Sustainable Production and Consumption 38 (2023) 372–388

Contents lists available at ScienceDirect

Sustainable Production and Consumption

journal homepage: www.elsevier.com/locate/spc

Towards regenerative business models: A necessary shift?

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ARTICLE INFO

Editor: Prof. Beatriz Lopes de Sousa Jabbour

Keywords:
Regeneration
Regenerative business models
Net positive
Nature positive
Circular economy
Sustainable business models

ABSTRACT

Regeneration has become a debated topic in organizational studies, yet its characteristics and distinctions from sustainability and circular business models remain unclear. This study aims to provide an initial framework for regenerative business models and differentiate them from sustainable or circular models. Employing literature reviews, six focus groups with international and indigenous participants, and comparisons with seminal articles on sustainable and circular models, this study finds that organizations with regenerative business models focus on planetary health and societal wellbeing. They create and deliver value at multiple stakeholder levels—including nature, societies, customers, suppliers and partners, shareholders and investors, and employees—through activities promoting regenerative leadership, co-creative partnerships with nature, and justice and fairness. Capturing value through multi-capital accounting, they aim for a net positive impact across all stakeholder levels. Regenerative business models share some design approaches with sustainable and circular models but differ in their main goals and systemic perspectives. Achieving regenerative business models requires strong and contested policy frameworks, including animal and nature rights and true pricing. Further research is needed to explore how organizations can incorporate intrinsic notions of value beyond capital and avoid new forms of greenwashing when adopting regeneration and net positive impact narratives.

1. Introduction

The goal of sustainability has been to meet the needs of present generations without compromising the ability of future generations to meet their own needs (WCED, 1987). But the prevalence of a linear and degenerative economy has weakened the planet's regenerative capacity, making it harder and harder to achieve this ambition (Dasgupta, 2021). Sustainability has become a necessary but insufficient condition for long-term human welfare. Next to sustaining, there is a growing need to regenerate our and the planet's ability to meet present and future needs. This has given rise to the field and idea of regeneration.

Regeneration is a key process of biological systems and refers to "*the capacity to bring into existence again*" (Muñoz and Branzei, 2021, p. 509). It lets cells, organisms and ecosystems recover from and build resilience against external shocks (Carlson, 2011). The term regeneration has increasingly been used in diverse fields such as agriculture, architecture, design, energy, nature conservation or tourism, to promote healthier natural ecosystems and thriving human societies (Muñoz and Branzei, 2021; Robinson & Cole, 2015; Rhodes, 2012, 2017; Hahn and Tampe, 2021; Bellato et al., 2022).

The interest in regeneration is not surprising given the present state of the living world. Since the 1970s, vertebrate species population sizes have decreased by nearly 70 % (WWF, 2020). Between 1990 and 2020, the global forest area decreased by 178 million hectares, an area the size of Libya (FAO and UNEP, 2020). A 2022 report by the WWF found that in some areas, species population sizes dropped by over 90 % due to overexploitation, pollution, climate change and habitat loss, exacerbated by deforestation (WWF, 2022). The impacts of climate change are also being felt globally, as over 1.4bn people live in highly water vulnerable areas (UN, 2020) and over 25 % of people worldwide live in moderate to severe food insecurity (UNICEF, 2021). It is also clear that these impacts are human induced (IPCC, 2022). Given the state of the living world and the need to go beyond sustainability, organizations have started adopting regenerative practices and strategies.

The starting point for regenerative thinking in organizations is the realization that humans are embedded in, part of and fundamentally dependent on nature. The economics of biodiversity and nature have been well summarized in a recent independent review (Dasgupta, 2021). The review describes the need for effective institutions, both in local communities, civil society as well as within nation states to enable regenerative markets. These institutions are about trust and clear rules, observation, cooperation, verification and enforcement of rules to

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https://doi.org/10.1016/j.spc.2023.04.014
Received 20 December 2022; Received in revised form 13 April 2023; Accepted 20 April 2023
Available online 25 April 2023

ensure the sustainability of social-ecological systems (Ostrom, 2009). Corruption and bribery decrease the willingness and ability to cooperate, leading to extractive and degenerative business practices that overexploit natural resources (Dasgupta, 2021). In this study, we zoom into the organizational lens to investigate what regenerative business models are, and how organizations can create, deliver and capture value in regenerative ways.

Creating, delivering and capturing value is the primary purpose of business organizations. What value is offered, and how it is created and captured is a key question of business model research. We view business models as activity systems that create, deliver, capture and potentially destroy value (Massa et al., 2017; Bocken et al., 2021). Business models have been useful to conceptualize new systems of production and consumption aimed at sustainability and a circular economy (Boons et al., 2013; Bocken et al., 2014; Evans et al., 2017; Geissdoerfer et al., 2018a, 2018b). A business model can be described in terms of what value is offered and to whom (the value proposition), the activities needed to create and deliver the value proposition (value creation and delivery), as well as how and what kind of value is captured by a focal firm and its stakeholders (value capture) (Zott and Amit, 2010).

Business models of regeneration have barely been defined, and several views on business and regeneration exist. Some argue that regenerative organizations promote the self-renewable capacity of natural systems that have been damaged or overexploited (Morseletto, 2020). This happens through a co-evolutionary process, where organizations align their activities with the living systems that surround them, to build resilience and adaptive capacity against disturbances and enhance the health of nature and human communities, in so-called social-ecological systems (Hahn and Tampe, 2021; Muñoz and Branzei, 2021; Vlasov, 2021). Others have described regenerative business models through the idea of net positive impact, which is achieved when an organization's handprint is bigger than its footprint (Norris, 2015; Norris et al., 2021). The handprint is the positive impact or difference a product or service makes in the market. The footprint is the negative impact that this same product or service creates along its life cycle. To become net positive, organizations need to take ownership of all their impacts, work towards the long-term benefit of business and society, and nurture a strong sense of purpose (Polman and Winston, 2021). A further branch of the literature has emphasized the role of leadership, and the importance of developing a sense of meaning, engaging in keen observation, deep listening, and generative conversations (Hardman, 2013). The literature on regenerative organizations has also proposed design approaches that include multiple concepts and methods, including green chemistry, biologically inspired product design, a circular economy (Wahl, 2016; Caldera et al., 2022), as well as multi-capital accounting methods and the need to ensure that profits flow back into the surrounding environment or local communities (Fullerton, 2015).

The manyfold interpretations of regenerative organizations have not yet been synthesized and merged with the concept of business models into a coherent framework. A lack of clarity on what regenerative business models are provides a roadblock for our understanding and adoption of this important perspective. It might also be just old wine in a new bottle. For example, studies on sustainable and circular business models have already argued for the need to develop a strong organizational purpose (Bocken et al., 2014), or resource strategies for a circular economy (Geissdoerfer et al., 2017). The use of the word regeneration in the context of a circular economy is unclear (Tedesco et al., 2022) and deserves to be more clearly delineated from the concept of a circular industrial economy (Morseletto, 2020; Konietzko et al., 2020). It is generally not clear how a regenerative business model compares to or differs from a sustainable or a circular business model, and whether it is just a new buzzword that adds noise to the debate on how organizations can become future fit. A lack of clarity on what regenerative business models are—including clear science-based targets for nature (SBTN, 2022), or systematic and transparent assessments of corporate biodiversity impacts and activities (IBAT, 2022)—might also lead to greenwashing and diluted interpretations both in practice and the literature, for example when organizations make and then retract net positive nature commitments (de Silva et al., 2019).

Finally, conceptualizing an idea such as regenerative business models requires the integration of different cultural perspectives, especially from indigenous communities. These are underrepresented in the emerging research on regenerative organizations (Caldera et al., 2022; Hahn and Tampe, 2021). It is important to include them, because indigenous people originate from and manage about 40 % of the remaining protected and biodiversity rich areas on the planet (Garnett et al., 2018). Furthermore, indigenous communities' knowledge has helped address issues like wildfire prevention and management in the US and Australia (Buono, 2020; Betegeri, 2020), and conduct biodiversity research and preservation (Gardner et al., 2022). We therefore explicitly consider indigenous perspectives in this study.

The main goal is to identify and describe important elements of regenerative business models, to add more clarity on this emerging and promising umbrella concept (Hirsch and Levin, 1999). A secondary goal is to identify overlaps with and differences between neighboring concepts like sustainable or circular business models. We address the following two pertinent research questions:

1. What are regenerative business models?
2. How do regenerative differ from sustainable or circular business models?

In the following, we describe the methods used to answer these questions, which include a literature and practice review of regenerative thinking in organizations, six focus groups, and a short review of seminal articles on sustainable and circular business models for comparison. This is followed by a description of the results and a discussion of important industries for regeneration, a framework for regenerative business models, differences and overlaps between regenerative, sustainable and circular business models and an account of limitations and opportunities for further research. We then conclude by summarizing the answers to the two research questions.

2. Methods

This study was developed in three methodological steps. We first conducted a systematic literature and practice review. For emerging themes like regenerative business models, it is essential to review academic literature and emerging insights from practice (Adams et al., 2016a, 2016b; Bocken et al., 2014, 2021; Pieroni et al., 2019). Second, we supplemented the literature and practice review with focus groups, a form of group interview and discussion (Bryman & Bell, 2015), with regenerative and sustainability professionals, to critically discuss the themes emerging from the review, validate them, and possibly add new ones, if any. We held three focus groups with (representatives of) indigenous groups from South America and India. Third, we reviewed seminal and highly cited articles on sustainable and circular business models. Fig. 1 summarizes the method. which we describe in more detail below.

