

SUSTAINABILITY | BIODIVERSITY | REGENERATIVE FINANCE

Opinion Piece

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From Exploitation to Regeneration

The Role of Regenerative Finance for Biodiversity
Preservation



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Extractive finance: wealth for the few, ruin for the many

Historically, the global financial system has prioritized short-term profit over long-term environmental protection. This means that the functioning of the economy and business activity has been adopting a model of extraction and consumption to the detriment of the environment and the society. At the same time, biodiversity loss has been accelerating at an unprecedented pace while traditional conservation funding is both insufficient and inadequate to reverse this global crisis. The Global Biodiversity Framework has estimated a \$700 billion biodiversity finance gap per annum by 2030. Meanwhile, the 2024 Living Planet Report highlights a 73 percent decline in wildlife populations from 1970 to 2020. Enormous changes in sea and land usage, excessive exploitation of natural resources, increasing global heating, and pollution, together with the spread of invasive species, are being considered the five key drivers of this loss according to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

Renowned sociologist Saskia Sassen argues that the financial sector's operational model can be likened to a mining process, where value extraction continues until sustainability collapses. This extractive approach, much like resource mining, follows a curve of diminishing returns, eventually reaching a point where further extraction becomes either unsustainable or highly destabilizing. However, the consequences of this unchecked financial extraction—such as environmental degradation, wealth concentration, and economic instability—often become evident to public authorities only after substantial damage has been done. By the time regulatory interventions are considered, the financial sector has already reaped significant gains and adapted to shift its focus elsewhere, leaving behind systemic risks and unsustainable economic structures.

This extractive model not only destabilizes economies but also exacerbates environmental crises, as financial incentives often prioritize short-term gains over ecological balance. The 2025 Global Risks Report by the World Economic Forum classifies extreme weather conditions and pollution among the ten global risks ranked by severity over the next two years. This picture is becoming gloomier, with extreme weather events, biodiversity loss, ecosystem collapse, critical change to earth systems, natural resources shortages, and pollution being considered the most critical global risks during the next ten years. Moreover, the interconnected nature of these risks creates a compounding effect where environmental degradation accelerates economic vulnerabilities, further intensifying global instability.

From degen to regen: how regeneration challenges extractive markets

Deforestation of agriculture, overfishing, biodiversity loss, ocean acidification, and damage to the ocean are among the most perilous examples of ecological destruction attributed to extractive economic activity. The World Economic Forum estimates that over half of the world's economic output, approximately \$44 trillion, is moderately or highly dependent on nature and its resources.

Conventional economic systems operate on the premise that value creation comes from extracting more value. This approach has led to excessive resource exploitation and ecosystem degradation for short-term gains, disregarding the importance of living systems and enabling an unfair and uneven distribution of profits. These systems fail to appropriately account for negative externalities, driving exponential yet unsustainable growth that disconnects prosperity from economic and financial health.

Regenerative economics, by contrast, places life at the center of decision-making, distinguishing between circulation and accumulation. Instead of solely capitalizing on resources, it reinvests a portion of value back to the planet and communities. Growth is becoming sustainable, steady, and responsible, ensuring healthy maturation. Unlike conventional economic systems that prioritize capitalism, regenerative economic systems focus equally on people and the planet. By incentivizing the generation and maximization of positive externalities, they actively contribute to regenerating, repairing, and healing ecological systems, fostering a sustainable and thriving environment where human, societal, and environmental health and well-being are inseparable components from economic and financial health.

Regeneration depicts a dynamic interdependence of economic, social, environmental, and ethical factors. The dichotomy between regenerative practices—centered on circularity and restoration—and extractive models of consumption and waste highlights the difference between economies of permanence and economies of depletion. Regeneration ensures that damaged or missing elements within complex systems are replaced or restored while maintaining full functionality in the near and the far future (Schletz et al. 2023). The foundational and critical layer of finance should adopt policies that enhance social and ecological well-being, creating tangible and sustainable value without relying on nor encouraging extractive practices. These systems further progress the restoration of natural habitat and biodiversity since they integrate ecological restoration and sustainability within the core of the financial systems (Fullerton 2015).

