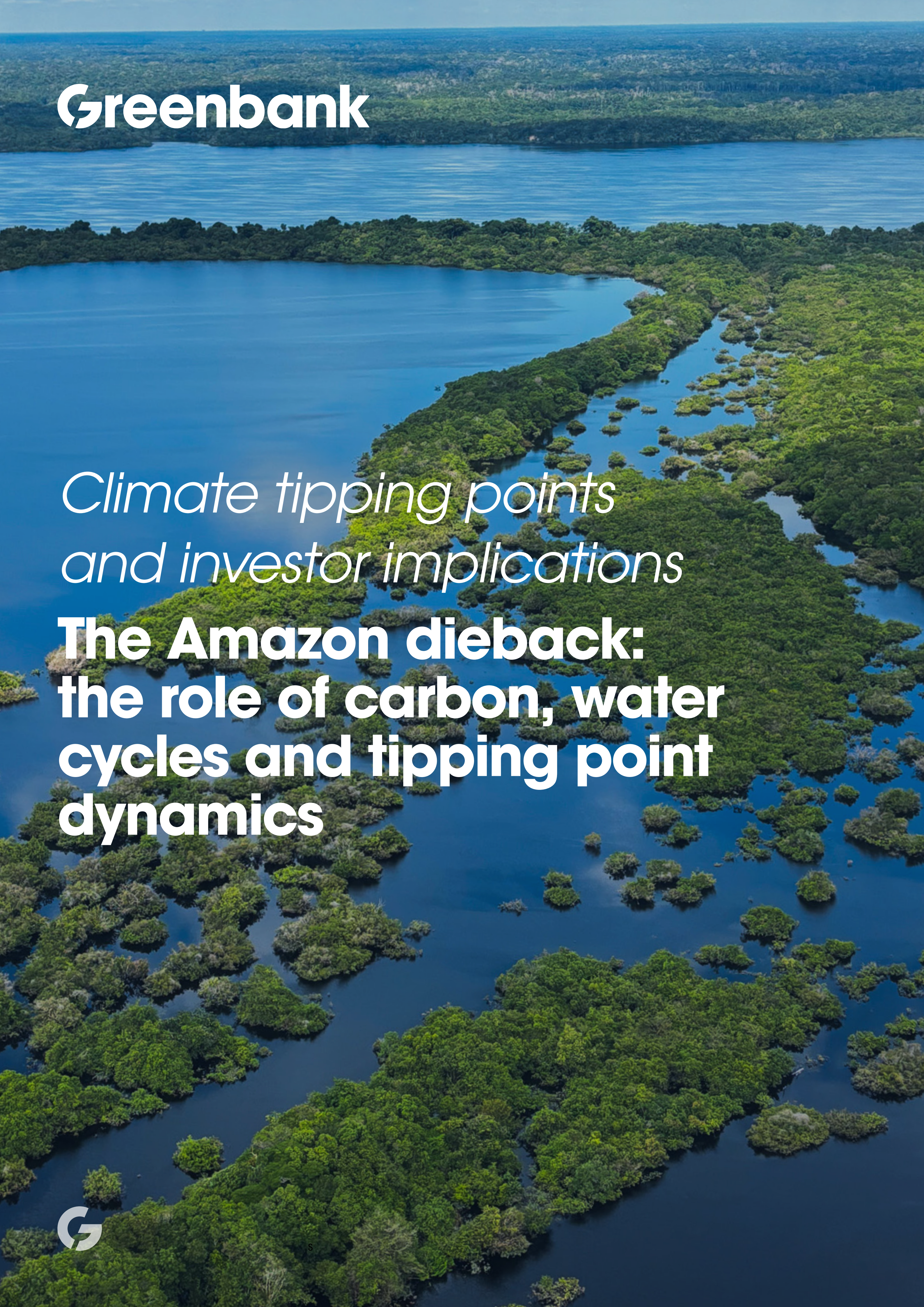

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Climate tipping points and investor implications

