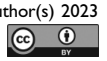
EPE: Nature and Space
2023, Vol. 6(4) 2113–2133



DOI: 10.1177/25148486231168393
journals.sagepub.com/home/ene


Introduction: Accumulation by restoration and political ecologies of repair

Amber Huff
Institute of Development Studies, The University of Sussex, UK

Andrea Brock
The University of Sussex, UK

Abstract

Accumulation by Restoration (AbR) represents a shift from a conservationist 'mode of production' emphasizing sustainability and preservation to a 'growth economy of repair' in which nature becomes valued not just for its use but also for its potential for repair or restoration. The 'repair mode' mobilizes the assumption, imagery and mythology of degradation juxtaposed with the promise of economic and ecological redemption. Through rationalization, restoration, re-creation and/or re-cultivation, it aims to generate new, better-disciplined, more legible, 'substitutable' natures to multiple accumulative ends. Bridging political ecology, critical agrarian studies and science and technology studies, contributions to this themed issue explore transformations associated with AbR at across scales and involving variegated alliances, discourses, technologies and institutional dynamics giving rise to ecologies of repair. We demonstrate how the dynamics and contradictions of the repair mode are mediated and enacted through the performative, spectacular and metrological rendering of 'mitigation', 'equivalence', 'neutrality' and 'repair' as instruments and object, simultaneous *means* and *ends*. These dynamics have given rise to new materialities and technologies of governance and new intensities and spatialities of resource control and accumulation, as what were consequences of growth have become strategic goals and the foundation of a new growth economy.

Keywords

Conservation, political ecology, repair, neoliberal natures, value

Corresponding author:
Amber Huff, The Institute of Development Studies, The University of Sussex, UK.
Email: a.huff@ids.ac.uk

Introduction

In early December of 2020, UN Secretary General António Guterres began an address at Columbia University with what reads like a eulogy for nature. His message is summarized with a brief and distressing claim: '[t]o put it simply, the state of the planet is broken.' The good news is, of course, that the solution is just in reach. Aligning financial assets with the goal of 'net zero' today, he assures us, will 'make peace with nature' and avert future climate impacts and global financial risks, ensuring that people can one day 'enjoy better health and the full respect of their human rights, and live with dignity on a healthy planet' (Guterres, 2020). The speech came amidst the global COVID 19 pandemic, days shy of the fifth anniversary of the UNFCCC Paris Agreement and in the lead-up not only to two major COP meetings on climate and biodiversity planned for 2021–22, but also the 2021 launch of the United Nations Decade on Ecosystem Restoration. It set the scene to promote a massively scaled-up approach to international action meant to 'flick the green switch' on global economic recovery, end humanity's 'war on nature' and repair the broken planet (Guterres, 2020: n.p.; Harvey, 2020; United Nations, 2021).

We open this special issue with reference to Guterres's speech because of the way in which it neatly packages and invokes a constellation of metaphors, images, actors and claims, exemplifying an evolving dynamic in the politics of environmental change, policy discourse and conservation finance. This dynamic, which we describe as 'accumulation by restoration' (AbR), arises from a shift or differentiation in the dominant international conservation paradigm from a 'conservationist mode of production' characterized by neoliberal market-protectionist approaches to environmental governance to the emergence of a 'repair mode' in line with the configuration of a broader growth economy of repair (Fairhead et al., 2012: 242; Huff and Brock, 2017). AbR is built from coherences and synergies that have coalesced across a heterogeneous and fragmented field of discursive, bureaucratic and political responses to deep and intractable systemic crises of globalized capitalism (i.e., the repair mode). Despite important continuities with aspects of colonial conservation, expert-led technocratic environmental governance and neoliberal conservation and outlined above, the novelty of AbR arises from a few important tendencies related to framing, scale, power relations and the types of knowledge and ways that knowledge is mobilized to support powerful value claims, undermine or silence dissent and obscure alternative pathways.

The conceptual basis of AbR is the 'globalization of nature', the view of nature as planetary, a 'global system' where – paradoxically – interconnections are discursively recognized, but subsequently denied in the acceptance of – and belief in – universality, abstractability, metrification, substitutability, and commensurability of nature (Brock, 2019). The repair mode embraces the anthropocene idea of humanity-as-a-force-of-nature and mobilizes the imagery and story of the planetary system on the brink, spoiled and 'broken' by the over-indulgence of an undifferentiated and growing 'humanity', giving rise to overlapping global crises of anthropogenic climate change, biodiversity loss and landscape degradation (Garland, 2008; Sultana, 2022; Swyngedouw and Ernstson, 2018).

Such crisis framings not only flatten social differences and imbalances in social and economic power and human-nature relationships, among others. By emphasizing temporal urgency, apocalyptic imagery and the global scale of crises, these framings underscore calls for international coordination and need for expert-driven, authoritarian 'stewardship from above' to effectively control and allocate scarce resources, oversee mitigation and manage 'a finite environmental budget' whilst engineering technical solutions to enable adaptation and sustainable or 'green' economic growth far into the future (Rockström, 2015). In this context, repair calls for the technical rationalization of nature so that it fits the market environmentalist model of an 'immanent market universe' (McAfee, 2012). At the heart of the repair mode is not only the proliferation of new ways of commodifying and assigning property rights to the non-human environment, but

the fantastical instrumentalization of 'neutrality', conceptualized as, simultaneously, a set of reparative calculative technologies (often discussed in terms such as 'no net loss', 'net positive impact', 'net zero'), a metric for assessing 'sustainability' at variable scales, as well as an end-goal in and of itself. Although repair is discussed in terms of restoration, rehabilitation and re-cultivation, the aim is produce new, better-disciplined, more legible and freely 'substitutable' natures that can support plural pathways of accumulation and rent-seeking, including via spectacular consumption, continued industrial production and via new growth markets for repair commodities that promise to themselves neutralize the environmental harms caused by growth (Brock, this issue; Huff, this issue).

Repair is in the air, neutrality seems to be everywhere, the only hope for a dying planet. Repair frames a flurry of recent policy proposals, campaigns, pledges and investment platforms that reflect and work to normalize nothing short of a new anti-politics of neo-colonial planetary enclosure in the name of fixing a broken world, reifying the market environmentalist conceptualization of nature as a balance sheet of substitutable capital, and opening the 'green' gates on what some have called potentially the biggest wave of 'value grabbing' in human history (Andreucci et al., 2017). The intensity of the control-and-repair story seems to have only increased in the shadow of the profound economic and social disruptions of the ongoing coronavirus pandemic, soaring energy prices and a series of major high-profile environmental gatherings convened under UNCED processes. From the UK government's 'Build Back Better' campaign to Mark Carney's task force to massively 'scale up' global voluntary carbon markets to the EU 'Green Deal' and a flurry of corporate and national level 'net-zero' pledges that shift greenhouse gas emissions to poor and middle-income regions (IRP, 2019) and effectively force open new 'green' extractive frontiers in a global scramble for minerals like lithium, which is needed for use in battery storage applications expected to power us through a global energy transition (Voskoboynik and Andreucci, 2021). We see a revival of the rhetoric justifying exclusionary fortress conservation in campaigns like the 30×30, Half-Earth, Terra Carta and the 'Global Safety Net' backed by powerful coalitions involving NGOs, scientists, multilateral institutions, governments, businesses and financial actors, telling their own versions of the broken planet story and proposing, as the only solution, to fence off huge swaths of the Earth's land and marine territory from people's use. Land restoration operations based on the principle of Land Degradation Neutrality (LDN) and supported by a financing mechanism launched in 2017 have become a new frontier in conservation finance and international investment, promising large-scale acquisitions of 'restoration-ready' (i.e., 'degraded') land in the majority world can be rehabilitated through 'sustainable' forestry and commodity production and setting up ecotourism infrastructure prior to reselling at huge profits (Huff and Brock, 2017). Compensatory offsetting associated with so-called 'sustainable' mining and other industrial operations can multiply the social and landscape level impacts of the operations exponentially. Not only do mining activities need to be accommodated and resources such as water and labor channeled to the operations, but additional territory is also required for conservation areas, compensatory afforestation and internal biodiversity offsetting programs that can be disastrous for resident populations, who may not have access to legal defence against involuntary physical or economic dispossession, and whose wellbeing may be put in danger due to industrial pollution, rapid demographic change and infrastructural pressures, as well as due to direct violence that can accompany securitization of extraction and conservation areas (Huff and Orengo, 2020; Srivastava and Mehta, 2017; Srivastava and Mehta, this issue).

Bridging political ecology, political economy, critical geography, science and technology studies (STS) and critical development studies, contributions to this themed issue use and elaborate on Accumulation by Restoration as a framework to explore the configuration of the repair mode over time and at different scales, from the microscopic to the macro-global, in different places and contested spaces of knowledge production and governance, and in discursive and practical dimensions. The cases we present are by no means exhaustive but nonetheless provide significant

insight, as they involve and elaborate on variegated alliances, tactics, scientific and policy discourses, technologies and institutional arrangements, as well as forms of biological life and social-ecological relationships, that enmesh in the production of the global repair regime.

