In this sense, it is advisable to reinstate the capacities and activities of environmental enforcement entities, including monitoring and punishing illegal deforestation.

Promote intensification and improve efficiency in agriculture and livestock activities, while enforcing the policies to protect natural vegetation, nature reserves and traditional communities' land. To this end, improve and expand existing policies and programmes to achieve higher yields in agriculture- —for example, the Low-Carbon Agriculture Plan, rural extension and technical assistance quality and coverage, and research, development and demonstration at agri-food research institutions. Improve and reactivate policies to combat deforestation, such as the plans to prevent and control deforestation in the Amazon and Cerrado areas, the PPCDAm (Action lan for the Prevention and Control of Deforestation in the Legal Amazon) and PPCerrado (Action Plan for the Prevention and Control of Deforestation and Forest Fires in the Cerrado) and accelerate the enforcement and implementation of the Forest Code.

Encourage and advance the development of the knowledge-based alternative protein production chain – from the promotion of diverse agricultural systems and use of bio-based raw materials to (primarily) the processing, industrialisation and production of the final good and incorporation of environmental and/or geographic attributes. Promote alternative proteins – such as plant-based foods, microbial protein (also called mycoprotein), insects and cultivated meat – due to their potential to mitigate GHG emissions and lower land and water resource usage. To this purpose, we recommend the creation of new funding programmes (and the strengthening of existing ones) at institutions such as BNDES, FINEP, EMBRAPII, Embrapa and CNPq, targeting farmers, cooperatives of family farmers, companies, start-ups and research institutions in all stages of the production chain.

Guide and encourage the financial sector to participate in and contribute to a 'policy-facilitated' transition of the agri-food system towards a sustainable pathway. To achieve this aim, policy-makers should work together with the financial sector in implementing policies that foster higher efficiency in the agri-food sector and protect natural ecosystems, and in establishing monitoring systems and aggregating environmental attributes to the agri-food sector in order to incorporate sustainability indicators in the sector's metrics, reports, portfolios and range of services generated by agricultural activities, which the financial sector funds.

Encourage the adoption of 'climate smart agriculture' (CSA), 'sustainable intensification' (SI) and 'nature-based solutions' (NbS) approaches, practices and techniques, such as low carbon agriculture. Encourage adding and incorporating their concepts, practices and techniques into ongoing policies and initiatives and promoting the advantages of these practices in increasing resilience and combating climate change (adaptation and mitigation). To achieve this goal, we suggest revising the operative plan of the ABC+ to embrace and explicitly mention internationally consolidated terminology and to present the ABC+ practices and techniques as aligned with and included in the above concepts and approaches. In addition, improve and increase actions and activities related to dissemination and training of farmers and professionals in the ABC+ practices and engagement with management committees at the sub-national level (states and municipalities). Ensure that the ABC+ policy and practices are disseminated, promoted and recognised as being adherent and aligned to the CSA, SI and NbS concepts. We also recommend the introduction of these concepts in (i) the curriculum of agricultural sciences colleges and schools, (ii) the training of professionals providing technical assistance and rural extension providers, and (iii) the training of financial agents involved in the disbursement of rural credit to farmers. Lastly, we recommend strengthening and expanding rural credit targeting the practices and technologies of the ABC+, and indeed, expanding the budgets allocated to that plan. Strengthen the National Program for the Strengthening of Family Farming (PRONAF) and the Food Purchase Program (PAA) and develop and integrate sustainability criteria into both programs. Strengthen the National Program for the Strengthening of Family Farming (PRONAF) and the Food Purchase Program (PAA) and develop and integrate sustainability criteria into both programs.

Improve food security in the country, considering the broad diversity of farmers, production systems, institutions and supply chain structures in Brazil's agri-food system; this will require policies and actions targeting improvements in human, social, physical and financial capital to those producers lagging behind in opportunities and access to markets and technologies. To this end, a broad set of actions is required, including improving the education system in rural areas, increasing and improving training of farmers and of professionals responsible for developing rural extension and technical assistance, generating and assessing quantitative and qualitative information (data gathering and dissemination) about the farmers with higher vulnerability, and creating new policies and revising/improving existing policies targeting these stakeholders on aspects such as technical assistance, financing technology transfer and commercialization, which must be aligned with the CSA, SI and NbS approaches. In that sense, the National Programme for Strengthening Family Farming (PRONAF) should be fully aligned with and given access to equitable funding for sustainable agriculture and implementation of the ABC Plan targeting smallholders. Re-equipping and urgently funding programmes such as the National Programme for Food Acquisition (PAA – Programa Aquisição de Alimentos) could be an effective strategy in the short term for increasing food security and improving environmental outcomes.