The Amazon dieback: the role of carbon, water cycles and tipping point dynamics

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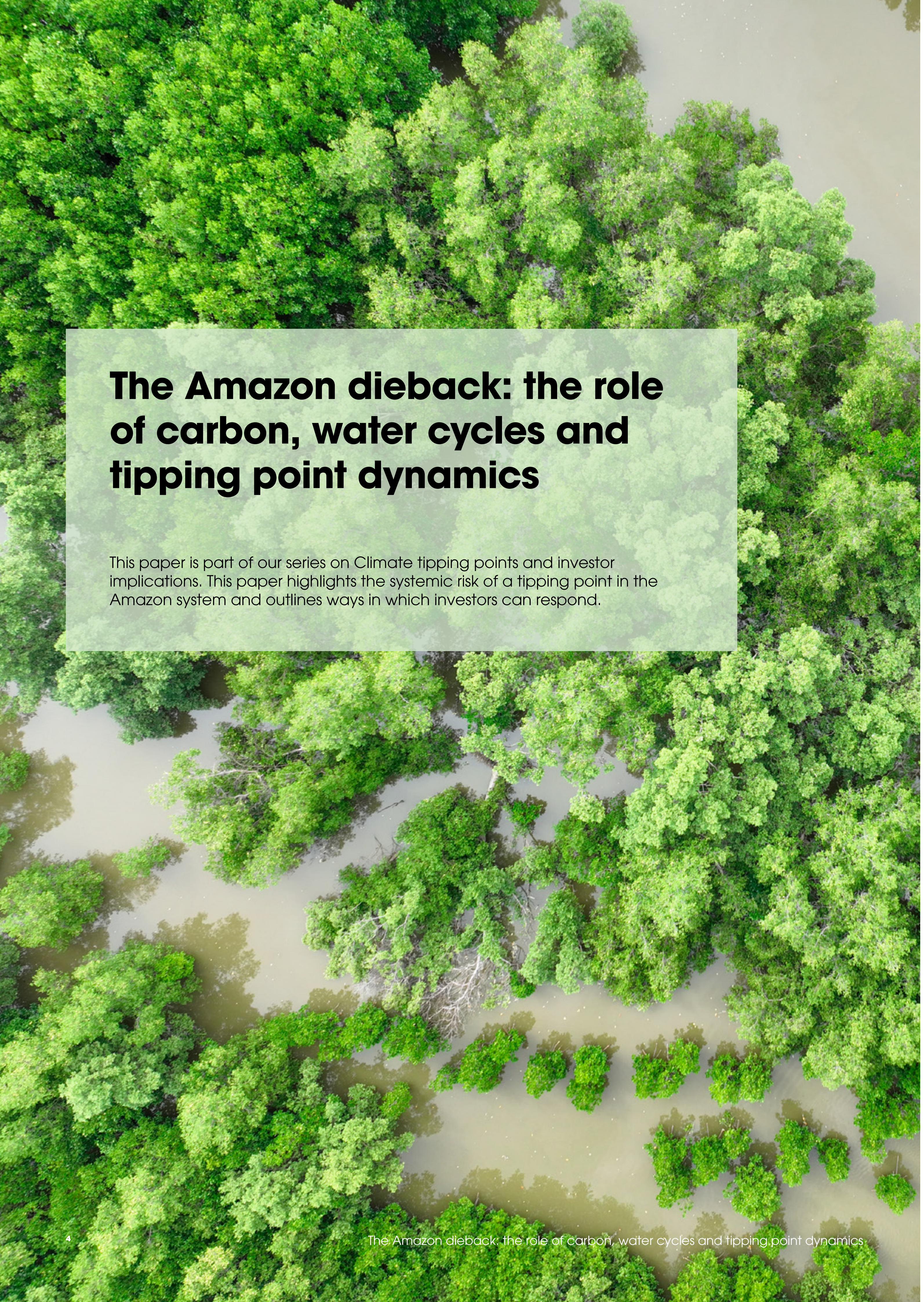


The Amazon dieback: the role of carbon, water cycles and tipping point dynamics

This paper is part of our series on Climate tipping points and investor implications. This paper highlights the systemic risk of a tipping point in the Amazon system and outlines ways in which investors can respond.

1

Introduction

Often referred to as the "lungs of the planet", the Amazon contributes approximately 20% of the world's oxygen supply, delivers 15% of the freshwater that flows into the oceans, and harbours around 10% of global biodiversity.[1] Furthermore, it serves as a substantial carbon sink, storing an estimated 150–200 Pg of carbon which is equivalent to 15 to 20 years' worth of global CO_2 emissions.[2] This immense capacity plays a pivotal role in moderating the Earth's climate through its net cooling effect, as the forest absorbs carbon dioxide and releases water vapour that helps regulate atmospheric temperature.

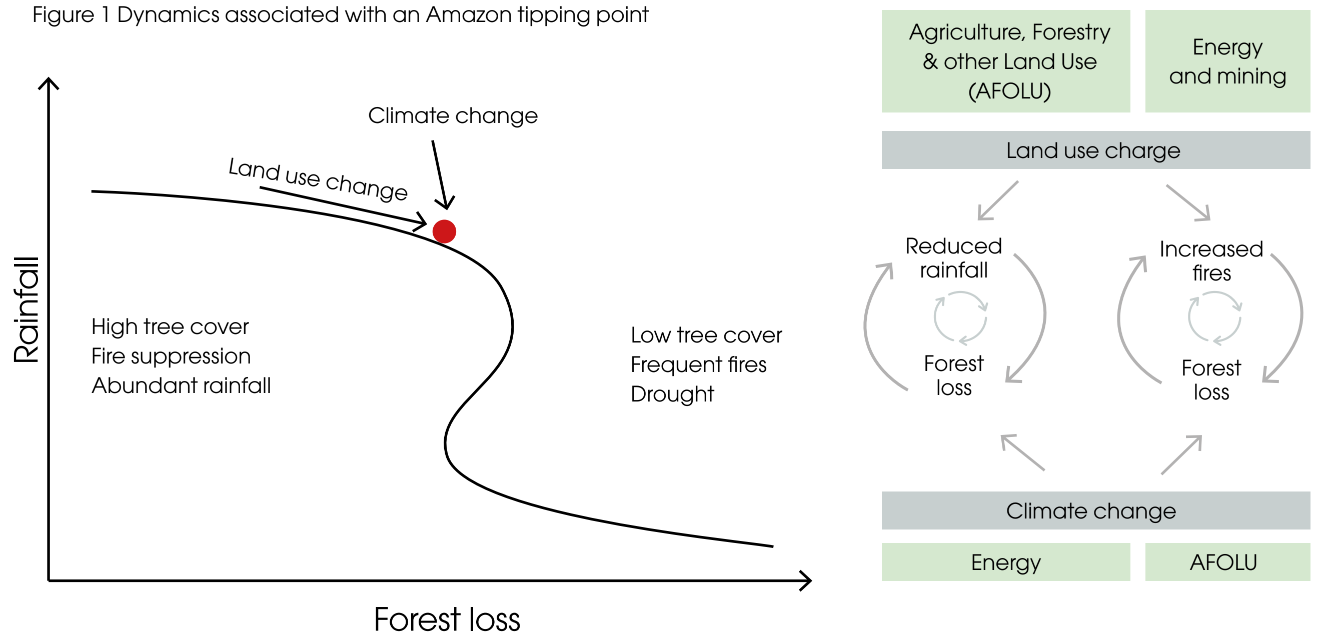
The Amazon requires sufficient amounts of rain for it to remain a tropical rainforest, which it gets from two sources. Half of it comes from evaporation in the ocean, which is transported via atmospheric circulation. The other half is generated by the forest itself through high levels of evaporation and transpiration. Forest cover plays a central role in internal moisture recycling, driving self-amplifying feedback mechanisms that connect fire suppression and atmospheric humidity. Together these processes support rainfall patterns and ecosystem stability.

