

CETEX

Centre for Economic
Transition Expertise

Research and Policy at LSE

Macroeconomic and financial implications of forest loss

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Agenda

- Critical role of forest ecosystems
- Macroeconomic and macro-financial impacts of deforestation
- Governance amplifiers
- Link to financial system
- Implications for policy



Critical role of forest ecosystems

- Examples
- Land use change overtime

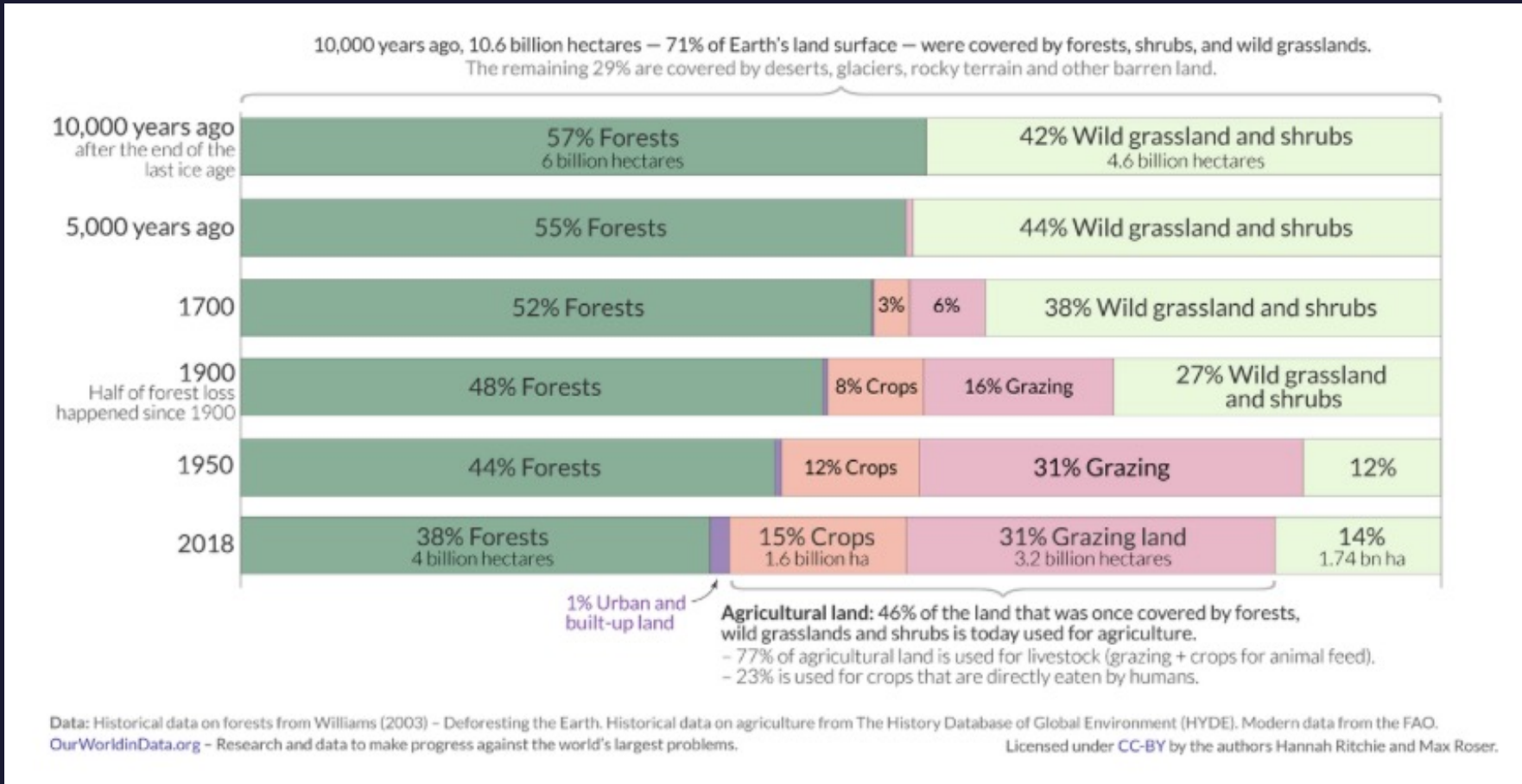


The critical role of forest ecosystem services

Function	Impacts of forest loss
Healthy soil makes water uptake available, reduces erosion, and enhances biological activity, enhancing agricultural productivity.	In western Kenya, land use change resulted in progressive soil degradation that impacted agricultural sustainability (Nyberg et al., 2012).
Forests absorb carbon emissions , but when cleared, they release stored CO ₂ .	Deforestation accounts for 12 – 20% of greenhouse gas emissions (Palmer et al, 2023)
Forests provide valuable resources such as timber and pollination but these take time to regenerate.	Land use change affects habitats of pollinators, resulting in crop yield reductions of nearby agricultural land
Healthy forest ecosystems regulate non-human diseases	Agriculture–forest interfaces contribute to plant disease epidemics through spillover from wild to domesticated plants (Guégan et al. 2023).
Forests moderate impact of storms and extreme rainfall by allowing soil to absorb water.	There is a strong relationship between deforestation and flooding and landslide events (Agarwal et al. (2023); Robalino et al. (2023))



Forest coverage and land use changes overtime



Source: Ritchie, 2021



Macroeconomic and macro-financial impacts of deforestation

- Impacts to households
- Impacts to firms
- Impacts to the economy
- Transmission to the financial system



Impact to workers and households

- Disease outbreak

Forest loss increases incidence of malaria

Premature mortality
and high medical
costs

Reduced economic
activity and higher
school absenteeism

High fertility rates
and population
growth

Reduced incomes

reduced savings
and investment
rates

Limiting economic
opportunities



Impact to workers and households

- Air quality and temperature regulation

Deforestation directly and indirectly worsens air quality and reduces forest ability to regulate temperature

Increases risk of forest fires

Increases risk of extreme heat

Higher mortality rates and healthcare costs

Reduced worker productivity



Impact to firms

- Physical risks

Deforestation profoundly affects rainfall patterns

Decline in water quantity

Decline in water quality

Output declines for agriculture and hydropower generation, and downstream industries

Increased treatment costs for industries dependent on clean water.