Many recent studies have pointed to the role of demand-side changes in helping to achieve sustainability targets in agri-food and energy systems (IPCC, 2019; IPCC, 2022). Notably, the current study explores supply-side options only, while demand-side options were assessed in the third report of this series - Finance, Nature and Food Systems - Consumers choosing sustainable food systems in Brazil (Bataillard, D., 2022). That report made several recommendations for demand-side interventions, as follows:

Encourage consumers to shop for food more sustainably by supporting them in making better decisions and avoiding counter-productive biases and choices. People normally use shortcuts when deciding between alternatives when they do not have all the information. Tailored information is a powerful tool that can provide consumers with cues or features that can make a difference between food options.

Ensure that consumers use valid sustainability tips. Advance food policies by designing socioenvironmental labels that can quickly characterise a food product as less harmful to a specific socioenvironmental impact in terms of intensity (low, medium and high). The target is to facilitate understanding of socioenvironmental impact information by developing a label on the front panel of packaged foods using simple icons. Life cycle sustainability assessment may be applied to evaluating environmental, social and economic decision-making processes towards sustainability throughout the food product life cycle.

The impacts should be chosen to represent the most critical ones to the environment and society based on robust scientific evidence pointing in this direction. Impacts should also be selected based on Brazilian consumers' concerns about them. The label must be designed to avoid biases, misleading information and repeating information already delivered by well-established official labels.

To guarantee the effectiveness of the label implementation, (Bataillard et al., 2022) recommend employing an educational programme wherein consumers make their decisions so they can visualise the different options and recognise the label to learn how to make sustainable food choices. This programme should be developed in collaboration with all stakeholders to guarantee their support when putting it into practice.

Improve and provide conditions for the development of mandatory origin control and traceability in the cattle ranching chain. To this end, we recommend (i) improving and reformulating SISBOV (Brazilian System for Individual Identification of Cattle and Buffalo) to achieve a mandatory system, and (ii) considering an implementation plan to disseminate and prepare rural extension professionals, cattle ranchers and other agents in the production chain to allow full coverage of the sector and informal market development, and to avoid exclusion of small farmers and less prepared producers.

Establish systems for monitoring and measuring sustainability indicators and metrics in the agri-business chains, primarily in the animal protein and alternative protein chains. We recommend the development of a multi-institutional taskforce to map and assess all existing (public, private and non-profit) patterns, systems, certifications and efforts aiming to monitor sustainability metrics in the agri-food sector. We also recommend the elaboration or adaptation of existing criteria and rules of monito- ring sustainability indicators in the agricultural sector in Brazil and developing a centralised platform to host and coordinate monitoring efforts.

Encourage and promote the aggregation of sustainability attributes and geographic identity to products from farmers who adopt sustainable agricultural practices, especially those associated with the Amazon and Cerrado biomes. To this end, regulate the Law of Payment for Environmental Services (PES), integrating the monitoring systems to PES, and create new programs at BNDES, FINEP, SEBRAE, Rural Credit and CNPq incentivising the integration of environmental and geographic attributes to agricultural goods.

Encourage the financial sector to participate in and contribute to establishing monitoring systems and aggregating environmental attributes to the agri-food sector to align the incorporation of sustainability indicators in its metrics, reports, portfolios and range of services generated by the agricultural activities that it finances.

Encourage and create conditions for the implementation of carbon markets and ecosystem and biodiversity services (nature credit markets) with clear rules that generate confidence for investors. To this purpose, we recommend the regulation of the PSA (National Policy for Payments for Environmental Services) and the provisions outlined in the Forest Code; this will encourage synergies between agricultural production, conservation, and recovery of natural resources.

Promote the training of new workers and professionals for sustainable protein production chains, as well as the retraining and reallocation of workers to migrate from contracting chains and sectors towards sustainable chains. Implement and improve training programs and dissemination of information and sustainable and resilient practices for farmers (extension services and technical assistance). We recommend reviewing the rural extension policy with a purpose other than technical assistance. Direct the rural extension to assist in the training of producers as well as teaching them to adapt to legal norms and requirements.

