The Trauma that Made Climate Change Possible

Psychological Preconditions for Sustainability Transitions

Discussion Paper III: Preconditions for Transformation

Author
Adina-Iuliana Deacu

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This paper is part of a six-paper series that examines how regenerative economic systems can emerge by connecting systemic diagnosis (Paper I), conceptual redefinition of business purpose (Paper II), psychological preconditions for transformation (Paper III), practical tools for cultivating agency (Paper IV), and enterprise architectures capable of stabilizing these capacities in practice (Paper V), before examining the policy environments required for wider adoption (Paper VI).

Summary

If redefining business is the paradigmatic shift required for systemic transformation (Paper II), what psychological preconditions are necessary to implement it? Despite rapid advances in renewable energy, digital efficiency, and green innovation, sustainability transitions remain insufficient in scale and speed to stabilize planetary systems. This paper argues that these limitations cannot be understood through technological or policy analysis alone, because social systems are fundamentally constrained by the psychological, physiological, and cultural capacities of the humans who design and inhabit them. Building on the systemic diagnosis developed in Paper I and the redefinition of business proposed in Paper II, this paper examines the human infrastructures that condition whether transformative change becomes possible.

Drawing on insights from neuroscience, psychology, behavioural economics, public health, decolonial thought, and ecological economics, the analysis conceptualizes trauma and chronic stress as forms of invisible infrastructure that shape economic behaviour, risk perception, institutional inertia, and social trust. It shows how collective nervous system dysregulation, scarcity cognition, distorted money narratives, and imagination collapse interact to reproduce extractive economic patterns, even among actors who intellectually support sustainability. These dynamics constrain attention, imagination, and behavioural capacity, reinforcing the value–action gap widely observed in sustainability transitions.

This paper therefore argues that the transition from a profit-maximizing paradigm to one oriented toward social value cannot be achieved through conceptual redefinition alone. It requires addressing the psychological and cultural conditions that enable individuals and institutions to perceive, relate, and act differently. In this sense, healing is reframed not as a private or therapeutic concern, but as a structural precondition for systemic transformation. Restoring regulatory capacity, relational trust, and imaginative possibility becomes a form of collective infrastructure necessary for change, preparing the ground for the practical tools and learning environments developed in Paper IV.

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Contents

1 Introduction

The Limits of Technocratic Sustainability

Sustainability transitions research has produced sophisticated models for decarbonization, circular economy design, and socio-technical change (Geels, 2002; Köhler et al., 2019). Yet empirical outcomes persistently fall short: emissions remain misaligned with planetary boundaries, biodiversity loss accelerates, social polarization deepens, and public trust erodes (Calvin et al., 2023; IPBES, 2019).

Mainstream strategies prioritize technological substitution, market incentives, and regulation. While necessary, these approaches assume rational, coordinated actors and often ignore the cultural and epistemological foundations of the "modern/colonial" worldview built on separation and extraction that generated the crisis (Machado de Oliveira, 2021). They also overlook how cognition, emotion, and decision-making are fundamentally shaped by stress, trauma, social context, and embodied states (McEwen & McEwen, 2017; Sapolsky, 2017).

The four dimensions of business redefinition discussed in Paper II—problem-solving orientation, planned obsolescence, profit-as-enabler, and multidimensional value—require corresponding human capacities: empathy and systems thinking; capacity to perceive multidimensional value; sufficiency-oriented money psychology; and comfort with impermanence and transition. Paper I demonstrated that environments designed by profit-centric logic function as stress-amplifying systems; this paper shows that the resulting chronic stress becomes internalized as trauma and nervous system dysregulation. This analysis extends the framework of Papers I and II using several critical concepts. Trauma as infrastructure describes how chronic stress becomes embedded in institutional designs and collective behaviours, linking directly to the cognitive load lock-in mechanisms analysed in Paper I. Scarcity mindset encompasses both material lack and manufactured psychological scarcity. Collective nervous system dysregulation refers to population-level physiological stress states shaped by environmental design, which is a somatic manifestation of the "invisible environmental designer" from Paper I. These concepts explain why technical solutions alone fail: the human "operating system" must be addressed alongside physical systems.

This paper proposes that sustainability transitions are bounded by collective psychological and somatic capacity, which is constrained and systematically reproduced by extractive institutional design. It also advances a causal chain in which extractive economic systems generate chronic stress and trauma; trauma manifests as collective nervous system dysregulation and scarcity cognition; these states suppress imagination, trust, and long-term thinking; and these constraints, in turn, cause societies to reproduce the very systems they consciously reject. Crucially, these constraints directly undermine implementing the business paradigm redefined in Paper II. Without addressing the trauma, scarcity cognition, and nervous system dysregulation examined here, the shift from profit-maximization to social problem-solving remains cognitively and emotionally inaccessible, trapping actors in the value-action gap even with regenerative intentions.

