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Is Innovation Innovating? Towards regenerative sense-making and value-creation

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Towards regenerative sense-making and value-creation

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Sustainability discourses in industry, settings have motivated companies and a new generation of innovators to align with climate change mitigating measures. As climate change is increasingly disrupting the systems that uphold consumption and production patterns, the dominant paradigm for value-creation and innovation culture falls short of interrogating their impact on the social and ecological systems on which they depend. I am exploring how design may examine assumptions of innovation thinking and value-creation for fostering an ethical practice of regenerative culture. If innovation is design, how can it adopt design justice principles to evolve into respecting planetary boundaries yet speak to human comforts? Through the metaphor of the dandelion latte, I explore how radical design principles may be applied to create references for planet-centred systems of provisioning. Research through mapping facilitates the process of designing from a complex, pluralistic and caring perspective. The project lies within the theoretical context of design justice, meta design, systems theory, and regenerative design. This builds predominately on work by Mathilda Tham, Dulmini Perera, Pamela Mang, Tony Fry, Tobias Hahn and Maja Tampe. It aims to invite critique and engagement for stimulating the legitimisation of economies of care.

Regenerative innovation for climate action: meeting problems and possibilities

This paper explores ideas of regenerative innovation, ontological design, and second-order design fiction (SoDF) in the contexts of design and climate justice. I seek to explore how SoDF may be used to reframe narratives around the purpose and possibilities of innovation culture towards regenerative, equitable systems of provisioning and economies of care. This framing is presented as a philosophical counterpoint to mainstream populist approaches to sustainability that encourages more radical and fundamental changes to design innovation.

Despite developments in systemic innovation (Midgley & Lindhult, 2021), the paradigm of linear economic growth-focused approaches to sustainability is increasingly prevalent as sustainability strategies in commercial and start-up culture are becoming more widely appropriated and adopted. According to Kuhnhenn et al. (2021), the preferred Western climate mitigation strategy of favouring technological innovation falls short of meeting the targets set out in the Paris Agreement.

The design output from this project, the dandelion latte (Figure 1), presents a model for how commercial products can be reconceived within a more planet-centred paradigm. The drink seeks to foreground the tensions between notions of comfort, survival and design justice that I believe are essential but often overlooked in commercial sustainability practices. It highlights the current *agnotological* oversights in mainstream commercial sustainability practices; agnotology refers to the study of culturally generated deliberate ignorance and how some bits of knowledge are delayed or ignored (Agnotology, 2022).

Within this work, the planet-centred paradigm is conceived as a speculative, non-anthropocentric value logic that adheres to planetary boundaries. Fry (2022)

describes second-order design fiction as a mode of design that "directly articulate[s] with ontological design", confronting causality, and "repositioning the designer's placement before the act of design". He argues that it is, therefore, "one of the emergent means of expanding the way design is understood and practiced". Perera (2021) posits that "SoDF is not the name given for a product" but rather "a method of making the problem present" for a range of concerns. Following my exploration of SoDF in my past work (Bertmark, 2022), it is a reflection on how the narrative of progress and value creation in our dominant systems and tools fall short of meeting changing needs in light of preferred climate change mitigation strategies, uncertainty and changing values.

I use the dandelion latte similar to what Cobb (2021) describes as a 'trojan horse for a set of ideas' and as an exploration of 'redirective practice', described by Fry (2022) through "transforming what already exists". It also looks at how it may be part of the diverse value co-creation and ecological services that a business may provide to its biome and ecosystem when acting as a regenerative agent. The fiction speculates on the possibility of a complement to our existing coffee and tea consumption, which supplies are threatened by climate change and is entangled with harmful historical and present conditions. With this objective, collaborating with a locally abundant species of Northern Europe, such as dandelion, may also have the potential to restore and enhance local biodiversity (Scottish Wildlife Trust, 2022). The dandelion latte was developed as a tangible and consumable artefact for accessible sense-making through research and collaboration with baristas Mustafa Perçin, Tommy Hardman and Tilly Devlin. When applying a considered roast profile, grinding, and extraction method to dried dandelion root, it has the capacity to mimic caffè latte in its bitterness and acidity when blended with a milk, albeit being caffeine free. To stay true to the concept of what may be derived from a northern European climate, I used steamed pea milk.

