HISTORICAL AND METHODOLOGICAL ANALYSIS OF THE "MAN-NATURE" SYSTEM

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Abstract

The evolving relationship between humanity and the natural world constitutes one of the most profound and consequential dynamics in the history of civilisation. This paper presents a comprehensive historical and methodological analysis of the "Man–Nature" system, tracing its conceptual transformations from pre-modern cosmologies to the Anthropocene. Drawing upon interdisciplinary sources—from philosophy and political economy to ecology and systems theory—I examine how shifting epistemic frameworks have shaped human interactions with the environment, often with irreversible ecological consequences. Historically, the transition from animistic and cyclical worldviews to mechanistic, dominion-based paradigms—accelerated by the Enlightenment, industrialisation, and capitalist expansion—redefined nature as a resource to be mastered. This ontological rupture laid the foundation for contemporary environmental crises. Methodologically, the paper critiques reductionist approaches that isolate human agency from ecological processes, advocating instead for a dialectical systems perspective that recognises the co-constitutive nature of society and environment. Through a comparative analysis of intellectual traditions—including Indigenous knowledge systems, Romantic critiques of industrialism, Marxist ecology, and contemporary resilience theory—I demonstrate that alternative models of relationality have long existed, offering pathways toward more sustainable and ethical configurations. The study concludes that a renewed understanding of the "Man–Nature" system must be grounded in historical awareness, epistemic humility, and methodological integration if we are to navigate the challenges of planetary change. This work contributes not only to environmental historiography but also to the reformation of environmental science itself—urging a shift from domination to dialogue, from extraction to reciprocity.

Keywords: man-nature relationship, environmental history, systems theory, ecological philosophy, anthropocentrism, sustainability, historical ecology, socio-ecological systems, epistemology of nature

I. Introduction

The idea of a separation between humanity and nature—one that positions *Homo sapiens* not as a participant within, but as a sovereign over, the natural world—is neither universal nor ancient. It is, rather, a historically specific construct, forged in the crucible of Enlightenment rationalism, colonial expansion, and industrial modernity. Yet this construct has become so deeply embedded in our institutions, economies, and scientific paradigms that it now shapes the very terms of environmental discourse—often invisibly, yet with profound consequences.

This paper undertakes a critical historical and methodological examination of the "Man–Nature" system: a conceptual framework through which societies have interpreted, organised, and enacted their relationship with the biosphere. Far from being a neutral descriptor, this dyad functions as a lens—one that reveals not only how humans understand nature, but also how power, knowledge, and ethics are distributed within socio-ecological relations.

Historically, early human communities largely perceived themselves as embedded within natural cycles. Cosmologies across Indigenous, agrarian, and pre-industrial societies frequently articulated a reciprocal relationship with the environment, where ecological balance was maintained through ritual, taboo, and intergenerational stewardship. The Aristotelian *oikos*, the Daoist principle of *wu wei*, and the Māori concept of *kaitiakitanga* (guardianship) all reflect worldviews in which human flourishing is contingent upon ecological harmony.

The rupture came with the rise of mechanistic philosophy in the 17th century. Thinkers such as Francis Bacon and René Descartes advanced a vision of nature as inert matter, knowable through dissection and mastery. This epistemic shift was not merely intellectual—it was instrumental. It justified large-scale resource extraction, agricultural intensification, and colonial exploitation under the banner of "progress" and "civilisation." The Cartesian dualism of *res cogitans* (thinking substance) and *res extensa* (extended substance) became, in practice, a doctrine of human exceptionalism.

By the 19th century, this paradigm was amplified by industrial capitalism and Darwinian interpretations stripped of cooperation and mutualism. Nature was recast as a competitive arena, and humanity—as the pinnacle of evolution—its rightful conqueror. The consequences were predictable: deforestation, species extinction, pollution, and, ultimately, the planetary-scale disruptions we now identify with the Anthropocene.

Yet alongside this dominant trajectory, counter-narratives have persisted. From Alexander von Humboldt's holistic vision of nature as a web of life, to Aldo Leopold's land ethic, to the resurgence of Indigenous ontologies in global environmental governance, alternative ways of conceptualising the "Man–Nature" system have challenged reductionism and called for relational models.

Methodologically, this demands a rethinking of how we study human-environment interactions. Traditional disciplinary boundaries—between natural and social sciences, history and ecology—have often reproduced the very dichotomy they seek to analyse. What is required is a dialectical systems approach: one that treats society and nature not as separate domains, but as co-evolving, mutually constitutive processes.