Impact to firms

- Transition risks

**Regulations
(or even consumer preferences)
to uphold
deforestation free
supply chains can
impact businesses**

EU Deforestation
Regulation

Fewer export opportunities
and declined earnings

UK Forest Risk
Commodities
regulation

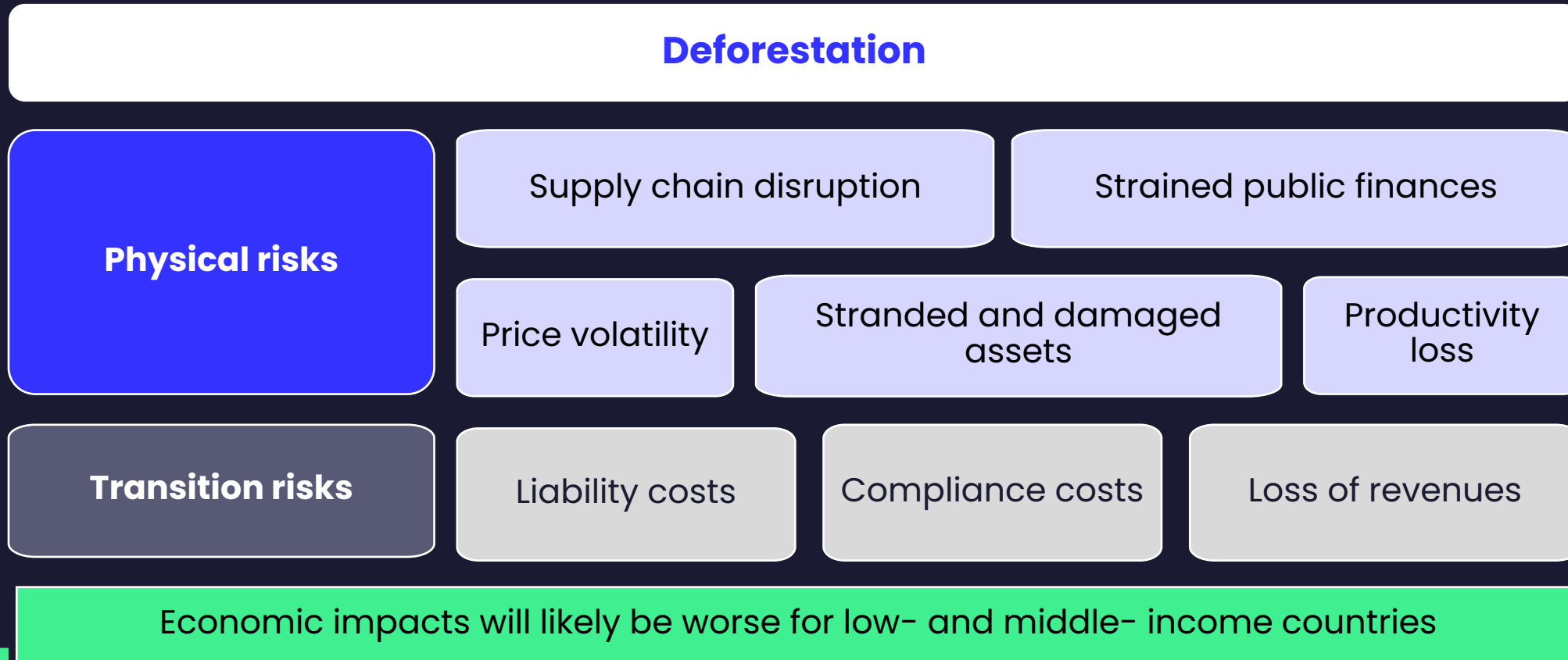
Reputational damage,
potential litigation costs