2.1. Literature and practice review of regenerative business models

The first step consisted of a literature and practice review, to derive a first set of themes and a rigorous foundation for the conceptualization of regenerative business models, which were categorized in the elements of business models. The literature review method we chose is based on a step-by-step guide to work with both academic as well as grey literature, like practice reports or popular books (Adams et al., 2016b). Inclusion of practice-based sources of information allows for a broader and richer picture of an emerging field (Adams et al., 2016a). We searched the academic database SCOPUS for [regenerative OR regeneration OR "net positive" OR handprint AND business OR strateg*] in February 2022

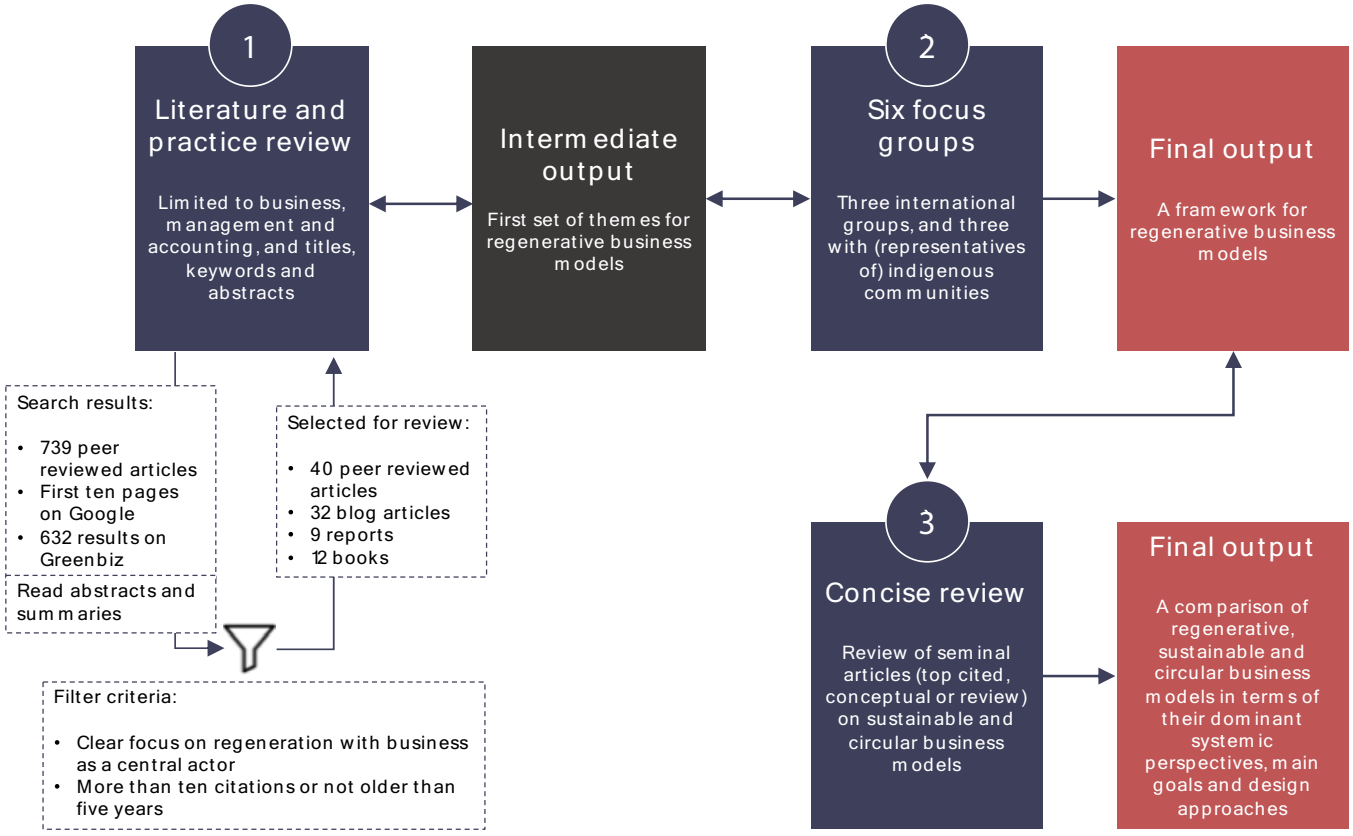

Fig. 1. An overview of the methodological steps of this study.

(including articles added later as they got published). This was limited to business, management and accounting literature and titles, keywords, and abstracts and resulted in 739 peer-reviewed publications. We then filtered the search results according to the following criteria: 1) articles that have a clear focus on regeneration with business as a central actor, and 2) either more than ten citations to exclude non-influential articles and/or are no older than five years, to accommodate recent research that did not yet have time to build their influence in the academic discourse. We used snowballing to identify further relevant articles. We also searched in the Google search engine for [Regenerative OR "net positive" AND business] and retrieved relevant books, reports and blog articles from the first ten pages of search results. Also, as suggested in the literature on practice reviews (Adams et al., 2016b), we searched for magazine outlets and decided to focus on GreenBiz, a popular magazine for sustainable business. Here we used the search term 'regenerative' (632 results). After screening all information, the final selection included 40 academic publications, 32 blog/magazine articles, 12 books and 9 reports.

2.2. *International and multicultural focus groups*

To discuss and validate the emerging insights from the literature review and enrich them empirically, we organized six focus groups with sustainability experts and (representatives of) indigenous communities. This was done to discuss the themes from the literature review and give the opportunity to add new ones. Focus groups are group interviews with several participants that emphasize interactions among the participants and the joint construction of meaning (Bryman & Bell, 2015). In focus groups, the researcher seeks to better understand how a group of participants view issues. We chose focus groups as a method, because definitions of important phenomena like regenerative business models can emerge from the collective intelligence of group participants. This goes back to early uses of the focus group method in management and business, where it helped define problems and work together on potential solutions. Furthermore, the interaction among focus group participants helps challenge each other's views and reveal what is motivating the viewpoints of participants, and to make sense of a phenomenon and construct meanings around it (Bryman & Bell, 2015).

To design and conduct the focus groups, we used the following criteria from Bryman & Bell (2015): 1) Provide a fairly unstructured setting, to allow for open discussions, 2) 6–12 participants, to create an intimate setting, 3) invite a diverse range of participants (NGOs, business, consultancies) who identify themselves as working on regenerative business and provide different viewpoints, 4) one facilitator to guide the discussion, to provide guidance for the discussion, but also limit the amount of interference, 5) allow for online focus groups, to enable participants to join without a lot of effort and ensure higher participation rates. As digital tools, we used Miro to allow the participants to write down their thoughts on digital post-it notes as a form of data collection (Fig. 2). The sessions were also recorded on Zoom to code discussions not noted down on Miro.

The participants of the focus groups were selected based on an outreach on LinkedIn to search for experts in regenerative business. Based on three posts, we received 76 responses from people that were interested in contributing to the study. We screened their profiles and invited selected participants based on expertise, and to ensure a diversity of backgrounds and nationalities. The focus groups with indigenous groups were organized based on personal networks. One of the co-authors is from India and could use her network to get access to two different indigenous communities, and a colleague from the first author had a network with access to (representatives) of indigenous communities in Ecuador. The sampling of these focus groups is not representative, but also does not claim to be. The focus groups are meant to complement and critically discuss the outcomes from the literature review with diverse insights from practice. An overview of the focus group participants is provided in Table 1.

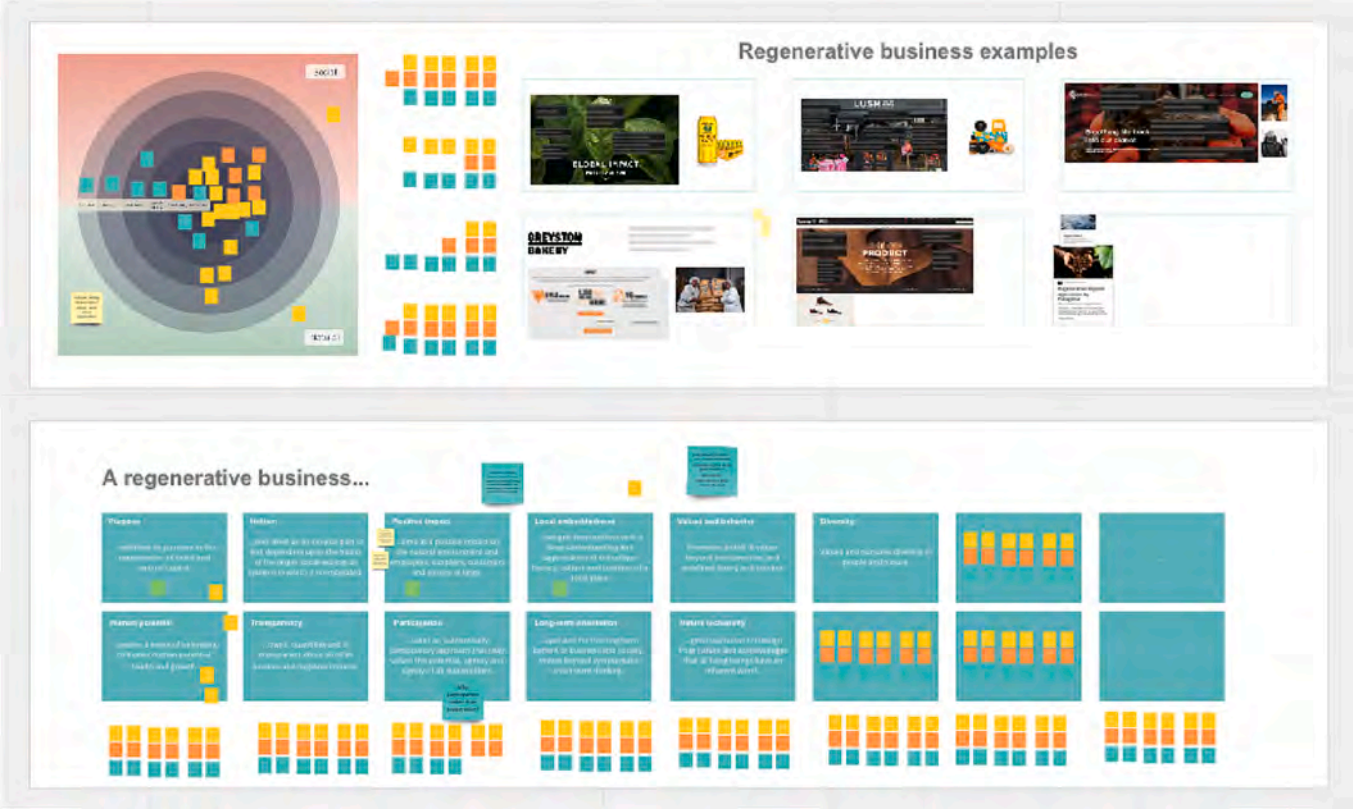

Fig. 2. A screenshot of one of the Miro boards used for the focus group discussions.