My focus on regenerative value-creation is to tackle the upstream causes of unsustainable lifestyles that most of us have little choice but to participate in; This is defined by what is available, how it is produced, and how, as a society, our preferences help perpetuate particular practices. I believe that incremental innovation that places the duty of change on consumers may give a false impression of progress. Rather than

asking how individuals may take more responsibility for sustainable lifestyles, I explore how just design through displacement innovation may permit consumers to participate instead in enhancing socio-ecological systems. Josie Warden (2021) asks how designers can learn to "work with the uncertainty and emergence inherent within living systems and through their work create the conditions to allow for ongoing development and evolution?" (p.19).

My methodology has included literary reviews and mapping exercises, and I am applying theories from meta design to define the aim and context for my practice. Metadesign is described by Jones and Lundebye (2012) as the "design of design" and presents a "comprehensive and dynamic framework for responding to uncertainty" by creating the capacity for a transdisciplinary and consensual approach. Tham's creative practice Me, We, World, and back again is a "'meta design meditation" (Tham, 2022, pp. 19–32) of mapping complexity for gaining perspective on how we relate to the artefacts and processes we use to navigate the world. I have also critically evaluated regenerative principles and ideas of categorisation and considered the level of complexity and boundaries for the project's scope.

Figure 1. The dandelion latte © Anna Bertmark.

Context: unsustainable purpose

My work centres around the current tensions between the inescapable climate emergencies, the continued inadequacy of proposed solutions to the destructive effects of human behaviour, and what the role of design may offer to (re)solve some of these tensions. Tom Snow (2022) states that the "role of design is not to give answers, but to interrogate, interfere and ask good questions through models, to stimulate industry to give different answers".

The IPCC (Masson-Delmotte et al., 2018) reports that nationally stated mitigation ambitions currently proposed under the Paris Agreement will not limit global warming to 1.5°C. Many decision-making economists deem an economy to be healthy when "growth, unemployment, and inflation are in balance" (Amadeo, 2022), which, according to Jones (1999, p.3) they equate to annual GDP growth of at least 3%. However, this speaks little to the health of humans and ecosystems, on which the economy's existence relies.

According to Daly and McElwee (n.d.), almost every economy and commercial organisation is based on an economic growth strategy, which is still currently coupled with inevitably harmful impacts. As our present individual and societal well-being is coupled with the well-being of other humans and ecosystems of the past, present and future, I argue for a greater emphasis on equity, intergenerational and planetary justice in the world of innovation and value-creation.

Climate change-mitigating pledges and tools have been created to tackle the degree of business activities' impacts on ecosystems. The Science Based Targets' (n.d.) Net Zero Standard was just recently agreed upon in late 2021 as the first framework for setting decarbonisation targets aligned with science-based requirements. However, Cranston and Steffen (2019) highlight that this is yet to become obligatory and only impacts some of the nine planetary boundary transgressions. Despite the many emerging legal obligations, there are few restrictions on harmful consequences of economic activity.

Trent Brown (2016) describes how sustainability has become an empty signifier, as the word has come to represent ambiguous and diverse meanings. This can obscure intentions by not providing a clear, meaningful, and actionable definition. In traditional

business structures, introducing sustainability strategies requires alignment with the core business goals, which are almost always that of shareholder primacy (Shareholder Primacy, 2022). Herein lies the challenge, as business practices based on Western economic value logic are governed and rewarded in ways that seem incompatible with the limited capacity of earth's systems and the climate challenges that we face. As a result, sustainable business discourse tends to preserve the status quo by design, so the value-creation approaches remain unsustainable. It sustains business interest rather than the systems that enable it. This leads me to the question: if adhering to the Brundtland report's (1987) definition of sustainable development, is sustainable business an oxymoron?