Beyond simply introducing AbR as a manifestation of primitive accumulation or 'socio-ecological fix under neoliberal capitalism' (Usher, 2022: 7), contributions to this themed issue show how AbR, as an orienting framework, helps deepen understandings of the roles of knowledge and of conceptual, social and built technologies of repair in driving the expansion of capital's enclosures into deeper realms of nature and social life and in the co-production of novel natures and ecologies of repair. How do authoritative discourses of society-nature relationships, 'repair' and 'truth' facilitate these changes? How do they mobilize environmental crisis to broaden the potential scope and scale of nature-based value extraction? How do they deepen alienation and reify human-nature separation embodied in colonial fantasies of domination and control? And how do they justify and legitimize the destruction and engineering of physical landscapes and spectacularization of nature conservation (Brock, this issue)? The pieces in this collection address these and other questions and delve deeply into stories and logics, spaces, emergent ecologies and performances of the repair regime to elucidate the disruptive, productive and ontological politics of the repair mode. Contributors show, in various ways, how the relations, contradictions, fictions and frictions of the repair mode are mediated and enacted through the spectacular, metrological and calculative rendering of globalized natures and ecologies through technologies and politics of accounting, mitigation, equivalence, neutrality and restoration, as simultaneous *means* and *ends*.

While cases in this issue illustrate theoretical and empirical aspects of AbR, we use this introduction to outline and historicise the broad configuration and evolution of the repair mode. We begin by presenting AbR as a regime of accumulation, with an abridged genealogy that situates the repair mode in relation to sedimented logics and practices of enclosure and as a 'strategic discourse' (Knights and Morgan, 1991) in recent politics of the environment, then discuss both continuities and divergences that, in our view, make the repair mode distinct and distinguishable from a conservationist mode of production.

Regimes of accumulation, dispossession and enclosure

Accumulation is a persistent theme in scholarship in political ecology, critical geography, political economy and adjacent fields, and attention is warranted not the least because primitive accumulation is a basic ontological condition of capitalism (De Angelis, 2001). Broadly speaking, regimes of accumulation are configurations of knowledge, technologies and governance techniques associated with specific patterns and relations of production, consumption and distribution in society and specific structural relations and social hierarchies. It is through the expression of these regimes and their logics that capitalism is instituted and produces the conditions amenable to its own reproduction in a variety of particular forms and 'on a continuously extending scale' supported by co-evolving legal, social, military and cultural institutions (Kelly, 2011; Marx, 1887: 507).

In discussing the origin of surplus value and profit in volume I of *Capital*, Marx (2015 [1887]: 507) described 'primitive accumulation' as facilitated through enclosure, eventually enabling mass privatization and elite control of the formal economy. Enclosure refers to the 'historical process of divorcing the producer from the means of production' transforming commons into forms of private property through legal, military, financial and biopolitical means. Most people will think of the 'old enclosures' in the Global North, associated with the widespread dispossession of the English peasantry from common land, forests and other productive resources from the thirteenth century (Caffentzis and Federici, 2014; Harvey, 2011). In classic Marxist thinking, these enclosures were a major part of the endogenous social and institutional changes in Europe that made industrialization possible, as control of the non-human, physical inputs and technologies of production

became concentrated in the hands of a few, resulting in class differentiation, proletarianization, urbanization, and with most persons in a society left without control over their means of production and possessing little of value aside from their own capacity to perform labor in exchange for wages. According to classic labor theory, the differential between the value created through labor and the wage derived by workers – surplus value – is the basis of profit and capitalist growth.

Feminist and other heterodox approaches in political ecology, critical geography and political economy have highlighted important aspects of capitalism's evolution, reproduction and structuring of social-ecological relationships across space and time that are often under-acknowledged in orthodox Marxist thinking but that help contextualize and situate this special collection. First and fundamentally, emergence and evolution of capitalism is not reducible to a single linear story. Capitalism has always been a 'variegated', plural and relational, but also a contradictory, contested and crisis-prone set of practices and ideological beliefs. This variegation creates what Jessop (2015) calls 'differentiated accumulation' based on co-existing modalities or regimes of value extraction and accumulation and the synergies and mutually undermining forces that can arise among them. For example, Huff (this issue) discusses how co-existent industrial-extractive and financial capitalisms find synergies via the repair mode, which can increase the scope and scale of nature-based accumulation and is also associated with the proliferation of novel ecologies of repair.

Second, despite the mythology of a totalising and self-reproducing economic system, market forces alone are not sufficient for capitalism's reproduction. Supplementary means of governance and 'inputs' are required to reproduce and grow the system, including that provided by state regulation and police and security forces, multilateral institutions and treaties, but also through strategies that facilitate exploitation of the means of social reproduction – the (often un- or under-paid, highly gendered and classed) work that creates the workers, the basis of collective social power and the conditions for life that re-produce society (Federici, 2019). A political ecology lens can extend and deepen our understanding of struggles to defend the means of social reproduction to the ways in which livelihoods, knowledge systems, capacities for work and social values emerge from situated and embodied social-ecological relationships involving people (i.e., society and social relationships), technology and transactions and exchanges with the natural environment.

Third, primitive accumulation, dispossession and enclosure are not just part of a northern origin story, a 'one-off, historical' event located in England at the dawn of capitalism (De Angelis and Harvie, 2014: 281; Harvey, 2004). Nor are they simply a tired framework speaking about capitalism's 'fix' (Usher, 2022). Historically speaking, institutional changes in Europe were not just shaped by internal disruptions and contestations, but also shaped through frictions with and within institutions, knowledge systems, markets and actors outside of Europe that were sometimes 'unambiguously more powerful than anything seen in Europe at the time' (Anievas and Nişancıoğlu, 2015: 4; Tsing, 2000). Furthermore, the evolution of these processes of institutional change in Europe would have been impossible without the violent extension of processes of enclosure and dispossession to diverse peoples, territories and ecologies through wars of colonization to secure wealth outflow, relations that are often reproduced through contemporary practices of international conservation and development projects.

Primitive accumulation, dispossession and enclosure are in fact sedimented logics and regular returns in the exercise of forms of power associated with the expansion of markets and capitalism, extending to processes of colonization, imperialism, and neoliberalization and associated practices of warfare, enslavement, ecocide and the creation of not just class, but gendered, sexualized, racialized and developmental hierarchies within and across societies and sectors of activity (Harvey, 2004; Luxemburg, 2016). Because of this, regimes of accumulation continue to offer fruitful analytic frameworks to refine and nuance our understandings of continuities and changes over time in the ways power, knowledge and technology are used in attempts to pacify and control people and the environment and in how such processes, practices and structured relations are instituted,

contested and refused, including the forms of knowledge, techniques and technologies that facilitate them, and how they articulate with phenomena like the politics of environmental change.

Situating accumulation by restoration

The coloniality of conservation enclosure

Forms of conservation and practices of elite resource expropriation certainly pre-date capitalism, wars of colonization and contemporary approaches to conservation. That said, many of these practices and their supporting narratives remain relevant to understanding the construction of the repair mode. The transition to capitalism in Europe was associated with fundamental changes in property relations and forms of policing as a means of defending and enforcing new property regimes and labor relations, as well as widespread changes in scientific, philosophical and cultural attitudes toward nature, land and the aesthetics of landscape (Anker, 2021: 243; Neumann, 1998). Among these, the consolidation of rationalistic, utilitarian and binary notions of the division between society and nature exercised a powerful influence on notions of morality and justifications for the subjugation and control of the 'other' (human and non-human alike) that fueled colonial ambitions of staking claim to new extractive and settler frontiers (Neumann, 1998; Ward, 2019). By the late 19th and early 20th centuries, resource management had become the business of European colonial administrators who were tasked ensuring pacified landscapes and wealth outflow from colonized territories, and their decisions about land use, influenced by cultural ideals of 'a people-free landscape' for leisure, consumption and extraction, gave rise to the earliest colonial reserves (Dressler et al., 2010: 6). In the late nineteenth century North America, capitalist interests as well as a settler imaginary of untouched 'virgin' wilderness as a space for white men to encounter the sublime and re-create the 'mythical frontier experience' of 'sleeping under the stars, participating in blood sports and living off the land' (Cronon, 1996: 14–15) shaped early formulations of 'fortress' conservation applied in the creation of Yellowstone and Yosemite National Parks in North America (Brockington and Duffy, 2010: 470).

As common practice, this sort of intervention required or built upon prior or active removal, though mass murder, eviction or resettlement, of resident populations of these landscapes. Creating a proto-spectacle in line with the imaginary of pristine wilderness also requires historical erasure and invisibilization of the social-ecological relationships and related (re)productive labors that shape landscape in place and through time. In some situations, members of populations of place could be tolerated as exemplars of the Edenic myth of noble savagery or primitive innocence (Cronon, 1996: 8–9) who, 'being closer to nature than civilization, could, hypothetically, be protected as a vital part of the natural landscape' (Neumann, 1998: 18). As Ward (2019: 8) explains, an 'underlying philosophical separation of humans in these preservation narratives hinges on the idea of nature as a binary opposite of society and therefore symbolically and materially places humans strictly, and often violently, outside of preservation areas'.