This is the basis of the Amazon's "tipping point" dynamic (Figure 1), as rainforest area declines, the volume of moisture released through evaporation and transpiration also diminishes, leading to reduced regional rainfall and accelerating forest dieback. In this context, 'forest dieback' refers to a large-scale loss of trees and forest biomass driven by climate stressors such as drought, heat, and fire, which weakens the forest capacity to recycle moisture and store more carbon, making the ecosystems increasingly vulnerable to further degradation. While these feedback mechanisms typically help stabilise the ecosystem, significant disruption can trigger a self-reinforcing cycle of degradation. This may result in a large-scale shift from rainforest to a drier, non-forested state such as savannah or grassland. Once this threshold is crossed, the loss of tree cover exposes the landscape to drier conditions and flammable grasses, creating an environment where fires spread more easily. These fires further inhibit forest regeneration and may prevent the ecosystem from recovering its original structure and function.

[1] Principles for Responsible Investment. (2019). The Amazon: A Critical Climate Tipping Point. https://www.unpri.org/Uploads/s/h/b/pri_theamazon_acriticalclimatetippingpoint_2019_659012.pdf; https://global-tipping-points.org/

[2] Flores, B. M., Montoya, E., Sakschewski, B., Nascimento, N., Staal, A., Betts, R. A., Levis, C., Lapola, D. M., Esquível-Muelbert, A., Jakovac, C., Nobre, C. A., Oliveira, R. S., Borma, L. S., Nian, D., Boers, N., Hecht, S. B., ter Steege, H., Arieira, J., Lucas, I. L., … Hirota, M. (2024). Critical transitions in the Amazon forest system. Nature, 626(7999), 555–564. https://doi.org/10.1038/s41586-023-06970-0

Figure 1 Dynamics associated with an Amazon tipping point



Since the 1960s, approximately 20% of the Amazon rainforest has been lost, significantly altering regional rainfall patterns.[3] Over the past decade, the region has experienced record-breaking droughts in 2005, 2010 and 2016, and floods in 2009, 2012 and 2014. The 2005 and 2010 droughts alone resulted in the loss of a decade's worth of carbon storage.

The growing oscillation between extreme droughts and floods is recognised as a potential signal that the Amazon ecosystem may be nearing a tipping point, where its ecological resilience, the capacity to maintain structure, function, and interactions despite disturbances, could be compromised.

Looking ahead, large parts of the Amazon are projected to experience mass mortality events in the coming decades due to climatic and land use-related disturbances. These disturbances risk accelerating global warming through increased carbon emissions and feedbacks within the climate system. As global temperatures rise, sea levels are expected to increase due to thermal expansion of ocean water and the melting of land-based ice sheets. While the Amazon is not directly linked to ice melt, its contribution to rising greenhouse gas concentrations makes it an indirect driver of long-term sea level rise.

Another key signal is that the Amazon starts to take longer to recover from disturbances and exhibits greater swings in key ecological measures, a phenomenon known as "critical slow down".

[3] Coe, Michael T., et al. The forests of the Amazon and Cerrado moderate regional climate and are the key to the future. Tropical Conservation Science 10 (2017): 1940082917720671

"The 2005 and 2010 droughts alone resulted in the loss of a decade's worth of carbon storage."

Recent advances in artificial intelligence and deep learning are enhancing our ability to detect these signals. With access to high-resolution satellite data and long-term ecological records, AI models are increasingly used to identify patterns that precede large-scale shifts, complementing traditional monitoring approaches.

Several biophysical indicators are being monitored to assess the stability of the Amazon system:

- CO_2 sensitivity to temperature: rising temperatures are causing the forest to release more carbon dioxide, indicating a weakening of its role as a carbon sink.
- Seasonal temperature sensitivity: areas that later experience collapse tend to show greater seasonal temperature variability, which may signal emerging climate instability.
- Vegetation Optical Depth (VOD): satellite observations reveal declining water content in trees, a sign of increasing physiological stress.
- Water recycling network stability: disruptions in the forest's internal water cycling system threaten regional rainfall patterns and may contribute to longer dry seasons and increased fire risk.

Together, these indicators point to a loss of resilience and a heightened risk of large-scale forest degradation. Monitoring these signals is essential for anticipating potential transitions and informing timely responses.

Cumulative carbon emissions offer a key indicator of the risk and timing of Amazon rainforest dieback. Evidence suggests that large-scale dieback could begin between 2°C and 3.5°C of global warming, with severe and potentially irreversible collapse above 4°C, particularly if regional drying and fire feedbacks are present. At current emission rates, the carbon budget for 2°C is projected to be exceeded within 30–35 years, and for 3°C within 50–60 years.[4] Even lower emissions could trigger dieback if feedback mechanisms or higher climate sensitivity amplify regional warming and drying.

[4] IPCC AR6 and SSP2-4.5, range given due to uncertainty

Cascading effects globally and irreversibility

Crossing a tipping point in the Amazon rainforest would not only compromise its role as a carbon sink, but it would also initiate a cascade of ecological disruptions that are both profound and largely irreversible. These transformations are driven by tightly interlinked feedback mechanisms across climate, hydrological, and land systems.

As climate change intensifies, reduced precipitation and elevated temperatures exacerbate drought conditions, which in turn suppress evapotranspiration and increase the frequency and severity of forest fires. These stressors accelerate forest dieback, undermining the Amazon's capacity for moisture recycling, a process responsible for up to 70% of the region's rainfall.[5] This self-reinforcing loop could push the ecosystem towards an alternative, degraded state such as savannah, from which recovery would not be feasible through reforestation alone.