Paradigms, entrepreneurship, and innovation

I believe there is a link between the issue of "sustainable business", the global and intergenerational injustices being committed, and Western culture's relationship with its story about the future. The future is a core part of our being and is subject to continuous reflection and imagination. Although it doesn't yet exist and is characterised by uncertainty, humanity's relationship with the future has been long distinguished by the quest for prediction for securing survival. This relationship has been and continues to be the origin of the creation of human worldviews.

The current dominant economic paradigm in the West can be traced back to the Renaissance (Alm et al., 2012, p. 73), where the idea of temporal and spatial limitlessness and endless possibilities gained a foothold. This paradigm enabled some members of Western society to break free of past moral and systemic constraints, which led to exploration, exploitation, extraction of the gifts of the earth and the delaying of debts onto future generations. Stern (Carrington, 2022) states that "economists have grossly undervalued the lives of young people and future generations who are most at threat from the devastating impacts of climate change". Therefore it may be understandable if younger generations' perception of the future may not seem as limitless and open to endless possibilities, as older generations.

According to Joe Carlen (2016, p.1), the French word entrepreneur was frequently translated to 'the adventurer' in English during the 1700s. A romantic notion of the word

transferred from traditional masculine activities of exploring, going to war and hunting into a context of risky economic activity with potentially large rewards. According to Adam Toren (n.d.), the neoclassical story of the entrepreneur can be compared to The Hero's Journey narrative, which speaks to an inherent capacity and right to be the master of one's destiny. It implies that everyone has this capacity and therefore denies responsibility for one's negative impacts on others along the way.

Midgley and Lindhult (2021) highlight how Schumpeter's mid-20th-century theories on innovation saw the role of the entrepreneur as an important actor in overcoming resistance to conventional processes and approaches. According to Joyce and Paquin (2016), the entrepreneurship discourse rarely considers how it systemically relates to the world. The phenomenon and narrative of entrepreneurship as a virtuous vocation, but rarely questioned in terms of purpose and impact, is perpetuated within UK Government-funded organisations.

Organisations such as RISE (n.d.) that support start-ups currently favour innovation that adheres to an approach to sustainability belonging to an anthropocentric paradigm. The wider purpose for innovation in the context of tools, such as Knowledge Transfer Network's (n.b.) Innovation Canvas and Osterwalder and Pigneur's (2010) business model canvas, often falls short of analysing the innovation's impact on socio-ecological systems. In short, it is understood as being 'good because it's new'. It fails to consider future, present or past stakeholders but optimistically pins its hopes on an uncertain future where resources and time are thought of as unlimited and at odds with the laws of nature.

Therefore, diversifying references for innovation to include adhering to planetary limits can be seen as a philosophical problem of conflicting interests, values and priorities. Robinson (2022) states that "if we really wish to create new startups which are authentic, purposeful and regenerative as well as sustainable, we need new ways to model them in a systemic manner". According to Midgley and Lindhult (2021, p. 642), "the idea of a systems hierarchy (or set of nested systems) is important to this ecologically-orientated understanding of innovation".

Donella Meadows' (n.d.) twelve points theory placed the ability to act and see beyond paradigms—and to create new ones—as effective levers for intervening in a system to create change. Therefore, it is important to interrogate current rules and frameworks that may not serve us as new necessities emerge. Chand (n.d.) argues that it is important to acknowledge that no paradigm is 'true', nor can it be tested, but that "it is built on a number of assumptions that deal with the nature of reality" and that it "provides the basis on which we build our verifiable knowledge". According to Thomas Kuhn (1970, pp. 17-18), "to be accepted as a paradigm, a theory must seem better than its competitors, but it need not, and in fact never does, explain all the facts with which it can be confronted". He states that "paradigms are assumed to be self-evident truths during times of normal science". His theory of paradigms identifies two phases of scientific research: the normal and the revolutionary. This relates to systems design as scientific revolutions occur when scientists find anomalies in the accepted dominant paradigm that can't be explained, which questions the whole worldview.