US FOREST Act

Increased compliance
costs



Impact to the economy

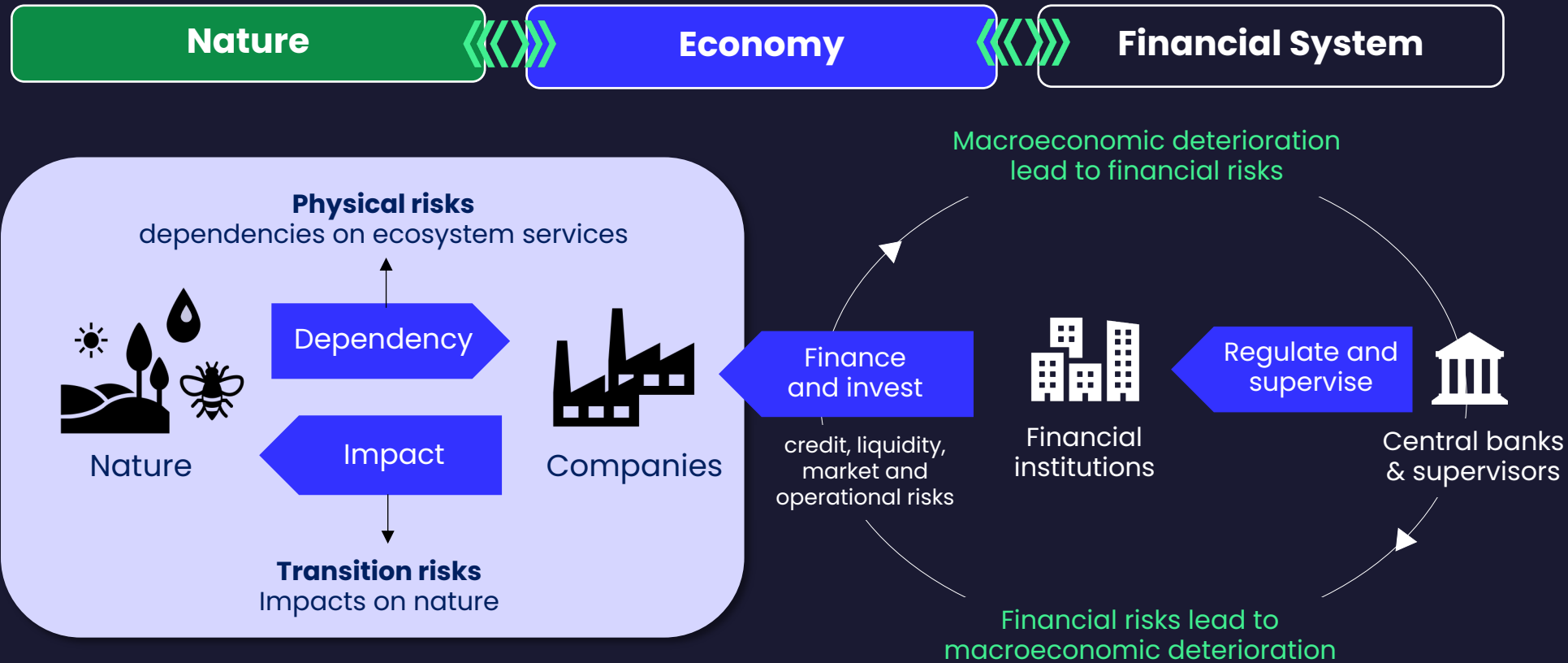


