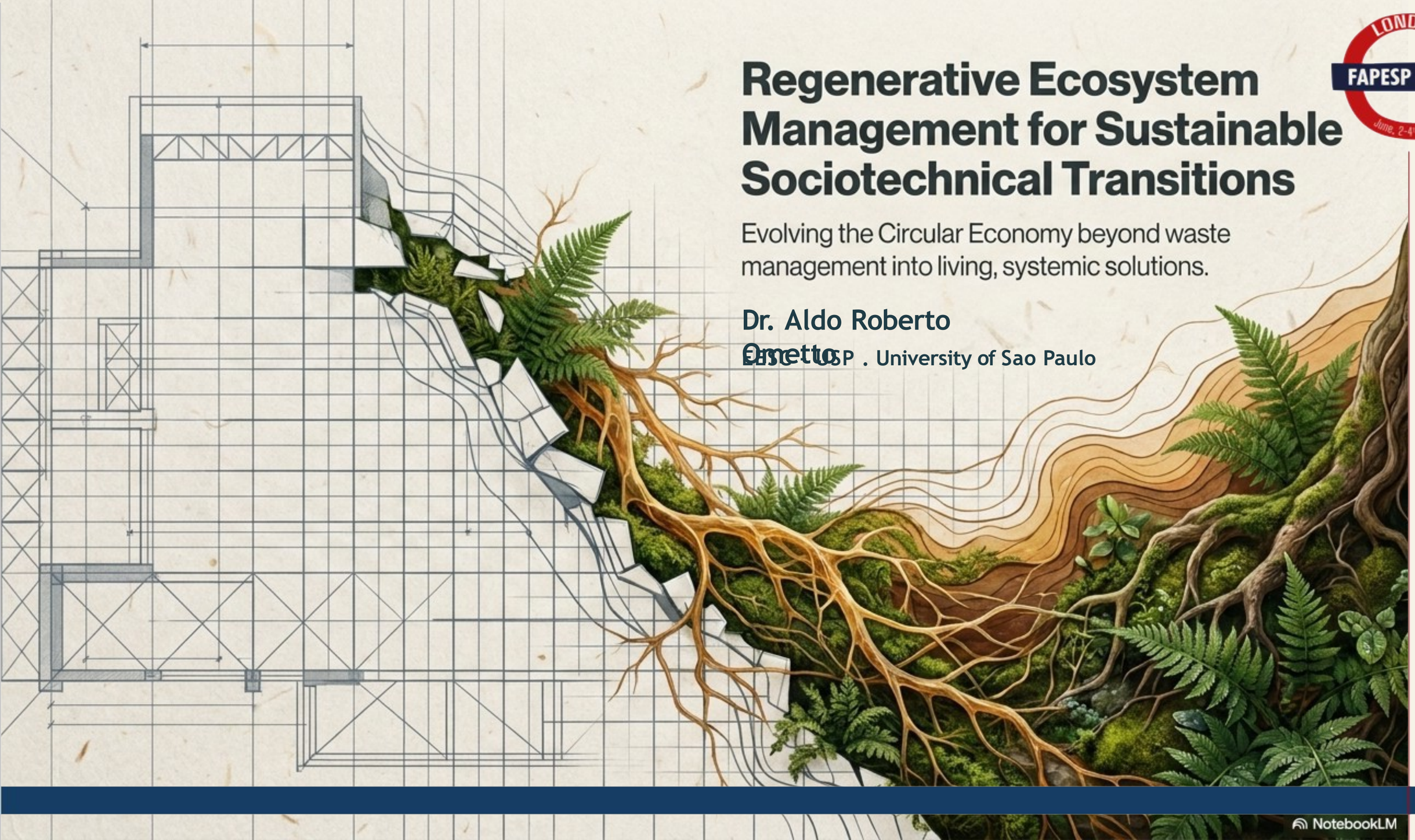
Regenerative Ecosystem Management for Sustainable Sociotechnical Transitions