After enough differences in the "normal" paradigm are found, and assumptions and beliefs no longer reflect the experience of reality, it reaches a crisis (tipping) point. A new paradigm is formed, and "an intellectual battle takes place between the followers of the new paradigm and the hold-outs of the old paradigm", Chand (n.d.) states. Could the tensions we are currently encountering be the starting point of a new paradigm forming? Mang and Haggard (2016, p. XXII) argue that how we define ideas depends on our assumptions about the world. Within the current mechanistic paradigm, sustainability professionals and those willing to create change are only capable of acting within certain ideas of progress.

As I researched this project through mapping, I collated terminology related to regenerative design principles from literary reviews (Figure 2). Its purpose was to get an overview of mindsets, systems and outputs through a structure inspired by Dark Matter Labs' Stacks (n.d.) and Mathilda Tham's (2022) Me, We, World, and back again reflective practice and Bryan et al.'s Systems Thinking Iceberg Model (2006). This served as a sense-making research exercise that allowed me to unpick the existing concepts to explore and design from a different path. I identified significant barriers to the transition to regenerative innovation needed to mitigate and adapt to climate change,

including, but not limited to, our view of the future and the systems that shape the tools we use. These factors dictate our definitions of prosperity, purpose, and capacity for change.

Regenerative design principles

In contrast with degeneration, which describes a process of decline and destruction, Mang and Haggard (2016, p. 20) believe that "a regenerative project seeks to build the evolutionary capacity of the systems into which it is designed". Josie Warden (2021) divides the notion of regeneration into a way of being and seeing the world as an unfolding paradigm. She posits that "having a regenerative mindset means seeing the world as a living system, built around reciprocal and co-evolutionary relationships and wholes, where humans, other living beings and ecosystems rely on one another for health."

Bill Reed's (2007) regenerative diagram has also inspired scholars, architects, and designers to employ these principles in their work and research. Variations on regenerative principles have been summarised by Western scholars and practitioners such as Josie Walden, John Fullerton, Pamela Mang and Ben Haggard, Jenny Andersson and Carol Sandford. Walden (2021) identifies them as; working from the potential of place and context, seeking different perspectives, building capacity and reciprocity, taking a nested view of success and consequences, designing for circulation, creating space for emergence, designing from a hopeful vision of the future and to work on the inside as well as the outside. Mang and Haggard's (2016) guidelines include maintaining the potential for evolution, aligning with the wisdom of nature, defining projects by their roles instead of products and services and growing value-generating capacity. Fullerton's (2015, p.44) principles for regenerative capitalism are in the right relationship between humans and nature, viewing wealth holistically, being innovative, empowering participation, honouring community and place, edge effect abundance, robust circulatory flow and seeking balance. Andersson (n.d.) defines regenerative businesses as having a planetary purpose, thinking intergenerational equity, designing for creativity and innovation, thinking patiently, operating systematically, thinking collaboratively, being multi-capitalist and seeking new legal models. Applying Doughnut Economics Action Lab's (n.d.) principles to business reveals similar conclusions of preferred traits.

Within this work, I have used Design Justice Network (2020) principles as a lens to interrogate value-generating activity to help avoid "unwittingly reinforcing the matrix of domination". According to the Design Justice Network (2018), their principles may also facilitate the alignment of innovation intentions to regenerative principles. The principles can be summed up in the core values over what the design's motivation is and who is involved in the design process, who/what is harmed and who/what benefits, as an adaptive way of generating shared design principles (Design Justice Network, 2020) (Figure 3). If replacing the instances of 'designer' with 'innovator' in these principles when using the tools for innovation and value-creation, it further exposes issues of paternalism and agnotology of the impact innovation can have and the possible injustices caused in rewarding such innovation.