The environmental cascades triggered by Amazon dieback have far-reaching socio-economic implications, as shown in the figure 2 on the right. Regionally, the degradation of the Amazon would disrupt rainfall patterns across South America, compromise air quality and diminish ecosystem services essential to agriculture, fisheries and hydropower. Declining river levels would impair transport and livelihoods, while deteriorating public health and food insecurity could contribute to displacement and social instability. At the global scale, the release of vast quantities of stored carbon would accelerate climate change, potentially destabilising other critical tipping elements such as the Greenland ice sheet and boreal forests. Altered atmospheric circulation and reduced forest productivity would influence climate regulation, freshwater availability and the spread of vector-borne diseases.

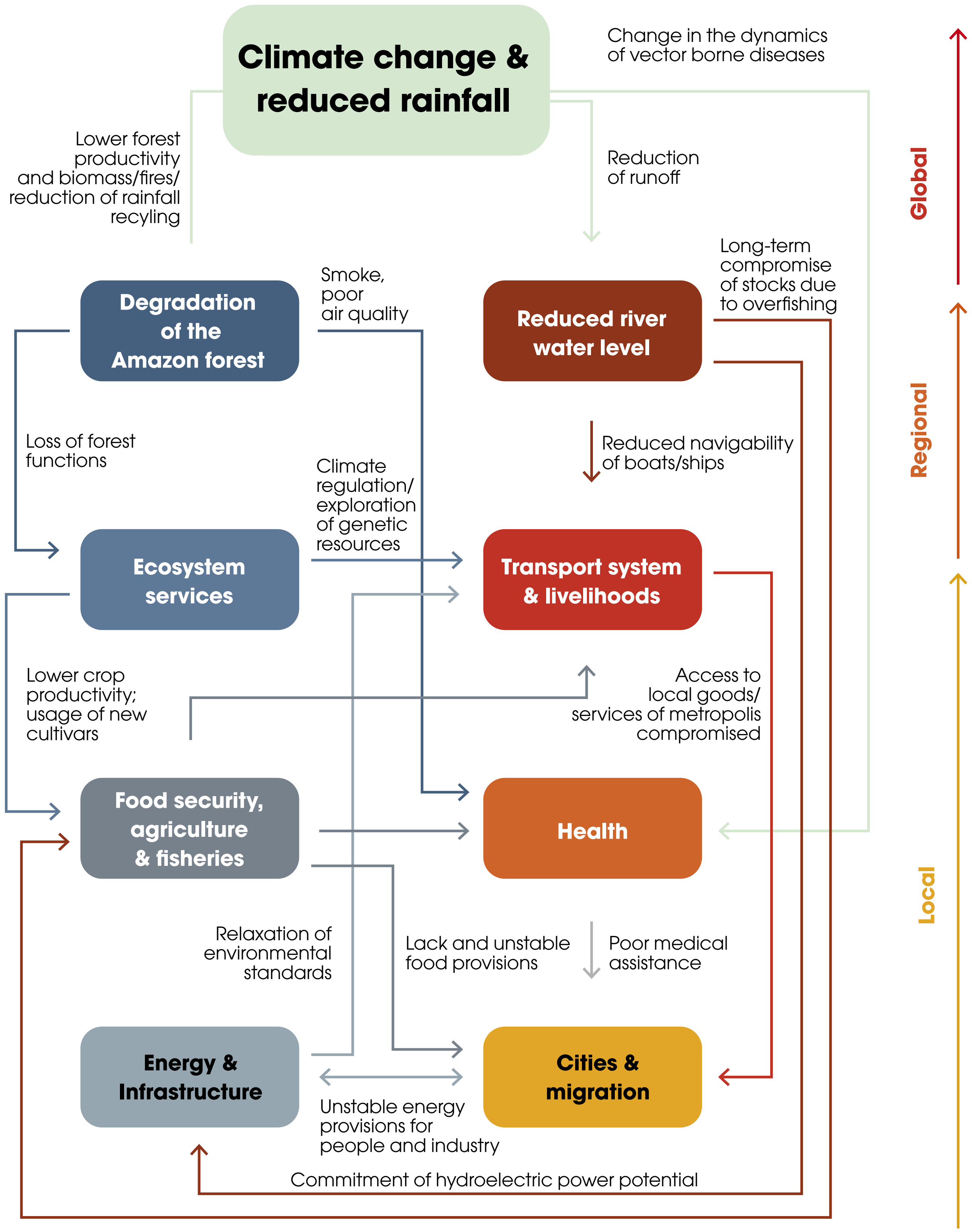
These impacts would be long-lasting and irreversible effects. They would affect both ecological and socio-economic systems, increasing exposure to risk and reducing resilience across regions and sectors. Addressing the risks associated with Amazon dieback is critical for maintaining biodiversity, climate stability, public health, infrastructure, and economic performance.

[5] Baudena et al., 2021

Figure 2 Tipping cascade in the Amazon rainforest

Source: Lenton et al., 2023

Figure 3 Socioeconomic impacts of Amazon dieback



Source: Lapola et al., (2018)

Interlinkages with other tipping points

Interactions between the different tipping points may either have stabilising or destabilising effects on the other tipping systems, potentially leading to cascades of abrupt transitions. These interactions may substantially reduce the thresholds required to trigger a tipping event, compared to when each tipping system is considered independently. The Amazon's stability is closely linked to other climate systems, meaning that shifts in one can amplify risks in the others.

For example, the El Niño–Southern Oscillation (ENSO), a recurring climate pattern of shifting ocean temperatures and winds in the tropical Pacific, influences regional rainfall patterns. Extreme El Niño events, the warm phase of ENSO marked by unusually high Pacific Ocean surface temperatures, particularly when combined with global warming, are increasingly linked to severe droughts and heat stress in the Amazon basin, raising tree mortality, wildfire risk and the likelihood of rainforest dieback.6,7 These conditions may also shift parts of the Amazon from a carbon sink to a carbon source, further destabilising the ecosystem and reinforcing climate feedbacks.

