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OPINION

Regenerative Development Goals should shape the post-2030 sustainability agenda

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Introduction

The global post-2030 sustainability agenda requires fundamental changes, because progress towards sustainability has been unsatisfactory in many key dimensions. Biophysically, humanity continues to transgress more and more planetary boundaries [1], while socially, key indicators show only slow improvements or even deterioration [2]. The science is clear: a continuation of existing trends would put the health of the planet and its people at risk [3].

The primary vehicle to agree on a set of universal goals to meet global environmental, political, and economic challenges is the United Nations Conferences on Sustainable Development. From 2000 to 2015, the *Millennium Development Goals* (MDGs) articulated global objectives for reducing poverty and hunger. During that period, over one billion people were lifted out of extreme poverty. However, a stark focus on economic growth also led to an unprecedented exploitation of natural resources [4]. For the period of 2015–2030, a more comprehensive set of 17 *Sustainable Development Goals* (SDGs) relevant for all nations was adopted. While there has been progress on some goals (e.g., SDG 7, 9 and 17), both global inequality and biophysical degradation have seen further increases [2]. Analyses suggest that both the MDGs and the SDGs were incompatible with meeting the scale and complexity of interrelated sustainability challenges and were unable to mobilize the necessary investments, despite the centrality of economic growth as a primary driver of change (Fig 1) [5,6]. Even with the intention of encouraging a holistic and connected approach, the seventeen goals are often cherry-picked and siloed in their implementation. The SDG era, with its failure to effectively address the globally intertwined dynamics of social-ecological system change and highly unequal social structures, thus will leave the world in a state that still falls far short of essential social and biophysical targets [7].

Here, we propose a fundamental shift in how sustainability is conceptualized and implemented by introducing a new sustainability orientation, the *Regenerative Development Goals* (RDGs). RDGs focus on the imperative to not only stop further environmental and social deterioration, but to actively restore and regenerate planetary and social systems. Our approach is grounded in regenerative systems thinking,

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which recognizes that today's sustainability challenges (e.g., global equity, climate change, biodiversity loss) are deeply interconnected [8]. Instead of addressing these complex challenges in isolation, sustainability efforts must adopt a holistic perspective to break through current spirals of degeneration and offer a hopeful vision for a future characterized by thriving rather than just growing [9,10].

Toward Regenerative Development Goals

Regenerative systems thinking points to three paradigmatic changes to the SDGs for the post-2030 sustainability agenda. These can be summarized under the umbrella concept of *Regenerative Development Goals* (RDGs) [10]. Each can be zoomed into for guidance on how to formulate specific objectives for the post-2030 sustainability agenda.

First, RDGs should span multiple domains in need of becoming *regenerative*. A regenerative system is one that has an **innate capacity to self-renew**, as long as it is managed well. Examples of regenerative systems abound, and interest in regeneration is rising across stakeholder groups (e.g., civil society, business, and politics) and academic disciplines (e.g., agriculture, education, and economics) [11]. Agriculture can be regenerative where it replenishes soils and restores biodiversity. Human health can be improved by systematically fostering the regenerative capacity of both body and mind, through a combination of rest, mental exercise (e.g., meditation), physical exercise (e.g., strength, flexibility and endurance training), and a healthy diet [12]. Education, too, can be regenerative if it fosters a relational understanding of the world that views nature as an agent, deserving to be treated with justice and care.

Second, RDGs will need to foster *development* that **promotes thriving**, denoting growth in qualitative terms rather than as a narrow, quantitative measure. For example, economically, a humanity that is thriving will be characterized by low inequality and a strong focus on quality of life rather than on the quantity of economic transactions. Development, in this context, refers to striving for a world in which both individuals and communities are free to exert agency in order to shape how they best function within a bigger context [13]. Notably, the thriving of all beings must be seen as interconnected, supporting others' capabilities without limiting others' freedom to thrive.

Finally, and perhaps most significantly, the definition of *goals* must change within the context of RDGs. Regeneration describes an **ongoing process**, consisting of interventions that turn degenerative dynamics into regenerative dynamics. Regenerative goal setting should therefore focus both on dismantling feedback loops that cause degeneration and on supporting feedback loops that lead to regeneration, which includes the enabling conditions that foster thriving within and across the domains being targeted. RDGs thus are less about achieving fixed, absolute quantities and more about ensuring that the underlying systems move towards healthy dynamics. Once such regenerative dynamics are in place across multiple domains, it becomes meaningful to set more outcome-oriented targets with specific time horizons. In the first instance, however, the priority must be to transition from degenerative system dynamics to regenerative, just and life-supporting ones.