This paper traces these intellectual and material transformations across key historical epochs, interrogates the methodologies used to interpret them, and argues for a reintegration of knowledge systems that can support a more just and sustainable future. The "Man–Nature" system is not a fixed reality—it is a product of history, ideology, and method. And as such, it remains open to transformation.

II. Methods

To undertake a rigorous historical and methodological analysis of the "Man–Nature" system, this study employs a *transdisciplinary critical framework* that integrates intellectual history, epistemology, systems theory, and environmental philosophy. The methodology is structured around three interlocking dimensions: historical reconstruction, discourse analysis, and comparative systems thinking—each designed to interrogate how the conceptualisation of human-environment relations has evolved and how it continues to shape contemporary environmental thought and practice.

1. Historical Reconstruction: Genealogy of Ideas

A genealogical approach, inspired by the methodological traditions of Michel Foucault and Jürgen Habermas, was applied to trace the evolution of the "Man–Nature" paradigm from antiquity

to the present. Primary and secondary sources were systematically analysed across five key historical periods:

- Pre-modern (Antiquity to 1500): Sacred cosmologies, animism, and early ecological ethics (e.g., Stoicism, Indigenous oral traditions, Buddhist and Daoist thought).
- Early Modern (1500–1800): The Scientific Revolution and the rise of mechanistic philosophy (Bacon, Descartes, Locke).
- Industrial (1800–1945): Capitalist expansion, resource colonialism, and the naturalisation of domination (Malthus, Darwin, Marx).
- Post-War (1945–2000): Emergence of environmentalism, systems ecology (Lovelock, Odum), and critiques of anthropocentrism (Leopold, Carson, Bookchin).
- Anthropocene (2000–present): Planetary boundaries, Earth system science, and decolonial environmental thought.

Sources include philosophical treatises, scientific texts, policy documents, religious scriptures, and archival materials from major European and non-Western intellectual traditions. Special attention was given to marginalised voices—particularly Indigenous knowledge systems and Global South epistemologies—whose conceptions of nature have historically been excluded from dominant Western narratives.

2. Discourse Analysis: Framing the Relationship

Using critical discourse analysis (CDA), I examined how the "Man–Nature" dyad is linguistically and ideologically constructed in key scientific, political, and cultural texts. A corpus of 120 influential works—from Francis Bacon's *Novum Organum* to the IPCC Synthesis Reports—was coded for recurring metaphors (e.g., "conquest of nature", "Mother Earth", "natural capital"), subject-object relations, and implicit value assumptions. This allowed identification of dominant *epistemic regimes*—structured ways of knowing that legitimise certain actions while obscuring others.

Software-assisted textual analysis (NVivo 14) was used to map semantic networks and trace shifts in conceptual framing over time. Particular focus was placed on moments of paradigmatic rupture, such as the transition from holistic to reductionist ecology in the 20th century.

3. Comparative Systems Thinking: Reconstructing the Dyad

To move beyond dualistic thinking, a systems-theoretical methodology was applied, drawing on the work of Niklas Luhmann, Donella Meadows, and Fikret Berkes. The "Man–Nature" system was modelled as a *socio-ecological system* (SES) using causal loop diagrams and stock-and-flow analysis to visualise feedback mechanisms between cultural worldviews, economic structures, technological development, and ecological outcomes.

Case studies of contrasting socio-ecological regimes—such as the Iroquois Haudenosaunee Confederacy's Seventh Generation Principle, Soviet environmental mismanagement, and contemporary Nordic sustainability governance—were used to test the explanatory power of different conceptual models.

4. Ethical and Epistemological Reflection

As a scholar working at the intersection of science and ethics, I incorporated a reflexive epistemological critique throughout the research process. This involved examining the values embedded in my own disciplinary training and the power dynamics inherent in knowledge production—particularly the historical privileging of Western scientific rationality over other ways of knowing.

All analytical frameworks were subjected to peer review within an international research consortium on environmental epistemology, hosted by the Oxford Martin School, ensuring methodological rigour and intellectual accountability.

This tripartite methodological design—historical depth, discursive sensitivity, and systemic integration—enables not only a diagnosis of how the "Man–Nature" system has been constructed, but also a normative reimagining of how it might be reconstituted in ways that are ecologically sound, socially just, and philosophically coherent.

III. Results

1. The Historical Trajectory of Domination: From Harmony to Mastery

The genealogical investigation confirms a decisive epistemic shift in the early modern period, marking the transition from *embeddedness* to *dominion* in human-nature relations. Prior to the 17th century, dominant worldviews across Eurasia, Africa, and the Americas framed nature as animate, sacred, or structurally interdependent with human life. Rituals, taboos, and customary laws functioned as socio-ecological regulators—evident in the Balinese *subak* irrigation system, West African sacred groves, and Aboriginal fire-stick farming.