The overall development of a regenerative economic system is grounded in restoring and enhancing social, environmental, and economic well-being by using economic systems built on Web 3.0 technology, decentralized finance, and digital tokens.

Regenerative Finance (ReFi): a blueprint for financial systems that work for biodiversity

The early 2000s marked the rise of sustainable and impact investing, laying the groundwork for regenerative finance (ReFi). Regenerative finance encapsulates the evolution of finance from sustainability to regeneration, going beyond ESG investing and traditional sustainability strategies. Unlike models focused on risk management and harm mitigation, ReFi is built on the premise of restoring and replenishing social, economic, and environmental systems. It reimagines finance as a vehicle for systemic healing—regenerating depleted resources, repairing societal and planetary ecosystems, and ensuring equitable value distribution.

Regenerative finance is deeply connected to Decentralized Finance (DeFi) and Web 3.0 technology (particularly blockchain and tokenization) nexus. These innovations foster the birthing of sustainable financial ecosystems that embed regenerative principles (ecological restoration) in decision-making, democratize access to inclusive financial services, and empower positive change (Shih et al. 2023). ReFi supports novel business models that combat climate change, unlock sustainable value, and shape a greener, more prosperous future (Meyer et al. 2024).

A critical parameter worth discussing briefly revolves around the scaling of ReFi beyond niche applications. This can be achieved in a number of ways:

- **Developing novel financial instruments** such as tokenized regenerative assets, green bonds, and impact-linked loans.
- **Implementing regulatory provisions and incentives** like tax benefits and capital relief for regenerative finance ventures, projects, and relevant investments.
- **Forging strategic partnerships** between traditional finance, ReFi ventures, and fintech firms.
- **Integrating regenerative metrics** into existing ESG frameworks and risk assessment models.

Regenerative finance will reach its full potential only when it becomes a core financial principle driven by strong institutional adoption rather than a theoretical concept by visionary entrepreneurs.

Regenerative finance also intersects with disruptive technologies, economic shifts, and geopolitics. Let us not forget that the 2023 CEO Excellence Survey by McKinsey identifies the rise of disruptive digital technologies, the risk of prolonged high inflation and economic downturn, and the escalation of geopolitical risks as top important concerns for business leaders. Moreover, climate change, business model, and operations reinvention, along with the transition to a low-carbon economy via climate-friendly investments, remain among the key priorities for CEOs in 2025 based on the 28th Annual Global CEO Survey by PwC. In this context, the multi-modality of regenerative finance calls for a multidisciplinary approach, affecting numerous facets of economic, societal, environmental, technological, and geopolitical activity.

The value proposition behind regenerative finance is branched across the following six elements:

- Generating and rewarding positive externalities by regenerating natural and social capital to benefit the global public good.
- Harnessing Web 3.0, blockchain technologies, tokenization, and decentralized finance to develop inclusive and regenerative economic systems. These systems are primarily deployed, structured, and governed as Decentralized Autonomous Organizations (DAOs) with net-positive, sustainable, and regenerative impact.
- Developing novel financial tools and leveraging token economics to create services that support an inclusive and regenerative economy.

- Prioritizing democratization and inclusion to ensure distributed, sustainable, and equitable prosperity.
- Utilizing impact tokens aligned with UN SDGs. These tokens can be programmed to represent measurable impacts—such as vaccinations, carbon reductions, or education access—offering a new way to facilitate relational and transactional engagements through tokenization.
- Providing verifiable proof of specific impact. Positive outcomes must be directly attributed to specific activities or investments, ensuring transparency, accountability, and responsible financial decisions. Technology and data-driven applications enable real-time verifiable tracking of performance across the value chain through quantitative and qualitative metrics.