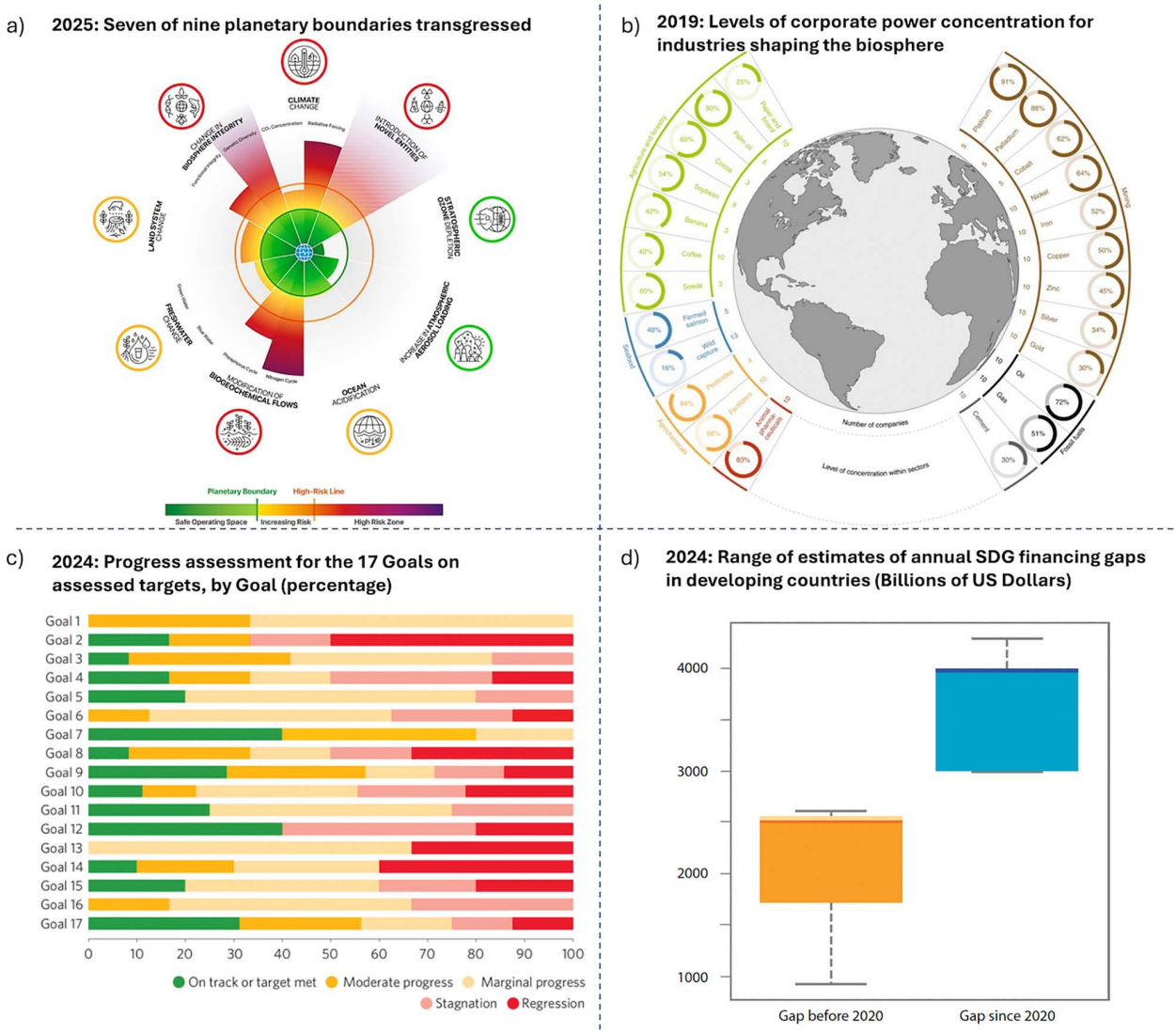

Fig 1. Core sustainability challenges to be addressed by the post-2030 sustainability agenda. The figure shows the alarming state of the Earth system, with seven out of nine planetary boundaries transgressed **(A)**, and the global influence of a handful of transnational corporations dominating key sectors that influence intertwined systems of people and nature **(B)**. Under the current SDG framework, progress towards the 17 social and environmental goals has been greatly inadequate **(C)**, as the global funding gap for SDGs, estimated at 2.5-4.0 trillion USD per year, is increasing, particularly in developing countries **(D)** [1,2,4,5] (Image sources: Planetary Health Check 2025 **(A)**; Nature Ecology & Evolution **(B)**; United Nations publications **(C&D)**).

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Enabling RDG processes via regenerative pathways

Operationalizing RDGs will mean enabling communities, government and private actors to jointly identify and move onto pathways of positive, self-reinforcing dynamics, i.e., 'upward spirals' [14] that benefit both people and nature. Adopting a pathways approach for RDG implementation emphasizes regenerative systems thinking and the directionality of change in numerous, interrelated parameters, instead of targeting isolated and fixed outcome measures. Opportunities for regenerative pathways exist for numerous sectors, actors, and scales, including in instances typically thought of as degenerative—such as agriculture, chemistry, companies, and economies.

Industrial agriculture degrades soils and reduces biodiversity. Regenerative agriculture, in contrast, is a rapidly emerging alternative that can foster healthy dynamics in multiple, interrelated domains. For example, the Commonland Foundation has worked in landscapes around the world to foster regenerative development pathways that benefit both people and nature. Through a holistic focus on the dynamics in multiple interrelated domains, simultaneous and interrelated benefits have been observed in social, economic, and natural returns in previously degraded agricultural landscapes [15].

Conventional chemistry, too, is often degenerative. Regenerative chemistry, in contrast, focuses on building up continuously self-renewing systems, including the use of appropriate raw materials as renewable and finite resources and energy, and assessments of product degradability with a focus on circularity to promote healthier dynamics for both people and the environment. For example, using biorefinery approaches, valuable chemicals can be extracted and manufactured from non-edible agro-industrial residues (e.g., citrus peel), such as bioactive compounds. By complexing some of these bioactive compounds with essential metals, green bio-based pesticides can be obtained, fostering symbiotic food production cycles and regenerative patterns [11].