2.3. A review of dominant themes from the sustainable and circular business model literature

Lastly, to understand how regenerative business models differ from sustainable or circular business models, we reviewed top cited and seminal articles on the latter. Because several reviews on sustainable and circular business models already exist, we decided not to do another full review, but instead summarize the definitions and dominant themes identified in these reviews. We searched in Scopus for "sustainable business model*" as well as "circular business model*" and retrieved the top cited articles that were either reviews or seminal and conceptual studies. For sustainable business models this resulted in eight articles (Bocken et al., 2014; Geissdoerfer et al., 2018a, 2018b; Boons et al., 2013; Joyce and Paquin, 2016; Evans et al., 2017; Upward and Jones, 2016; Boons and Lüdeke-Freund, 2013; Stubbs and Cocklin, 2008), and for circular business models in six articles (Geissdoerfer et al., 2018a, 2018b; Linder and Williander, 2017; Geissdoerfer et al., 2017; Merli et al., 2018; Lewandowski, 2016; Bocken et al., 2016).

2.4. Data analysis

The final set of literature from the review and the post-it notes from the focus groups were collected and coded subsequently in Excel to derive definitions and categories to conceptualize regenerative business models. To conduct a structured data analysis, we used the coding technique outlined by Newhart and Patten (2018), which involves a first round of open coding to identify the most salient themes, which we did using the literature and the output from the focus groups. We then used axial coding to uncover links between the emerging categories from open coding. Lastly, we conducted core coding to establish high-level categories that encompassed the other subcategories. This was an iterative process and led to the development of an initial regenerative business model framework.

For the comparison of regenerative with sustainable and circular business models, we read the identified seminal articles, coded the dominant themes, and then mapped the emerging themes onto the high-level categories on regenerative business models. For this step, we recognize that this is not a complete comparison. Our ambition here is not to be complete, but to identify dominant themes from seminal articles and delineate them from the dominant themes emerging on regenerative business models. We iterated several times between the themes from the literature and practice review on regenerative business models, the focus groups, and the review of seminal articles on sustainable and circular business models, represented by the bi-directional arrows in Fig. 1. This was complemented by additional snowballing to refine the themes and provide more depth. The results provide a detailed account of what regenerative business models consist of, and how they compare to sustainable or circular business models in terms of their dominant systems perspectives, main goals and common approaches for the design of these business models.

3. Results and discussion

We propose the following definition of regenerative business models, and an associated framework that is explained in more detail below:

> *Organizations with regenerative business models focus on planetary health and societal wellbeing. They create and deliver value at multiple stakeholder levels—including nature, societies, customers, suppliers and partners, shareholders and investors, and employees—through activities promoting regenerative leadership, co-creative partnerships with nature, and justice and fairness. Capturing value through multi-capital accounting, they aim for a net positive impact across all stakeholder levels.*

Regenerative business models recognize that nature is an irreplaceable foundation of human health and wellbeing, that human societies are deeply embedded in the biosphere, and that they depend on the

Table 1
Location and number and types of participants of the focus groups.

Focus group	Country	Virtual/face-to-face?	Number of participants	Participant roles and functions	Date	Duration
1	International	Virtual	7	- Director at a Circular Economy Institute - Operations Manager at a Dutch machine manufacturer - Green Analytics Advisor - Regenerative entrepreneur - Insights & Experience Strategy Lead at a large healthcare company - Impact Analyst - Head of Digital Experience at a United Nations agency	2.6.2022	1.5 h
2	International	Virtual	7	- EHS Global Representative at an automotive supplier - Sustainability Manager at a Brazilian manufacturer of paper and forest products - Ethnobotanist Researcher - QA/QC Specialist - Regenerative entrepreneur - PhD Candidate on Sustainable Food Systems - Regenerative entrepreneur	9.6.2022	1.5 h
3	International	Virtual	4	- Sustainability Research Analyst at an environmental services company - Partner & Co-Founder at a design agency - Regenerative entrepreneur - Sustainability Operations Manager at an asset management company	22.6.2022	1.5 h
4	Ecuador	Virtual	5	- -Organizational researcher and social impact entrepreneur - Regenerative entrepreneur - Regional Financial Officer at an NGO for small-scale farmers - Regional Programs Coordinator at an NGO for small-scale farmers - Coordinator at a center for innovation and entrepreneurship	7.7.2022	1.5 h
5	India	Face to face (Khadaput village, Koraput, Odisha, India)	8	- Members of the Paraja tribe - Farmers - Hunter-gatherers - Managers of small-scale farm-to-market businesses	30.07.2022	1 h
6	India	Face to face (Gholvad village, Dahanu, Maharashtra, India)	9	- Members of the Warli Tribe - Farmers - Fishers	05.08.2022	1 h

health of the biosphere for their own health (see, for example, Robinson and Cole, 2015; Rhodes, 2017; van Hille et al., 2021; Hahn and Tampe, 2021; Hernández and Muñoz, 2022; Griggs et al., 2013). This fundamental shift in perspective, away from an anthropocentric worldview, is the foundation of the value that regenerative organizations offer, and it is the most dominant finding across the literature and the focus groups we conducted.

The increasing awareness of these links between humans and nature has also given rise to a new transdisciplinary research field called "planetary health". It studies "*the health of human civilization and the state of the natural systems on which it depends*" (Whitmee et al., 2015, p. 1978). Some of the recent research from this field has shown, for example, that the nutrient density of crops appears to decrease with higher concentrations of anthropogenic CO_2, leading to a potential crisis of nutrition resulting from climate change (Myers and Frumkin, 2020). Another example of the links between environmental impacts and health are diets heavy in red meat and processed foods, which drive environmental degradation and are associated with an increased risk of cardiovascular disease, diabetes and obesity (Willett et al., 2019). A last example is combustion engine cars. They are both damaging to human health—because they contribute to poor air quality, respiratory diseases, and prevent healthy physical activity—and to the environment, because of their large contribution to climate change (Nieuwenhuijsen and Khreis, 2016; Gössling et al., 2022). In contrast, from the perspective of regeneration, products and services are made to improve the health of both people and the environment.

Because of their close ties to nature, regenerative business models are most often associated with industries that are highly dependent on natural capital and ecosystem services. These include agriculture, forestry and fishing, as well as mining, manufacturing, energy and construction. Estimates suggest that around 55 % of global GDP is directly dependent on nature's services (Swiss Re Institute, 2020).

The most dominant industry in the regeneration literature is food and agriculture, which occupies large areas of land and has more than 50 % of the estimated overall pressure on nature and biodiversity (Kurth et al., 2021). The literature contains extensive reference to regenerative agriculture and its potential to improve species abundance, soil health and fertility, or store carbon through agroforestry (Rodale, 1986; Dick et al., 2022; Caldera et al., 2018; Savory, 1991). A vivid debate on regenerative agriculture has started, with efforts to quantify its benefits and explore reasons for a lack of adoption and barriers to scale (Jordon et al., 2022).

Another important legacy industry for regenerative thinking in business is the built environment (including infrastructure), because it is material intensive and co-occupies vast areas of land with nature (Lyle, 1996; Robinson and Cole, 2015; Mang and Reed, 2020; du Plessis, 2012). There is a direct opportunity for organizations in this industry to source materials from regenerative sources, create more biodiverse habitats for other living species in cities and surrounding areas, and align buildings and infrastructure more closely with water, air, soil, carbon, and nutrient cycles. This can be as simple as discontinuing mowing, and sowing the landscape with native plant species, or as complex as on-site water retention and treatment (Urban Land Institute, 2022).

While some industries depend more on nature than others, any industry can and should adopt regenerative thinking. This is because

virtually all organizations and humans have close interactions with nature in the regional environment in which people and organizations live and operate. In the following, we propose a framework that dives deeper into the three key elements of regenerative business models: their value proposition, value creation and delivery, and value capture mechanisms.

3.1. A framework for regenerative business models

Based on the review and focus groups, we propose the following framework for regenerative business models (Fig. 3). It includes the key elements of a business model: the value proposition, value creation and delivery and value capture mechanisms (e.g., Bocken et al., 2014; Richardson, 2005). It also contains different human and non-human stakeholder levels that impact and are impacted by organizations with regenerative business models: their employees, shareholders and investors, customers, partners and suppliers, as well as societies and the natural environment at large (see also Stubbs and Cocklin, 2008; Bocken et al., 2013). At each stakeholder level, an organization with a regenerative business model proposes value, creates and delivers it in sync with nature, and enables value capture. We describe the elements of this framework in more detail below and list the elements and examples in Table 2.