Another critical system is the Atlantic Meridional Overturning Circulation (AMOC) which strongly influences rainfall across tropical South America, particularly the Amazon. Changes in Atlantic sea surface temperatures shift the Intertropical Convergence Zone southward, reducing rainfall in northern South America while increasing it in the southern Amazon and northeastern Brazil.8 Although the precise impacts vary across models, this underscores how interconnected climate systems influence Amazon rainfall.

Overall, these interlinked climate systems mean that a tipping event in the Amazon could trigger or be triggered by other tipping points, amplifying cascading effects globally.

[6] Jiménez-Muñoz, J. C., Mattar, C., Barichivich, J., Santamaría-Artigas, A., Takahashi, K., Malhi, Y., Sobrino, J. A., & van der Schrier, G. (2016). *Record-breaking warming and extreme drought in the Amazon rainforest during the course of El Niño 2015–2016.* Scientific Reports, 6, Article 33130. https://doi.org/10.1038/srep33130
[7] Nobre, C. A., Sampaio, G., Borma, L. S., Castilla-Rubio, J. C., Silva, J. S., & Cardoso, M. (2016). *Land-use and climate change risks in the Amazon and the need of a novel sustainable development paradigm. Proceedings of the National Academy of Sciences of the United States of America*, 113(39), 10759–10768. https://doi.org/10.1073/pnas.1605516113
[8] Bellomo, K., Meccia, V. L., D'Agostino, R., Fabiano, F., Larson, S. M., von Hardenberg, J., & Corti, S. (2023). Impacts of a weakened AMOC on precipitation over the Euro-Atlantic region in the ECEarth3 climate model. Climate Dynamics, 61(7), 3397–3416.

Financial and systemic risks

Crossing the Amazon tipping point would generate cascading risks through the loss of critical ecosystem services. These risks manifest directly in sectors immediately dependent on nature and indirectly through macroeconomic and financial systems dynamics.

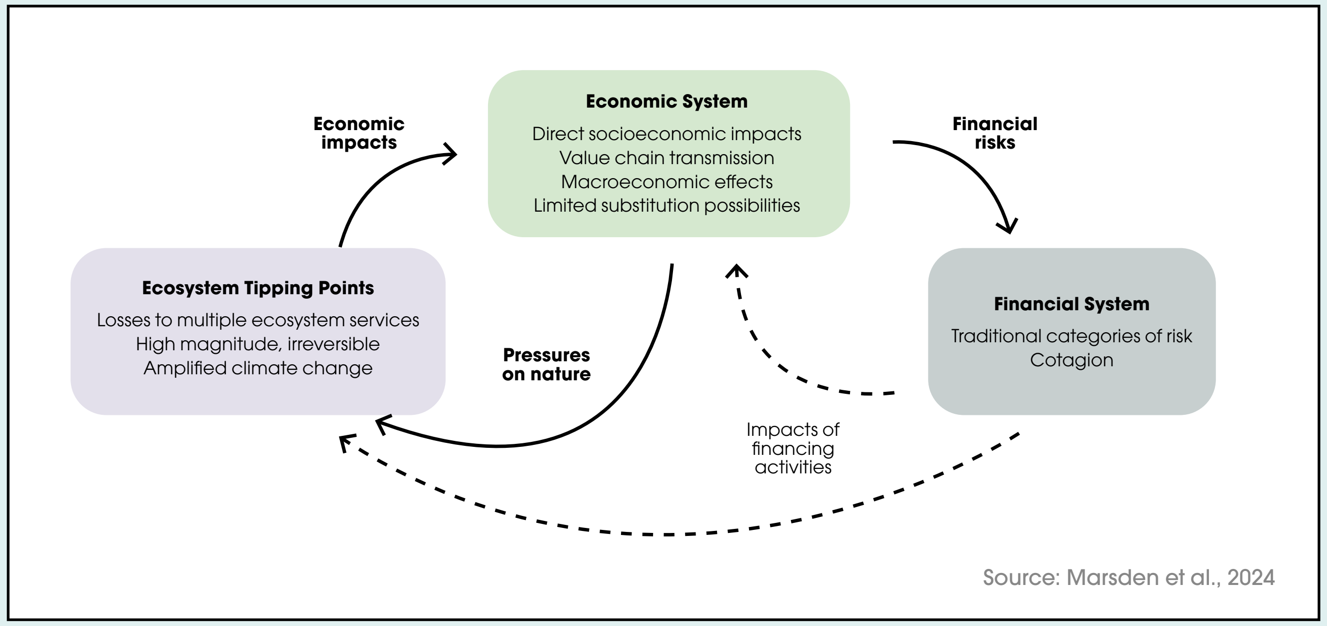
Direct risks would fall most acutely on agriculture, forestry, energy and transport. Reduced rainfall and river discharge would undermine hydropower production and crop yields, while soil degradation linked to deforestation would impair the long-term productivity of industries reliant on timber, soy and palm oil. These impacts increase operational costs, erode asset values, and create stranded asset risk where climate-related physical risks have not been adequately priced.

Indirect risks would also emerge through second-order effects and compounding dynamics.[9] Supply chain disruptions in food and energy markets could create significant inflationary pressures, with staples such as soy and beef becoming more volatile and expensive. Season-wide crop failures would not only affect local producers but reverberate globally through higher food prices, threatening food security and fuelling political instability. Energy shortages and rising transport costs would further amplify inflation volatility. These macroeconomic stresses would weaken productivity, reduce investment flows, and heighten sovereign and corporate credit risks.

The financial system may further amplify these risks, both through feedback effects and by supporting economic activities that drive ecosystem tipping points.[10] From a financial stability perspective, Amazon dieback underscores the interconnectedness between the financial sector and nature. Figure 4 illustrates how substantial losses across multiple ecosystem services could translate into significant economic and financial impacts.