Without wishing to appropriate and extracting ideas from already marginalised communities, I want to highlight those practices of regenerative principles, such as anti-fragility (Derbyshire, 2022), honourable harvesting (Wall Kimmerer, p. 157), companion planting and symbiosis, form the basis for many traditional ways of knowing for survival from Indigenous peoples around the globe. The need for Western scholars to intellectualise these practices into formal frameworks points to how the mechanistic paradigm has separated our culture from the knowledges of survival in balance with nature.

PLANET-CENTRIC / ECOLOGICAL

Local
EASIER TO CHANGE

PRODUCT

Materials, services, technologies, processes; What we do.

Dandelion Latte (local & seasonal produce)

Low-energy innovation (analog AI)

Design for evolution

Soil-as-Service

Eco-stewardship Roles over siloed services and products

Legal requirement to declare supply chain transparency

VISIBLE

INVISIBLE

SYSTEM

Business models, regulations, policy, infrastructure; How what we do is distributed, organised and goverened.

Limit growth if it means harmful effects on SES   Flexibile/Experimental

Multi-profit

Open source   Collaboration & Diversification

Growth diversity   Adaptation policies

End-of-Life planning   Regenerative principles of production and consumption

Net-positive impact

Cyclical reporting

Honourable harvesting

Outside-in approach (Business strategies derived from socio-ecological system requirements)

CONTEXT

PARADIGM
(CULTURE & MINDSET)

Driving logic, purpose of society, values, norms, language, meaning; Why we do what we do. The assumptions that deal with the nature of reality.

"Time is life"   Relational   Anti-fragility

Finite resources   Entanglement

Good ancestry

Ecology of knowledges   Ambiguity

Symbiotic

Impermanence   Pluriversal   Embedded

Regenerative spectrum of enhancing SES
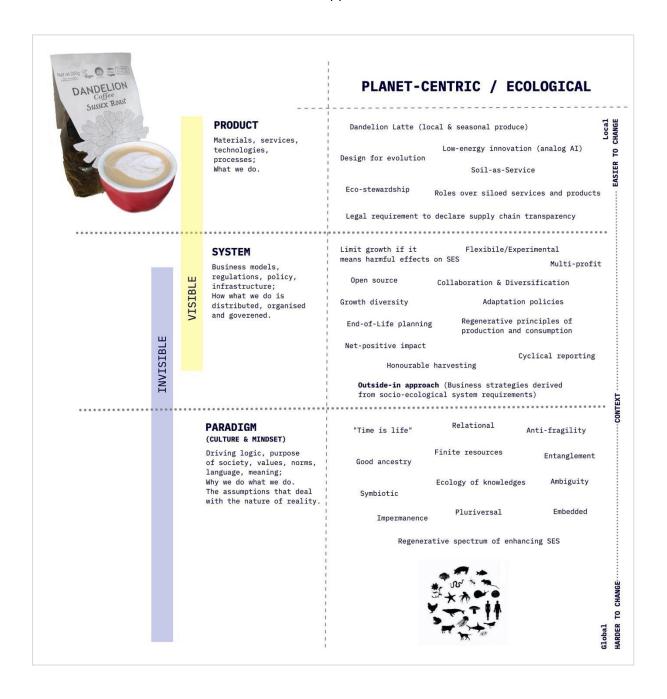
Global
HARDER TO CHANGE

Figure 2. The dandelion latte as a metaphor and model in the context of the planet-centred paradigm map of regenerative terminology that may make up a planet-centred paradigm and design fiction from which the artefact originates. Research from my creative practice and literary review, and map theoretical mapping approach adapted from Tham's "Me, We, World and back again" meta design meditation, Dark Matter Labs' Stacks (n., and Bryan et al.'s Systems Thinking Iceberg Model.
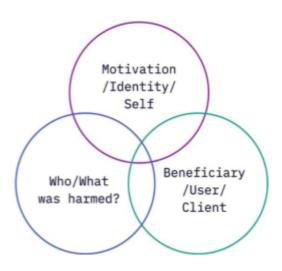
Figure 3. Adapted from The Design Justice Network Principles.