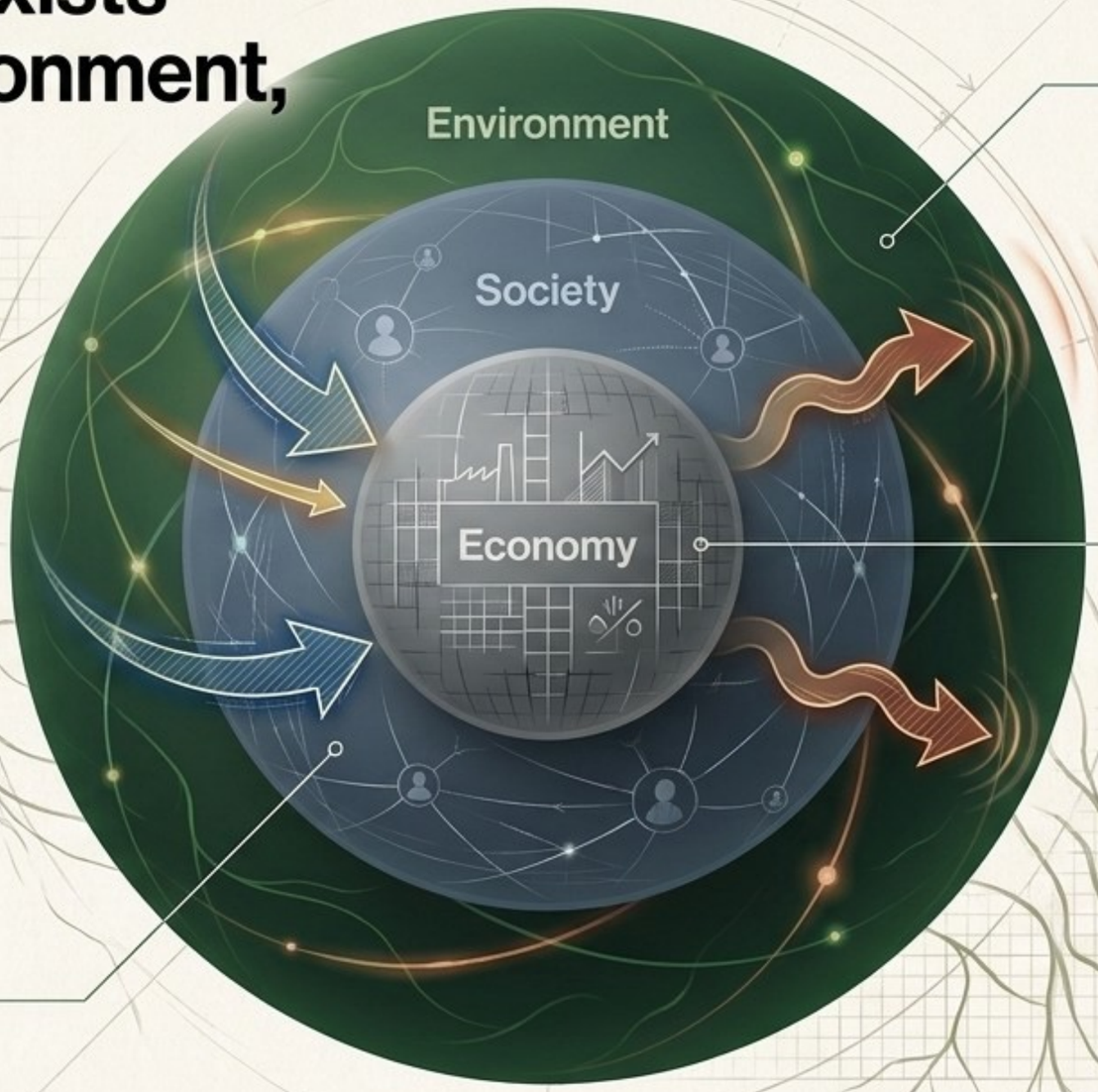
Evolving the Circular Economy beyond waste management into living, systemic solutions.

Dr. Aldo Roberto Ometto
EESC-USP . University of Sao Paulo



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The Economy Exists Inside the Environment, Not Beside It



The environment is the medium for the conservation and maintenance of planetary life.

The Circular Economy is not an end in itself; it is a means for Sustainability.

The economy is fundamentally a social science, entirely reliant on a stable society and environment.

(Velenturf & Pummel, 2021)

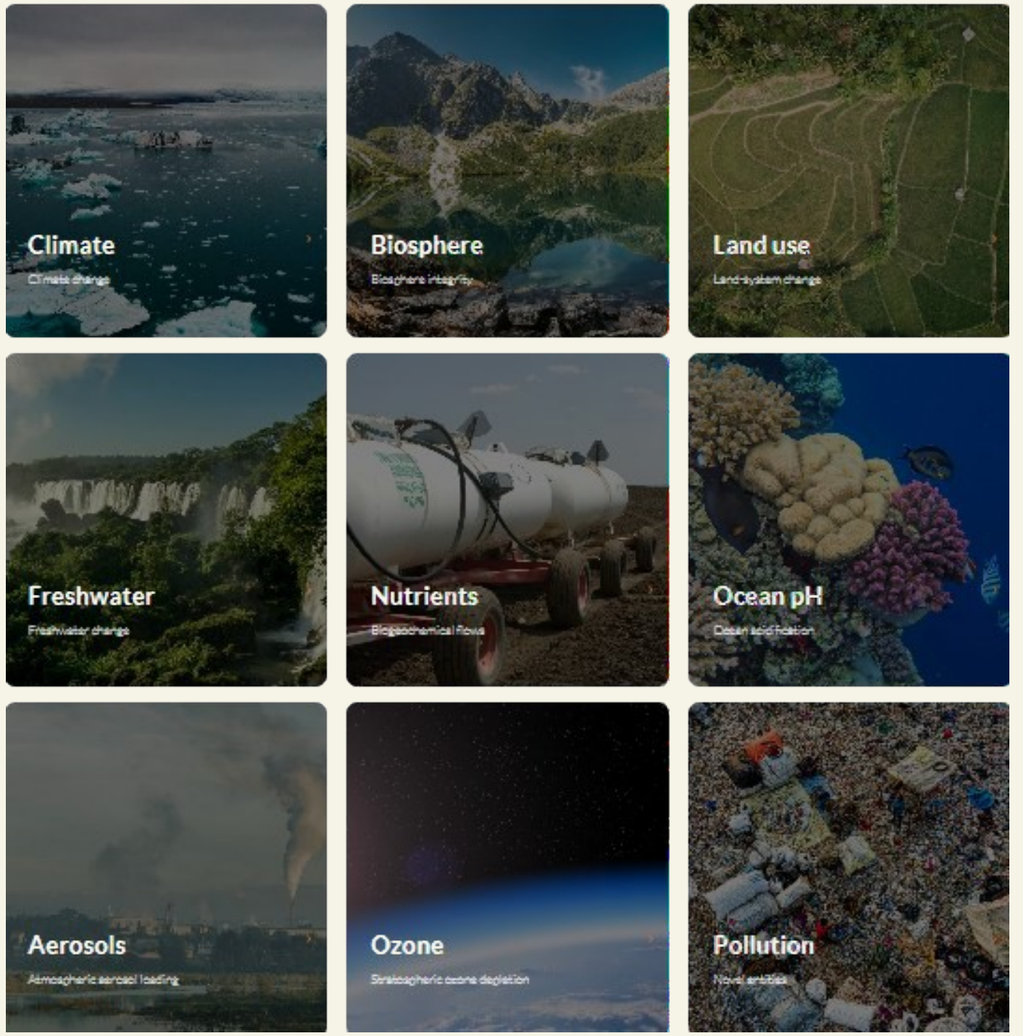
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Planetary Boundaries