Regenerative finance in action: key traits and game-changing models

Regenerative finance systems are designed for global accessibility, financial inclusion, censorship-free participation, and cross-border coordination. They automate positive actions, embedding desired behavior into ecosystem structures to promote environmental and humanitarian protection while ensuring healthy economic growth. These systems are also highly adaptable, responding to changing and volatile market conditions with flexibility. By removing traditional barriers, ReFi eliminates friction and streamlines transactions. Its technology stack enables seamless, programmable interactions, resulting in greater fluidity, efficiency, and effectiveness.

According to the [2024 State of ReFi Report](#), at least 500 ReFi solutions were active in 2024, signaling strong momentum in the sector. Similarly, the [Coinchange 2023 Institutional DeFi Report](#) highlights how, in 2022, the digital Voluntary Carbon Market (VCM) took shape, with tokenized carbon credits enabling new Web 3.0 applications—such as using them as collateral in DeFi debt markets. That same year, ReFi projects collectively secured approximately \$120 to \$160 million in funding.

Climate finance investments have surged to \$630 billion annually, up from an average of \$480 billion between 2011 and 2022 (Chainlink 2023). Major financial institutions have made substantial commitments: JPMorgan has pledged \$2.5 trillion while Barclays, HSBC, and Citigroup have each committed \$1 trillion toward sustainable initiatives. Additionally, Project Genesis 2.0, a collaboration between the Bank for International Settlements, the Hong Kong Monetary Authority, and the UN Climate Change Global Innovation

Hub, builds on the success of its first phase by further advancing the tokenization of retail green bonds. As governments, financial institutions, and businesses intensify efforts to achieve net-zero targets, ReFi's potential becomes even more pronounced. ReFi is poised to transform the expansion of microfinance, climate adaptation finance, and retail impact investing, eventually unlocking trillions of sustainable funding opportunities.

Within the regenerative finance ecosystem, several innovative projects focus on climate change and biodiversity:

- Solid World DAO enhances climate financing and liquidity for Voluntary Carbon Markets (VCM). It recently launched the first Carbon Risk Identification and Scoring Principles carbon liquidity pool on Polygon, democratizing access to project financing and scaling global carbon removal efforts. As a community-driven protocol, it leverages crowdsourcing and digital climate capabilities to create a new class of "liquidity providers."
- Regen Network is the world's first public ecological ledger, integrating blockchain technology with ecological stewardship. The Regen Ledger, a public proof-of-stake blockchain network, tracks ecological data and assets. Projects focusing on ecological regenerations utilize Regen Registry's innovative community-governed carbon and ecological credit standard, aiming to create a measurable global climate impact.
- CarbonPath develops a new type of carbon credit by proactively and permanently closing oil and gas wells. These efforts result in accessible, transparent, and verified tokens built on the Celo Blockchain.
- Preservaland focuses on global nature conservation, leveraging innovative financial solutions to promote sustainable land use, environmental restoration, and preservation.

Decentralized for good: how impact DAOs and impact tokens redefine change

One of the most innovative developments enabled by blockchain and tokenization is the rise of Impact DAOs—Decentralized Autonomous Organizations designed to create a net-positive, sustainable, and regenerative impact. These Impact DAOs generate positive externalities within their ecosystems and utilize impact tokens, which are tailored to specific areas such as education, poverty alleviation, health, biodiversity, etc. Impact tokens enhance trust among relevant stakeholders, promote financial and social inclusion, incentivize sustainable behaviors, and improve data collection, monitoring, and verification processes.

The DAO and DeFi protocol KlimaDAO, established in August 2021, exemplifies how blockchain can drive climate action. By creating a blockchain-enabled climate market, KlimaDAO uses its KLIMA token as a floating algorithmic reserve currency backed by carbon offsets. The token relies on algorithmic mechanisms to regulate supply and demand and is designed to maintain stability and value without direct fiat backing. Each KLIMA token represents at least one carbon tonne in the KlimaDAO treasury. This open climate finance protocol incentivizes high-impact carbon reduction projects by tokenizing carbon credits, ensuring transparency, efficiency, reliability, and accountability in the voluntary carbon market using its Carbonmark API smart contract (Ballesteros-Rodríguez et al. 2024). KlimaDAO's innovation lies in accelerating the price appreciation of carbon assets to drive climate action.