The 'Yellowstone model' of conservation was among techniques of dispossession taken up by European powers and 'rolled out on the colonial map' (Bond, 2018; Ward, 2019). As the fortress model was adapted in different places and different ecologies, generalized and morally charged 'preservation narratives' (narratives of value) and ecological 'degradation myths' (narratives of threat) (Kull, 2000) emerged to explain or justify conservation enclosures for environmental reasons using simple stories that appealed to both popular northern landscape aesthetics and social biases, and which sought to displace, suppress or erase prevailing social ecologies.

Such degradation stories (then and now) capitalize upon deeply ingrained prejudices against poor people, people of color, indigenous people and members of agrarian and peasant populations. Their function is to depoliticize enclosure, using 'common sense' stories of change that appeal to

ingrained cultural and aesthetic biases to undermine 'other' people's resistance or delegitimize counterclaims in the face of physical, social-ecological or economic dispossession. The role that preservation narratives and degradation myths play in the history and contemporary practice of international conservation and the production of injustice cannot be over-emphasised. They are dehumanizing, heavily racialized and gendered, frequently depicting, implicitly or explicitly, resident people as predators or invasive species, and often bear much in common with broader narratives of underdevelopment that shift blame for policy failures to people who lack social power or are members of historically marginalized groups.

With widespread independence, and the rise of the international development industry and the NGO sector post-WWII, development agencies and NGOs took up management, promotion in many places, and approaches to conservation diversified in response to critiques, but logics of colonial and imperial natural science, resource management and conservation were and are retained in institutions, as were often nationally specific preservation and degradation narratives that became received wisdoms. At the same time, degradation myths found particular resonance with neo-Malthusian tropes that shaped influential northern environmentalist discourses about relationships between aggregate population growth, environmental degradation and resource scarcity. Furthermore, particularly in resource-rich countries that have become framed as international conservation priorities and 'hot spots', that are historical and contemporary sites of extractive outflow of natural resources, degradation narratives continue to serve two important depoliticising functions. They continue to justify elite resource enclosure and smallholder dispossession and serve to hide the extent and magnitude of the ecological impacts of continued extractive trajectories pursued in the name of growth-oriented development.

Neoliberal nature and the conservationist mode of production

The practices that link conservation, capitalism and the 'spectacle of nature' are old even if the specifics of the relationship have varied place to place and have evolved with scientific knowledge, cultural aesthetics and technological changes in the ways that both information and 'nature' are claimed, inscribed, produced, marketed and consumed (Brockington and Duffy, 2010; Igoe, 2010; Igoe et al., 2008). International conservation as we know it today emerged in the context of colonization as a tool for claiming, engineering and controlling people and landscapes. Critical researchers have long argued that the coloniality of neoliberal governance of nature reproduces and extends violent processes of territorialization, enclosure and dispossession that disrupt lives and life-worlds, re-fashion social relationships with the non-human, create exclusionary property regimes in the form of protected areas and materialize the imagined natures of powerful groups, even while varieties of conservation have diversified and differentiated (see, for example, Büscher et al., 2012; Carver, this issue; Castree, 2003; Castree and Braun, 1998; Heynen et al., 2007; Huff, this issue; Kelly, 2011; McCarthy and Prudham, 2004; Robertson, 2006; Smith, 2007; Sullivan, 2009; Sultana, 2022).

Work on the conservationist mode sees these dynamics in terms of world-building, a productive politics at work on many levels (Igoe, 2010). Representations of ideal natures and threats to them are co-produced with material realities, with territory, cultural heritage, biological life and 'needs' being claimed, enclosed, remade and marketed as targets of intervention and conservation commodities (Garland, 2008: 52). The entry of finance into environmental governance has meant that, contrary to explicitly industrial-extractive commodity production involving the physical removal and sale of resources as primary commodities (i.e., raw materials), in the conservationist mode, certain types of resources can be made to serve the role of 'capital' – to generate forms of market value – when they are exploited to produce types of property, commodity forms and financial instruments that have very little to do with their immediate material use. By producing a hyperreal 'spectacle of

nature' to be consumed, comprising tourist experiences, as well as 'images and commodities whose circulation mediates relationships between people and between people and nature' (Brockington and Scholfield, 2010: 552), the conservationist mode works to deepen the subsumption of nature by abstraction and *virtual* extraction of and from concrete landscapes and places, whilst charismatic species and other attributes of ideal nature are bundled together as 'natural capital' from which in situ development can ostensibly be fashioned through tourism, sustainable extraction, regulated community use and direct management intervention (Garland, 2008: 52).

Assembling accumulation by restoration: from neoliberal environmentalism to planetary problems and the flat ontology of the anthropocene

We are all astronauts … We are in this together, we need to fix this together (Peter Bakker, World Business Council on Sustainable Development)[1]

AbR does not present a stark disjuncture; rather, the repair mode has been shaped by and shares continuities with colonial conservation enclosure, modernization-oriented forms of technocratic environmental governance and neoliberal conservation and outlined above, and many practices and received wisdoms have been retained in institutions and practice and continue to operate in parallel or subject to repair. As with colonial, post-colonial and neoliberal conservation, the repair mode mobilizes powerful narratives and imagery of nature in crisis. While there is a primacy to the planetary scale of crisis framings in the repair mode, fictions necessary to the abstraction, rationalization and representation that characterize it (and are discussed in detail below) create slippages and frictions between concrete and imagined natures, across scales, geographies and ontologies of nature (Ouma et al., 2018). Generalized degradation narratives continue to serve important, depoliticizing functions, particularly on national and sub-national levels: they continue to morally justify elite enclosure and expropriation of land and other resources to protect them from the ostensibly irrational 'other' and serve as a spectacular red herring that distracts from the continuing and escalating consequences of extractivism. While the role of industrial extraction in continuing to exacerbate environmental problems may be acknowledged in international fora as contributing factors to environmental change (see, for example, IPCC, 2021), in practice and in continuity with the neoliberal market-preservationist approach, the industries and actors who have collectively generated and benefitted the most from harmful practices are privileged in decision-making about response and are often treated as self-regulators. High level narratives of crisis and repair repurpose and draw heavily on the affective resonance and depoliticizing force of 'classic' neo-Malthusian tropes and generalized degradation stories. At the same time, the highest burden of top-down, repair-focused interventions continue to fall on people and landscapes in the majority world.

Furthermore, AbR has arisen in a context shaped by neoliberal globalization and financialization of the economy, and by a series of punctuating political economic crises, changes and responses, as well as the rise of the post-political situation since the end of the Cold War. It has emerged from geopolitical context shaped by thirty years of UN-led processes on sustainable development and environmental change and the global War of Terror, and the accompanying flurry of national level policy reform processes, particularly in but not limited to the majority world, to further liberalize and securitize natural resource sectors – from those governing land tenure to forest access and protection to mining – to attract 'green' investments and usher in the vision of a global green growth and its promised wins for all (UNEP, 2011; UNEP and International Resource Panel, 2011). In terms of its conceptual and institutional genealogy, we see AbR as most directly emerging from the spectacular mediation of nature-society relationships characteristic of neoliberal conservation alongside the rising dominance of the 'green economy' discourse following Rio +20, which

adopted a strong market environmentalist approach as an ideological under-laborer, drawing causal linkages between market failures and a range environmental problems – climate change, resource scarcity, environmental degradation, urbanization, soil depletion and biodiversity loss – and re-framed them as both urgent crises as well as opportunities for achieving sustainable growth via a bundled package of existing and aspirational policy and accounting mechanisms, conceptual and bureaucratic technologies and powerful alliances between capital, the state and finance that can be used to make capital appear responsive to, and thus less in need of, environmental critique (Huff and Brock, 2017; Mol and Spaargaren, 2000).

But the repair mode is also distinct in some important ways, which we unpack in this section and throughout the papers included in this special issue, and which require consideration of the high-level and discursive politics of framing environmental crisis and nature-based 'solutions' to problems of accumulation at the science-policy interface alongside lived, embodied and emplaced experiences of change. The changes described above have unfolded on a complicated and highly contested knowledge terrain, involving the rising prominence of ecopolitical frameworks, which conceptually link environmental change to international security issues (Dalby, 1992; Dalby, 2017), and the synergy between market environmentalist ideology and rising fields of expertise including environmental economics and some strands of Earth Systems and Sustainability Sciences. The repair mode draws on the anthropocenic narrative and related notions of aggregate boundaries, breaches and thresholds, which reify the *planetary* as an ontological reference point for understanding, evaluating and responding to environmental changes (Moore, 2015; Swyngedouw and Ernstson, 2018: 3). This is associated with framings that invoke planetary ecology, global (tragedies of the) commons and post-natural utilitarian framings (Cantor and Knuth, 2019; Moore, 2015: 515) to construct an overarching story of an urgent, existential planetary 'poly-crisis' (Huff, this issue; Homer-Dixon et al., 2021; Hui, 2020; Moore, 2015; Nelson, 2014).