Encourage farmers to diversify primary agricultural production at the property and/or local level in order to supply raw materials for the alternative protein industry and encourage and promote the sustainable intensification of livestock.

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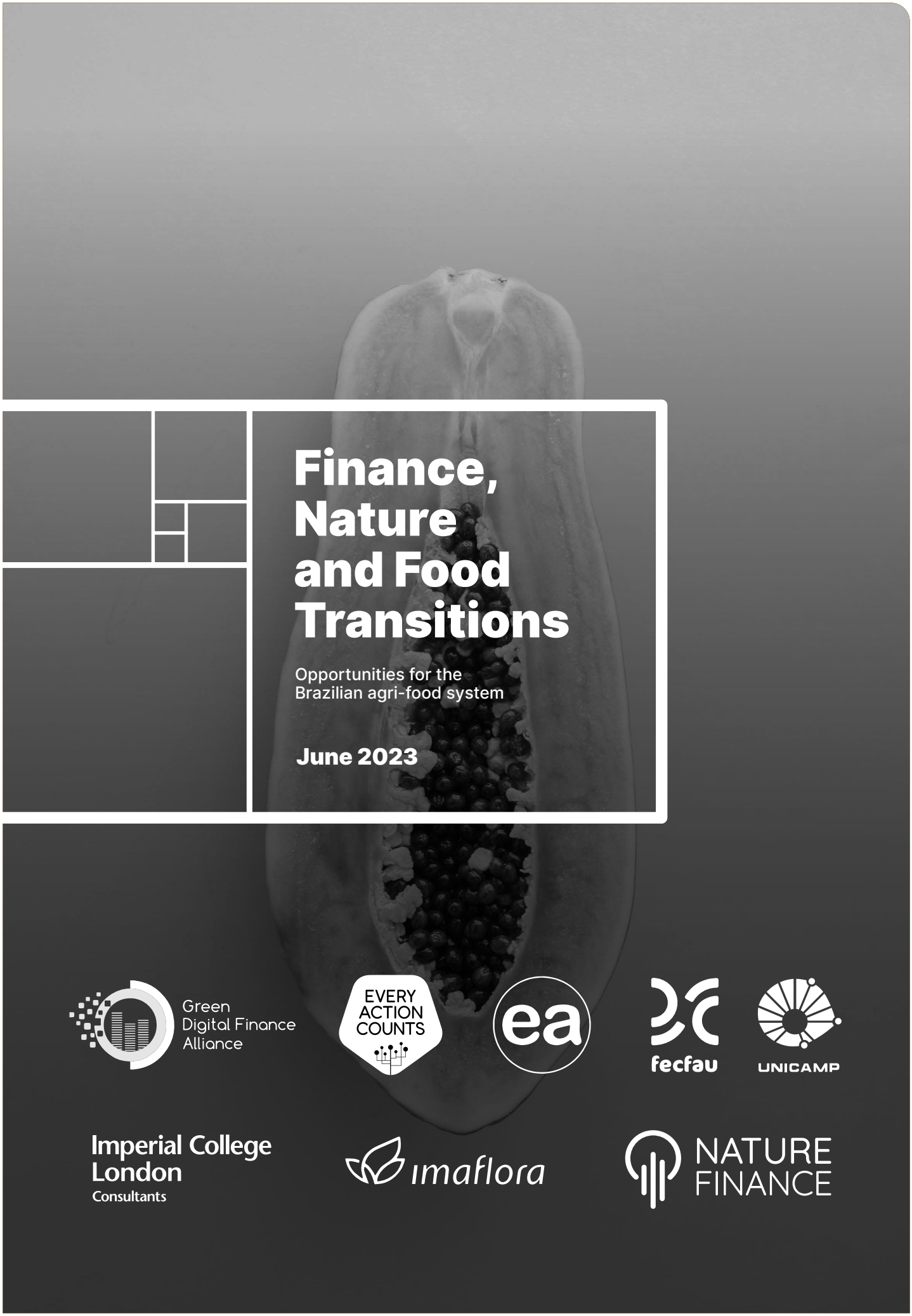

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