The need for, and challenges of, new tools

Growth within the corporate discourse assumes growth for all, but it's important to interrogate when growth is discussed; what do we hope to grow and for whose benefit? Jenny Andersson (2019) states that "The Limited Liability Company, designed over 200 years ago, gave the corporate organisation the ability to operate without recourse to intergenerational responsibility". She posits that the "immediate barrier to progress is the legal forms available for organisations to operate within" and argues that new legal models are needed to make the necessary changes and transition towards making regenerative business a realistic option. I believe that the present Western value logic is a product of a paradigm from a different time, which is another reason to call for different models that are designed for our present challenges and pluralistic desires. It is important to remember that business models and structures are fictional boundaries, and businesses are mere tools for value creation. Thorn (2022) states that an idea can be seen as a piece of technology, a type of mental tool that focuses our attention and comes with its own way of seeing. These tools then shape the subjects (us) that use them, and with prolonged use, the tools can become 'invisible'. Therefore, we

sometimes don't think about where our tools come from or how they work until they cease to function in the way we expect them to. According to Sandford (2022), regenerative business is a paradigm shift, as it "thinks about systemic change in how it does business, working to create a greater capacity for all living beings, thus promoting each realising its essence". At odds with mechanistic ideals and possibilities, the goal of regenerative business isn't to scale up but to find its optimum size for the role of what the project or organisation sets out to do. Liu and Davison (2021) state that "the first step towards business as a regenerative practice is the recalibration of our idea of success. If we don't do this, we simply get swept up in all the dominant narratives and expectations". Regenerative organisations and projects, therefore, first consider the needs and potential of a system rather than what problem it sets out to solve. It is also important to consider at which point a regenerative project or enterprise has reached the end of its lifecycle once it has achieved its goal.

Hahn and Tampe's (2021) work provides an overview of the nuances of regenerative principles, criteria and practical applications of regenerative strategies across businesses. They identify that regenerative capacity lives on a spectrum rather than as a binary choice and that it "offers an alternative to the dominant approach to business sustainability that is based on an inside-out approach". The inside-out approach bases the organisation's business goal as a starting point for creating sustainability principles, while the outside-in approach derives business strategies from socio-ecological system requirements. They analysed various models of sustainable and regenerative organisations and divided levels of regenerative ambition and capacity into three main levels; preserve, restore and enhance, whereby the latter was the most ambitious. I have adapted their tables 'Principles and Practical applications' (Figure 4) and 'Principles and criteria of regenerative business' (Figure 5), respectively, into nested models, highlighting the 'enhanced' characteristics that they identify in each category. The blurred lines highlight the spectrality of the approach and the nuance of the capacity of the principles when applied in practice. The original tables can be found in the appendix. They conclude that long-term organisational resilience and regeneration "cannot be well managed without an understanding of the feedback effects across nested systems."

I have proposed that the act of innovating is designing. Therefore, applying principles of design justice and regenerative sustainability is to "weigh up" the ethics and benefits of our innovations. The dandelion latte represents a possible displacing innovation outcome and, for a familiar purpose, is derived from local system requirements and capacities. It serves many purposes through enhancing regenerative action, enabling consumers with nurturing capacity and stewardship of socio-environmental systems within a planet-centred narrative rather than through a destructive system of provisioning. Synthesising these principles into the packaging label facilitates the design as a practice of *alathea,* defined as "unconcealment" and honest disclosure (Fry, 2022), in contrast to its more typical agnotological power.