The safe operating space for humanity

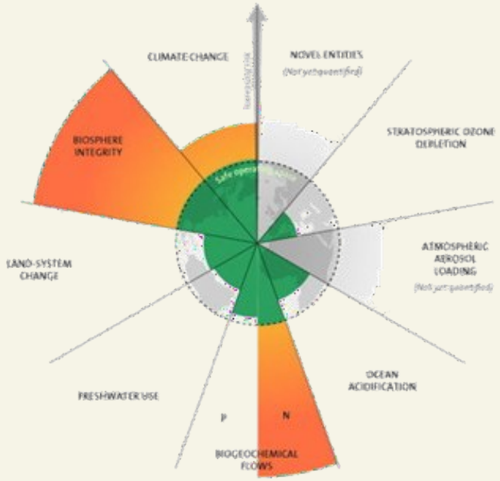
The nine planetary boundaries



https://www.stockholmresilience.org/research/planetary-boundaries.html

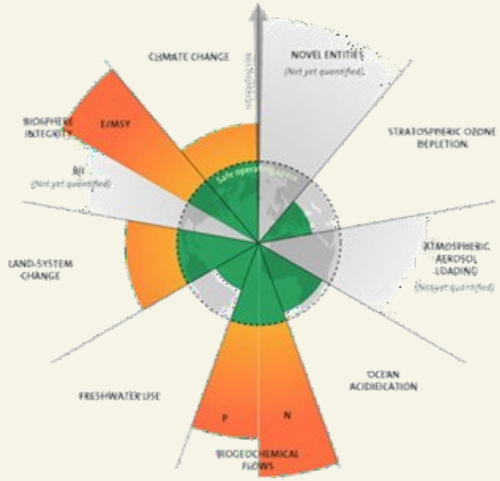
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2009