Trauma, chronic stress, and scarcity cognition act as structural constraints on governance, innovation, and cooperation yet remain marginal in sustainability policy. Importantly, these are not only diffuse social ailments but are mirrored and amplified in the psychological profiles of the leaders and architects of extractive systems. This creates a self-reinforcing loop: traumatized leaders design institutions that replicate their inner landscapes of scarcity, control, and disconnection, which in turn traumatize populations and constrain collective capacity for change. This trauma-leadership feedback loop presents a fundamental barrier to the business redefinition proposed in Paper II. When economic systems are architected by leaders operating from unhealed trauma, institutional designs prioritize control and extraction over the relational stewardship and collective problem-solving central to regenerative business. Healing this trauma infrastructure is therefore a structural prerequisite: it prepares the cognitive and emotional ground for the paradigm shift from profit-as-objective to profit-as-enabler (Paper II, Section 3.3). Consequently, addressing psychological infrastructure requires examining both its widespread symptoms and its specific, powerful sources, particularly within the domains of leadership and finance. However, it must be mentioned that in this paper, healing is not understood as individual therapy, but as the collective restoration of regulative, relational, and imaginative capacity at individual, communal, and institutional levels. The following sections examine the psychological

infrastructures that constrain these capacities, moving from trauma and physiological regulation to scarcity cognition, money psychology, behavioural reproduction, and imagination collapse to illustrate the depth of the issue.

2 Trauma as Invisible Infrastructure of Extractive Systems

In this paper, trauma is not approached as an individual clinical phenomenon but as a population-level pattern of prolonged stress exposure that becomes embedded within institutional systems. Extending Paper I's analysis of how the invisible environmental designer shapes cognition and behaviour, trauma can be understood as a form of psychological infrastructure underlying extractive economic systems. Chronic exposure to stress, instability, and threat generates environmental and cognitive load lock-in (Paper I, Section 3.1), in which individuals and institutions operate under conditions that systematically impair the executive function, emotional regulation, and adaptive problem-solving required for sustainability transitions (McEwen & McEwen, 2017; Van der Kolk, 2015).

This trauma infrastructure is produced through multiple overlapping forms of structural stress. Adverse childhood experiences, economic insecurity, environmental instability, and chronic work pressure accumulate into allostatic load—the physiological wear and tear produced by sustained stress exposure (Felitti et al., 1998; Shonkoff et al., 2012). When such stressors occur at scale, they generate population-level patterns of anxiety, impulsivity, cognitive narrowing, and diminished capacity for long-term decision-making. For example, sociological and political economy research demonstrates that contemporary economic systems often intensify these pressures through precarity, inequality, and competitive labour markets (Standing, 2016; Wilkinson & Pickett, 2010). From this perspective, extractive systems do not simply produce environmental or economic harm; they also generate chronic psychosocial stress that shapes how individuals perceive risk, authority, and possibility.

The historical and intergenerational dimensions of trauma further deepen its systemic effects. For instance, decolonial and ecological scholarship highlights how colonial dispossession, cultural erasure, and the rupture of reciprocal relationships between communities and ecosystems have produced enduring patterns of collective trauma (Kimmerer, 2020; Menakem, 2017). Such trauma does not remain confined to historical events but continues to influence cultural memory, identity formation, and institutional trust. Research in post-conflict and post-genocide contexts similarly demonstrates how unprocessed historical violence can shape social relations and political behaviour across generations unless addressed through processes of dialogue, mourning, and relational repair (Gobodo-Madikizela, 2016).

Crucially, these conditions become embedded within institutional architecture through specific psychosocial mechanisms that translate trauma into organizational behaviour. Institutional betrayal occurs when trusted institutions fail to prevent harm or actively contribute to it, deepening collective distrust and compounding psychological injury (Smith & Freyd, 2014). Moral injury arises when individuals working within bureaucratic systems are required to implement policies that violate their ethical commitments, leading to distress, disengagement, and burnout (Litz et al., 2009). Organizational silence further stabilizes these patterns when fear suppresses the reporting of problems, preventing institutional learning and perpetuating harmful practices (Morrison & Milliken, 2000). Through these mechanisms, trauma becomes encoded within institutional cultures, shaping environments characterized by burnout, risk aversion, and diminished capacity for adaptive change.

However, while scholarship often emphasizes the trauma these systems produce in the general population, it is equally important to examine how trauma shapes the leaders and decision-makers who design and maintain such systems. As physician and trauma expert Gabor Maté (2022) argues, many traits commonly rewarded in contemporary leadership cultures (e.g. hyper-competitiveness, emotional dissociation, relentless productivity, and control-oriented decision-making) can reflect survival adaptations rooted in unprocessed childhood trauma. These traits may function effectively within high-pressure economic environments, yet they also shape institutional cultures that prioritize dominance, competition, and expansion over relational or ecological wellbeing.