While this research shows how regenerative enterprise can work in practice, many barriers remain for it to become mainstream. Regenerative business models are unlikely to see wide adoption in the near future, but it provides a viable option to having sustainability 'tacked on' or to the conventional business case of product or service innovation. Hahn and Tampe (2021) state that net positive outcomes in business activities are not always possible, as it requires a different 'possibility space'. I believe that we urgently need accessible and practical manifestations of the regenerative concept. Our destructive structures and tools still project an illusion of permanence to the detriment of a manageable and just systems transition. According to Kahupi et al. (2021, p. 1), "the overall barrier hindering the success of some sustainable innovations is not their cost, but the human nature to put off change until problems become critical". We know we need to change but are easily distracted by profundities which absolve us from feeling bad, so we keep participating in the usual patterns of harm. The inability to solve sustainability problems quickly also tends to elevate people who give wild promises and simplified solutions.
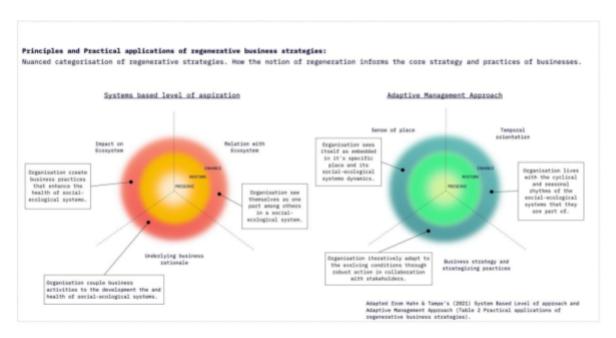
Figure 4. Principles and practical applications of regenerative business strategies. Model adapted from research according to Hahn and Tampe (Table 1).
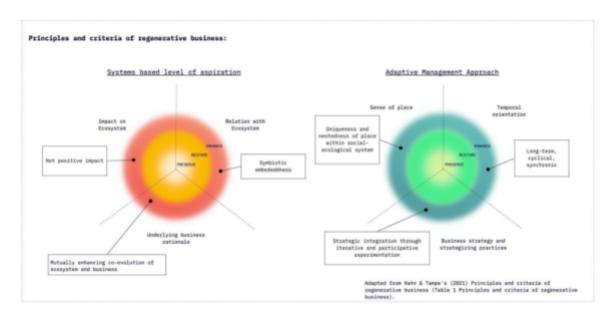

Figure 5. Principles and criteria of regenerative business. Model adapted from research according to Hahn and Tampe (Table 2).

Conclusion

This paper seeks to interrogate the insufficient capacity of sustainability discourse in industry. I explore how meta design and second-order design fictions may provide models to reframe the narrative around the possibilities, purpose, and displacing innovation towards more equitable, regenerative and caring economies and systems of provisioning. The often-lauded "sustainable" product has a limited capacity to support socio-ecological systems when originating from the dominant anthropocentric paradigm, giving a distorted sense of progress. As climate change is increasingly disrupting the systems that uphold consumption and production patterns, the dominant paradigm for value-creation and innovation falls short of acknowledging its impact on the social and ecological systems on which it depends. I argue that if innovation is design, it is important to apply design justice principles to innovation thinking to align with equitable planetary boundaries and evolve tools for value creation.

The output of the project, the dandelion latte, is a model of displacing innovation that allows for regenerative consumption that emerges from a regenerative and planet-centred paradigm with a northern European perspective. The design emerges from confronting causalities and presents a way to encounter and reflect on agnotological, harmful and unjust global systems of provisioning. It also illustrates how change reveals what we want to keep and not solely what we need to replace. Through this project, I looked at how design may be used to examine assumptions of innovation thinking, value-creation and entrepreneurship for fostering an ethical practice of regenerative culture. I conclude that we need more evolved systems and models of producing value. Rather than asking individuals to live more "sustainable" lives, I believe more focus can be placed on how value-logics may ensure innovation that provides citizens with capability and access to just and diverse options to meet their needs and desires. New models and references are needed that offer an inherently restorative and enhancing capacity for socio-ecological systems to include a wider range of concerns and values. This requires an innovating and governing approach that is open to experimentation, flexibility, unusual alliances, and evolving systemic thinking and practice.

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Figures

Figure 1. Dandelion latte made by barista Tommy Hardman and author. Photo by author.