3.1.1. Value proposition: planetary health and societal wellbeing

Organizations with regenerative business models have a value proposition of planetary health and societal wellbeing to nature and society at large. This found widespread agreement across the literature and all focus groups (e.g., Stuchtey and Rosse, 2008; Hajek, 2018; Hutchins, 2017; Rhodes, 2015; Slawinski et al., 2021; Dias, 2019; Wahl, 2016; Hutchins and Storm, 2017; Vlasov, 2021; Gerhards and Greenwood, 2021). As one participant in focus group 1 put it, the idea is that the organization "*promotes wellbeing as a cultural vision of success*" (focus group 1). Across the first three focus groups, this discussion led to the shared idea that health and wellbeing require moving from single and quantitative measures, like profit, to include qualitative indicators of progress and value creation. Health and wellbeing are qualitative system states and go beyond the notion of continuous growth in the volume of

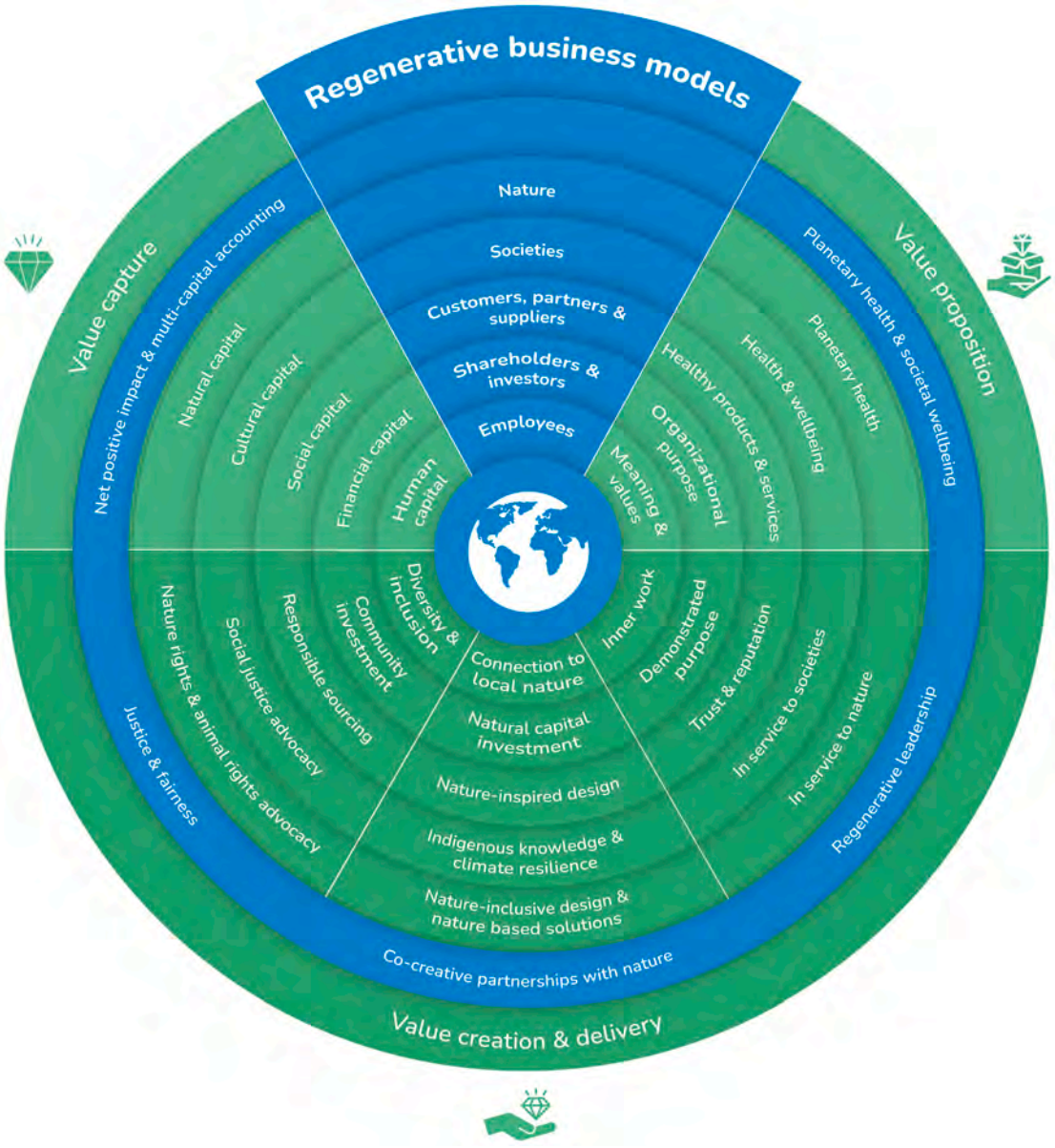

Fig. 3. A framework for regenerative business models. Developed in this study based on the literature and practice review, supplemented with insights from focus groups.

Table 2
The elements of the regenerative business model framework including examples.

	Stakeholder levels				
	Nature	Societies	Customers, partners & suppliers	Shareholders & investors	Employees
Value proposition					
Planetary health and societal wellbeing	**Planetary health** A holistic value proposition that prioritizes human health and the health of the planet. Example: Seventh Generation produces eco-friendly household and personal care products that explicitly propose value for both human health and the health of the planet, by utilizing plant-based, biodegradable ingredients, sustainable packaging, and ethical business practices, as well as high-quality, safe, and effective solutions.	**Human health and wellbeing** A value proposition that promotes physical, mental, and/or social well-being. Example: The company Headspace provides a meditation and mindfulness app with personalized guided sessions and diverse content to reduce stress, improve focus, and enhance overall well-being.	**Healthy products and services** Products and services co-created with customers, suppliers and partners that contribute to the physical, mental, and social well-being of individuals and communities while also promoting the long-term health and sustainability of the Earth's natural systems. Example: Claytec produces natural clay-based and low-carbon building materials, promoting sustainable construction practices.	**Organizational purpose** The underlying motivation that defines why an organization exists, encompassing its core values, mission, and vision. Example: Lush, a cosmetics company announced in November 2021 that it will be signing out from social media platforms Facebook, Instagram, Snapchat, WhatsApp and TikTok, until these platforms can provide a safer environment for their users. The decision was made in line with its mission to advance people's and nature's wellbeing.	**Meaning and values** A value proposition to employees of a healthy and meaningful place and culture of work that aligns with the values of the employees and creates an intrinsic motivation to positively impact the organization's goals and broader societal values. Example: Phipps Conservatory and Botanical Gardens has built a Center for Sustainable Landscapes (CSL), a net-positive energy and net-zero water building that provides a healthy working environment.
Value creation & delivery					
Regenerative leadership	**In service to nature** An intentional focus on preserving, restoring, and enhancing ecosystems and biodiversity, minimizing the environmental footprint, and actively contributing to the health of the planet's natural systems. Example: Ecosia, an eco-friendly search engine has environmental protection embedded in its ownership structure and allocates most of its ad revenue to fund global reforestation projects.	**In service to society** Operations with a commitment to addressing social challenges, promoting equity, and creating shared value for the well-being and prosperity of the served communities. Example: The shoe company TOMS has equity built into its mission, which is why they invest one-third of their profits in grassroots initiatives that promote social justice.	**Trust and reputation** Demonstrated transparency, accountability, and commitment to the health of people and planet. Example: The Mate drinks company Guayaki has published an impact report that details the impact made on reducing greenhouse gas emissions, water stewardship, packaging and land preservation and biodiversity.	**Demonstrated purpose** Guided by a clear, inspiring mission that embeds the well-being of individuals, communities, and the environment into the core strategy, operations, and culture to create lasting positive impact. Example: Roxanne Quimby, co-founder of Burt's Bees, a personal care brand, divested 80 % of her ownership to purchase land to have it designated and protected.	**Inner work** Employees are encouraged to engage in self-reflection and personal development to enhance self-awareness, emotional intelligence and the ability to have generative conversations about wicked problems. Example: Women of the Paraja tribe in India recognized the need to change extractive agricultural practices, initiated generative conversations, and promoted conservation efforts and agroforestry practices in the area.
Co-creative partnerships with nature	**Nature-inclusive design** Integrate measures to increase the suitable habitat for native plant and animal species populations that have been degraded. Example: Studio Gang's Nature Boardwalk at Lincoln Park Zoo is an urban wildlife habitat and educational pavilion that transforms a former pond into a thriving ecosystem, promoting biodiversity and fostering a connection between people and nature in Chicago.	**Climate resilience** The ability to anticipate, withstand, and adapt to the impacts of climate change and other disruptions, by integrating proactive strategies and measures to minimize risks, maintain operations, and seize new business opportunities. Example: When two hurricanes hit Mexico's Carribean coast, some hotels and businesses suffered less damage than others due to protection by the Mesoamerican Barrier Reef System.	**Nature-inspired design** Nature-inspired design is a creative approach that emulates nature's forms, processes, and ecosystems to develop sustainable, resilient, and innovative solutions in architecture, product design, and various other fields. Example: The Eastgate Centre in Harare, Zimbabwe has a passive cooling system that mimics the structure and ventilation mechanisms of termite mounds, maintaining comfortable indoor temperatures without relying on conventional air conditioning, significantly reducing energy consumption.	**Natural capital investment** Invest financial returns to improve other forms of capital than only financial, with a focus on natural capital. Example: At 83, Patagonia's founder Yvon Chouinard declared "Earth is now our only shareholder", as the company sought a legal structure to dedicate profits to conserving and regenerating ecosystems, a challenge within traditional corporate frameworks.	**Connection to local nature** Activities that deepen the understanding and commitment of employees to preserving surrounding ecosystems, through team-building, conservation volunteering, or implementing nature-based solutions. Example: The shoe company Timberland has a "Path of Service" program that fosters environmental stewardship by giving employees paid time off to be in nature and participate in conservation efforts like tree planting and habitat restoration.

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Table 2 (*continued*)