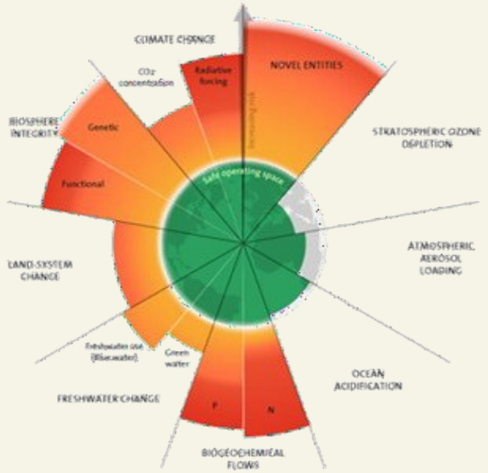
7 boundaries assessed,
3 crossed

2015



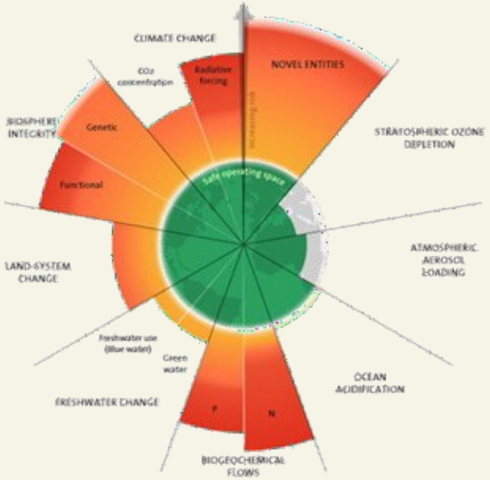
7 boundaries assessed,
4 crossed

2023



9 boundaries assessed,
6 crossed

2025



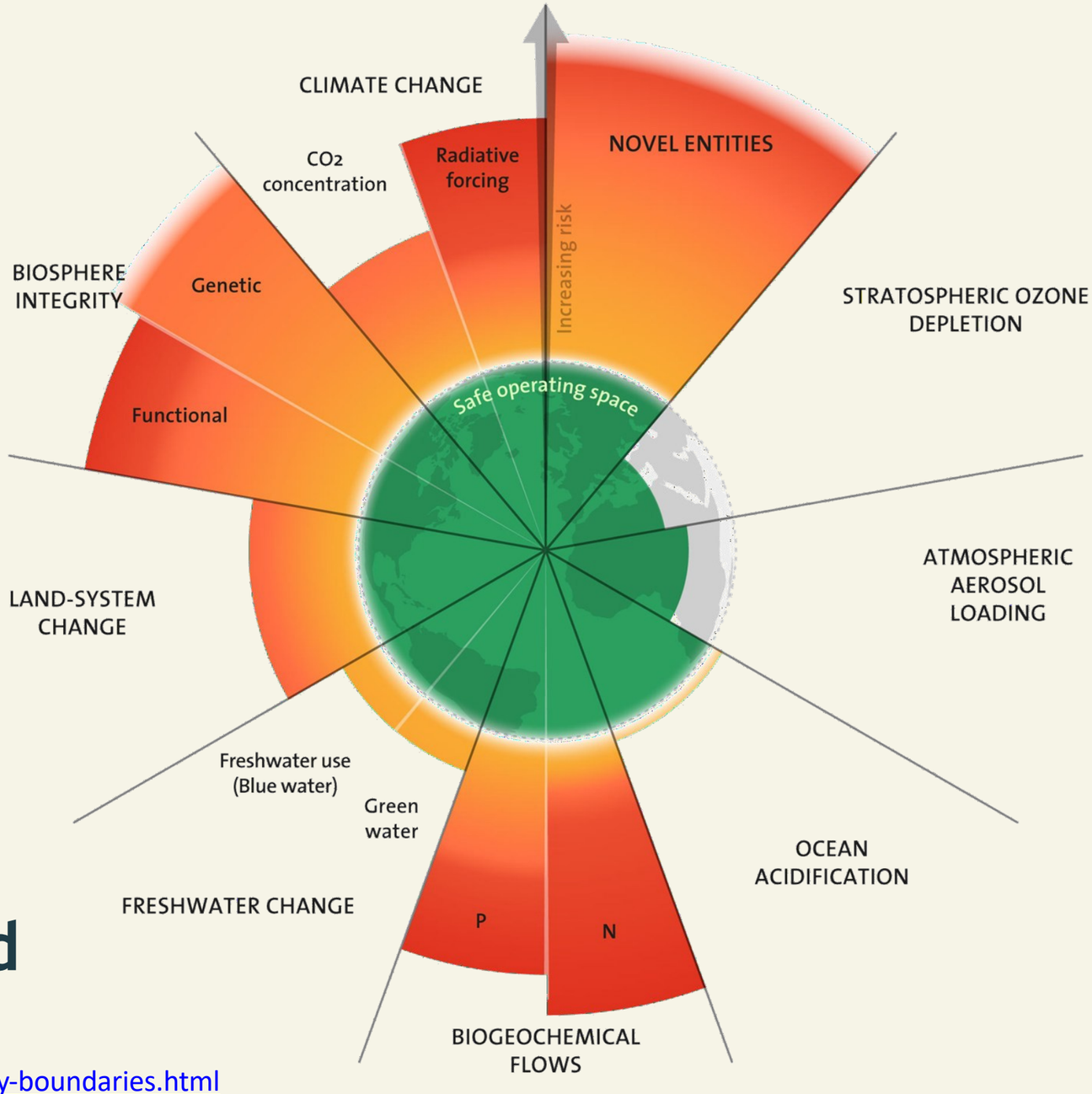
9 boundaries assessed,
7 crossed

https://www.stockholmresilience.org/research/planetary-boundaries.html

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202

5 boundaries assessed
7 crossed



https://www.stockholmresilience.org/research/planetary-boundaries.html

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The Essence of Circular Economy: a pathway to sustainability

Core Principle: Generating value without depending on the extraction of new natural resources, creating long-term positive systemic effectiveness.

Diversity + Efficiency = Resilience

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Crossing the baseline from restorative to regenerative

LONDON FAPESP WEEK June, 2-4th 2026

1 CONVENTIONAL

Staying within the law

Externalises all/most environmental/social topics which are not regulated. Operates according to the linear economy principles

2 GREEN

Less bad impact

Focus on quality assurance, health & safety, code of conduct, some environmental/ social initiatives. Circular economy is about recycling.

3 SUSTAINABLE

Not increasing additional harm

Sustainability vision, CO2 carbon neutrality target and action plan, business focus missing. Uses eco-design approach



3 SUSTAINABLE

Not increasing additional harm

Sustainability vision, CO2 carbon neutrality target and action plan, business focus missing. Uses eco-design approach

4 RESTORATIVE

Humans doing things to nature

Ambitious frontrunner implementing circular economy principles in strategy, business model and product/service design

5 REGENERATIVE

Humans acting as nature

Transformative leader: business strategy and R&D create success through holistically net-positive solutions.

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The dedicated engine for global ecosystem transition

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CEPID
BRIDGE

FAPESP Research, Innovation and Diffusion Centre

Building Radical Innovation and Disruption for Global Ecosystems

Mission: Develop new theories, methodologies, managerial tools, and technologies to create, transform, and manage multiple ecosystems.