Biographical analyses of prominent corporate and political leaders illustrate how unresolved childhood trauma can manifest as compulsive domination, grandiosity, or emotional

detachment. These are all patterns that readily scale into organizational norms and policy decisions (Trump, 2021; Vance, 2015). This does not imply that social crises are reducible to individual psychology. Rather, it highlights a reinforcing loop in which traumatized individuals may reproduce the same competitive and defensive environments that shaped their own experiences. In this way, extractive systems both produce trauma and are partly constructed by actors whose decision-making is influenced by unprocessed trauma and survival-oriented worldviews. This is important because research in trauma-informed governance increasingly recognizes that unaddressed trauma undermines policy legitimacy, social trust, and institutional learning (Hübl & Jordan Avritt, 2023; Magruder et al., 2017).

Taken together, these dynamics reveal a trauma loop embedded within contemporary socio-economic systems. Extractive institutions generate chronic stress and instability that shape collective cognition and behaviour, influenced by leadership cultures and governance structures that reproduce conditions of competition, insecurity, and environmental exploitation. Trauma therefore functions simultaneously as both cause and consequence of systemic crises.

Recognizing this loop is essential for sustainability transitions because reform efforts that fail to acknowledge the psychological dynamics shaping elite decision-making cannot create the relational environments necessary for secure, empathetic leadership. From this perspective, trauma does not remain confined to individual psychology. It becomes embedded in institutional systems and manifests physiologically through collective nervous system dysregulation, shaping perception, threat sensitivity, and social interaction across societies.

3 Collective Nervous System Dysregulation

Collective nervous system dysregulation emerges from the interaction of three reinforcing environments: socio-technical media systems, accelerated temporal regimes, and spatial conditions of ecological and urban stress. Neuroscience increasingly conceptualizes regulation as socially embedded. The autonomic nervous system is co-regulated through relational environments, institutional rhythms, and spatial design (Feldman, 2017; Porges, 2011). High-density urban environments, digital overstimulation, economic precarity, and media polarization contribute to chronic sympathetic activation ("fight-or-flight") and reduced parasympathetic recovery ("rest-and-digest"), establishing a baseline of physiological alert.

This state can be understood through the lens of Polyvagal Theory, which posits that the vagus nerve, a key component of the parasympathetic system, has evolved to support social engagement and co-regulation (Porges, 2011). Central to this is the concept of "neuroception"—the nervous system's unconscious, subcortical process of continuously scanning the internal and external environment for cues of safety, danger, or life threat. In a healthy, regulated state, neuroception detects cues of safety (e.g., familiar faces, calm voices, predictable environments), allowing the "social engagement system" to come online, facilitating connection, communication, and cooperative problem-solving. However, modern socio-technical systems are increasingly engineered to hijack this process. Algorithmic architectures of social media and 24-hour news cycles amplify threats, social comparison, and outrage, flooding the neuroceptive system with cues of chronic social danger (Brady & Crockett, 2019; Vogel et al., 2014). Similarly, polarized political discourse often relies on dehumanizing rhetoric, which the nervous system interprets as a threat, triggering defensiveness and impairing cognitive flexibility (Haidt, 2013). These designed environments create neuroceptive traps—contexts that persistently signal threat, locking individuals and collectives into sustained defensive arousal.

This dysregulation is exacerbated by the spatial and temporal design of extractive societies, which systematically disrupt natural and communal rhythms essential for nervous system recovery. "24/7 digital capitalism" demands constant availability, blurring work-rest boundaries and contributing to the severe dysregulation of widespread sleep deprivation (Crary, 2014; Walker, 2017). Sociologist Judy Wajcman (2015) analyzes this as a "temporal disorder," where the acceleration and commodification of time create a chronic stressor that erodes spaces for reflection. Furthermore, the loss of connection to communal and seasonal rhythms, replaced by artificial, profit-driven cycles, severs a fundamental anchor for biological regulation (Macy & Johnstone, 2012). This temporal disorientation couples with the spatial experience of "slow violence"—the gradual, attritional harm from pollution, climate change, and economic decay (Nixon, 2011). Unlike acute disasters, slow violence is a creeping, often invisible threat that evades immediate neuroceptive detection yet accumulates as a background condition of pervasive insecurity, fuelling an ambient, chronic anxiety that further dysregulates collective physiology.