This meta-framing harnesses the notion of a fundamental 'breach' or transgression of the human-nature binary due to 'humanity' progressing to the point at which it has cumulatively overshot the constraints of bio-geophysical nature, underscored by the 'anthropocene idea' that humanity has itself become a pre-eminent and 'collective force of nature' at the planetary scale (Moore, 2015: 515; Swyngedouw and Ernstson, 2018). In this framing, the work to 'repair' is to extend market liberalism, the fiction of the 'self-regulating market', to encompass bio-geophysical nature and its ecological networks, elements, processes (Dalby, 1992; Dalby, 1996b; McAfee, 2012). Within the market environmentalist ideological project in particular, the guiding assumption is that marketization will correct the mismatch between growth and limits. Bringing unpriced and neglected units of nature into the market gaze will generate action to reverse ecological crises by sending appropriate cost signals to market actors. If individuals and firms can 'see' the actual monetary costs of, for example, CO_2 emissions, deforestation and industrial pollution, economic actors will be able to make better decisions, eliminating governance and market failures to which crises are attributed, and achieving a more sustainable growth trajectory (Cavanagh and Benjaminsen, 2014; Hardt and Negri, 2018; Robertson, 2006; Sullivan, 2013b).

At the same time, nature-based financial instruments create virtual and potentially infinite space for new growth markets and nature-based commodity forms (see Huff, this issue, on carbon offsets).The commodification of this virtual nature is intended to serve as the basis of new sectors of not just of production and growth, but also of 'repair' – simultaneously creating a risk buffer against future crises of over-accumulation and new classes of asset that can be applied directly to 'neutralize' environmental damage. As Huff (this issue) writes, 'virtual nature is produced through technologies of repair in the form of new financial instruments and nature commodities to feed the expansion of new growth markets that promise to re-create, repair or restore the damage caused by industrial expansion and growth' through substitution to achieve 'neutrality' and, as if

by one easy trick, 'decouple' natural resource use and environmental despoilation from economic growth (Fischer-Kowalski and Swilling, 2011). What packages and holds this complicated story together is the specific instrumentalization of 'neutrality' as, simultaneously, a set of technologies for addressing multiple overlapping crises through abstraction and rationalization and control; a metric for assessing sustainability goals at variable scales, from microscopic to ecosystemic to landscape to planetary; as well as an end-goal in and of itself (e.g., 'net-zero'; carbon neutrality; 'no-net-loss', etc.).

Beyond the authoritarian tone of high-level repair discourse, there are other well-critiqued problems associated with its generalized framings and representations. ESS, anthropocene formulations and planetary thinking have all been critiqued for their homogenizing and deeply depoliticizing effects, which are at work in authoritative scientific, policy and public facing narratives of the repair mode. The social and spatial homogenization that characterizes anthropocenic crisis stories presents humanity as an undifferentiated force and the planet as an aggregate space. These framings, as they are reproduced in society and policy at different levels of policy and practice, obscure politics of social difference and processes of placemaking, and present ready vessels for repurposing, explicitly or implicitly, similarly generalized, often racist and Eurocentric degradation myths and forms of environmental othering that attribute environmental change, resource scarcity, terrorism and any number of so-called 'global challenges' to generalized processes such as population growth, urbanization, development and consumption patterns, often in the majority word. At the same time, the strategic deployment of decontextualized imagery to signify threat, degradation and loss (e.g., a burning forest, a washout, a swidden field, an emaciated polar bear, a parched mudflat) combined with messaging of large-scale catastrophe just around the corner invokes a particular type of urgency for and call for coordinated action.

In terms of identifying specific problems and their causes, the policy discourse that emerges is of a rationally self-interested and undifferentiated 'humanity' that has become a preeminent force of nature, capable of not only planetary disruption that manifests in overlapping (but abstracted and aggregated) crises of anthropogenic climate change, biodiversity loss and landscape degradation, but of upending the stability of the Holocene and its 'safe operating space' that allowed humanity to flourish in the first place (Rockström et al., 2009; Steffen et al., 2015). The discourse on remedying these problems is saturated with a politics and economics of 'solutionism' (Hulme, 2021) in which 'big science, geo-engineering, and big capital can gesture to save' a broken earth and redeem humanity without compromising the growth imperative (Swyngedouw and Ernstson, 2018: 5). The crises are urgent, encompassing, everywhere at once and therefore in critical need of planetary governance – 'stewardship from above' – driven by experts to effectively secure and allocate increasingly scarce resources, engineer the alignment of nature with the global economy, restore and (re)construct habitat and oversee the repair of nature in line with the logics of an imminent market world and a finite 'environmental budget' (Peet et al., 2010; Rockström, 2015). New multi-stakeholder coalitions and partnerships produce an unending march of PR websites and glossy brochures package and deliver compelling imagery and just-so stories of crisis, planetary stewardship and salvation, 'win-win-wins'.

These dynamics have not only shaped powerful multi-stakeholder alliances and dominant policy approaches in recent years but have also shaped public understandings of environmental change as well, particularly in northern countries. As in Guterres's speech and so many other examples in popular media, simple stories of nature-in-crisis repackage familiar neo-Malthusian tropes and imagery of eco-catastrophe related to climate change, biodiversity loss and landscape degradation. Newspapers and editorials in academic journals present pop-ecology celebrities as authorities on the detrimental excesses of an undifferentiated 'humanity', harbingers of the certain and impending 'collapse of civilization' and an overall 'ghastly future' ahead (Bluwstein et al., 2021; Bradshaw et al., 2021; Carrington, 2018; Huff and Mehta, 2019; Mehta et al., 2019). David Attenborough,

British national treasure and 'soothing voice' of the apocalypse (according to GQ magazine), has called humanity 'a plague on the Earth', and attests that 'we are intruders… latecomers and that the natural world, by-and-large, would do much better if we weren't there at all' (Bosiotti, 2021; Clipson and Bugler, 2020; Staff, 2013).

The force of it all seems like we have been thrown back in time to the 1970s, 80 s and 90 s, respectively, and a stew of often frustrating and ideologically pungent debates around 'limits to growth', the misanthropy of certain types of deep ecological thinking, and Kaplan's (2000 [1994]) forewarning of 'The Coming Anarchy', a grimly detailed updating of Hardin's (1968) ostensible 'tragedy' for the era of international securitization and global neoliberalization (Bookchin, 1987; Dalby, 1996a; Devall and Sessions, 1985; Kopnina, 2012; Meadows et al., 1972; Naess, 1973). But to say that we have heard all this before and its nothing new, to dismiss such framings as 'old wine in new bottles' (Mehta et al., 2019) disregards the productive work that is done in society through the deployment of sedimented and familiar narratives to support novel regimes of governance and accumulation. Such framings have allowed powerful actors to configure an increasing amount of political and economic activity across sectors and scales in the name of 'sustainable' growth with the promise of 'sustainability transitions' and, above all, repair (Moore, 2015: 515).

This form of repair works on the ground through enclosure involving material dispossession via expropriation and green grabbing and rent seeking (Andreucci et al., 2017) but at the same time 'grabbing green' (Corson et al., 2013), involving practices of translation, inscription and representation that can create new forms of market value and new spaces of commodification by making elements in nature quantifiable, substitutable and legible to the market gaze (Callon, 1980; Robertson, 2006; Robertson, 2012; Robson and Bottausci, 2018; Smith, 2007). As Jana Hrckova argues in this special issue, forms of technically mediated management and surveillance produce a nature that is 'more easily controllable and more importantly produced in a way that '"capital can see" and act upon'. Such forms of management and surveillance are socially dangerous in other ways, feeding into ecofascist, nationalist and white supremacist fearmongering over population growth, south-north migration and so-called 'white genocide' (Benoist, 2020; Smith, 2021; Taylor, 2019). They further prepare the ground for the 'false green (technological) solutions' – including industrial-scale low carbon energy systems that facilitate green grabs and further dispossession, or fantasies of geoengineering – that are promoted and violently enforced by corporate and state actors (Dunlap and Brock, 2022). Narratives of collapse and unprecedented urgency can ignore and invisibilize long histories of ecological exclusion, displacement and dispossession and enclosed life worlds that colonized and formerly colonized people have struggled against for centuries. Alongside this, they propagate narrow, often counterfactual and depoliticized public understandings of the causes and consequences of environmental and demographic change at different scales, supressing critique and visibility of alternate pathways and side-line questions of politics and justice in the name of 'trade-offs' or 'urgency'.