Deindustrialization



Climate Urgency

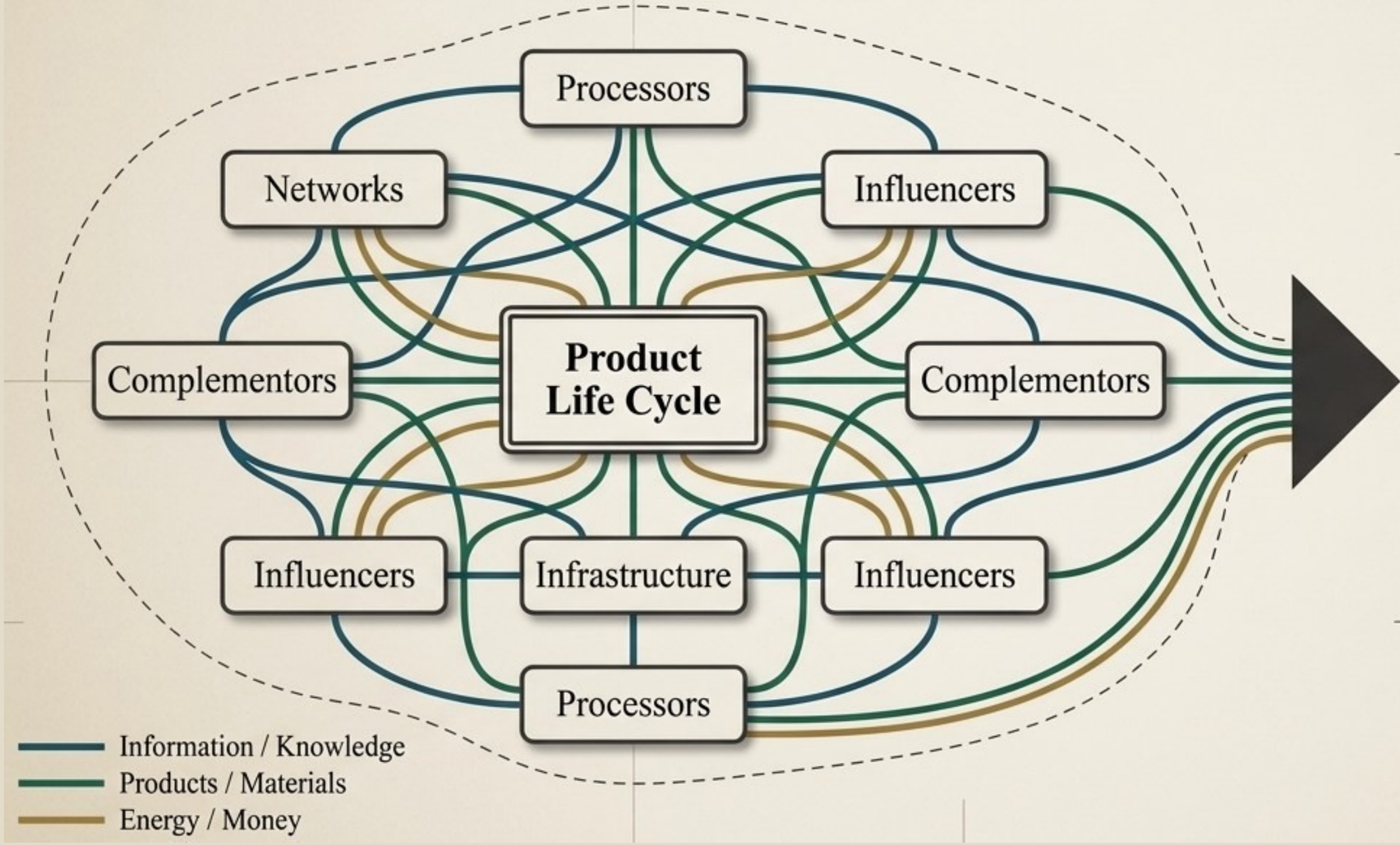


Inequality



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Architecture of Value Creation in Regenerative Ecosystems