Businesses, too, can set themselves on a regenerative pathway by adopting inclusive workplace designs and practices. By offering decent work, fair pay, and supportive social relations, businesses can directly support the reintegration of stigmatized and marginalized people back into society. For example, in inclusive workplaces, work tasks are crafted according to people's capabilities, instead of hiring employees to fulfill predefined functions. Businesses with inclusive workplace cultures replace classical efficiency and performance measures and thrive because of the diversity among their workforces. Successful examples include Greyston Bakery (US), Heyho (Germany) and La Fageda (Spain).

Beyond individual sectors and actors, entire economies can become at least partly regenerative, by seeking to minimize waste and maximize the reuse of resources within the economy, while investing in the regeneration of natural and human capital. While non-renewable resources are inevitably degraded as they flow through the economy, the stocks of knowledge, social and natural capital can be increased via purposeful investments. For example, direct trade models for valuable commodities such as coffee or cocoa seek to replace exploitative economic practices (premised on power asymmetries between the Global North and Global South), with practices that actively seek to build relations premised on transparency, trust and knowledge sharing between producers and consumers [16]. A primary focus of direct trade is building social capital within the economy across the entire supply chain. Crucially, unlike traditional trade relations, this investment in social capital means that all economic actors take shared responsibility for sustainable management of both those relationships and the natural resources on which that economic activity is ultimately dependent [17].

In need of a roadmap for RDG implementation

As a next step, we see a need to identify concrete cross-sectoral regenerative dynamics that can serve to develop roadmaps for the post-2030 sustainability policy agenda at national, regional and local levels. As our examples illustrate, regenerative development is possible, but fundamentally relies upon replacing degenerative dynamics with regenerative dynamics that integrate natural and social domains. This represents a paradigmatic shift for the post-2030 sustainability agenda. The SDGs were ratified based on the assumption that breaking complex sustainability challenges into a set of 17 sustainability goals and 169 targets would help offer prosperity and development for all. The post-2030 sustainability agenda may comprise similar and additional domains as those captured by the MDGs or SDGs. However, in the future, pathways need to be identified to instigate regenerative dynamics that span multiple domains – this will be vital within an ever more hyper-connected context of social-ecological complexity. As we face, understand, avoid, and mitigate the global polycrisis, the inevitable interactions across domains and across scales can become the cornerstone of a global 'poly-opportunity' [9].