[9] Network for Greening the Financial System. (2021). NGFS Climate Scenarios for Central Banks and Supervisors.
[10] Marsden, L., Ryan-Collins, J., Abrams, J.F. & Lenton, T.M., 2024. Financial system interactions with ecosystem tipping points: evidence from the Brazilian Amazon and Indonesian peatlands. UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP WP 2024_11). Available at: https://www.ucl.ac.uk/bartlett/public-purpose/publications/WP-2024_11

Figure 4 Potential macro-financial dynamics with crossing earth systems tipping points



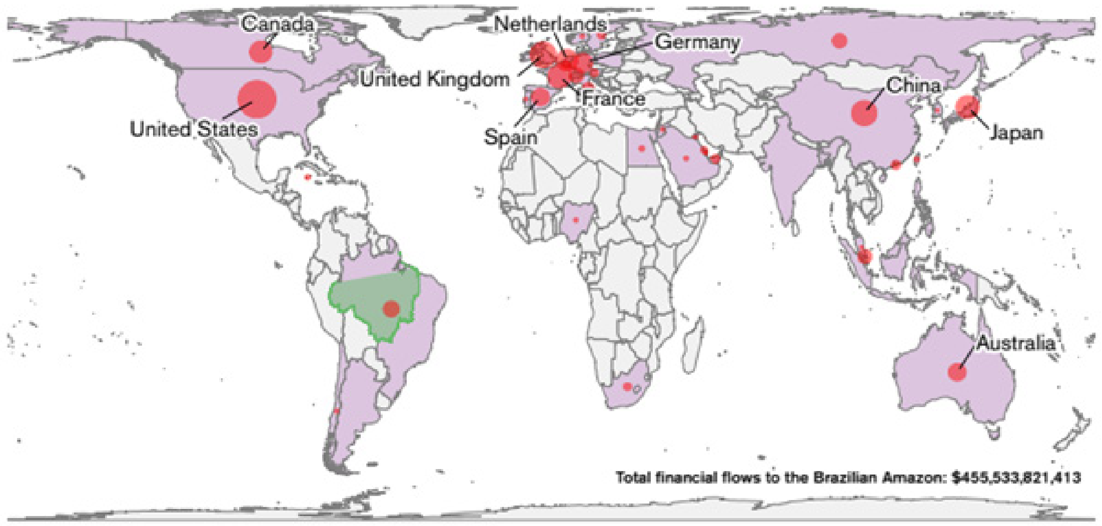
The sector is not only exposed to nature-related risks but also influences them through capital allocation to activities driving deforestation. Crucially, the financial flows enabling deforestation in the Amazon are highly globalised. Institutions in North America and Europe facilitate the majority of capital directed toward Amazon-linked companies, despite being geographically and politically distant from the biome itself.[11] As shown in Figure 5, the map of financial origin reveals that the degradation of the Amazon is largely financed by actors outside Brazil, underscoring the need for international financial governance to address ecosystem risks.[12] This represents significant systemic risk, with the potential to destabilise multiple markets simultaneously.

[11] Marsden, L., Ryan-Collins, J., Abrams, J.F. and Lenton, T.M., 2024. Financial system interactions with ecosystem tipping points: evidence from the Brazilian Amazon and Indonesian peatlands. UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP WP 2024-11). Available at: https://www.ucl.ac.uk/bartlett/public-purpose/publications/WP-2024-11
[12] Ibid.

“Risk is shaped by three factors: hazard, exposure and vulnerability.”

Figure 5 Financial flows to companies linked to the land use change in Amazon, by country

Note: Countries in lilac are those where financial flows (e.g. loans and equity or debt issuance) to companies linked to land-use change in the Amazon originate from. The Amazon is filled in green. The size of the circles indicated the size of the financial flow. The names of the top 10 countries are displayed on the map.



Source: Marsden et al., 2024

These dynamics reflect that the financial system is not only exposed to nature-related risks, but also plays a role in driving them through capital allocation decisions. The overall risk profile is shaped by three factors hazard (a natural or human induced physical event), exposure (the extent to which socio-economic systems could be affected by this hazard) and vulnerability (the extent to which socio-economic systems can adapt to or withstand the hazard).[13,14] Losses to ecosystem services from tipping points can increase both the level of hazard and the vulnerability of affected systems. These systemic dynamics can be further illustrated through scenario analysis.

[13] Reisinger, A., Howden, M. and Vera, C. (2020). The concept of risk in the IPCC Sixth Assessment Report: a summary of cross-Working Group discussions – Guidance for IPCC authors.
[14] Ranger, N., Alvarez, J., Freeman, A., Harwood, T., Obersteiner, M., Paulus, E., & Sabuco, J. (2023). The Green Scorpion: The macro-criticality of nature for finance: Foundations for scenario-based analysis of complex and cascading physical nature-related financial risks.

2

Scenario analysis and pathways

Early-stage Amazon tipping scenario

If warming is held around 2 °C by 2040, the Amazon rainforest will face chronic stress but is likely to fall short of a full, abrupt collapse. Models already show that the forest's resilience is weakening with roughly 15% of the Amazon deforested and another 17% degraded.[15] Coupled with this, studies warn that passing 20–25% forest loss could flip parts of the basin into dry savannah.[16] In a 2 °C scenario, the Amazon's ability to generate its own rainfall weakens, heightening drought and deforestation risk in the region by mid-century. This threatens agricultural output in key South American markets and increases volatility in global supply chains. Even partial dieback poses systemic risks to climate stability, biodiversity and asset exposure linked to land use, commodities, and natural capital.

For investors and capital markets, these climate outcomes translate into rising physical and economic risks. South America is a key producer of soy, beef, coffee and other commodities, which have also been significant drivers of deforestation. Reduced rainfall in the Amazon threatens the La Plata Basin and Cerrado farms with water shortages, which could lower crop yields, force shifts in planting patterns, and drive up global food prices. For example, Brazilian soybean and maize yields, currently among the world's largest, could fall several percentage points if Amazon rainfall declines.[17,18] Cumulatively, Latin American GDP could lose hundreds of billions of US dollars by 2050 as a result.