Transmission to the financial system

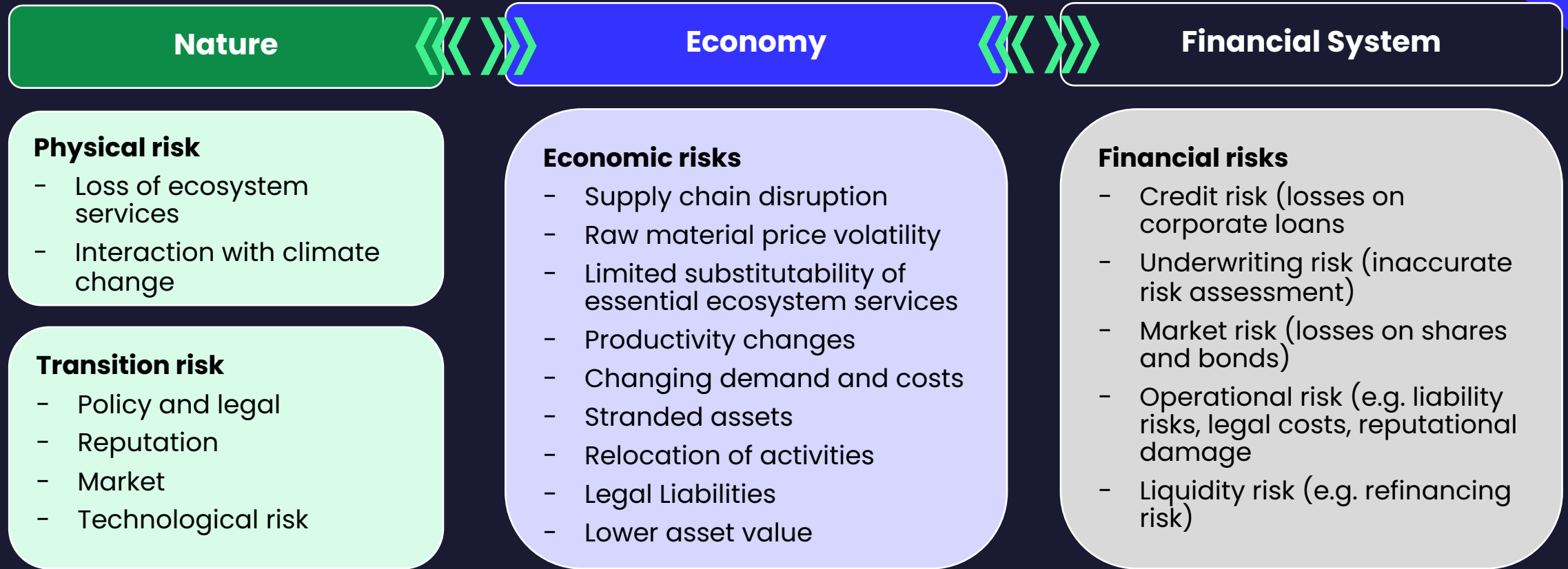
- From nature to economy to finance
- Nature climate nexus