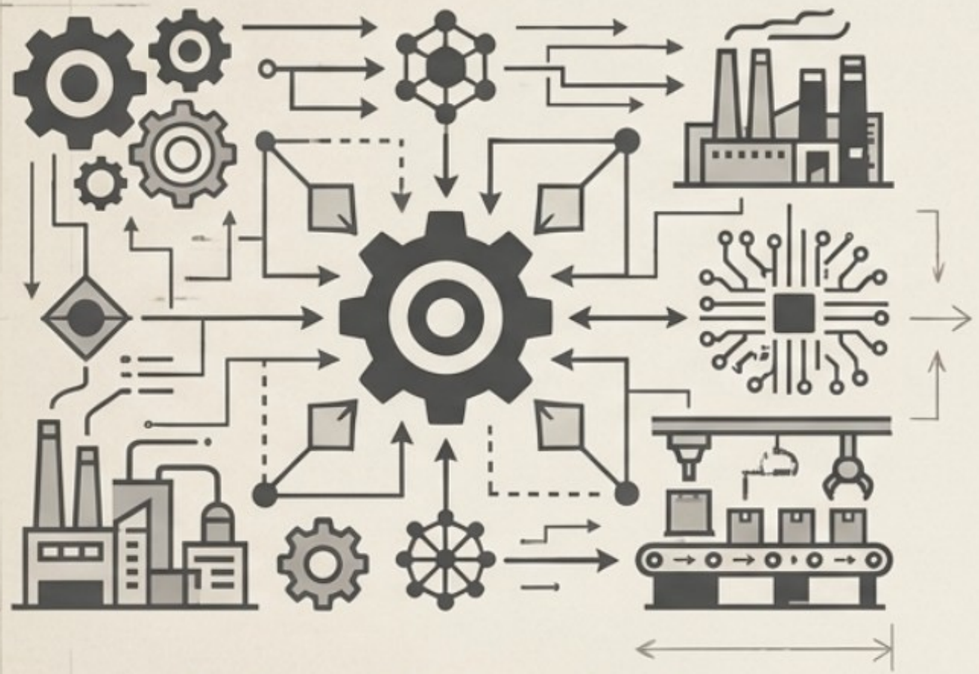
VALUE

Solutions	Goods & Services
Social & Environmental Gains	Image & Reputation

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Adaptability Across Sociotechnical Regimes

Industrial Complexity



Industrial Complexity

Applying ecosystem transition frameworks to optimize highly structured, hyper-industrialized manufacturing cases.

Bio-Regional Networks



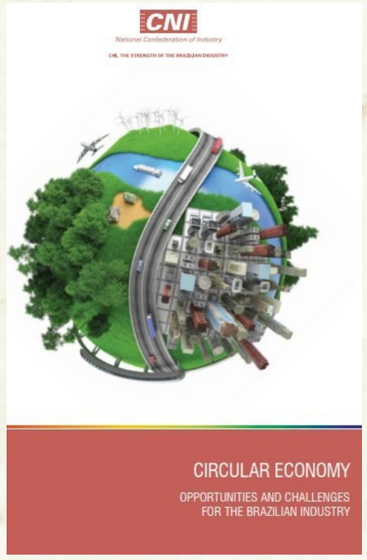
Bio-Regional Networks

Adapting the exact same regenerative ecosystem management models to empower complex Amazonian communities.

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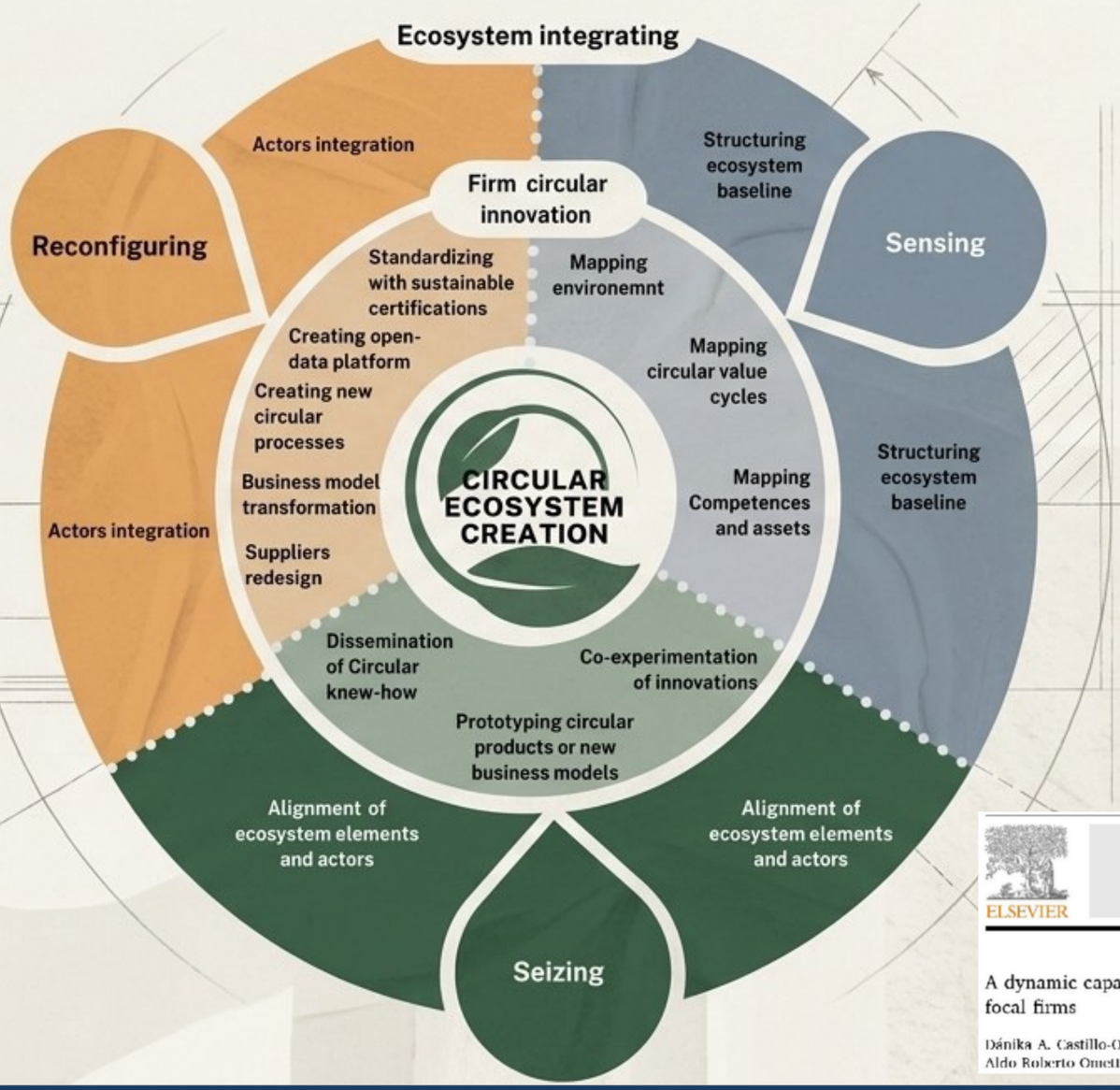
The fundamental shift in operating paradigms