The KLIMA token serves numerous purposes:

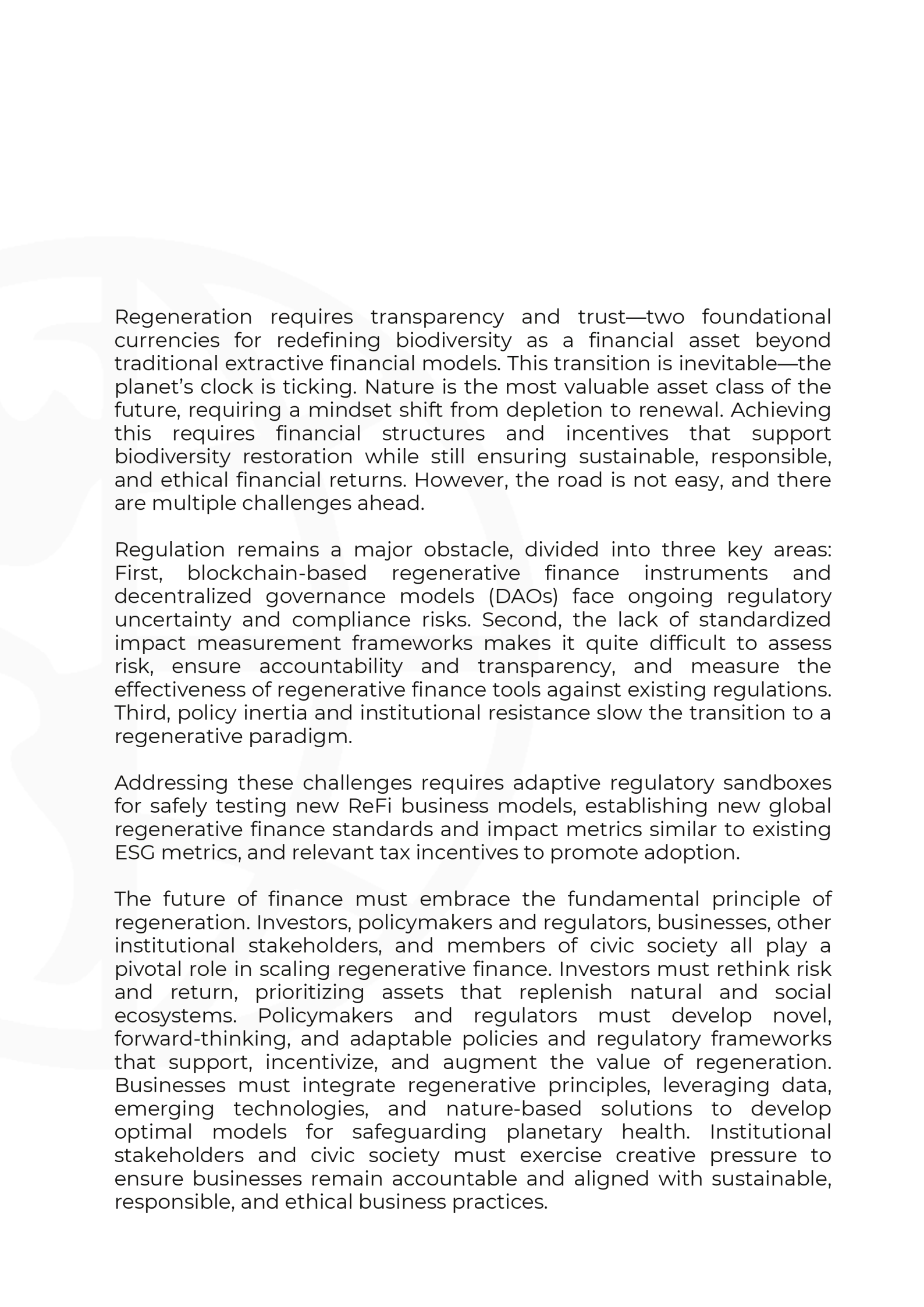
- a. Providing liquidity for on-chain markets and facilitating digital carbon transactions.
- b. Enabling staking and hedging strategies.
- c. Acquiring digital carbon reserve assets and liquidity for the treasury (open-source software).
- d. Allowing holders to participate in the governance and decision-making processes of KlimaDAO.