[15] Kirkham, J. Forest and Ice Tipping Points in the Earth System. United Nations Framework Convention on Climate Change (UNFCCC). Available at: https://unfccc.int/sites/default/files/resource/Forest_and_Ice_Tipping_Points_in_the_Earth_System_JamesKirkham.pdf
[16] World Wide Fund for Nature (WWF). Amazon on the Brink. Available at: http://livingplanet.panda.org/amazon-rainforest-on-the-brink/
[17] Flores, B.M. et al. (2024) 'Critical transitions in the Amazon forest system', Nature, 626, pp. 555–564.
[18] Azevedo, A.A. et al. (2021) 'Deforestation reduces rainfall and agricultural revenues in the Brazilian Amazon', Nature Communications, 12, 4727.

The UK and EU import significant quantities of soy and beef from Brazil, so global supply chains would strain. Any sustained drop in yields or supply disruptions would tighten global supply, driving up global prices of these commodities and their derivatives such as feed and biodiesel inputs. For investors, this implies rising input costs and heightened counterparty and credit risk, for agribusinesses, food manufacturers, and commodity traders reliant on Brazilian soy and beef.[19] It also increases exposure to regulatory and reputational pressures, as UK regulators, consumers and NGOs demand climate-resilient and deforestation-free supply chains. These factors are likely to drive a reallocation of investment capital away from high-vulnerability agricultural assets toward more resilient or diversified exposures.

These trends are already transpiring even if the major tipping point has not yet been reached, The Amazon feeds hydroelectric dams within South American region, supplying a significant portion of the region's energy mix. Already the Belo Monte dam in Brazil has sharply reduced dry-season flows in the Xingu River, a trend expected to worsen, potentially making the dam economically unviable.[20] Some models predict that Amazon hydropower output could drop by 25–40% in extreme droughts.[21] Given that hydropower currently provides two-thirds of Brazil's electricity, such cuts endanger power supply in Brazil and neighbouring countries. In addition, dams are a major driver of the nation's financial wellbeing, with hydropower accounting for 56% of the electricity generated in 2024 supplying the industrial sector in the Amazon and elsewhere.[22]

[19] Trase & Stockholm Environment Institute (SEI), 2023. UK soy imports and deforestation exposure: Briefing. (pdf) Stockholm: Trase. Available at: https://resources.trase.earth/documents/Briefings/UK-soy-manifesto-dependencies-and-deforestation-exposure.pdf
[20] Hanbury, S., 2020. Amazon tipping point puts Brazil's agribusiness, energy sector at risk: Top scientists. (online) Mongabay. Available at: https://news.mongabay.com/2020/02/amazon-tipping-point-puts-brazils-agribusiness-energy-sector-at-risk-top-scientists/
[21] Global Tipping Points, 2023. Potential for Earth system tipping points to magnify or accelerate impacts of global warming. Available at: https://report-2023.global-tipping-points.org/section2/2-tipping-point-impacts/2-2-assessing-impacts-of-earth-system-tipping-points-on-human-societies/2-2-5-potential-for-earth-system-tipping-points-to-magnify-or-accelerate-impacts-of-global-warming/
[22] https://ember-energy.org/countries-and-regions/brazil/

Investors with global portfolios can be exposed to Amazon hydropower risks indirectly through equity, debt, or infrastructure investments in Brazilian utilities, industrial borrowers, and infrastructure funds. Many funds invest globally in renewable energy projects or emerging market infrastructure, but climate-related disruptions in the Amazon introduce both financial and climate related risks into portfolios.

Moreover, reduced transpiration from the Amazon can impact assets in adjacent regions. For example. river levels influence key trade routes. As Amazon flows shrink, inland shipping routes, including bulk transport to Atlantic ports, becoming increasingly uncertain, posing operational and supply chain risks. Critically, Panama Canal traffic, which handles approximately US$270 billion of trade annually, is now constrained by drought. The recent cut of daily passages from 36 to 22 vessels, along with imposed draft limits shows that trade routes are already being affected.[23] Persistent drying from Amazon loss would aggravate these restrictions, raising global shipping costs and delays.

Even a gradual Amazon decline would drive complex, multi-sector effects. Reduced rainfall and river flows can disrupt commodity supplies, raise food and energy prices globally and increase operational costs for agribusinesses and utilities. These pressures heighten credit risk, potentially leading to downgrades for governments and companies exposed to the region. Standard climate models that do not integrate tipping points are likely to underestimate these risks, leaving portfolios vulnerable to sudden shocks if rainfall, crop yields, or hydropower output decline faster than expected. Globally, supply chain bottlenecks and energy shortfalls could propagate price volatility and inflation, underscoring the systemic nature of Amazon-related tipping risks.

[23] de Bolle, M. (2024). The Panama Canal may dry up because of Amazon deforestation | PIIE. Available at: https://www.piie.com/blogs/realtime-economics/2024/panama-canal-may-dry-because-amazon-deforestation.

Full collapse of Amazon tipping point scenario

While above current consensus of 2.5 to 2.9°C of warming[24], at 3 to 4 °C of warming by mid-century, climate models indicate that the Amazon could reach a critical threshold[25], beyond which large portions of the basin would irreversibly convert to dry scrub or savanna.[26] Unlike gradual stress, this scenario represents a tipping point collapse, the Amazon rainforest could flip from a carbon sink into a carbon source, with estimates suggesting it may release up to 75 billion tonnes of carbon into the atmosphere.[27] This abrupt change would intensify regional droughts, disrupt South American weather systems, and amplify global climate feedbacks, including accelerated ice-sheet melting and monsoon variability.