Transmission to the financial sector



Transmission channel in more detail



Transmission to the financial system

- Climate and nature are deeply interconnected

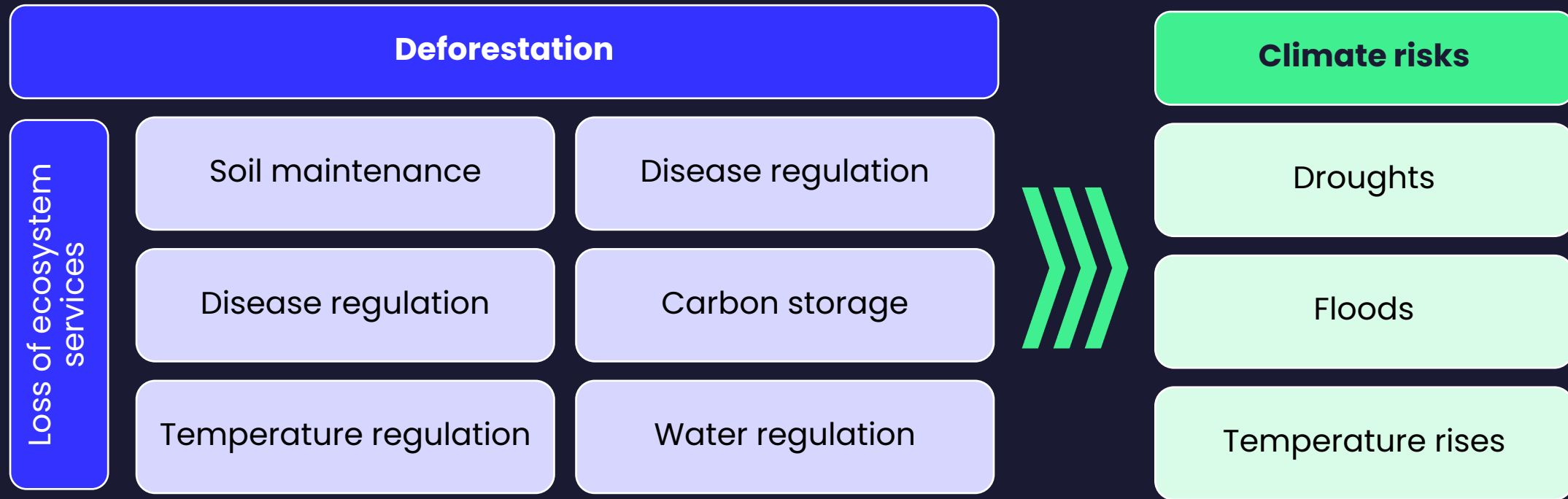
Connection	Example
Climate change drives nature loss	Climate change can cause or worsen flooding, wildfires, ocean heating, invasive species and cyclones which disrupt the water cycle, affect soil health and accelerate habitat and wildlife loss.
Nature loss drives climate change	Deforestation accelerates climate change through the release of long stored carbon into the atmosphere
Climate change mitigation can drive nature loss	Clearing forests/natural ecosystems to mine minerals or install renewable technology
Nature based solutions can mitigate against climate change	Ecosystems like rainforests and mangroves help increase resilience to climate impacts like floods, wildfires, landslides, storm surges

Source: Adapted from NGFS Report on the Nature Conceptual Framework (2023)



Transmission to the financial system

- Nature loss increases the frequency and severity of climate-related risks



Economic pressures on forests

- International demand
- Domestic pursuit for development



International demand

- Growing demand for resources (e.g. food, fuel and consumer products) globally and the dependence of economies on extractive activities are fundamental drivers of deforestation and land-use change. This contributes to deforestation through

Large scale land acquisition

- Foreign land investments account for 76% of all acquired land area in the Global South
- These investments are often aimed at securing access to natural resources or agricultural commodities, such as palm oil, timber, and wood fiber, which are in high demand in both domestic and international markets. t these acquisitions frequently target areas with high forest cover, leading to elevated rates of deforestation.