	Stakeholder levels				
	Nature	Societies	Customers, partners & suppliers	Shareholders & investors	Employees
	Nature-based solutions Integrate measures that protect, sustainably manage and restore natural or modified ecosystems to address societal challenges like climate change, food and water security or natural disasters. Example: The company Notpla creates plastic-like food packaging from seaweed, which biodegrades naturally in compost in 4–6 weeks. The raw material seaweed doesn't compete with food crops, requires no fresh water, helps deacidify oceans and provides fishing communities that are affected by climate change with an alternative source of income.	**Indigenous knowledge** Indigenous knowledge, refined over thousands of years, offers invaluable techniques to foster harmony with nature and to adapt to climate change, such as preventing and controlling wildfires, understanding plant species, and conserving biodiversity. Example: Guayaki utilizes indigenous practices and collaborates with local communities to grow nutrient-rich Mate Yerba, revitalizing ecosystems through their regenerative business model.			
Justice and fairness	**Nature rights and animal rights advocacy** Acknowledge and advocate for rights of nature and animals and move beyond an anthropocentric worldview, by providing animal-free and regenerative solutions that minimize land, water, energy use and emissions. Example: Those Vegan Cowboys developed the first cow-free cheese using milk protein from precision fermentation and strive to create ethical and equivalent protein alternatives that do not rely on animal use.	**Justice advocacy** Promote equality, human rights, fair labor practices, ethical sourcing, diversity and inclusion, and address systemic inequities and discrimination. Example: The ice cream company Ben & Jerry's advocates for justice and fairness through fair trade sourcing, support for marginalized communities, progressive policies, diversity and inclusion, and local community engagement.	**Responsible sourcing** Ethical and sustainable procurement that minimizes negative impacts, improves supplier practices, ensures transparency, and promotes fairness in the supply chain. Example: The Body Shop sources its ingredients ethically and sustainably and has implemented community trade programs that support small-scale producers and suppliers.	**Community investment** Prioritize social and environmental impact alongside financial returns, recognize businesses' role in addressing systemic issues, and support practices promoting diversity, inclusion, and ethical conduct. Example: The Blue Haven Initiative seeks to generate positive social and environmental impact alongside financial returns. The firm invests in businesses that promote gender equity, social justice, and environmental sustainability.	**Diversity and inclusion** A workplace culture that values differences, promotes diversity in hiring and promotion, ensures equal access to opportunities, and combats discrimination and bias. Example: Greyston Bakery practices inclusive employment and aims to provide opportunities to at least 40,000 Americans facing barriers to employment.
Value capture					
	Natural capital	**Cultural capital**	**Social capital**	**Financial capital**	**Human capital**
Multi-capital accounting and net positive impact	Assess environmental impact and achieve net positive impact on natural capital by decreasing the ecological footprint—the negative impact of one's products and services—and by increasing the handprint, i.e., the amount of impact that comes from substituting products and services in the market. Examples: Store more carbon than is emitted, replenish more water than is used, or contribute to higher species abundance than was there before.	Promote shared values, awareness, and behaviors aligned with regeneration. Example: German supermarket chain Penny (Rewe Group) tested an information campaign displaying both actual prices and true prices, accounting for environmental and social costs, to raise awareness of consumption practices' real impact.	Build trust by conducting, communicating and acting upon honest and holistic assessments of the social cost of a company's products and services. Example: A car has diverse social costs in terms of cost, for example, road infrastructure, delays caused by car traffic for other forms of mobility, noise, air pollution, exhaust gases, climate change, injuries or other health effects, estimated at a cost to society of €4674 for an average car.	Direct a share of the financial capital towards businesses and initiatives that prioritize the preservation and enhancement of natural, cultural, and social and human capital. Example: Paul Polman, former Unilever CEO, successfully convinced investors to reinvest financial capital into natural, social, and cultural capital by demonstrating the potential for responsible and sustainable business practices to drive long-term growth and create shared value.	Prioritize comprehensive employee development, well-being, and support, creating a resilient, engaged, and high-performing workforce. Example: Buffer, a social media management platform, prioritizes employee well-being and work-life balance through flexible working hours, a remote-first culture, and generous vacation policies, reducing stress and minimizing burnouts among its employees.

production and consumption (focus groups 1, 2 and 3). An example of a company that has such a holistic value proposition is Seventh Generation, a producer of eco-friendly household and personal care products that explicitly proposes value for both human health and the health of the planet, by utilizing plant-based, biodegradable ingredients, sustainable packaging, and ethical business practices, as well as high-quality, safe, and effective solutions (Seventh Generation, 2023). Another example, with a focus on human health, is Headspace, a company that provides a meditation and mindfulness app to reduce stress, improve focus, and enhance overall well-being (Headspace, 2023).

Based on the value proposition for societies and nature, organizations with regenerative business models co-create products and services that are healthy for people and nature, together with customers, suppliers and partners (Fullerton, 2015; Wahl, 2016). For example, ClayTec, a German construction business, uses clay, an ancient building material with minimal energy input and almost zero CO_2 emissions across the supply chain. It is locally sourced, pollutant-free and improves the health and well-being of customers with its regulating properties for a pleasant and mold preventing indoor climate (ClayTec, 2022). At the end of life, the materials break down safely into natural components.

For the shareholders and investors, the value proposition entails an organizational purpose aligned with norms, values and beliefs that are oriented towards the planet, diversity, inclusion and health (Hardman, 2013; Polman and Winston, 2021). An example of how this is practiced is Lush, a large cosmetics business that provides care products for its customers that are based on a rich diversity of natural ingredients, purposefully sourced in collaboration with indigenous communities. In November 2021, Lush announced it will be signing out from social media platforms Facebook, Instagram, Snapchat, WhatsApp and TikTok, until these platforms can provide a safer environment for their users. The decision was made in line with its value proposition to advance people's and nature's wellbeing (Lush, 2022).

To employees, this involves a value proposition of a healthy and meaningful place of work that create an intrinsic motivation, driven by the belief that each employee's contributions positively impact the organization's goals and broader societal values (Hardman, 2013; Hutchins and Storm, 2017; Slawinski et al., 2021). An example of a space that provides a healthy work environment is Phipps Conservatory and Botanical Gardens, which has built a Center for Sustainable Landscapes (CSL), a net-positive energy and net-zero water building (Piacentini, 2018). To build regenerative work environments, organizations need to adopt a different mindset and approach to work, one that helps people stay healthy and well, and is conducive to their growth. Increasingly, organizations with high employee turnover and burn-out rates recognize the phenomenon of 'quiet quitting' where employees have resigned internally and just do what is required. Reasons for quite-quitting include a lack of feeling cared about, few opportunities to learn and grow, and a missing connection with an organization's purpose (Harter, 2022). To counter this, organizations with regenerative business models prioritize the health, wellbeing and a sense of purpose among their employees.

3.1.2. *Value creation and delivery: regenerative leadership, co-creative partnerships with nature, and justice and fairness*

Organizations with regenerative business models conduct diverse activities to create and deliver their value proposition, most notably activities that promote regenerative leadership, co-creative partnerships with nature, and justice and fairness.

3.1.2.1. Regenerative leadership. Regenerative leadership engages people in developing higher levels of awareness and stimulates actions that regenerate different forms of capital, with a focus on natural capital (Hardman, 2013). Regenerative organizations put themselves in service of nature, with an intentional focus on preserving, restoring, and enhancing ecosystems and biodiversity, minimizing their environmental footprint, and actively contributing to the well-being of the planet's natural systems. Take Ecosia, an eco-friendly search engine that has environmental protection embedded in its ownership structure and allocates most of its ad revenue to fund global reforestation projects (Ecosia, 2022). At the same time, regenerative organizations put themselves in service to society, with a commitment to addressing social challenges, promoting equity, and creating shared value for the well-being and prosperity of the served communities. The shoe company TOMS, for example, invests one-third of their profits in grassroots initiatives, including cash grants and partnerships with community organizations, to promote and help create more equitable societies (TOMS, 2023).

The notion of being in service to nature also showed strong support across all focus groups. Especially the ones with indigenous perspectives described how they adapt their lives to live alongside the processes of nature, instead of trying to change nature to meet their needs (focus group 5). For example, one focus group participant described how the community left their land fallow when there was less water and turned to alternative economic activities to decrease water stress. They recognize that humans are fully dependent on nature and the weather, and that caring for nature is an important responsibility (focus group 6). Nature is seen as a living part of the family or organization instead of an 'other' (focus group 5). This requires changing the underlying values of how humans and organizations behave and how they work to be in sync with and support of nature (focus group 5). Regenerative leadership promotes 'two-eyed seeing', where Indigenous and Western perspectives are integrated to promote holistic understanding and respectful collaboration (Martin, 2012; Wooltorton et al., 2022).

For customers, suppliers and partners, this means developing a way of doing business that generates trust and a good reputation through demonstrated transparency, accountability, and commitment to sustainability for nature and local communities (Hardman, 2013; Hutchins and Storm, 2017). Consider the Mate company Guayaki, which has put regeneration and indigenous approaches to growing Mate at the heart of its business model and has published an impact report that details and quantifies the impact made on reducing greenhouse gas emissions, water stewardship, packaging and land preservation and biodiversity (Guayaki, 2021).

Shareholders and investors promote this regenerative leadership through a clear, inspiring and demonstrated vision and purpose that prioritizes the well-being of individuals, communities, and the environment, embedding health of nature and people into its core strategy, operations, and culture to create lasting positive impact. For instance, Roxanne Quimby, co-founder of Burt's Bees, a personal care brand, divested 80 % of her ownership to purchase land to have it designated and protected. In 2016, coinciding with the National Park Service's 100th anniversary, Roxanne donated 87,500 acres of Maine's North Woods—comprising majestic mountains, forests, and waters—to be federally protected as Katahdin Woods and Waters National Monument (Burt's Bees, 2023).

For employees, regenerative leadership involves a culture that allows them to engage in inner work, i.e., self-reflection and personal development to enhance self-awareness, emotional intelligence and the ability to have generative conversations about wicked problems (Ryff and Singer, 1996). This can help the organization innovate faster and more effectively, attract more customers, and make the business more successful (Sanford, 2017). The purpose, promoted by shareholders and investors, is co-created with the employees who are encouraged to engage in inner work, composed of keen observation, deep listening, and generative conversations (Hardman, 2013; Hutchins and Storm, 2017; Wahl, 2016; Sanford, 2017; Quarshie et al., 2021; Roland and Landua, 2015). An example comes from Paraja tribe members of focus group 5, where the women came together and recognized the need to change extractive agricultural practices, initiated generative conversations, and promoted conservation efforts. Ten years later, the local ecosystem regenerated, providing alternative food sources, more biodiversity, and improved environmental conditions.

3.1.2.2. Co-creative partnerships with nature. Value creation in regenerative business models is often based on learning from, co-evolving and ultimately thriving with nature in co-creative partnerships. An example of a design approach to thrive with nature is nature-inclusive design, which refers to product or service design that integrates measures to increase the suitable habitat for native plant and animal species populations that have been degraded (Hermans et al., 2020). To illustrate,

Studio Gang's Nature Boardwalk at Lincoln Park Zoo is an urban wildlife habitat and educational pavilion that transforms a former pond into a thriving ecosystem, promoting biodiversity and fostering a connection between people and nature in Chicago (Studio Gang, 2022). Another approach is referred to as nature-based solutions, i.e., practices that protect, sustainably manage and restore natural or modified ecosystems to address societal challenges like climate change, food and water security or natural disasters (Cohen-Shacham et al., 2016). For example, Notpla, which recently won the 2022 Earthshot prize, creates plastic-like food packaging from seaweed (Earthshot Prize, 2022). The packaging biodegrades naturally in compost in 4–6 weeks. The raw material, seaweed, is regenerative as it doesn't compete with food crops, requires no fresh water, helps deacidify oceans and provides fishing communities that are affected by climate change with an alternative source of income (Notpla, 2022).