The homogenizing and depoliticizing effects extend beyond social impacts and violence against people. The discursive re-packaging of nature is grounded in a long history of framing and reconceptualizing nature based on changing paradigms and novel inventions, measurements and valuation techniques – from cost-benefit analysis to contingent valuation or Willingness to Pay – to 'objectively' quantify and abstract biodiversity impacts and opportunities. It has been supported by the rise of large dataset quantitative modeling sciences since the 1970s. Such technologies and scientific approaches helped foster and reify what might be seen as view 'from above' and develop a 'planetary understanding' that has since proliferated in the social sciences as well as in among the public. The view of nature as global (eco)system – to be engineered, governed, restored – does not depart from the utilitarian view of nature as a stock of extractive resources, which lies at the root of its destruction to begin with. AbR, then, is based on the conceptual

'globalization of nature' – the view of nature as a 'global system' where – paradoxically – interconnections are discursively recognized, but subsequently denied in the acceptance of – and belief in – universality, metrification, substitutability, and commensurability of nature (Brock, 2019).

In a second step, despite gesturing toward heterogeneity at smaller scales, it reifies the planetary view – including recent and curious social constructs such as that of the non-existent tCO2e or tons of 'carbon dioxide equivalent' and 'biological diversity' that excludes humans – as 'global' thing – one planetary ecosystem with 'planetary boundaries' (Rockström et al., 2009). This double process of abstraction (Brock, 2019) or 'double fetish' (Huff, this issue) – first the conceptual abstraction of nature from its ecological networks and context to make it commensurable and offsetable, and then its re-embedding into a globalized (eco)system – creates the (new) necessary linkages and interdependencies that allow for the ideas of commensurability and replaceability (net) that AbR needs to allow for claims such as 'neutrality' in relation to things like carbon emissions or landscape degradation.

This reductionism involves what Sian Sullivan (2017) has criticized as ontological flattening; the process of abstracting, distancing, flattening and dematerializing nature to construct a 'planetary ecology' comprising commensurable and substitutable capitals and services (Sullivan, 2010) and the 'new environmental values' (Sullivan, 2013a: 80) which drive the repair economy and the proliferation of novel ecologies of repair. These are the same technical and evaluative processes that make nature 'legible' as natural capital and constitute the 'economization' of human and nonhuman nature (Sullivan, 2014, 2017). This remaking of nature as natural capital, ecosystem service, and new nature involves ideological and technological work, drawing 'attention to the multiplicitous ways in which value(s) for nature(s) are fabricated rather than found' (Sullivan, 2019; Sullivan and Hannis, 2017). Forms of value extraction that characterize AbR thus rely on assumptions, calculations, and the making of 'ontological equivalence' (Sullivan, 2017: 229) or 'species equality' (Regnery et al., 2013). This equivalence is grounded in indifference to the uniqueness of natures and values of 'existences' (Kröger, 2022), promoting instead conceptual and separation, categorization and distancing. It facilitates what Dunlap and Sullivan (2020) call 'accumulation by alienation', referring to the human-nature alienation at the heart of market relationships that allow destructive political and economic choices and associated accumulation processes.

'New and better' natures

Deepening the integration of ecology and social life into the global economy, the story goes, will produce new, better-disciplined, more legible, rationalized and infinitely 'substitutable' planetary natures. This will facilitate continued (but transformed, de-coupled, clean and green) extractive and industrial growth, while at the same time creating new growth markets for the repair of nature that has been harmed by these modalities of growth. But these new natures, the product of repair work, can even become a better version of nature itself, some claim (see Brock, this issue). Not just can they serve the interests of capital, but through trust in science and engineering, they are made out as better natures with co-benefits for biodiversity, communities and corporate bottom lines (Brock, this issue; Huff, this issue). In the case presented by Huff (this issue), multiple ecosystem services and 'co-benefits' that projects claim to generate can be bundled together with new nature commodities like carbon offsets and sold as high value 'boutique' or 'charismatic' offsets on the Voluntary Carbon Market.

These new natures might be easier to 'consume', mediated through technologies and QR codes and eco-tourist infrastructures, and easier to access through objectification and commodification. Through their 'othering' and externalization from the human realm – to be experienced but not be part of – our ecosystems and ecologies and their 'conservation' are turned into spectacles (Igoe, 2010) and 'extractive attractions' (Brock and Dunlap, 2018); to be consumed, sold and

marketized. The "spectacularization of conservation" (Igoe; Brock this issue) relies on packaging and sale of images of conservation (commodities) that are grounded in ideas of wilderness and problematic assumptions about human-nature relations and the destructiveness of human-nature interactions (Corson, 2010; Neves, 2010). However, as Brock (this issue) shows, it can also play with fantasies of total human control and the ability of corporations to 'upgrade nature' and make 'better natures'. Either way, spectacularization of nature is linked to nature-based commodity fetishism (Carrier, 2010), 'fetishized commoditization' (Neves, 2010: 719) or 'virtualism' (Huff, this issue) where images and ideas prevail over the importance of lived experiences and actual human relations with – and being part of – the nonhuman world. Nature is thus 'subsumed' (Carton and Andersson, 2017; Carton et al. 2017) into the broader growth economy of the repair mode.

New natures and ecologies of repair are thus grounded not only in dispossession but in the objectification, separation and alienation of humans from nonhuman nature to make the latter legible and quantifiable. In the repair mode, 'nature' has value not only as an input for industrial-extractive production and growth but, seemingly paradoxically, has also been reframed and reconfigured as a parallel realm of repair and source of cheap resources and technical and financial solutions that can ostensibly address or neutralize the harm caused by continued growth. In practice, through technical rationalization, restoration, re-creation and / or re-cultivation, environmental intervention in the repair mode aiming to generate new, better-disciplined, more legible, and infinitely 'substitutable' natures to feed a range of revenue streams.

In different ways, through different approaches, the contributors to this themed issue all illuminate the technologies and practices underlying the repair mode, their financial and political entanglements, and how they facilitate accumulation by restoration. This involves critically investigating the knowledge regimes and framings that are mobilized for repair, and the effects they have. This knowledge/governance nexus requires new technologies to mediate relationships between nature and society in the repair mode. This rendering of repair, through mechanisms and tools of 'mitigation', 'compensation' and 'equivalence', as well as constructs like 'neutrality' and 'repair' as both instrument and objective, simultaneous means and ends, is spectacular, performative and metrological. It reproduces and enacts social ecological relations and dynamics, through technologies that can take a wide variety of (social, material, political) forms – many of which are explored in this issue. They can be 'mycorrhizal technologies' (Oviatt, this issue) that help commodify fungi for large-scale agriculture and become entangled in the growing process and the imaginary of a new green revolution; marketed as ecological repair of soils to 'optimize' natural processes. Here, AbR takes the form of a commodified fix to benefit the same corporate actors that are responsible for industrialized agriculture and its huge ecological costs to begin with. It represents, Peter Oviatt argues, a 'broader economy in which streams of revenue shift from being complicit in the destruction of environments, to being explicit in their repair'. AbR promises to restore ecological functions of what is framed as 'clean' (=dead?) arable lands; it goes hand in hand with the 'making' of these spaces through the "clean slate" rationale, where 'industrial agricultural practices – e.g., severe tilling regimes and the heavy use of chemical pesticides and fertilizers – have rendered beneficial soil microbes ineffective'.

These technologies can also be 'social technologies of governance' to which spectacle, performance and representation are integral (Brock, this issue). In her contribution, Jana Hrckova argues that the 'spectacle of repair', which she conceptualizes as a 'carefully calibrated social technology of green governance' helps manage environmental degradation – and the population – through state control over images. Through her study of the 'Million Trees for Warsaw' initiative she illustrates the rise of new opportunities for capitalist expansion through restoration activities that equate the selective 'management of visibilities' with sustainability. The imaginaries and green credentials associated with new trees, with greening and greening spectacles, serve as a repair technique to

compensate for inaction in relation to the systemic drivers and real causes of air pollution – coal and cars. This 'management of visibilities' thus aims to alleviate citizens' pressure to tackle (largely invisible) air pollution while avoiding policies that harm capital accumulation. This 'spectacle of repair', she argues, is an emergent technique of governance that simultaneously depoliticizes air pollution and feeds the economy of appearances, 'deployed to decouple the polluted reality from the green spectacle'.

Relatedly, Brock problematizes the 'spectacularization of conservation' (this issue) involved in turning coal mine operator RWE's offsetting (and mining!) activities into eco-touristic and recreational opportunities through clever PR, advertising videos, and marketing. Offsetting thus feeds into the ecotourism–extraction nexus while profiting the company through the creation of new, ordered 'ecologies of repair' that provide legitimacy as well as direct profit opportunities. The performance of spectacular conservation – through partnerships, visuals, and events – legitimizes clear-cutting and mining activities as 'temporary use of the land' and 'temporarily impacting' on local ecologies, ignoring its irreversible impacts. Spectacle, she argues, drawing on Debord (1967), 'imposes a sense of unity in situations of fragmentation, legitimizing and justifying political systems and dominant power relations, and stipulating consumption as the (only) way of engaging with the world', thus contributing to alienation while mediating the relationships between resident and mining tourist, coal operator and nature; remaking the (human) landscape and communicating the reconcilability of sustainability and coal.