Population-level dysregulation often manifests in heightened social reactivity, political polarization, burnout, and declining institutional trust. These are conditions that weaken collective problem-solving and reduce long-term governance capacity (McEwen & McEwen, 2017; OECD, 2023). These outcomes are not only psychological or political but also physiological. Chronic stress disrupts the regulatory systems through which individuals maintain emotional balance and social attunement, making cooperative deliberation and adaptive learning more difficult. Somatic and Indigenous scholarship further suggests that this dysregulation reflects a deeper form of disconnection: an alienation from the body and from the ecological contexts that historically supported human co-regulation and relational awareness. Scholar Bayo Akomolafe (2017), for example, argues that settler colonialism can be understood as a trauma lodged in the body, one that fractures embodied and place-based relationships. Healing, in this perspective, requires re-inhabiting embodied and emplaced ways of being that restore a felt sense of connection both to one's own body and to the specific ecological and cultural landscapes one inhabits. From this vantage point, urban design, work organization, and social policy do more than structure economic activity. They shape the physiological conditions that enable or constrain cooperation, trust, and innovation. These embodied dynamics also influence how individuals perceive risk, scarcity, and opportunity, a phenomenon examined in the next section through the concept of scarcity mindset.

4 Scarcity Mindset and Fear-Based Decision Making

If trauma shapes the baseline physiological state of societies, scarcity cognition shapes how individuals interpret resources, risk, and opportunity within those environments. Behavioural economics demonstrates that scarcity captures cognitive bandwidth, reduces executive control, and promotes short-term optimization over long-term planning. Scarcity environments increase tunnel vision, risk aversion, and defensive behaviour, all traits that reinforce the status quo even when it is widely recognized as harmful (Mullainathan & Shafir, 2014).

Chronic economic insecurity and time pressure institutionalize scarcity cognition across populations, reinforcing the cognitive load lock-in described in Paper I, Section 3.1, where overloaded environments erode capacity for systemic thinking and long-term planning (Zwane, 2012). Neuroendocrine stress responses further amplify threat sensitivity and reduce cognitive flexibility (Sapolsky, 2017). As ecological economist Manfred Max-Neef and colleagues (1991) argue, poverty is not merely a lack of goods but a systemic scarcity of opportunities, breeding a pervasive mindset of lack that is easily exploited by consumer economies.

To fully grasp the societal grip of scarcity, a critical distinction is necessary. Absolute scarcity refers to the objective, life-threatening lack of necessities like food, water, and shelter. Manufactured scarcity, in contrast, is a socially produced fear of losing status, security, or advantage within systems of perceived abundance, distinct from absolute material lack. It is engineered through algorithms, marketing, and competitive institutional design to drive consumption and productivity (Mullainathan & Shafir, 2014). While absolute scarcity is a brutal material reality for billions, manufactured scarcity operates as a psychological engine of consumer capitalism, creating a background condition of anxiety even for the affluent. Social media algorithms, for instance, are designed to manufacture scarcity in attention and social validation, fuelling compulsive engagement through fear of missing out (FOMO) (Alter, 2017; Brady & Crockett, 2019). Similarly, advertising and neoliberal ideologies actively produce scarcity in time (“24/7”), personal adequacy, and future security to drive perpetual consumption (Cushman, 1990; Wajcman, 2015). As Amartya Sen’s (1999) work on entitlements implies, this manufactured scarcity is not a natural condition but a political-economic outcome that distorts priorities and entrenches inequality. It creates a society-wide “scarcity trap” where cognitive bandwidth is hijacked by artificial deficits, leaving little mental space for envisioning systems based on sufficiency and shared abundance.

This explains why organizations and governments often default to incremental efficiency improvements rather than transformative restructuring, even when scientific evidence supports radical change (Stoknes, 2015). Operating within a cognitive landscape shaped by both absolute and manufactured scarcity, the perceived risks of transformation are magnified, and the capacity to conceive of alternative, abundant systems is severely diminished. Scarcity cognition does not emerge in isolation; it is institutionalized and politically reproduced.

This societal scarcity trap is actively maintained by policies and narratives crafted within leadership cultures shaping and shaped by trauma, as discussed in Section 2. The inability to envision abundance is thus a systemic feature reproduced by leadership paradigms that equate security with control and view sufficiency as a threat, which raises the importance of discussing money psychology.

5 Money Psychology as the Embodiment of Trauma and Scarcity

Scarcity cognition becomes most visibly institutionalized through societies' relationship with money, where psychological narratives of fear, security, and worth are encoded into economic institutions. A critical yet overlooked dimension of our psychological infrastructure is our collective and individual relationship with money, which is a subject directly relevant to Paper II's framing of profit as an enabler versus profit as an objective (Paper II, Section 3.3). Money is not just a neutral medium of exchange but a psychological projection screen for deep-seated beliefs about safety, worth, power, abundance, and scarcity (Argyle & Furnham, 2013; Tang, 1992). The trauma and scarcity encoded in our money psychology directly oppose the regenerative economic principles proposed in Paper II: where Paper II positions financial surplus as a means to sustain problem-solving capacity, unhealed money trauma treats accumulation as an end in itself, reinforcing extractive patterns despite intellectual commitments to change.