For societies, thriving with nature helps build resilience and climate adaptation while drawing from the wisdom of indigenous communities and their knowledge. Developing resilience involves the capacity to anticipate, withstand, and adapt to climate change impacts and other disruptions by integrating proactive strategies to minimize risks, maintain operations, and seize new business opportunities. For instance, hotels and businesses on Mexico's Caribbean coast experienced less damage from hurricanes due to the protective Mesoamerican Barrier Reef System (Nature Conservancy, 2019).

Indigenous knowledge, evolving and being refined over thousands of years, offers invaluable techniques to foster harmony with nature and to adapt to climate change, such as preventing and controlling wildfires (Buono, 2020), understanding plant species, and conserving biodiversity (Gardner et al., 2022). This wisdom has also bolstered resilience in agricultural value chains, as ancient techniques facilitate sustainable yield generation and ecosystem health. Guayaki, a beverage company, exemplifies this by using indigenous practices to grow Mate Yerba, a nutrient-rich plant that once thrived in vast areas supporting native species (Guayaki, 2021). Their regenerative business model and collaboration with local indigenous communities have contributed to the revitalization of Mate plants and their ecosystems.

For customers, suppliers and partners, organizations with regenerative business models jointly design and provide nature-inspired and regenerative products and services that emulate nature's forms, processes, and ecosystems to develop resilient, and innovative solutions that improve the quality and quantity of the natural environment. Nature-inspired design concepts include biomimicry or cradle-to-cradle, with a focus on the biological cycle (Wahl, 2016; Stuchtey and Rosse, 2008; Caldera et al., 2018). An example of nature-inspired design is the Eastgate Centre in Harare, Zimbabwe. It has a passive cooling system that mimics the structure and ventilation mechanisms of termite mounds, maintaining comfortable indoor temperatures without relying on conventional air conditioning, significantly reducing energy consumption (Garcia-Holguera et al., 2016).

Furthermore, to build co-creative partnerships with nature, shareholders and investors invest a high share of financial returns to improve other forms of capital than only financial, with a focus on natural capital (Fullerton, 2015). This is based on ecological economics, a transdisciplinary field that has researched the interdependencies and the co-evolution of human societies and natural ecosystems since the late 1980s (Røpke, 2004). Natural capital refers to a stock of natural resources, including ecosystems, that provide a flow of goods and services to humans and organizations, also called ecosystem services, i.e., the benefits that people obtain from ecosystems (Hernández-Blanco and Costanza, 2018). The most iconic example of channeling financial flows back to nature is Patagonia's founder Yvon Chouinard who, at age 83, declared that "*Earth is now our only shareholder*" (Chouinard, 2022). Patagonia struggled to find a legal structure that supports the idea that all profits will be used to conserve and regenerate natural ecosystems, something not easily accommodated by current corporate legal frameworks (Chouinard, 2022).

Lastly, for the employees of an organization, thriving with nature refers to activities that deepen the connection to local nature, and an understanding and commitment of employees to preserving surrounding ecosystems, through team building, conservation volunteering, or implementing nature-based solutions (focus groups 2, 3), cultivating mental well-being and preventing burnouts (focus group 2). Going on walks in the forest and spending time in nature improves people's health, enhances their emotional state and alleviates feelings of anxiety and depression (Hutchins and Storm, 2017; Wen et al., 2019). This has also been associated with an increased engagement of people with biodiversity conservation measures, as more time spent in nature and in protected areas predicted small increases in connection with nature and positive conservation outcomes (Hatty et al., 2022). An example is the shoe company Timberland which has a "Path of Service" program that fosters environmental stewardship by giving employees paid time off to be in nature and participate in conservation efforts like tree planting and habitat restoration (Timberland, 2023). The focus groups confirmed that a sense of place and belonging is important for local communities to evolve their agroecosystems using regenerative techniques (focus group 2).

3.1.2.3. Justice and fairness. Organizations with regenerative business models also promote justice and fairness at different levels. For nature, they acknowledge and advocate for rights of nature and animals and move beyond an anthropocentric worldview in how to do business, by providing animal-free solutions that minimize land, water, energy use and emissions. For example, the company Those Vegan Cowboys is developing the first cow-free cheese using milk protein from precision fermentation and strive to create ethical alternatives that can free humans from their dependency on industrialized and unethical forms of animal farming (Those Vegan Cowboys, 2023). The idea of nature rights goes back to the seminal article titled '*Should trees have standing*' by Christopher Stone (1972). He eloquently explained that in legal history, previously unthinkable rights have been consistently extended over time, including children or human rights (Stone, 1972). The jurisprudence around rights of nature has received increasing attention over the past ten to twenty years, with a recent review counting 409 legal initiatives in 39 countries (Putzer et al., 2022). There is also an online monitor that helps keep track of the evolving landscape of nature rights initiatives (Eco Jurisprudence Monitor, 2022).

For the value creation of a regenerative organization, this means that plants and animals are seen to have an inherent worth and therefore deserve respect and care (Hernández and Muñoz, 2022). For businesses with close and often extractive and degenerative ties to the environment, the rights of nature may impact their future ability to do business. For example, the agrifood industry's ability to extract large amounts of water from streams, or the plastics and chemical industry's liability for the impact of their products on the health of rivers and oceans (when rivers and oceans have recognized rights) (Uldrich, 2021). Legal progress on this can be followed as it happens. Recent examples include the approval of Chile's Constitutional Convention to include rights of nature provisions in the country's draft constitution, Panama's adoption of a national rights of nature law, or Spain's first rights of nature law that grants legal rights to the Mar Menor lagoon (CDER, 2022).

On a societal level, regenerative organizations promote equality, human rights, fair labor practices, ethical sourcing, diversity and inclusion, and address systemic inequities and discrimination. They also value integrity, transparency, and constructive competition (Fullerton, 2015) and take a position in the face of rights infringements (Polman and Winston, 2021). This includes both distributive (how resources are allocated) and procedural justice (ensure fair processes) and their structural causes (Forum for the Future, 2021; Sanford, 2017). For example, the ice cream company Ben & Jerry's advocates for justice and fairness through fair trade sourcing, support for marginalized communities, progressive policies, diversity and inclusion, and local community

engagement (Ben and Jerry's, 2023). With regards to customers, partners and suppliers, organizations with regenerative business models engage in responsible sourcing, supported by supply chain transparency and the rights and access to information among suppliers, and support in terms of education, training and development. An example is the Body Shop, which sources its ingredients ethically and sustainably and has implemented community trade programs that support small-scale producers and suppliers (The Body Shop, 2023). For customers, this serves to educate them about the origins of a product's inputs and to continuously work and report on how the organization nurtures fairness and justice in its supply chain.

For shareholders and investors, justice and fairness mean prioritizing social and environmental impact alongside financial returns, recognizing businesses' role in addressing systemic issues, and supporting practices promoting diversity, inclusion, and ethical conduct. This requires the redistribution of profits and investments into the communities and natural ecosystems that provide the foundation of an organizations' business model. It demands a reframing of profit, from an end to a means aimed at planetary health and societal wellbeing (Forum for the Future, 2021). An example of this is the Blue Haven Initiative, which seeks to generate positive social and environmental impact alongside financial returns. The firm invests in businesses that promote gender equity, social justice, and environmental sustainability, and emphasizes diversity and inclusion in its own governance and decision-making (Blue Haven Initiative, 2023).

For employees, this refers to organizational inclusion and diversity, i.e., a workplace culture that values differences, promotes diversity in hiring and promotion, ensures equal access to opportunities, and combats discrimination and bias. An example of an organization that practices inclusive employment is Greyston Bakery, a food company that actively regenerates social and human capital. It has the vision to "*provide employment opportunities to at least 40,000 of the ten million Americans facing barriers to employment*" (Greyston, 2022). Organizations with regenerative business models acknowledge the value of diversity and invest in a diverse and inclusive workforce (Forum for the Future, 2021).

3.1.3. Value capture: multi-capital accounting and net positive impact

There has been a widespread agreement in the literature and the focus groups that regenerative businesses give more than they take and strive for net positive impact (Muñoz and Branzei, 2021; Polman and Winston, 2021; Mang and Reed, 2020; Perey and Benn, 2015). To achieve this, regenerative business models seek multi-capital optimization and impact accounting in both positive and negative terms. Next to understanding negative impacts, it is important to nurture a positive framing of impact. This is because of so-called asymmetries in anticipation, where the desire to experience positive outcomes is stronger than the desire to delay or avoid negative outcomes (Norris et al., 2021). This is a different psychological perspective on the relationship between humans and the natural environment and is assumed to be more motivating than a negative framing that aims at merely decreasing negative environmental or social impacts (Robinson and Cole, 2015). Regenerative business models acknowledge that this negative impact exists in its products and services and that it needs to be mitigated. In addition, it assumes and emphasizes that products and services, and how they are produced can also have a positive impact on the environment and communities. This idea of net positive impact requires multi-capital accounting across the different levels and types of capital.

For nature, it means assessing environmental impact and striving for net positive impact. Positive impact on natural capital happens on a spectrum of 1) restoring, to compensate for negative impact, 2) preserving, to avoid negative or have net zero impact, and 3) enhancing, to achieve net positive impact (Hahn and Tampe, 2021). According to the idea of net positive impact, organizations with regenerative business models achieve net positive impact on nature when their ecological footprint—the negative impact of their products and services—is smaller than their handprint, i.e., they build the capabilities to replace degenerative products and services with ones that, for example, store more carbon than they emit, replenish more water than they use, or contribute to higher species abundance (Norris et al., 2021).