Louise Carver's contribution picks up this same theme. She shows how the principle of 'No Net Loss' (NNL) itself *acts* as a 'conceptual technology', an 'abstraction that shapes the world in its image'. In other words, NNL itself enacts restoration ecologies of repair, together with associated metrological and calculative devices. The accretion, normalization and adoption of such technologies helps make nature substitutable and offsetable by framing nature as 'aggregated sums of environmental totals' that are suitable for balance sheet accounting models. This allows for the idea of substitutability and exchange between kinds and types of environmental goods and bads, ignoring specificities or differences. These technologies are thus not only manifest in material techniques, but they colonize thinking patterns, Carver argues, working to prescribe some and restrict other solutions, and emphasize certain drivers of biodiversity loss over others. That's how NNL and the mitigation hierarchy are performative.

The instrumentalization of 'neutrality' is a recurring theme that emerges in many of the contributions to this issue and it is fundamental for the productive work of AbR. Neutrality functions both a technical mechanism for addressing multiple overlapping crises and a metric for assessing, materializing and trading the idea and performance of 'sustainability' at different scales, from individual to ecosystem to landscape to planetary. Neutrality, as an operating principle, is thus not only key to the processes of commensuration, but as Huff (this issue) demonstrates, through abstraction and virtualization it reifies the market environmentalist imaginary of globalized, balance-sheet nature. This in turn facilitates conceptual and phenomenological 'slippages' between ecologies of place and imagined planetary natures and concrete and imagined development geographies of the repair mode. The instrumentalization of neutrality underscores the importance of asking 'what nature' is being made the object of intervention?' This is the case not only in the context of understanding the production of commodified offsets such as in VCM carbon forestry projects, but also in the context of compensatory offsetting (Srivastava and Mehta, this issue) can be scale-making and world-making projects, producing natures and spatialities of repair that extend far beyond project boundaries. They focus on discourses, practices and politics of value-making and un-making to understand the simultaneous depletion and securitization of mangroves. In effect these turn herders and fishers into 'compliant environmental subjects' while eroding their livelihoods and identities. As Huff (this issue) emphasizes, restoration regimes and their entangled and co-produced ecologies can transcend scales and span rural and urban, North and South,

metropolitan and frontier geographies, the 'distant' conservation landscape and the intimacies of lived space (Huff, this issue; Tsing, 2000, 2005).

Conclusions

Accumulation by restoration has become central in the contemporary political economy of conservation, characterized by narratives of planetary control, stewardship, aggregate limits and boundaries and collective responsibility. Capitalism in repair mode should not just be understood as a way of making money by investing and repairing damaged landscapes, making markets more friendly to the conditions of life, nor indicative of a step away from harmful industrial and extractive practices that drive climate disruption, habitat and species loss and spiraling inequalities. Rather, the repair mode has several important effects and consequences that we outline in this conclusion.

First, the repair mode enacts a dangerous anti-politics that uses tropes of urgency and control to shut down space for deliberation, de-legitimizes alternative approaches to understanding and responding to intersecting crises, and flattens differences of place, society and experience. Repair itself is constructed as 'rational, neutral and apolitical' (Collins et al., 2021: 1) response to ecological hazard, with little attention to its roots, politics or justice implications.

Second, the depoliticization of the repair mode individualizes responsibility and puts decision-making and 'solutions' in the hands of the very actors and ideologies that created the problems in the first place. In fact, it further empowers the corporations and state actors that profited of ecological exploitation in the first place; legitimizing their operations and providing avenues for discursive alignment of their interests and ecological sustainability which initially emerged as a challenge to growth-oriented capitalist 'business as usual'. Economic rationality is invoked to manage this challenge and incorporate it into business models and state operations. This leads to continued enclosures, privatization and commodification of land, excluding people and deepening human-nature separation through re-enforcing myths around colonial imaginaries of wilderness and pristine natures.

Third, the repair mode does not challenge but thrives on the continued global growth pathway, legitimizing ecologically destructive activities through its productive power, and the making of new, ordered 'ecologies of repair'. It helps invisibilize the social and ecological costs of 'developments', whether infrastructures, extraction or green capitalist projects, pacifying (potential) obstacles to – and create new opportunities for – extraction of value in multiple forms. It helps hide the substantive drivers of degradation, while ecologies of repair are enacted (Carver, this SI). The focus on repair is thus about pacification of resistance more than conservation as such; entangled with extractivism, infrastructures and state power.

Beyond its material consequences, the repair mode entrenches a particular worldview of commensurability and substitutability, focusing on services rather than unique natures, ecosystems and habitats, and our roles within them and relations with other species. This facilitates the further loss of nonfinancial values; and undermining non-utilitarian values of nonhuman lives and existences more generally. However, it also leads to the deepening of alienation and loss of connection; relationships of care that eco-feminists have long emphasized are ignored or dismissed. In the long-term, the repair mode creates a demand for degradation of nature in the form of repair-ready objects and landscapes, which in turn incentivizes further and even intensified material extraction to feed the expansion of industrial growth and, in parallel, feeds new growth markets for repair in the form of nature-based commodities, financial products and 'green' industrial products.

To counteract the worst effects of the ecological crises we are encountering, we need not only to fundamentally alter political economic structures and power relations and to stop degradation

and destruction – we also need meaningful repair and healing. We need to repair ecological harm but more importantly our relationships with and connections to the nonhuman world around us. Healthy relationships are integral to healthy people and ecologies. There is much to learn from land-based communities around the world who are not only defending their territories but also doing groundwork, healing and repairing soil and socio-natural relationships around it. Peter Gelderloos (2022) explores how people take Buddhist, Sámi, Mushkegowuk, Métis-Cree, Diné, Hawai'ian and Sioux approaches to nonhuman natures, rejecting the anthropocentrism of Western science and interventionism, to look after their land. Others are building movements around agroecology, forestry and permaculture, aiming to create and defend new food production and distribution regimes based on ecological values and de-commodifying practices, while others are developing ways to foster biodiversity in cities and heal landscapes scarred by war, depleted by industrial monocropping or polluted by mines and factories. Explicitly rejecting state-dictated solutionism and centering the values of autonomy, solidarity, reciprocity, kinship, ecological healing, justice and (food) sovereignty rather than (market) values, people across the world understand that repair is deeply entangled with access, place-making, (re)connection and (re)commoning. In other words, repair is a social and political, not purely technological process. Access to land and fighting inequalities around land are thus central to repair. Only when repair work meaningfully challenges the logics of growth, property and alienation, valuing autonomy and connectivity, and taking a more holistic approach to healing, can meaningful change occur. That repair work is fundamentally different, in terms of logics, motivating values, socio-techno-environmental relationships and horizons, from the repair mode we outline here is happening in many places in the majority and minority worlds, against enclosure and defying corporate and state power. Rather than allowing for corporate control over and intervention into landscapes and ecosystems, we need to empower, amplify, and walk with people who are already doing this work.

Highlights

- This themed issue explores and elucidates 'Accumulation by Restoration' (AbR), a new dynamic in conservation finance and the governance of nature.
- AbR arises from trajectories of neoliberal environmental governance but represents a shift from the dominance of approaches to conservation that emphasise preservation of landscapes, ecosystems and biological life to a 'growth economy of repair' in which nature becomes valued not just for its use in production or recreation, but also for its repair or restoration.
- Accumulation in the repair mode is associated with new politics of anthropocenic or 'planetary crisis', new technologies of governance and inscription, as well as new intensities and spatialities of resource control.
- The repair mode relies on an implicit nature-society distinction and the assumption, imagery and often mythology of degradation and loss juxtaposed with the promise of economic and ecological 'redemption'. Through technical rationalization, restoration, re-creation and/or re- cultivation, the goal is to generate new, better-disciplined, more legible and freely 'substitutable' natures that can circulate globally and be put to multiple accumulative ends.
- Despite claims of sustainability transitions and 'green growth', the politics of AbR and conservation in the 'repair mode' work to incentivise continuing ecological harm whilst creating a governmentality that undermines consideration of alternative pathways. What were consequences of growth have become strategic goals and the foundation of a new growth economy.

Acknowledgements

We would like to thank the many people whose insights, contributions and feedback have contributed to the production of this themed issue, including contributors and participants in a panel on Accumulation by Restoration at the POLLEN Political Ecology Network 2018 biennial meeting in Oslo, Norway. Special thanks to the journal editors and to James Fairhead and Jean-Louis Couture for their support and encouragement.

Data availability statement

There is no data associated with the article.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported in part by the ESRC STEPS Centre at the University of Sussex under Grant ES/I021620/1 and the ESRC Centre for Future Natures under grant ES/W009331/1

ORCID iDs

Amber Huff https://orcid.org/0000-0002-2614-2045
Andrea Brock https://orcid.org/0000-0001-5771-5603

Note

1. Speech at the 2014 Biodiversity and Business Offsetting Programme conference (Brock, 2019).

References

Andreucci D, García-Lamarca M, Wedekind J, et al. (2017) Value grabbing: A political ecology of rent. *Capitalism Nature Socialism* 28(3): 28–47.