Currently, approximately 20,393,479 carbon credits are available via KlimaDAO.

The road ahead: a paradigm shift in the finance and ecology nexus

The future of business and finance is undergoing a fundamental transformation, gradually shifting toward stakeholder-driven and regenerative capitalism, prioritizing transparency and accountability for social and environmental impact. The future of biodiversity is driven by the growing recognition that our society and our economy should not only generate profit through extractive value-creation practices but also actively and meaningfully contribute to the planet's well-being and preservation.

Technological advancements, particularly blockchain, enable the creation of financial tools and mechanisms that reduce heavy environmental footprints while incentivizing the regeneration of our planetary and biodiversity ecosystem. At the core of this transformation is the "data revolution," which unlocks innovative business models and impact-driven value propositions focused on long-term regeneration and sustainability. Blockchain's decentralized nature connects stakeholders, fostering transparency, traceability, efficiency, and beneficial relationships and actions.

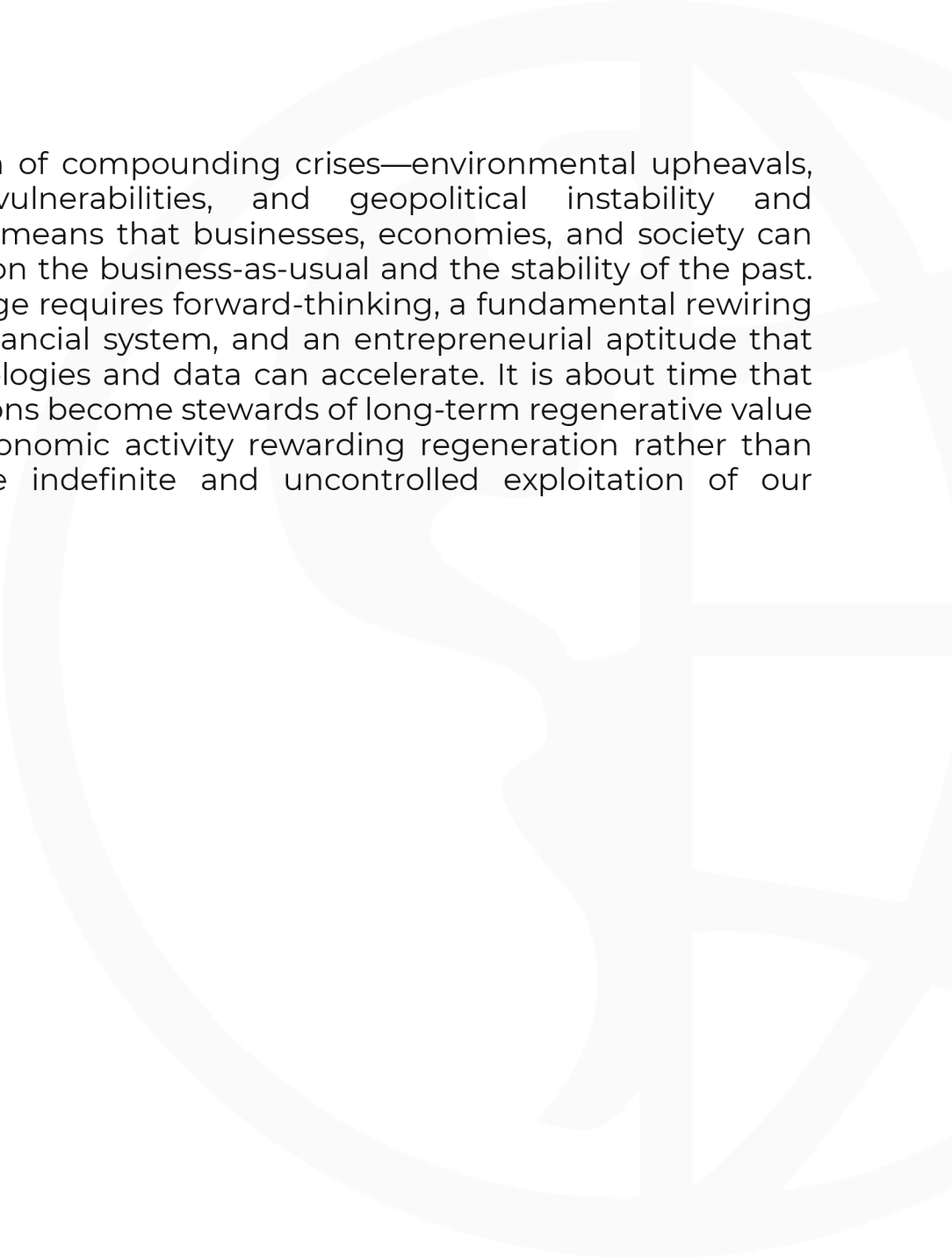


Regeneration requires transparency and trust—two foundational currencies for redefining biodiversity as a financial asset beyond traditional extractive financial models. This transition is inevitable—the planet’s clock is ticking. Nature is the most valuable asset class of the future, requiring a mindset shift from depletion to renewal. Achieving this requires financial structures and incentives that support biodiversity restoration while still ensuring sustainable, responsible, and ethical financial returns. However, the road is not easy, and there are multiple challenges ahead.

Regulation remains a major obstacle, divided into three key areas: First, blockchain-based regenerative finance instruments and decentralized governance models (DAOs) face ongoing regulatory uncertainty and compliance risks. Second, the lack of standardized impact measurement frameworks makes it quite difficult to assess risk, ensure accountability and transparency, and measure the effectiveness of regenerative finance tools against existing regulations. Third, policy inertia and institutional resistance slow the transition to a regenerative paradigm.