For societies, regenerative business models invest in cultural capital, i.e. they promote shared values, awareness, and behaviors aligned with regeneration. For example, German supermarket chain Penny (Rewe Group) tested an information campaign displaying both actual prices and true prices, accounting for environmental and social costs, to raise awareness of consumption practices' real impact (Michalke et al., 2022). For customers, suppliers and partners, regenerative organizations build trust by conducting, communicating and acting upon honest assessments of the social cost of a company's products and services. Research on the social cost of products and services is widespread. A good example is the car, which has diverse social costs in terms of cost for road infrastructure, delays caused by car traffic for other forms of mobility, noise, air pollution, exhaust gases, climate change, injuries or other health effects. This is estimated at a cost borne by society of €4674 per year for the example of an Opel Corsa, over a lifetime of 50 years (Gössling et al., 2022). By providing transparency into externalized cost, companies can start incorporating the cost and redirecting financial flows into internalizing negative and generating more positive externalities (Fullerton, 2015; Seru and Mitchell, 2020; Roland and Landua, 2015).

Accordingly, shareholders and investors direct a high share of the financial capital towards businesses and initiatives that prioritize the preservation and enhancement of natural, cultural, social and human capital. For example, Paul Polman, former Unilever CEO, successfully convinced investors to reinvest financial capital into natural, social, and cultural capital by demonstrating the potential for responsible and sustainable business practices to drive long-term growth and shared value creation (Polman and Winston, 2021).

For employees, creating net positive value means prioritizing comprehensive employee development, well-being, and support, creating a resilient, engaged, and high-performing workforce. Information on rates of employee turnover, sick days, or reported conflicts or compliance issues indicate how well an organization is regenerating its human capital. This can then help advance programs that improve human capital, employee health and retention (Rappaport et al., 2020; Polman and Winston, 2021). An example of a company that is actively investing in employee health and wellbeing is Buffer, a social media management platform, through flexible working hours, a remote-first culture, and generous vacation policies, reducing stress and minimizing the occurrence of burnout among its employees (Forbes, 2019).

3.2. How do regenerative business models differ from sustainable or circular business models?

Based on the above framework of regenerative business models, we now compare them to sustainable and circular business models. We highlight what is different and where and how they overlap with the others. We pose that neither of the framings of regenerative, sustainable or circular business models are right or wrong. Instead, they provide different normative and sometimes overlapping perspectives on value creation for future fit organizations.

We frame these differences and overlaps in terms of their dominant systems views, main goals, as well as the design foci (Fig. 4). In their dominant systems view, we find that sustainable business models focus primarily on socio-technical systems, circular business models on closed-loop economic systems, and regenerative business models on social-ecological systems. In terms of their main goals, sustainable business models focus on the triple bottom line, circular business models on material productivity, and regenerative business models on planetary health and societal wellbeing. We also propose that the design foci of these three perspectives overlap. Sustainable and circular business models share a design focus on the circular technosphere (design for the

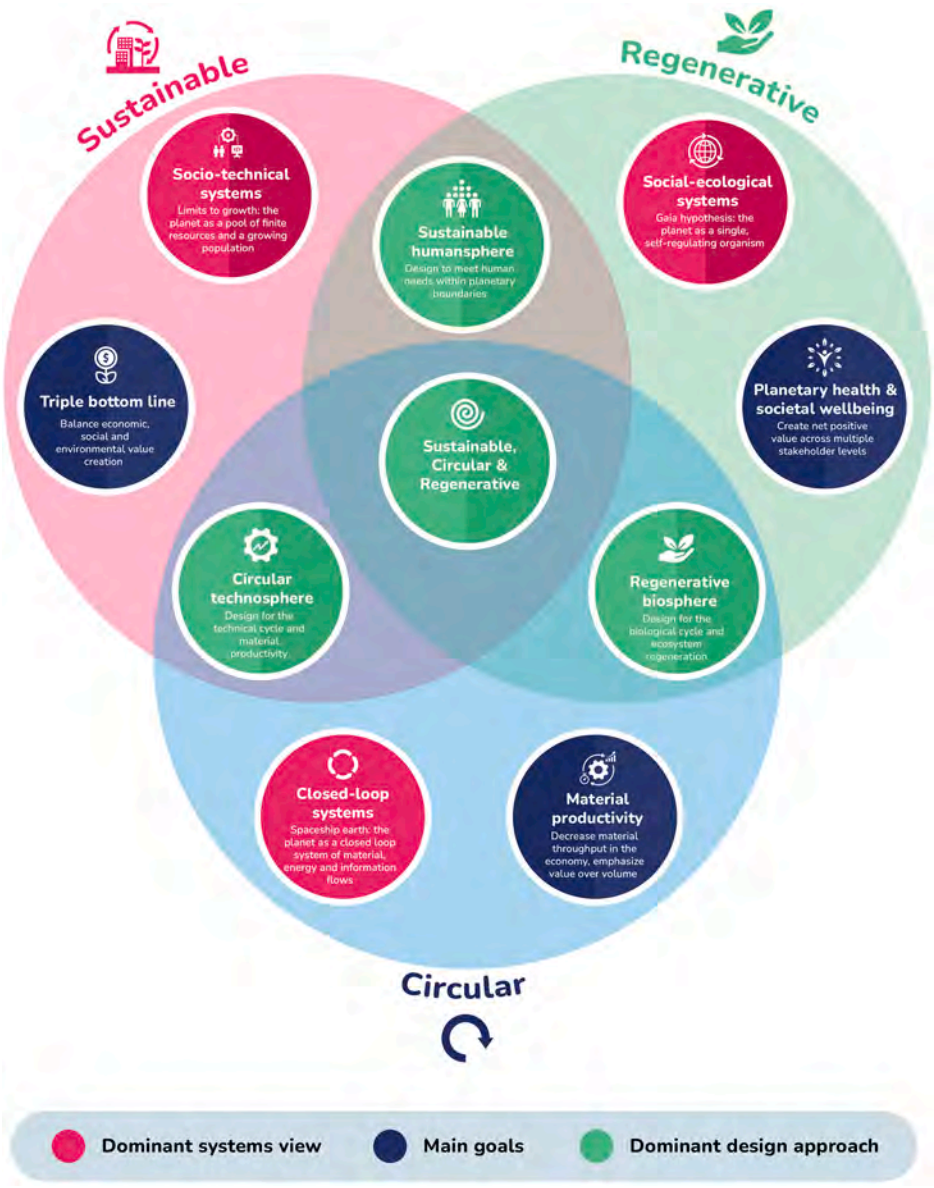

Fig. 4. The uniqueness of regenerative business model literature, and its overlaps with the sustainable and circular business model literature.

technical cycle and material productivity), sustainable and regenerative business models share a focus on the sustainable humansphere (design to meet human needs within planetary boundaries) and circular and regenerative business models share a design focus on the regenerative biosphere (design for the biological cycle and ecosystem regeneration). The swirl in the middle of Fig. 4 represents the co-evolutionary path of these design approaches, as they merge, learn from each other, and develop the theory and practice of sustainable innovation. We explain the differences and overlaps in more detail below.

3.2.1. The dominant systems views of sustainable, circular and regenerative business models

The dominant systems view of sustainable business models is on socio-technical systems, primarily product-service systems, and organizational, inter-organizational and societal levels, where nature is referred to in rather abstract terms as the environment (Boons et al., 2013; Stubbs and Cocklin, 2008; Evans et al., 2017). The key focus here is on the need to mitigate negative impacts on the natural environment and communities affected by business operations (Boons and Lüdeke-Freund, 2013; Boons et al., 2013). This view goes back to early sustainability scholarship where zero population growth was assumed to be a precondition for an environmentally sustainable civilization (Holdren and Ehrlich, 1974). This assumption is reflected in the framing around 'net zero', and the need to design low-impact products that reduce the ecological footprint of production and consumption (Stubbs and Cocklin, 2008). Sustainable business models are thus based on a "limits to growth" view of a planet with finite resources that cannot sustain infinite economic and increasing consumption and population growth (Meadows et al., 1972).

The dominant systems view in circular business models is not far off from this and shares some views around the so-called technosphere, and the need to make it more resource efficient and circular, to mitigate negative environmental impact by minimizing material and energy throughput in industrial systems (Merli et al., 2018; Lewandowski, 2016). Circular business models have an explicit focus on this with closed-loop economic systems of material and energy flows that are organized to minimize material and energy throughput, and maximize value creation (Geissdoerfer et al., 2017; Linder and Williander, 2017). Circular business models are based on the analogy of planet earth as a spaceship, which primarily sees a closed-loop system of material, energy

and information flows aiming at minimizing throughput by prioritizing value over volume (Boulding, 1966; Blomsma and Brennan, 2017).

Compared to the dominant systems views of sustainable and circular business models, regenerative business models take the perspective of social-ecological systems. They describe integrated and interdependent systems of natural ecosystems and human societies (Folke et al., 2010; du Plessis and Brandon, 2015) and have a strong focus on health and wellbeing. We therefore argue that regenerative business models are based on the Gaia hypothesis by Lovelock, which poses that the planet is a single, self-regulating organism (Lovelock, 1988; Lyle, 1996), an observation that has evolved into looking at social-ecological systems analogous to organisms composed of organs of tissues, tissues of cells and cells of proteins (Ostrom, 2009).

3.2.2. The main goals of sustainable, circular and regenerative business models

In terms of their main goals, sustainable business models aim at a balance between economic, social and environmental value creation, the so-called triple bottom line (Bocken et al., 2014; Geissdoerfer et al., 2018a, 2018b; Boons et al., 2013; Joyce and Paquin, 2016; Evans et al., 2017; Upward and Jones, 2016; Boons and Lüdeke-Freund, 2013; Stubbs and Cocklin, 2008). Animals and plants are mentioned only in abstract terms as 'the environment' in the seminal articles on sustainable business models. Circular business models aim at an increase in material productivity (Geissdoerfer et al., 2018a, 2018b; Linder and Williander, 2017; Geissdoerfer et al., 2017; Merli et al., 2018; Lewandowski, 2016; Bocken et al., 2016), with a markedly lower focus on the health of nature and the planet. And regenerative business models aim at the health and wellbeing of social-ecological systems (Hahn and Tampe, 2021; Muñoz and Branzei, 2021; Wahl, 2016). They often specify as their goals a type of societal or nature regeneration. For example, the work by Hawken (2021) is fully focused on the types of regeneration that would be possible for land, water, or species.