Anievas A and Nişancıoğlu K (2015) *How the West Came to Rule: the Geopolitical Origins of Capitalism*. Chicago: Pluto Press.

Anker P (2021) *Imperial Ecology. Imperial Ecology*. Cambridge: Harvard University Press.

Benoist L (2020) *Green is the New Brown: Ecology in the Metapolitics of the French far Right Today*. Lund.: Lund University.

Bluwstein J, Asiyanbi AP, Dutta A, et al. (2021) Commentary: Underestimating the challenges of avoiding a ghastly future. *Frontiers in Conservation Science* 2: 15.

Bond P (2018) Ecological-Economic narratives for resisting extractive industries in Africa. In: Cooney P and Freslon WS (eds) *Environmental Impacts of Transnational Corporations in the Global South*. Online: Emerald Publishing Limited, 73–110.

Bookchin M (1987) Social ecology versus deep ecology: A challenge for the ecology movement. *Green Perspectives: Newsletter of the Green Program Project* 1987: 4–5.

Bosiotti A (2021) David Attenborough says 'world would do better if humans weren't here'. *Daily Express*, 15 April.

Bradshaw CJ, Ehrlich PR, Beattie A, et al. (2021) Underestimating the challenges of avoiding a ghastly future. *Frontiers in Conservation Science* 1: 9.

Brock A (2019) *Conserving Nature Power: An Exploration of Biodiversity Offsetting in Europe and Beyond*. Doctoral thesis (PhD). Brighton: University of Sussex.

Brock A and Dunlap A (2018) Normalising corporate counterinsurgency: The everyday operations of RWE in the Hambacher Forest and beyond. *Political Geography* 62(1): 33–47.

Brockington D and Duffy R (2010) Capitalism and conservation: The production and reproduction of biodiversity conservation. *Antipode* 42(3): 469–484.

Brockington D and Scholfield K (2010) The conservationist mode of production and conservation NGOs in sub-saharan Africa. *Antipode* 42(3): 551–575.

Büscher B, Sullivan S, Neves K, et al. (2012) Towards a synthesized critique of neoliberal biodiversity conservation. *Capitalism Nature Socialism* 23(2): 4–30.

Caffentzis G and Federici S (2014) Commons against and beyond capitalism. *Community Development Journal* 49(suppl_1): i92–i105.

Callon M (1980) Struggles and negotiations to define what is problematic and what is not. In: *The Social Process of Scientific Investigation*. London: D. Reidel Publishing Company, 197–219.

Cantor A and Knuth S (2019) Speculations on the postnatural: Restoration, accumulation, and sacrifice at the Salton sea. *Environment and Planning A: Economy and Space* 51(2): 527–544.

Carrier JG (2010) Protecting the environment the natural way: Ethical consumption and commodity fetishism. *Antipode* 42(3): 672–689.

Carrington D (2018) Interview: Paul Ehrlich: 'Collapse of civilisation is a near certainty within decades'. *The Guardian*, 22 March.

Carton W and Andersson E (2017) Where forest carbon meets its maker: Forestry-based offsetting as the subsumption of nature. *Society & Natural Resources* 30(7): 829–843.

Carton W, Jönsson E and Bustos B (2017) Revisiting the "subsumption of nature": Resource use in times of environmental change. *Society & Natural Resources* 30(7): 789–796.

Castree N (2003) Commodifying what nature? *Progress in Human Geography* 27(3): 273–297.

Castree N and Braun B (1998) The construction of nature and the nature of construction. *Remaking reality: Nature at the millenium*. 3-42.

Cavanagh C and Benjaminsen TA (2014) Virtual nature, violent accumulation: The 'spectacular failure' of carbon offsetting at a Ugandan national park. *Geoforum; Journal of Physical, Human, and Regional Geosciences* 56: 55–65.

Clipson E and Bugler D (2020) Why David Attenborough is a national treasure. *GQ*, 19 March.

Collins YA, Macguire-Rajpaul V, Krauss JE, et al. (2021) Plotting the coloniality of conservation. *Journal of Political Ecology* 28(1).

Corson C (2010) Shifting environmental governance in a neoliberal world: USAID for conservation. *Antipode* 42(3): 576–602.

Corson C, MacDonald KI and Neimark B (2013) Grabbing "green": Markets, environmental governance and the materialization of natural capital. *Human Geography* 6(1): 1–15.

Cronon W (1996) The trouble with wilderness: Or, getting back to the wrong nature. *Environmental History* 1(1): 7–28.

Dalby S (1992) Ecopolitical discourse: 'environmental security' and political geography. *Progress in Human Geography* 16(4): 503–522.

Dalby S (1996a) The environment as geopolitical threat: Reading Robert Kaplan's' coming anarchy'. *Ecumene* 3(4): 472–496.

Dalby S (1996b) Reading Rio, writing the world: The New York Times and the 'earth summit'. *Political Geography* 15(6–7): 593–613.

Dalby S (2017) Anthropocene formations: Environmental security, geopolitics and disaster. *Theory, Culture & Society* 34(2–3): 233–252.

De Angelis M (2001) Marx and primitive accumulation: the continuous character of capital's enclosures. *The Commoner* 2.

De Angelis M, Harvie D (2014) The commons. In: Parker M, Cheney G, Fournier V, et al. (eds) *The Routledge Companion to Alternative Organization*. London: Routledge, 280–294.

Debord G (1967) *Society of the Spectacle*. London: Aldgate Press.

Devall B and Sessions G (1985) *Deep Ecology*. Salt Lake City: Gibbs M. Smith, 266 .

Dressler W, Büscher B, Schoon M, et al. (2010) From hope to crisis and back again? A critical history of the global CBNRM narrative. *Environmental Conservation* 37(1): 5–15.

Dunlap A and Brock A (2022) *Enforcing Ecocide: Power, Policing & Planetary Militarization*. Switzerland: Palgrave Macmillan.

Dunlap A and Sullivan S (2020) A faultline in neoliberal environmental governance scholarship? *Or, why accumulation-by-alienation matters. Environment and Planning E: Nature and Space* 3(2): 552–579.

Fairhead J, Leach M and Scoones I (2012) Green grabbing: A new appropriation of nature? *Journal of Peasant Studies* 39(2): 237–261.

Federici S (2019) Social reproduction theory. *Radical Philosophy* 2(4): 55–57.

Fischer-Kowalski M and Swilling M (2011) *Decoupling: Natural Resource use and Environmental Impacts from Economic Growth*. Nairobi: UNEP.

Garland E (2008) The elephant in the room: Confronting the colonial character of wildlife conservation in Africa. *African Studies Review* 51(3): 51–74.

Gelderloos P (2022) *The Solutions are Already Here: Strategies for Ecological Revolution from Below*. London: Pluto Press.

Guterres A (2020) *Secretary-General's Address at Columbia University:"The State of the Planet"*. London: Climate Action.

Hardin G (1968) The tragedy of the commons. *Science (New York, N.Y.)* 162(3859): 1243–1248.

Hardt M and Negri T (2018) The powers of the exploited and the social ontology of praxis. *tripleC: Communication, Capitalism & Critique. Open Access Journal for a Global Sustainable Information Society* 16(2): 415–423.

Harvey D (2004) The 'new' imperiealism: accumulation by dispossession. *The Socialist Register*. 63–87.

Harvey D (2011) The future of the commons. *Radical History Review* 2011(109): 101–107.

Harvey F (2020) Humanity is waging war on nature, says UN secretary general. *The Guardian*.

Heynen N, McCarthy J, Prudham S, et al. (2007) *Neoliberal Environments: False Promises and Unnatural Consequences*. London: Routledge.

Homer-Dixon T, Renn O, Rockstrom J, et al. (2021) A call for an international research program on the risk of a global polycrisis. *Available at SSRN 4058592*.

Huff A (2021) Frictitious commodities: Virtuality, virtue and value in the carbon economy of repair. *Environment and Planning E: Nature and Space*. : 1–26. Online first.

Huff A and Brock A (2017) Accumulation by Restoration: Degradation Neutrality and the Faustian Bargain of Conservation Finance. *Antipode Interventions*.

Huff A, Mehta L (2019) Untangling scarcity. In: Brewer J, Fromer N, Jonsson FA, et al. (eds) *Scarcity in the Modern World: History, Politics, Society and Sustainability, 1800–2075*. London: Bloomsbury, 27–46.

Huff A and Orengo Y (2020) Resource warfare, pacification and the spectacle of 'green' development: Logics of violence in engineering extraction in southern Madagascar. *Political Geography* 81.

Hui Y (2020) For a planetary thinking. *E-Flux Journal* 114.