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References

1. Planetary Boundaries Science (PBScience). Planetary health check 2025. Potsdam, Germany: Potsdam Institute for Climate Impact Research (PIK); 2025.
2. United Nations. The Sustainable Development Goals Report 2024. New York: United Nations Department of Economic and Social Affairs; 2024.
3. Gupta J, Bai X, Liverman DM, Rockström J, Qin D, Stewart-Koster B, et al. A just world on a safe planet: a Lancet Planetary Health-Earth Commission report on Earth-system boundaries, translations, and transformations. Lancet Planet Health. 2024;8(10):e813–73. https://doi.org/10.1016/S2542-5196(24)00042-1 PMID: 39276783
4. Folke C, Österblom H, Jouffray J-B, Lambin EF, Adger WN, Scheffer M, et al. Transnational corporations and the challenge of biosphere stewardship. Nat Ecol Evol. 2019;3(10):1396–403. https://doi.org/10.1038/s41559-019-0978-z PMID: 31527729
5. United Nations. Financing for Sustainable Development Report 2024: Financing for Development at a Crossroads. New York: United Nations Department of Economic and Social Affairs; 2024.
6. Fuso Nerini F, Mazzucato M, Rockström J, van Asselt H, Hall JW, Matos S, et al. Extending the sustainable development goals to 2050 - a road map. Nature. 2024;630(8017):555–8. https://doi.org/10.1038/d41586-024-01754-6 PMID: 38886551
7. Reyers B, Bennett EM. Whose conservation, revisited: how a focus on people-nature relationships spotlights new directions for conservation science. Philos Trans R Soc Lond B Biol Sci. 2025;380(1917):20230320. https://doi.org/10.1098/rstb.2023.0320 PMID: 39780592
8. Søgaard Jørgensen P, Jansen REV, Avila Ortega DI, Wang-Erlandsson L, Donges JF, Österblom H, et al. Evolution of the polycrisis: anthropocene traps that challenge global sustainability. Philos Trans R Soc Lond B Biol Sci. 2024;379(1893):20220261. https://doi.org/10.1098/rstb.2022.0261 PMID: 37952617
9. Fischer J, Farny S, Pacheco-Romero M, Folke C. Resilience and regeneration for a world in crisis. Ambio. 2026;55(1):24–34. https://doi.org/10.1007/s13280-025-02287-6 PMID: 41291163
10. Gibbons LV. Regenerative—the new sustainable? Sustainability. 2020;12:5483.
11. Fischer J, et al. Mainstreaming regenerative dynamics for sustainability. Nat Sustain. 2024;7:964–72.
12. Tang SKY, Marshall WF. Self-repairing cells: How single cells heal membrane ruptures and restore lost structures. Science. 2017;356:1022–5. https://doi.org/10.1126/science.aam6496
13. Sen A. Development as Freedom. Oxford University Press, New York, 1999.
14. Isaac R, et al. Can holistic landscape restoration drive regenerative social-ecological change? – A preliminary assessment of landscapes in Spain and Australia. Ambio.
15. Zuin VG. Circularity in green chemical products, processes and services: Innovative routes based on integrated eco-design and solution systems. Curr Opin Green Sustain Chem. 2016;2:40–4. https://doi.org/10.1016/j.cogsc.2016.09.008
16. Guimarães ER, Dos Santos AC, Leme PHMV, Azevedo ADS. Direct trade in the specialty coffee market: contributions, limitations and new lines of research. Internext. 2020;15:34–62. https://doi.org/10.18568/internext.v15i3.588
17. Ferreira J. Creating ethical choices for coffee consumption from farm to cup and beyond. In: Carrigan M, Wells V, Papadas K, editors. Research handbook on ethical consumption. Edward Elgar Publishing; 2023. pp. 91–106. https://doi.org/10.4337/9781802202021.00012