3.2.3. The design foci of sustainable, circular and regenerative business models

Each of the concepts of sustainable, circular and regenerative business models is grounded in normative concepts of what a societal transformation could look like (Boons and Lüdeke-Freund, 2013), e.g., a sustainable society, future circular economy or regenerative economy. Hence, sustainable, circular and regenerative business models are strongly associated with the ability of organizations to *design* new systems of production and consumption, and to develop co-creative partnerships with nature (Antikainen et al., 2017; Bocken et al., 2013; Lewandowski, 2016; Hahn and Tampe, 2021).

In sustainability and circular business model literature to date, there is a strong design focus on what the Ellen MacArthur Foundation (MacArthur, 2013) refers to as the technical cycle, the manmade materials and durable products as opposed to biological resources. We name the design approach at this intersection of sustainable and circular business models the circular technosphere (Bocken et al., 2014; Geissdoerfer et al., 2018a, 2018b; Boons et al., 2013; Linder and Williander, 2017).

Regenerative business practices are prominent in both circular economy and regenerative business models literature and practice, an intersection we refer to as the regenerative biosphere. In the circular economy literature, this is mostly referred to as design for the biological cycle, including biological, biodegradable and non-toxic materials that retain their renewability and whose decomposition contributes to ecosystem regeneration (Kusumo et al., 2022). The regenerative business model literature also has this reference (e.g., Wahl, 2016), although it goes a lot deeper into design approaches to improve and heal human-nature relationships.

The sustainable and regenerative business model literature shares a focus on meeting human needs within planetary boundaries, which we refer to as the sustainable humansphere (Upward and Jones, 2016; Boons et al., 2013; Forum for the Future, 2021). In sustainable business models, this often has a focus on the bottom of the pyramid (Boons et al., 2013). In regenerative business models, this is complemented with a focus on human health and wellbeing as priorities for organizational activities.

3.3. Discussion

The consistent degradation of natural capital over the past decades shows that humans and organizations have worked against, instead of with nature. This has led the UN's Secretary General António Guterres to call upon humanity to "*end the suicidal war on nature*" (UNRIC, 2022). To end this war and find peace, organizations need to find entirely new ways of doing business. This study contributes to business and sustainability studies through a definition and framework for regenerative business models, as well as a perspective on how regenerative differ from sustainable or circular business models, and where they overlap. The examples cited throughout this study show how organizations that are regenerative can also be profitable, and that making a profit and having a regenerative business model are not mutually exclusive. In the following, we discuss our findings and the limitations of this study.

3.3.1. Main foundations of a regenerative business model

While the field of regeneration is nascent and only gradually adopted by business, three key principles emerged across the literature and practice review and focus groups. Regenerative organizations:

- Recognize that human societies are deeply embedded in the biosphere, and that they depend on the health of the biosphere for their own health
- Have a value proposition of planetary health and societal wellbeing to nature and society at large
- Give more than they take and strive for net positive impact

Following these principles means finding entirely new ways of doing business at scale and in co-creative partnerships with nature and a focus on health and wellbeing. But organizations cannot do this alone. Ambitious policies are needed that incentivize the adoption of regenerative business models.

3.3.2. The need for strong policy frameworks and mindset shifts that stimulate the adoption of regenerative business models

There is a need for strong policy frameworks that include supply chain due diligence, carbon and environmental / true pricing, nature rights, and animal rights. Most countries have adopted at least one National Biodiversity Strategies and Action Plan (NBSAP) (Convention on Biological Diversity, 2022). For example, in the European Union, the 2030 Biodiversity Strategy is a comprehensive, long-term plan to protect nature and reverse the degradation of ecosystems (European Commission, 2022). The biodiversity strategy aims to put Europe's biodiversity on the path to recovery to benefit society, the climate and the planet (European Commission, 2022). As part of this plan, in June 2022, the European Commission also adopted a proposal for a Nature Restoration Law (European Commission, 2022).

In the USA, in 2022, at least 23 states considered legislation to increase biodiversity protection. For example, in the states of California, New York, Vermont, Washington and Utah, measures were taken to establish or strengthen goals to conserve at least 30 % of the nation's land and oceans by 2030, an initiative known as "30 × 30" (National Caucus of Environmental Legislators, 2022). And most recently, the COP 15 struck a historic deal to halt biodiversity loss by 2030, protect 30 % of Earth by 2030 and protect the rights of indigenous peoples (UNEP, 2022).

Yet, such upcoming legislation still needs to be adequately linked to organizations and aligned with their need to make use of natural resources. To date, measures to improve human-nature relationships tend

to be reactionary rather than visionary. For example, during periods of drought, farmers in some regions of the Netherlands were restricted in their groundwater use to water crops (Loef, 2022). However, preventive measures and policies would have been more powerful. After several years of droughts, some farmers have decided to start growing less water intensive crops (Siepman, 2022). Moreover, to tackle the nitrogen crisis, the Dutch government is taking measures on a sector-by-sector basis (e.g., agriculture, building sector, other industry) to reduce nitrogen oxide emissions that are harmful to the natural environment (KVK, 2022). More holistic and adaptive measures are needed to heal human-nature relationships. A focus on health and wellbeing means adopting policies that encourage a more plant-based and healthy diet, prices that reflect the true costs of products and services to society and nature, and nature and animal rights. Each of these are controversial policy suggestions, and intuitively opposed by many people, as they can involve hard trade-offs. For example, true pricing increases the cost of living for many basic goods, raising social concerns around their affordability. It is a political question how a regenerative economy can be supported to promote equitable access to products and services. The idea of regenerative organizations can be seen as a new vision around human-nature relationships and proposes planetary health as a guiding framework for how societies want to live and evolve. Policy for regenerative organizations is an important field for future research and the foundation to provide the right regulatory frameworks for regenerative business models to emerge.

3.3.3. Limitations and future work

We would like to acknowledge the following limitations and needs for future research on regenerative business models: the dangers of a 'capital-only' framing of value, the risk of new forms of greenwashing, and the need for deep-dives on the different concepts of this study.

First, there is a danger in framing nature or humans only in terms of capital and not in terms of their intrinsic value. It is important to investigate how organizations can develop intrinsic notions of value that move beyond quantifying everything in terms of some form of capital. Nature and animal rights provide a starting point for this shift in perspective on life. But it is still unclear how this can be applied to and made practical for organizational value creation.

Second, there is a risk of new forms of greenwashing from using the terms regenerative or net positive. Especially conflicting priorities among the different forms of capital—human, financial, social, cultural or natural—bear the question of how to assess when an organization is net positive. Clear standards and guidelines are needed for multiple capital, true-cost and impact accounting, so that organizations are comparable, and that their claims can be scrutinized. We argue, however, that the idea of regeneration in business does not have any higher risk of being misused than other sustainability related terms. Avoiding greenwashing in all its forms requires regulation and legislation.

Third, we are confident that our methods provide sufficient rigor for a first answer to the broad question of what regenerative business models are. The main foundation of this is the rigorous review of the existing literature, both from academic publications and popular books and reports. This provides a strong foundation to provide an initial answer to the first research question. The focus groups served to validate and critically discuss the findings from the literature and practice review and to add new themes, if any. The resulting framework is an initial attempt at conceptualizing regenerative business models. More research will be needed to provide alternative frameworks and go deeper into the institutional, strategic and operational aspects of doing business in regenerative ways. More research is also needed to better understand the planetary health implications of products and services, as well as different forms and cultures of regenerative leadership and design approaches that build co-creative partnerships with nature, promote justice and fairness, and enable true cost and impact accounting at multiple stakeholder levels.

4. Conclusion

This study sought to answer two research questions. First, what are regenerative business models? Second, how do regenerative differ from sustainable or circular business models? The answer to the first question is that organizations with regenerative business models focus on planetary health and societal wellbeing. They create and deliver value at multiple stakeholder levels—including nature, societies, customers, suppliers and partners, shareholders and investors, and employees—through activities promoting regenerative leadership, co-creative partnerships with nature, and justice and fairness. Capturing value through multi-capital accounting, they aim for a net positive impact across all stakeholder levels.

The answer to the second question is that regenerative business models add to the sustainable and circular business model literature with a focus on social-ecological systems (Berkes et al., 2000), based on an understanding of the planet as a living system, the so-called Gaia hypothesis (Lovelock, 1988). They also propose the new goal and framing of planetary health and societal wellbeing and advance a motivating narrative that aims not merely at the reduction of negative impacts (net zero) or the balance between economic, social and environmental value creation (triple bottom line), but at a redefinition of the relationship between humans and nature. Regenerative business models also add a focus on individual purpose and meaning, questions of leadership and spirituality, as well as nature and animal rights and the role of indigenous communities in helping to reconnect humans and nature. The three concepts of regenerative, sustainable and circular business models have overlaps in their design foci. Regenerative and circular concepts intersect where design efforts are aimed at the regenerative biosphere. Sustainable and circular connect on the circular technosphere; and sustainable and regenerative business models connect through the sustainable humansphere. This study intends to help advance organizational efforts to evolve humanity towards planetary health and societal wellbeing.

Funding

This research project has received funding from the European Union's Horizon 2020's European Research Council (ERC) funding scheme under grant agreement No 850159 (project Circular X www.circularx.eu).

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

The authors would like to extend their gratitude to the following people who helped realize this study: Rasika Ganame, Jagat Dora and Kavitha Ware who assisted in facilitating the focus groups with indigenous communities in India, as well as Fatima Delgado who opened her network in Ecuador to organize focus groups with (representatives of) indigenous communities. We would also like to thank Ann-Sophie Stoppelkamp for her support during the start of this study.

Furthermore, we would like to thank the following people for their participation in the focus groups: Ethan Smith, Nele Van Campfort, Anais Sägesser, Nguyen Hong Quan, Simona Nickmanova, Emmi Kimppa, Maya Zuckerman, Sofia Cavalleri, Alfred Bulaya, Tomas Santa Maria, Mattia Edoardo Curmà, Raj Dhabalia, Aravinth Raj Arivalagan, Sarah Dubreil, Bernd Herbert, Angela María Díaz-Márquez, Juan Carlos Pomaquero, and Caterine Gabriela Gaibor.

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