The cascading impacts of Amazon dieback would be profound and systemic. Agricultural production in Brazil and neighbouring countries could collapse in vulnerable regions, triggering global commodity shocks with far-reaching effects on food security, inflation and trade. Hydropower generation dependent on Amazon river flows could decline by as much as 60% under severe climate–forest loss scenarios, destabilising energy grids, creating stranded assets and increasing the risk of blackouts across Latin America.[28] Inland waterway transport would be severely restricted, amplifying shipping costs and bottlenecks for global trade.

Amazon dieback would become a systemic economic shock. One modeling study estimates place the potential economic damages of Amazon dieback at between US$957 billion and US$3,589 billion (net present value, over 30 years, as of 2018), primarily through ecosystem service losses.[29] Sovereign borrowers like Brazil would face plummeting export revenues and fiscal stress. Commodity-linked equities and infrastructure assets would be repriced sharply lower as global markets anticipate declining productivity.

[24] Climate Action Tracker, Nov 2025 update
[25] Nobre, C.A., Sampaio, G., Marengo, J.A., et al., 2016. Land-use and climate change risks in the Amazon and the need of a novel sustainable development agenda. Proceedings of the National Academy of Sciences, 113(39), pp.10759–10768. Available at: https://doi.org/10.1073/pnas.1605516113
[26] Hanbury, S., 2020. Amazon tipping point puts Brazil's agribusiness, energy sector at risk: Top scientists. (online) Mongabay. Available at: https://news.mongabay.com/2020/02/amazon-tipping-point-puts-brazils-agribusiness-energy-sector-at-risk-top-scientists/
[27] World Wide Fund for Nature (WWF). Amazon on the Brink. Available at: http://livingplanet.panda.org/amazon-rainforest-on-the-brink/
[28] de Oliveira Serrão, E.A., Siqueira Júnior, J.L., Lima, L.S., de Souza, E.B. and Latrubesse, E.M., 2023. Future impacts on hydropower and revenue for the Amazon under climate-forest interactions. Journal of Cleaner Production, 421, p.138458.
[29] Lapola, D.M., et al., 2018. Limiting the high impacts of Amazon forest dieback with no-regrets science and policy action. Proceedings of the National Academy of Sciences, 115(46), pp.11671–11679. Available at: https://doi.org/10.1073/pnas.1721770115

"A tipping point in the Amazon becomes a tipping point in the global economy."

Investors worldwide would face portfolio losses and heightened volatility as market participants repriced risk across sectors both directly and indirectly exposed to Amazon-related disruptions. Equities and fixed-income instruments in agriculture, energy and logistics would likely experience sharp downward repricing as crop failures and prolonged drought erode revenue streams and compress margins. Sovereign credit risk would rise for nations heavily dependent on Amazon exports, with trade balance deterioration potentially triggering rating downgrades and higher sovereign spreads.[30] At the same time, supply constraints in global food and commodities markets would exert upward pressure on consumer-price inflation across importing economies, adding volatility to macroeconomic conditions and risk-adjusted returns.

These risks are highly global given Brazil's central role in global agriculture. As the world's largest producer and exporter of soy, Brazil relies heavily on the so-called Amazon arc, the transport infrastructure for hauling soybeans and maize. Traffic along this route grew 4.8% over the past year and has surged 288% over the past decade.[31] Consequently, any disruption in this region would ripple through global food prices and trade networks. Even without direct investments, higher global inflation and market turmoil would weigh on UK asset prices and economic stability. Similarly, insurers underwriting or investing in Amazon-linked companies could face significant write-downs, while businesses reliant on imported food, soy-based feed, or biofuels would encounter rising input costs, squeezing margins and reducing consumer purchasing power.

Ultimately, full Amazon dieback represents a global systemic event. The interconnection of climate, ecological, and economic systems means that the consequences extend far beyond South America. This underscores the need for robust climate mitigation and adaptation strategies to avoid pushing the Amazon past this irreversible threshold.

[30] Nature Finance, 2022. Nature loss and sovereign credit ratings. (online) Available at: https://www.naturefinance.net/wp-content/uploads/2022/09/NatureLossSovereignCreditRatings.pdf?utm_source=chatgpt.com
[31] The Guardian, 2025. Agriculture in the Amazon: how deforestation and soy cultivation are changing Brazil's landscape. (online) Available at: https://www.theguardian.com/global-development/2025/sep/29/agriculture-deforestation-farming-soya-cultivation-eating-brazil-amazon

3

Investor response

The systemic risks arising from Amazon tipping dynamics present a material challenge for investors. Conventional valuation models frequently underestimate the non-linear impacts of ecosystem tipping points, leaving portfolios exposed to sudden shocks in commodity prices, credit markets and energy supply. Moreover, as regulatory and societal expectations evolve, companies with exposure to deforestation or climate-sensitive operations may face heightened legal, reputational, and operational pressures.

To safeguard portfolio value and align with responsible investment mandates, investors should consider a proactive, forward-looking approach:

- Screen for ecosystem-linked risks: identify holdings in sectors vulnerable to ecosystem degradation, such as agriculture, hydropower and natural-resource extraction, then assess the potential for stranded assets or reduced long-term viability.
- Reallocate capital to resilient and nature-positive assets: prioritise investments that support ecosystem restoration, sustainable land use and climate adaptation, including renewable energy alternatives and other climate-resilient opportunities.
- Engage proactively with portfolio companies: work with investee companies to develop transition strategies that reduce exposure to ecosystem risk, enhance resilience, and ensure alignment with long-term sustainability objectives, most notably on deforestation.
- Integrate robust scenario analysis: incorporate stress testing and climate scenario modelling into valuation and risk frameworks to capture potential non-linear effects and systemic shocks.

By embedding these practices, investors can mitigate exposure to ecological tipping points, strengthen portfolio resilience and contribute to broader environmental and societal objectives.

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