Embodied deforestation in imported products

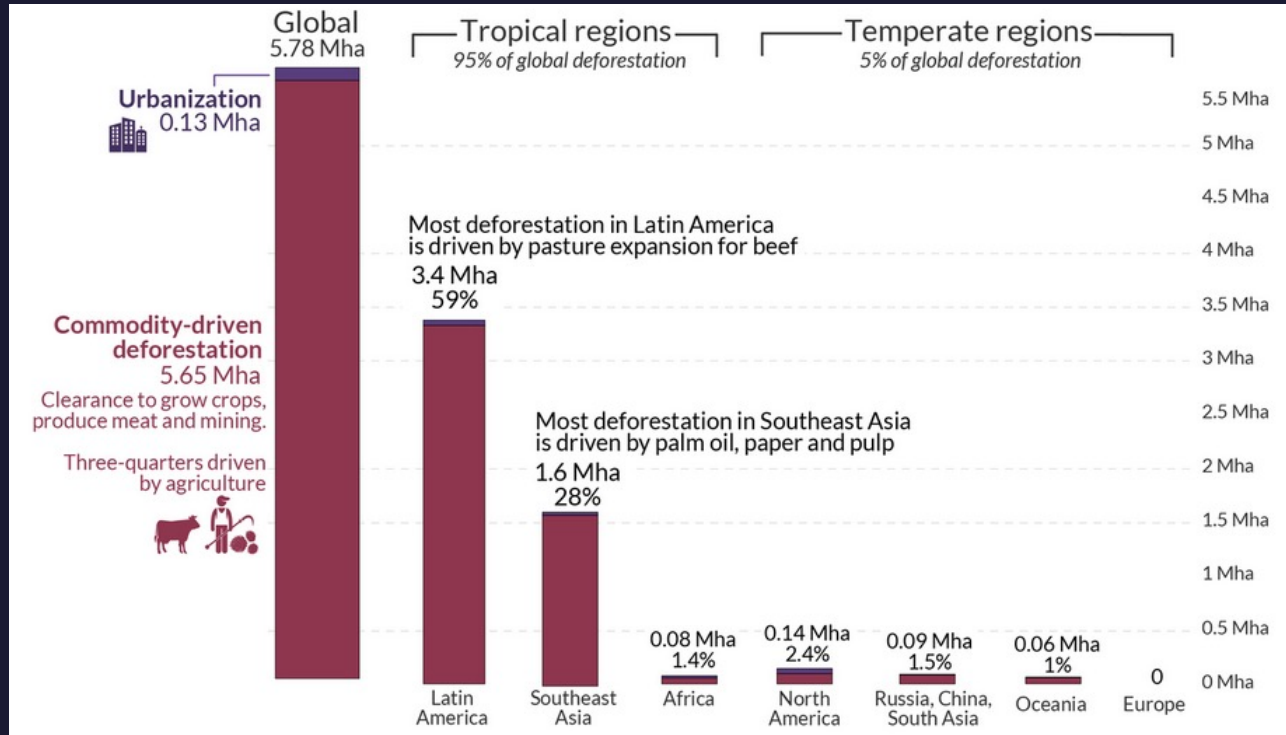
- Many developed countries, despite obtaining net forest gains domestically, have increased the deforestation embodied in their imports,.
- A handful of countries contribute a large part to the import and consumption of embodied deforestation (China, India, Russia, and the US)
- Deforestation is being displaced through international trade.