Figure 2. Map of terminology that may make up a planet-centred and ecological paradigm design fiction, from which the dandelion latte originates. Map adapted from Dark Matter Labs' Stacks (n.d.) and Mathilda Tham's (2022) Me, We, World, and back again reflective practice and Bryan et al.'s Systems Thinking Iceberg Model (2006).

Figure 3. Venn diagram adapted from the Design Justice Principles, Design Justice Network.
https://designjustice.org/news-1/2016/05/02/2016-generating-shared-principles

Figure 4. Principles and practical applications of regenerative business strategies. Model adapted from research according to Hahn and Tampe (2021 (Appendix Table 1).

Figure 5. Principles and criteria of regenerative business. Model adapted from research according to Hahn and Tampe (2021) (Appendix Table 2).

Appendix

Table 1. Principles and criteria of regenerative business.

Principles		Systems based level of aspiration			Adaptive management approach		
	Criteria / Strategies	Impact on ecosystem	Relation with ecosystem	Underlying business rationale	Sense of place	Temporal orientation	Business strategy and strategizing practices
	Exploit	Impact as externality	Domination	Maximize shareholder value	Disembedded from place and ecosystem	Short-term, linear	Business as usual within minimum legal requirements
Degree of regeneration	Restore	Compensate negative impact	Instrumental separation	Secure exploitation and maximize yield from ecosystem	Place and ecosystem as exchangeable commodity	Transactional, linear	Enlightened business as usual through post hoc repair, punctual and unilateral intervention
	Preserve	Avoid impact or net zero impact	Mutually dependent co-existence	Operate business within ecological boundaries	Acknowledgement of place-specific characteristics and requirements	Long-term, linear	Adjustment of business operations through regular feedback and adaptation
	Enhance	Net positive impact	Symbiotic embeddedness	Mutually enhancing co-evolution of ecosystem and business	Uniqueness and nestedness of place within social-ecological system	Long-term, cyclical, synchronic	Strategic integration through iterative and participative experimentation

Table 2. Practical applications of regenerative business strategies.

Principles		Systems based level of aspiration			Adaptive management approach		
	Criteria / Strategies	Impact on ecosystem	Relation with ecosystem	Underlying business rationale	Sense of place	Temporal orientation	Business strategy and strategizing practices
Degree of regeneration	Restore (Nestle's agroforestry initiative)	Firms deploy damaging activities, such as open pit mining, but acknowledge the need to repair the damage.	Firms see ecosystems, such as mineral deposits, as commercially valuable objects to be owned and exploited.	Firms optimize the rent from exploiting ecosystems under the constraint of restoring ecosystem functioning.	Firms engage with place to the degree necessary to restore ecosystem functioning, for instance, through renaturation plans.	Firms interact with the ecosystem for the limited time of the transaction, often codified through temporary exploitation rights.	Firms adhere to profit maximizing strategies but adjust practices so that SES can resume functioning.
	Preserve (Sustainable tourism, net-zero)	Firms choose practices that safeguard the functioning of the SES, such as restricting access to ecotourism sites.	Firms understand that they depend on functioning ecosystems, such as ecotourism sites.	Firms are willing to limit business growth to remain within the carrying capacity of the ecosystem they depend on.	Firms seek to understand the conditions and dynamics of local SES they rely on.	Firms are interested in the long-term functioning of ecosystems that they depend on.	Firms react to changing conditions of SES to preserve the status quo, such as fauna and flora of an ecotourism destination.
	Enhance (Shorefast Fogo Island, Playa Viva)	Firms develop business practices that enhance the health of SES, for instance, through farming practices that increase soil quality.	Firms see themselves as one part among others in a SES.	Firms couple their business activities to the development and health of SES.	Firms see themselves as integral part of a specific place and its SES dynamics.	Firms live with the cyclical and seasonal rhythm of the SES they are part of.	Firms iteratively adapt to the evolving conditions through robust action in collaboration with stakeholders.

SES: social-ecological system.