Processes	Scope: Ecosystems
Efficiency	Premise: Effectiveness
Cost Reduction	Value Proposition: Value Generation
Profit	Focus: Innovation and New Values
Shareholders	People: Stakeholders
Competition	Ethics: Collaboration
Consumer	Role: User
Extract, Produce, Discard	Core Action: Plan to Restore and Regenerate



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Dynamic capabilities for circular ecosystem creation



Technovation
Volume 124, June 2023, 102745

Circular ecosystem innovation portfolio management

Leonardo Augusto de Vasconcelos Gomes [a], Danika A. Castillo-Ospina [b], Ana Lucia Figueiredo Facin [c], Camila dos Santos Ferreira [d], Aldo Roberto Ometto [b]

Contents lists available at ScienceDirect
Sustainable Production and Consumption
journal homepage: www.elsevier.com/locate/spc

A dynamic capabilities framework for building circular ecosystems by focal firms

Dánika A. Castillo-Ospina [a], Marta Ormazabal [b,*], Leonardo de Vasconcelos Gomes [c], Aldo Roberto Ometto [a]

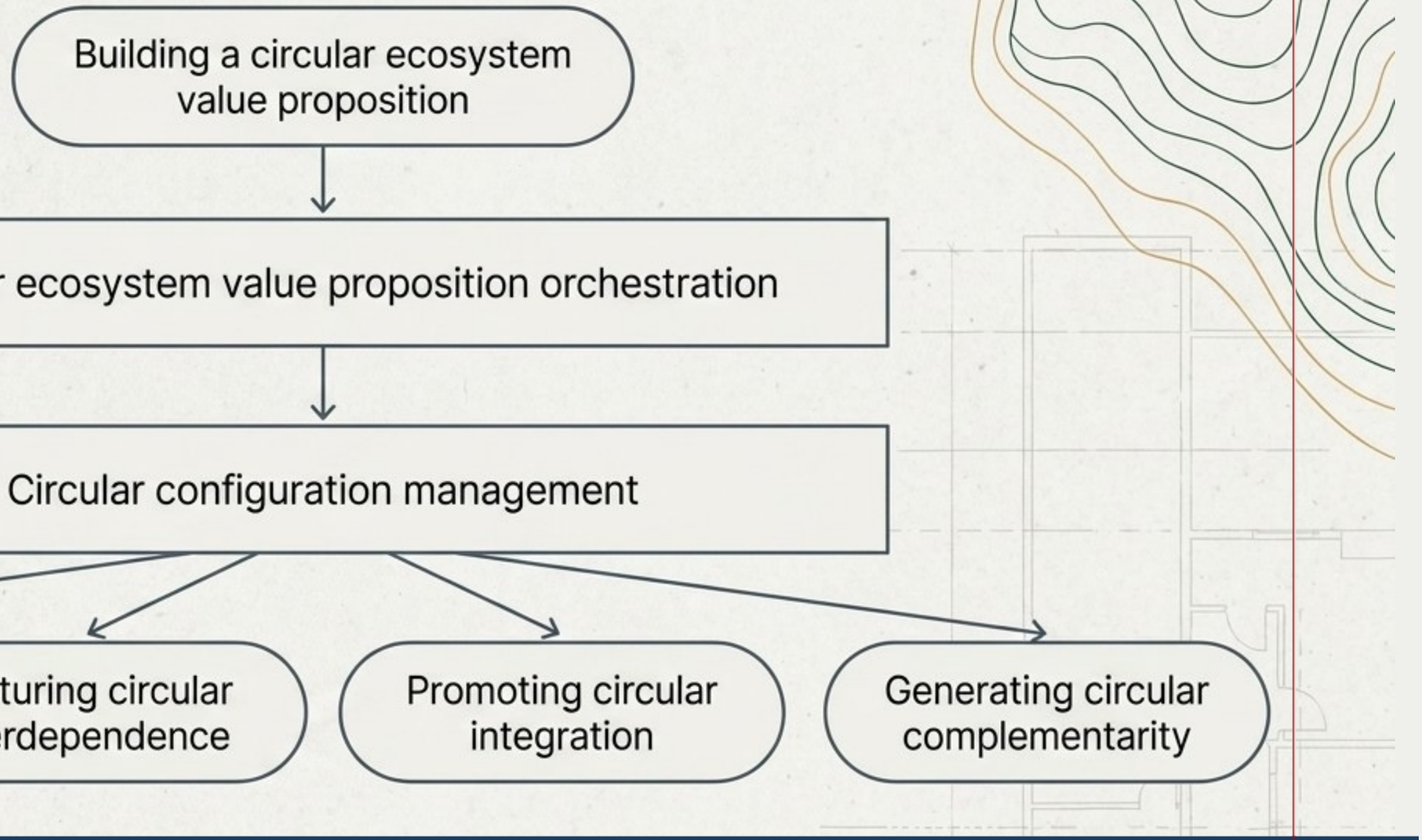
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Circular Ecosystem Management