To understand this, it is important to first recognize that money's modern form as a universal, abstract commodity is a historical anomaly that enables psychological disembedding. For most of human history, "economic" transactions were deeply embedded in social and sacred relations (Polanyi et al., 2010). As anthropologist David Graeber (2014) illustrates, early credit systems and "special-purpose monies" (e.g., shell strings, cloth) were tools for creating and maintaining social relationships. Money was a language of sociality, not separate from it. Its transformation into an impersonal, all-purpose tool—a process legal scholar Christine Desan (2014) argues was a deliberate constitutional project of early modern states to centralize power and fund warfare—stripped money of its relational context. This abstraction allowed value to be quantified and circulated independently of social or ecological reciprocity. This fostered what decolonial scholar Sabelo J. Ndlovu-Gatsheni (2013) identifies as a key colonial outcome: the dislocation of indigenous economic consciousness and the imposition of an extractive, disembedded logic. This historical shift laid the groundwork for the psyche of separation we experience today, where financial gain can be mentally divorced from its social or environmental cost.

This disembedded and traumatic relationship is mirrored and amplified in the psyches of those who architect global financial systems. The leadership trauma analysed in Section 2, characterized by hyper-competitiveness, emotional dissociation, and a relentless drive for control, becomes encoded in modern finance's design principles. As political economist Mark Blyth (2015) argues, post-2008 austerity was less a rational economic response and more a policy reflex born of a deep-seated, fear-based orthodoxy around debt and scarcity. Furthermore, the volatility and predation in speculative finance can be interpreted as a trauma re-enactment, institutionalizing patterns of hyper-vigilance and relational rupture. This creates a "pathology of extraction" in global financial architecture. As African political economist Thandika Mkandawire (2014) details, the imposition of scarcity-driven doctrines (like structural adjustment programs) on the Global South has replicated colonial-era extraction, inflicting socio-economic trauma by dismantling public systems. The compulsive, growth-at-all-costs logic of shareholder capitalism, analysed by Indian economist and philosopher Amit Bhaduri (2009) as "predatory growth," reflects a societal-level addiction to accumulation that mirrors individual trauma responses of hoarding and insecurity. When leaders operating from a place of trauma design monetary policy and financial institutions, they create inherently dysregulating systems that replicate conditions of threat and disconnection. Therefore, healing our collective relationship with money necessitates not only personal work but also a trauma-informed scrutiny of the psychological drivers embedded in the highest echelons of economic power.

Internalized economic trauma, stemming from poverty, debt, economic violence, or living within systems predicated on endless extraction, shapes unconscious money scripts. These are core, often unexamined beliefs about money formed in childhood that automatically drive financial behaviours. Scripts such as "money is security," or "more is never enough" drive hoarding, overconsumption, and aversion to models based on sufficiency (Klontz & Britt, 2012).

The lived experience of debt under this abstract system provides a potent case study of economic trauma. Debt is a psychosocial state of subordination carrying profound weight (Han, 2011). Psychologically, it is linked to shame, chronic anxiety, and a foreshortened future orientation where long-term planning becomes impossible. Systematic reviews confirm a strong, bidirectional relationship between unsecured personal debt and deteriorated mental and physical health, mediated by chronic stress (Drentea & Lavrakas, 2000; Richardson et al., 2013). This trauma is racialized and gendered; historical debt peonage and contemporary microfinance schemes often entrap communities in cycles of intergenerational obligation, reproducing colonial patterns of extraction (Hudson, 2017; Karim, 2011).

This stands in stark contrast to the psychology fostered by the regenerative principles in Paper II. Where debt psychology is rooted in lack and obligation, the profit-as-enabler framework requires a psychology of “enoughness”, which is a conscious move away from accumulation toward sufficiency (Twist, 2017). It also requires “circulatory wealth,” where value is understood to increase through sharing and social circulation, as seen in many Indigenous and African communitarian philosophies (Coulthard & Alfred, 2014; Gyekye, 1996). These frameworks foster security, generosity, and a long-term, relational orientation, deriving well-being from the health of the network, not the size of the private stockpile.

Healing this rift requires confronting the "shadow" of money—the unprocessed emotions and trauma we project onto it—and consciously reintegrating economic activity into the fabric of relational care (Mullainathan & Shafir, 2014). As Twist (2017) argues, this involves transforming our relationship with money from one of fear and scarcity to one of “right relationship,” where money becomes a tool for expressing our highest values and fostering life.

Therefore, practices from transformative finance, community economics, and somatic therapy that address money trauma and reprogram scarcity narratives become core infrastructural work. They rebuild the internal capacity to envision and enact regenerative economies based on reciprocity, circulation, and “enoughness,” rather than extraction and accumulation (Anielski, 2007).