These methods highlights justice and equity issues in forest loss



International demand

- Nearly all deforestation occurs in the tropics



Source: Ritchie, 2021



Domestic pursuit of development

- Countries with large forest biomes often face difficult choices when balancing the need for economic development and the preservation of their natural resources. This tension is especially pronounced in developing nations, where poverty alleviation and economic progress are pressing priorities.

Agricultural and mining activities

- As populations grow and urbanisation increases, the demand for arable land and food production rises, prompting the conversion of forested areas into farmland or pastures.
- Global demand for commodities often outweigh the perceived benefits of forest conservation, leading governments to prioritise short-term economic gains over long-term environmental sustainability.

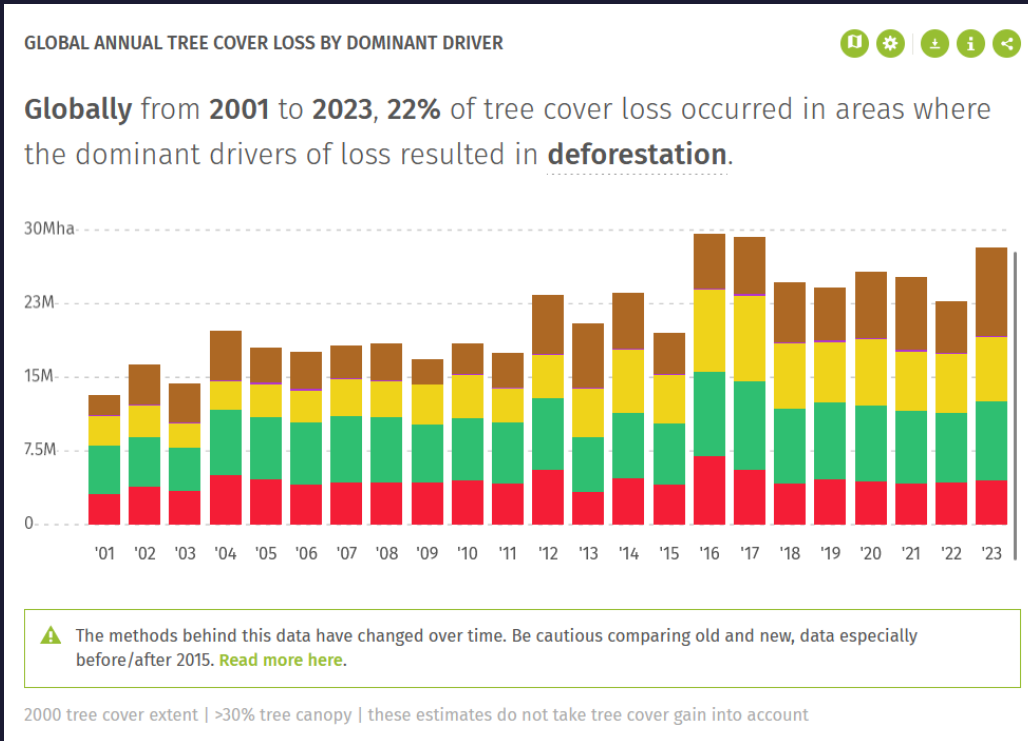
Infrastructure expansion

- Interacting processes incentivises deforestation
- Road building creates easy access to pristine ecosystems, thus exerts significant pressure on forests.
- New transport networks open up previously inaccessible forests to logging activities, illegal settlements, and further deforestation.



Economic pressures driving deforestation

- Deforestation pressures is heavily concentrated in a number of economic activities



2023	
Total	28.2 Mha
Forestry	8.05 Mha
Shifting Agriculture	6.60 Mha
Wildfire	9.00 Mha
Drivers of permanent deforestation:	
Urbanization	123 kha
Commodity Driven Deforestation	4.46 Mha



Governance amplifiers

- An absence of legal mechanisms and reliance on voluntary initiatives
- Trade and supply-chain governance
- Domestic governance