Hulme M (2021) One earth, many futures, no destination. In: Böhm S and Sullivan S (eds) *Negotiating Climate Change in Crisis*. Cambridge, UK: Open Book Publishers, 3–11.

Igoe J (2010) The spectacle of nature in the global economy of appearances: Anthropological engagements with the spectacular mediations of transnational conservation. *Critique of Anthropology* 30(4): 375–397.

Igoe J, Brockington D and Duffy R (2008) *Nature Unbound. Conservation, Capitalism and the Future of Protected Areas*. London: Earthscan, 264.

IPCC (2021) *Climate Change 2021: The Physical Science Basis. Contribution of Working Group14 I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press.

IRP (2019) *Global Resources Outlook 2019: Natural Resources for the Future We Want*. Nairobi: United Nations Environment Programme, 158.

Jessop B (2015) Comparative capitalisms and/or variegated capitalism. In: *New Directions in Comparative Capitalisms Research*. Basingstoke: Palgrave Macmillan, 65–82.

Kaplan RD (2000 [1994]) The coming anarchy. In: Mehlinger HD (ed) *Globalization and the Challenges of a New Century: A Reader*. Bloomington: Indiana University Press, 34–60.

Kelly AB (2011) Conservation practice as primitive accumulation. *Journal of Peasant Studies* 38(4): 683–701.

Knights D and Morgan G (1991) Corporate strategy, organizations, and subjectivity: A critique. *Organization Studies* 12(2): 251–273.

Kopnina H (2012) The Lorax complex: Deep ecology, ecocentrism and exclusion. *Journal of Integrative Environmental Sciences* 9(4): 235–254.

Kröger M (2022) *Extractivisms, Existences and Extinctions: Monoculture Plantations and Amazon Deforestation*. London: Routledge, 176.

Kull C (2000) Deforestation, erosion, and fire: Degradation myths in the environmental history of Madagascar. *Environment and History* 6(4): 423–450.

Luxemburg R (2016) *The Accumulation of Capital: A Contribution to an Economic Explanation of Imperialism*. London: Routledge, 496.

McAfee K (2012) Nature in the market-world: Ecosystem services and inequality. *Development (Cambridge, England)* 55(1): 25–33.

McCarthy J and Prudham S (2004) Neoliberal nature and the nature of neoliberalism. *Geoforum; Journal of Physical, Human, and Regional Geosciences* 35(1): 275–283.

Marx K (1887) *Capital: A Critique of Political Economy, vol. 1*. The Marx Engels Archive.

Meadows DH, Meadows DL, Randers J, et al. (1972) *The Limits to Growth: A Report for the Club of Rome's Proyect on the Predicament of Mankind*. New York: Universe Books.

Mehta L, Huff A and Allouche J (2019) The new politics and geographies of scarcity. *Geoforum; Journal of Physical, Human, and Regional Geosciences* 101: 222–230.

Mol AP and Spaargaren G (2000) Ecological modernisation theory in debate: A review. *Environmental Politics* 9(1): 17–49.

Moore A (2015) Islands of difference: Design, urbanism, and sustainable tourism in the anthropocene Caribbean. *The Journal of Latin American and Caribbean Anthropology* 20(3): 513–532.

Naess A (1973) The shallow and the deep, long-range ecology movement. A summary. *Inquiry: A Journal of Medical Care Organization, Provision and Financing* 16(1–4): 95–100.

Nelson SH (2014) Resilience and the neoliberal counter-revolution: From ecologies of control to production of the common. *Resilience* 2(1): 1–17.

Neumann RP (1998) *Imposing Wilderness: Struggles over Livelihood and Nature Preservation in Africa*. Berkeley: The University of California Press, 271.

Ouma S, Johnson L and Bigger P (2018) Rethinking the financialization of 'nature'. *Environment and Planning A: Economy and Space* 50(3): 500–511.

Peet R, Robbins P and Watts M (2010) Global nature. In: Peet R, Robbins P and Watts M (eds) *Global Political Ecology*. London: Routledge, 15–62.

Regnery B, Couvet D and Kerbiriou C (2013) Offsets and conservation of the species of the EU habitats and birds directives. *Conservation Biology* 27(6): 1335–1343.

Robertson M (2012) Measurement and alienation: Making a world of ecosystem services. *Transactions of the Institute of British Geographers* 37(3): 386–401.

Robertson MM (2006) The nature that capital can see: Science, state, and market in the commodification of ecosystem services. *Environment and Planning D: Society and Space* 24(3): 367–387.

Robson K and Bottausci C (2018) The sociology of translation and accounting inscriptions: Reflections on Latour and accounting research. *Critical Perspectives on Accounting* 54: 60–75.

Rockström J (2015) Plenary debate – Planetary boundaries and the politics of resources. *Resource Politics: Transforming Pathways to Sustainability.* Brighton, UK.

Rockström J, Steffen W, Noone K, et al. (2009) A safe operating space for humanity. *Nature* 461(7263): 472–475.

Smith JK (2021) *The (Re) Emergence of Eco-Fascism: White-Nationalism, Sacrifice, and Proto-Fascism in the Circulation of Digital Rhetoric in the Ecological Far-Right*. Waco, Texas: Baylor University.

Smith N (2007) Nature as accumulation strategy. *Socialist Register* 2007: 16.

Srivastava S and Mehta L (2017) The Social Life of Mangroves: Resource Complexes and Contestations on the Industrial Coastline of Kutch, India. *STEPS Centre Working Paper*. Brighton: ESRC STEPS Centre.

Srivastava S and Mehta L (2021) The social life of mangroves: Neoliberal development and mangrove conservation in the changing landscape of Kutch. *Environment and Planning E: Nature and Space*. 1–20. 25148486211045360. Online First.

Staff (2013) Humans are a 'plague on Earth': Sir David Attenborough warns that negative effects of population growth will come home to roost. *Independent*, 22 January.

Steffen W, Richardson K, Rockström J, et al. (2015) Planetary boundaries: Guiding human development on a changing planet. *Science* 347(6223): 1259855.

Sullivan S (2009) Green capitalism, and the cultural poverty of constructing nature as service provider. *Radical Anthropology* 3(1): 18–27.

Sullivan S (2010) Ecosystem service commodities'-a new imperial ecology? Implications for animist immanent ecologies, with Deleuze and Guattari. *New Formations* 69(69): 111–128.

Sullivan S (2013a) After the green rush? Biodiversity offsets, uranium power and the 'calculus of casualties' in greening growth. *Human Geography* 6(1): 80–101.

Sullivan S (2013b) Banking nature? The spectacular financialisation of environmental conservation. *Antipode* 45(1): 198–217.

Sullivan S (2014) *The Natural Capital Myth; Or Will Accounting Save The World? Preliminary Thoughts On Nature, Finance, And Values. Manchester:* The Leverhulme Centre for the Study of Value.

Sullivan S (2017) What's ontology got to do with it? On nature and knowledge in a political ecology of the'-green economy'. *Journal of Political Ecology* 24(1): 217–242.

Sullivan S (2019) Bonding nature(s)? In: Bracking S, Fredriksen A and Sullivan S, et al. (eds) *Valuing Development, Environment and Conservation: Creating Values that Matter*. London: Routledge, 101–121.

Sullivan S and Hannis M (2017) "Mathematics maybe, but not money": On balance sheets, numbers and nature in ecological accounting. *Accounting, Auditing & Accountability Journal* 30(7): 1459–1480.

Sultana F (2022) The unbearable heaviness of climate coloniality. *Political Geography*. 102638.

Swyngedouw E and Ernstson H (2018) Interrupting the anthropo-obScene: Immuno-biopolitics and depoliticizing ontologies in the anthropocene. *Theory, Culture & Society* 35(6): 3–30.

Taylor B (2019) Alt-right ecology: Ecofascism and far-right environmentalism in the United States. In: *The far Right and the Environment*. London: Routledge, 275–292.

Tsing A (2000) The global situation. *Cultural Anthropology* 15(3): 327–360.

Tsing AL (2005) *Friction: An Ethnography of Global Connection*. Princeton: Princeton University Press, 344.

UNEP (2011) *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*. Nairobi: UNEP, 52.

UNEP (2011) Decoupling natural resource use and environmental impacts from economic growth. A report of the Working Group on Decoupling to the International Resource Panel.Nairobi: UNEP, 153.

United Nations (2021) *Climate Action*. Available at: https://www.un.org/en/climatechange/un-secretary-general-speaks-state-planet (accessed 28 December).

Usher M (2022) Restoration as world-making and repair: A pragmatist agenda. *Environment and Planning E: Nature and Space*: 1–26, 25148486221107221.

Voskoboynik DM and Andreucci D (2021) Greening extractivism: Environmental discourses and resource governance in the 'Lithium Triangle'. *Environment and Planning E: Nature and Space*: 1–23, 25148486211006345.

Ward K (2019) For wilderness or wildness? Decolonising rewilding. In: *Rewilding*. Cambridge: Cambridge University Press, 34–54.