6 Why People Reproduce Systems They Intellectually Reject

The psychological infrastructures described in the previous sections do not remain internal states; they translate directly into organizational behaviour and institutional decision-making. This section therefore examines how trauma, scarcity cognition, and nervous system dysregulation make people continue to reproduce systems they consciously reject. As discussed in Paper I, knowledge doesn't automatically translate into behavioural change due to the value action gap mechanism (Blake, 1999; Kollmuss & Agyeman, 2002). On top of that, habitual routines, identity threats, institutional lock-in, and emotional safety needs stabilize existing systems (Argyris & Schön, 1978; Kahneman, 2011).

Fear of loss, uncertainty, and social exclusion activate defensive rationalizations that justify continuity (Jost et al., 2004). Even sustainability advocates often reproduce extractive behaviours under institutional pressure, reflecting misalignment between values and embodied capacity, which is another manifestation of the value-action gap discussed in Paper I. This is amplified by the daily psychological labour of 'metabolizing hostilities' (Machado de Oliveira, 2021), i.e. navigating systems that are inherently harmful, which depletes the energy needed for transformative action.

To achieve behavioural change, it is critical to examine the more complex psychological and moral positions that sustain complicity. The concept of "wilful ignorance," as developed by philosopher Nancy Tuana (2006), describes the active, though often unconscious, process of avoiding knowledge that would compel us to act against our interests or unsettle our worldview. This is not a lack of information, but a strategic moral and psychic avoidance that allows individuals and institutions to benefit from harmful systems while maintaining a positive self-concept. Complementing this is the framework of "implicated subjectivity," articulated by Michael Rothberg (2019). This perspective moves beyond the binary of perpetrator/victim to describe how many of us occupy positions of indirect responsibility and benefit within structures of historical and present-day violence and inequality, such as global supply chains or racialized economies. This enmeshment creates profound ambivalence: a genuine intellectual rejection of the system coexists with a lived, often unexamined, dependence on its privileges. This ambivalence, as postcolonial scholars like Ashis Nandy (2010) have long argued, is a defining psychic feature of colonized (and colonizing) subjects, leading to complex identificatory processes that bind people to the very systems that harm them.

At the organizational and institutional level, this complicity and ambivalence manifest as structural inertia, which can be powerfully analysed through the lens of "competing commitments" (Kegan & Lahey, 2009). This theory posits that alongside our stated, progressive commitments (e.g., to decarbonize, to implement equity policies), we hold powerful, usually hidden, "competing commitments" that are immunized against change. For a corporate manager, a competing commitment might be to "not undermine departmental stability" or "not alienate senior leadership." For a policy-maker, it could be to "avoid appearing radical" or "not jeopardize re-election." These hidden commitments are profoundly shaped by the institutional environments often created by traumatized leadership. When organizational cultures prize hyper-competitiveness, punish vulnerability, and are led by figures who view relationality as a weakness—patterns traced to leadership trauma in Section 2—the "safety" that competing commitments protect often aligns with surviving within that toxic paradigm rather than transforming it. The work of metabolizing hostilities, therefore, includes navigating the specific psychological demands imposed by leaders whose own unmet needs for safety and control become embedded in institutional norms. These competing commitments are not flaws, but "loyalties": protective attachments to existing relationships, identities, and forms of safety. They create a "dynamic equilibrium" of non-change, where every effort toward transformation is silently counterbalanced by an equally powerful, unseen force maintaining the status quo. This model provides a more nuanced explanation than "lock-in" by locating the source of resistance not merely in external structures, but in the internal psychological architecture of individuals and groups woven into those structures. This gap explains widespread climate anxiety combined with political paralysis (Clayton et al., 2021). Together, these dynamics restrict not only behaviour but imagination itself, a constraint examined in the next section.

7 Imagination Collapse and Future Illiteracy

Beyond shaping behaviour, these psychological and institutional dynamics also constrain the cognitive horizon through which societies imagine possible futures. Future studies research highlights declining collective imagination capacity under conditions of uncertainty, crisis saturation, and algorithmic attention economies (Milkoreit, 2017; Poli, 2021). When futures become cognitively inaccessible, societies default to reactive governance and short-termism.

Imagination is a cognitive skill supported by psychological safety, narrative coherence, and embodied regulation (Immordino-Yang et al., 2019). Trauma and chronic stress suppress exploratory cognition and creative foresight. Indigenous and post-development scholars remind us that "future literacy" is not a neutral skill but is culturally patterned. Colonialism actively suppressed Indigenous futurities and prophecies, enforcing a single, linear, and progress-oriented timeline (Kothari et al., 2019). Recovering plural, cyclical, and relational imaginations of time is thus a decolonial act essential for viable futures.