International Journal of Production Economics
Volume 256, February 2023, 108725

Circular ecosystem management: Orchestrating ecosystem value proposition and configuration

Leonardo Augusto de Vasconcelos Gomes [a], Aline Mariane de Faria [a], Antonio Carlos Braz [a], Adriana Marotti de Mello [a], Felipe Mendes Borini [a], Aldo Roberto Ometto [b]



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Defining the next frontiers of ecosystem management

LONDON FAPESP WEEK June. 2-4th 2026



Horizon 1: Planetary Boundaries

Developing Absolute Environmental Sustainability Assessments to measure true net-positive impact globally.

Horizon 2: Biorefineries & Bioeconomy

Transforming biological resources into the chemical and material foundation of the future economy.



BRIDGE Core



Horizon 3: Environmental Digital Passports

Utilizing traceability architectures and global ecosystem management indices.

Horizon 4: Digital Platforms & AI

Science-based applications and AI AI tools to create, transform, and manage complex socio-technical systems at scale.



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Applied regeneration: The Amazonian socio-biodiversity case

LONDON FAPESP WEEK June. 2-4th 2026

Focus Area:
Regenerative Ecosystems and Sociobiodiversity

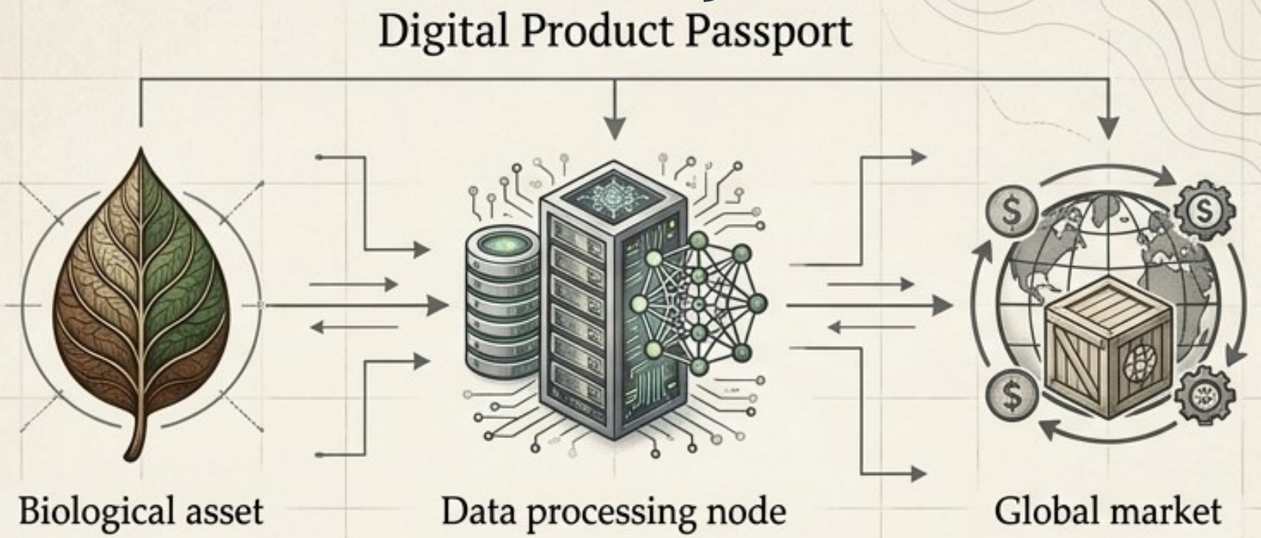
Key Concept:
Transitioning from a model of resource extraction in the Amazon to a digitally enabled socio-biodiversity platform.

The Mechanism:
Using environmental digital passports and ecosystem management indices to protect poundaries while empowering local communities and fostering a truly regenerative bioeconomy.



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The Digital Mechanism of the Bioeconomy



Core Action: Using environmental digital passports and ecosystem management indices to rigorously protect planetary boundaries.

Systemic Outcomes:
- **Traceability:** Absolute verification of biological origins and impact.
- **Empowerment:** Channeling economic value directly to local communities.
- **Regeneration:** Fostering a truly regenerative bioeconomy that outcompetes linear extraction models.



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LONDON
FAPESP WEEK
June, 2-4th 2026
The grand challenge of our time
The transition from linear extraction to regenerative ecosystems is not a matter of process optimization—it is a fundamental requirement for survival within planetary boundaries.
This transition will not happen by accident. It requires radical innovation, rigorous frameworks, and systemic orchestration. Let's build the blueprint together.
Thank you
Dr. Aldo Roberto Ometto aometto@usp.br
FAPESP Research, Innovation and Diffusion Centre BRIDGE
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