An absence of legal mechanisms

Global Governance of Forests: Challenges and Initiatives

- There is no overarching global convention on forests, unlike for climate change, desertification, and biodiversity.
- Voluntary initiatives such as the New York Declaration on Forests and the Glasgow Declaration on Forests and Land Use aim to halt deforestation but lack enforcement mechanisms

Inconsistencies in defining forest terms

- Definitions and monitoring processes for forests and deforestation vary across countries and international agreements.
- Different definitions and classifications hinder the comparability of forest protection across countries, lead to problematic inclusions such as monoculture plantations being recognised as forests, and affect data collection and monitoring

Voluntary private sector initiatives

- There is growing initiatives to take into account forest conservation (e.g. TNFD)
- Private sector have made financial pledges for forest conservation
- But the effectiveness and scope of these voluntary efforts are still uncertain



Trade and supply-chain governance

Ensuring legality

- Countries have sought to enact policies or legislation that aims to avoid importing products linked to deforestation abroad.
- Key focus is on the issue of legality, with the aim to curb illegal deforestation

- **Problem:** entrenches pre-existing institutional and power structures to control access to and use of resources.

Promoting certification

- Market-led initiatives have emerged to track and verify the source of commodities and determine whether they are produced sustainably
- Key aim is to enhance global transparency for consumers

- **Problem:** costly and inaccessible for smallholders, who may operate sustainably, but would lack certification

Importer's duties (new)

- Recognises both legal and illegal deforestation.
- Aim to guarantee that the products consumed do not contribute to deforestation or forest degradation worldwide
- Too early to assess (only EUDR)

- **Attention to:** issues of 'leakage', that may disadvantage small scale farmers whose livelihoods are dependent on demand from foreign markets

Ultimately, entrenches systems of inequality and injustice



Domestic governance

- The IPCC's 6th Assessment report summarises key factors that contribute to increasing forest loss in tropical regions in the context of environmental law and implementation:
 - Weak forest sector governance and institutions, conflicting policies beyond the forest sector, corruption and illegality;
 - Poor implementation and enforcement of environmental laws owing primarily to a lack of political will;
 - Conflicting legal instruments, lack of clarity in implementation, monitoring and evaluation, poorly defined and fragmented responsibilities across multiple agencies;
 - Lack of sanctions, transparency and accountability;
 - Open-ended decision-making exacerbating political asymmetries

Ultimately, in many developing nations, elite capture, political patronage, lack of political will, transparency, accountability, human rights protections and law enforcement, all amplify deforestation



Challenges of policy making on nature risks and areas for further work

- Nature climate nexus
- Global and local effects



Policy consideration 1: Global coordination

Local and Global Dimensions

- Biodiversity risks have both local and global implications, with local contexts affected by global climate changes.
- in addition to domestic pressures on growth megadiverse countries in the Global South are most vulnerable to forest loss, while wealthier countries contribute to global deforestation through economic influence and consumption demand.

Economic Pressures and International Dynamics:

- Low- and middle-income countries face developmental trade-offs and structural imbalances in the international financial system, leading to environment-damaging activities.
- Wealthier countries contribute to forest loss through consumption but are regulating their impact by imposing stricter supply chain requirements

Need for Locally Adaptive Solutions

- International agreements are necessary to foster bespoke policy solutions, balancing local relevance with global integration.
- Decision makers must find a balance between local actions and global repercussions to effectively address deforestation



Policy consideration 2: Understanding nature's complexity

Nature's interconnectedness

- The biophysical system is extremely complex, requiring integrated policy approaches to account for interconnections between ecosystem services.
- Understanding and valuing these interactions is crucial for managing environmental risk and halting nature loss.

Non-linear processes and uncertainty

- Biophysical processes often behave non-linearly, introducing uncertainty in decision-making.
- Natural equilibria exhibit tipping points, leading to abrupt and irreversible impacts if not addressed

Irreversibility and substitutability

- Natural capital is not substitutable, and its loss can be existential for certain economic activities.
- Policymakers must account for the different levels of substitutability across ecosystem services and economic sectors



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- visit <https://www.lse.ac.uk/cetex> or email e.k.almeida@lse.ac.uk