Critically, this collapse is an active political and economic process. The imaginative space vacated by stress and trauma is readily colonized by dominant narratives that serve existing power structures and constrain agency. On one side lies the pervasive corporate and state-sponsored narrative of "solutionism": the belief that complex socio-ecological crises can be solved with discrete, market-ready technological fixes without challenging underlying systems of power or consumption (Bendor, 2018; Morozov, 2013). This narrative, often critiqued as a form of "greenwashing," offers a seductive fantasy of continuity, foreclosing deeper questions about justice, sufficiency, and radically alternative ways of organizing life. On the opposite side flourishes a culture of dystopian and apocalyptic inevitability. While rooted in legitimate scientific warnings and historical trauma, a singular focus on collapse can become, as Caribbean scholar-activist Édouard Glissant (1997) warned, another form of intellectual surrender, a failure to imagine the right to self-determined futures for marginalized peoples. As post-development and pluriversal scholars argue, both solutionism and apocalypticism are two sides of the same colonized coin: they represent profound imaginative failures that foreclose the vast terrain of plural, radically alternative futures (Escobar, 2018; Kothari et al., 2019). They prevent the collective envisioning of societies built on relational ontologies like buen vivir (Andean) or ubuntu (Southern African), which exist outside the binary of techno-optimism and doom.

This colonization of the imaginative field is inextricably linked to the economic psychology of power. The dominance of solutionist narratives is underwritten by financial and political elites whose worldviews, shaped by trauma and scarcity, as analysed in previous sections, cannot conceive of value outside growth and control, thus funnelling imagination into market-friendly techno-fixes. Conversely, apocalyptic inevitability can serve as a perverse solace for the same elite psyche, absolving it of responsibility for systemic change. As Kenyan philosopher and novelist Ngũgĩ wa Thiong'o (2011) contends in Decolonising the Mind, the most potent power is the power to define reality and foresee the future. Restoring the collective imagination, therefore, requires dislodging this power from the grip of a traumatized economic and political leadership that is, itself, future-illiterate.

Without future literacy, transformative pathways cannot be collectively envisioned or legitimized. When survival-oriented cognition and defensive routines dominate, the mental space required for generative, long-term thinking contracts, leading to the collective 'imagination collapse' examined here.

8 Healing as Structural Condition for Transformation

If trauma, dysregulation, scarcity cognition, and imagination collapse constrain transformation, healing must be understood as systemic capacity-building rather than individual medical recovery. Public health research demonstrates that population wellbeing strongly predicts economic productivity, civic participation, and innovation capacity (Allen & Marmot, 2014). Trauma-informed organizational models show improvements in trust, learning, and adaptive capacity (Bloom & Farragher, 2013). Globally, Indigenous-led and community-based healing movements centre cultural revitalization, land reconnection, and intergenerational dialogue as foundational to systemic health (Kimmerer, 2020; Waziyatawin, 2008)

Within the context of this paper, "healing" must be understood not as a private, clinical activity but as a public and systemic process. It is defined here as the deliberate, collective restoration of regulative capacity—the ability to maintain physiological, emotional, and social equilibrium—at individual, communal, and institutional levels. This moves beyond the paradigm of individual therapy to encompass what Māori scholar Linda Tuhiwai Smith (2022) describes as "decolonizing methodologies," involving the active recuperation of cultural practices, languages, and land relationships as therapeutic and sovereign acts. Similarly, transformative justice frameworks, particularly those from Black and Indigenous communities, posit healing as a necessary public process for addressing systemic harm, moving from punishment to accountability and the repair of social fabric (Ginwright, 2018; Yazzie & Baldy, 2018). Healing, in this structural sense, is the work of repairing the relational and psychological infrastructure that extractive systems have damaged.

This reparative work directly enables the implementation of Paper II's redefinition of business. The shift from a "profit engine" to a "social problem-solver" requires not only new organizational blueprints but a healed human operating system capable of:

1. Trust-based collaboration over competitive scarcity,
2. Long-term stewardship over short-term extraction,
3. Relational value creation over transactional exchange, and
4. Sufficiency orientation over accumulation anxiety

Without this healing, the cognitive and emotional patterns shaped by traumatic economic environments will continue to reproduce extractive behaviours, rendering even well-designed regenerative business models vulnerable to mission drift.

As established in previous sections, systemic healing is incomplete without addressing the generational and personal trauma of those in positions of power. The dysregulated nervous systems and unexamined money scripts of elites become public health concerns, as they become codified into law, economic policy, and organizational culture. Therefore, healing-centred transitions require mechanisms for elite accountability and transformation, creating "safe-enough" yet challenging containers, such as restorative justice circles adapted for corporate boards, where leaders can confront the roots of their own scarcity and control paradigms. This interrupts the intergenerational transmission of traumatic logic at its source. Practices for this are nascent but evident in Indigenous-led processes that engage state and corporate actors through dialogue, historical truth-telling, and rebuilding relational accountability (Corntassel, 2012).