Addressing these challenges requires adaptive regulatory sandboxes for safely testing new ReFi business models, establishing new global regenerative finance standards and impact metrics similar to existing ESG metrics, and relevant tax incentives to promote adoption.

The future of finance must embrace the fundamental principle of regeneration. Investors, policymakers and regulators, businesses, other institutional stakeholders, and members of civic society all play a pivotal role in scaling regenerative finance. Investors must rethink risk and return, prioritizing assets that replenish natural and social ecosystems. Policymakers and regulators must develop novel, forward-thinking, and adaptable policies and regulatory frameworks that support, incentivize, and augment the value of regeneration. Businesses must integrate regenerative principles, leveraging data, emerging technologies, and nature-based solutions to develop optimal models for safeguarding planetary health. Institutional stakeholders and civic society must exercise creative pressure to ensure businesses remain accountable and aligned with sustainable, responsible, and ethical business practices.



We live in an era of compounding crises—environmental upheavals, supply chain vulnerabilities, and geopolitical instability and uncertainty. This means that businesses, economies, and society can no longer count on the business-as-usual and the stability of the past. Meaningful change requires forward-thinking, a fundamental rewiring of the current financial system, and an entrepreneurial aptitude that emerging technologies and data can accelerate. It is about time that financial institutions become stewards of long-term regenerative value creation, with economic activity rewarding regeneration rather than perpetuating the indefinite and uncontrolled exploitation of our planet.

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