This systemic healing is also a prerequisite for a specific kind of resilience crucial for sustainability transitions: transformative resilience. This concept, emerging from critical social-ecological systems research, stands in contrast to dominant "bounce-back" resilience, which aims to restore a system to a previous state and often reinforces unjust status quos (Folke et al., 2010; Swilling, 2019). Transformative resilience denotes the capacity for fundamental, anticipatory restructuring: the ability to question and alter a system's underlying rules, power structures, and goals (Pelling, 2010). This form of resilience is impossible under collective trauma, scarcity cognition, or nervous system dysregulation, as these conditions contract cognitive and relational bandwidth, locking societies into reactive, defensive patterns. Healing, by expanding this bandwidth and restoring trust, creates the

psychological and social "safe-enough space" necessary for the experimentation, risk-taking, and deep cooperation that transformative change requires.

From a systems perspective, interventions at the level of paradigms, feedback loops, and human capacity represent high-leverage change points (Meadows, 2011). Healing the cognitive, emotional, and relational infrastructure, including the internalized economic relations discussed in previous sections, is therefore such a leverage point.

Thus, psychological, cultural, and economic capacity-building must be treated as core infrastructure for sustainability transitions, alongside energy and digital systems. Investing in healing is an investment in transformative capacity: the fundamental human "operating system" update required to run new, life-affirming societies. From a systems perspective, healing increases parasympathetic capacity, widens attentional bandwidth, and restores relational trust, thereby enabling the behavioural patterns required by Paper II's redefinition: collaborative problem-solving, acceptance of sufficiency, comfort with impermanence, and commitment to multidimensional value. Healing therefore functions as a capacity multiplier for paradigm enactment.

9 Conclusion

Reframing Sustainability Transitions

This paper has discussed how trauma infrastructure, nervous system dysregulation, scarcity cognition, distorted money psychology, and imagination collapse form a mutually reinforcing psychological architecture that stabilizes extractive economic systems while constraining collective capacity for transformation. These dynamics are not peripheral to economic change but central to its feasibility. They help explain why the redefinition of business proposed in Paper II, although conceptually coherent, may encounter resistance that cannot be attributed solely to institutional inertia. Trauma, scarcity, and chronic dysregulation create embodied disconnections between intellectual commitment to regenerative values and the behavioural capacity required to enact them.

Recognizing these constraints reframes sustainability transitions. Rather than a purely technical or policy challenge, transformation emerges as a coupled psychosocial, physiological, and institutional process. Healing, understood here as the restoration of regulatory capacity, relational trust, and healthier patterns of meaning-making around resources and cooperation, becomes a structural prerequisite for regenerative futures. In this sense, healing work must be concurrent with economic redesign: the human “operating system” must evolve alongside institutional architectures.

This perspective shifts sustainability planning from technological optimization toward a broader project of psychosocial and institutional renewal. Investments in psychological and relational infrastructure, including within leadership, governance, and policy environments, become foundational conditions for systemic change.

The following paper turns from diagnosis to practice. If trauma, scarcity cognition, and chronic stress constrain long-horizon decision-making, then transformation requires practical tools that help individuals and groups act differently within existing environments. Paper IV therefore introduces a set of epistemic tools, learning environments, and living prototypes designed to translate the capacities identified here into everyday practice and regenerative experimentation.

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Author

Adina-Iuliana Deacu

Adina-Iuliana Deacu is a sustainability researcher and social entrepreneur working at the intersection of environmental psychology, systems change, and regenerative economics. She is the 2025 Klaus Töpfer Sustainability Fellow at the Research Institute for Sustainability (RIFS) in Potsdam, Germany, where her research explored how redefining business as a social problem-solving institution can contribute to addressing the polycrisis. Adina is also the founder of Tianmei World Academy, a translocal learning platform experimenting with environments and tools that cultivate agency, relational intelligence, and regenerative leadership. Her work integrates systems thinking, design research, and cross-cultural knowledge traditions to explore how inner transformation and institutional redesign can support sustainability transitions.

The Research Institute for Sustainability (RIFS) conducts research with the goal of understanding, advancing, and guiding processes of societal change towards sustainable development in Germany and abroad. The Institute is embedded within the GFZ Helmholtz Centre for Geosciences and is thus part of the Helmholtz Association. Its research approach is transdisciplinary, transformative, and co-creative: RIFS cooperates with partners in science, political and administrative institutions, the business community, and civil society to understand the problems of sustainable development, identify appropriate solutions, and support their implementation in cooperation with relevant actors and affected communities. Its central research topics include the energy transition, climate change and socio-technical transformations, as well as sustainable governance and participation. A strong network of national and international partners and a Fellow Programme support the work of the Institute.

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Contact:
Adina-Iuliana Deacu: tianmeisworld@outlook.com

Address:
Berliner Straße 130
14467 Potsdam
T: +49 (0) 331–28822–340
media@rifs-potsdam.de
www.rifs-potsdam.de

ViSdP:
Prof. Dr. Doris Fuchs,
Scientific Director, Speaker

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