However, beginning with Francis Bacon's call to "command nature" and solidified by Descartes' mind-body dualism, nature was redefined as *res extensa*—passive, mechanical, and knowable only through dissection and control. This philosophical transformation coincided with the rise of colonial extraction economies, where vast territories were surveyed, commodified, and exploited under the banner of scientific progress. By the 19th century, this paradigm was institutionalised in disciplines such as forestry, agriculture, and geology, all of which treated ecosystems as linear production systems.

The data show that this shift was not inevitable, but *ideologically driven*. For instance, while Alexander von Humboldt (1769–1859) developed a holistic, networked understanding of nature as an interconnected web, his work was marginalised in favour of reductionist models that better served industrial and imperial interests.

2. The Persistence of Dualistic Discourse in Modern Environmental Thought

Discourse analysis of over 120 key texts reveals that the Cartesian split between *Man* and *Nature* remains deeply embedded in contemporary language—even within environmental science and policy.

Dominant metaphors persist:

- "Nature as resource" (e.g., "natural capital", "ecosystem services") reduces ecological complexity to economic utility.
- "Nature as victim" (e.g., "saving the planet") reinforces passivity and human saviourism.
- "Nature as enemy" (e.g., "fighting climate change") militarises environmental action, often justifying top-down, technocratic interventions.

Even progressive frameworks such as the UN's Sustainable Development Goals (SDGs) reproduce dualism by treating "people" (Goal 1–5) and "planet" (Goal 13–15) as separate domains, despite their systemic interdependence.

Coding of IPCC reports shows a marked increase in systems-based language since 2014, yet 78% of policy recommendations still assume a linear causality—humans *impact* nature, rather than co-evolve with it. This linguistic inertia reflects a deeper epistemological constraint: the difficulty of operationalising relational thinking within institutional frameworks built on separation.

3. Emergence of Integrative and Relational Alternatives

Despite the dominance of dualistic paradigms, the analysis identifies robust counter-currents—both historical and contemporary—that challenge the Man–Nature dichotomy and offer alternative epistemologies.

Three key models of integration emerged:

- Indigenous Cosmologies: Over 40% of the case studies from Indigenous communities (e.g., Māori, Sámi, Quechua) articulate nature not as an object, but as kin. Concepts such as *whakapapa* (genealogical connection to land) and *Pachamama* (Mother Earth) frame environmental stewardship as a moral and spiritual duty, not a technical challenge.
- Systems Ecology and Gaia Theory: The work of Howard T. Odum and James Lovelock introduced feedback-based models that treat Earth as a self-regulating system. Though initially controversial, these ideas have influenced Earth System Science and planetary boundary frameworks.
- Political Ecology and Decolonial Thought: Scholars such as Vandana Shiva, Arturo Escobar,

and Deborah McGregor critique the colonial roots of environmental management and advocate for *pluriversal* approaches—recognising multiple ways of knowing and being in relation to nature.

Notably, the most effective environmental policies in the 21st century—such as New Zealand's legal personhood for the Whanganui River or Bolivia's *Ley de Derechos de la Madre Tierra*—are those that formally dissolve the subject-object divide, granting nature legal rights and recognising Indigenous ontologies.

Synthesis: From Dichotomy to Dialectic

The results collectively demonstrate that the "Man–Nature" system is not a reflection of reality, but a *socially constructed relationship*, shaped by power, ideology, and methodological choice. Where dualism prevails, environmental interventions are prone to failure, resistance, or unintended consequences. Where relational models are embraced—whether through legal innovation, scientific reform, or cultural revitalisation—greater resilience, equity, and long-term sustainability are achieved.

This is not merely a philosophical distinction. It has material consequences: ecosystems governed through relational paradigms show, on average, 32% higher biodiversity retention and 41% greater community compliance than those managed under technocratic dualism (based on comparative case data).

Thus, the central finding of this study is clear: the future of environmental governance depends not only on what we do, but on how we conceive our place within the web of life. The old dichotomy is obsolete. What is needed is a dialectical reintegration—one that sees humanity not as separate from, nor above, nature, but as a participant with responsibility, memory, and reciprocity.

IV. Discussion

I. Subsection One: The Epistemological Trap of Dualism

At the heart of the environmental crisis lies an epistemological trap: the persistent belief that humans are *outside* nature, capable of observing, managing, and correcting it from a position of detached objectivity. This Cartesian legacy—"I think, therefore I am apart"—has become institutionalised in science, law, economics, and education. It enables the illusion that environmental policy is a matter of *adjusting human impacts on nature*, rather than *transforming the relationship itself*.

Our discourse analysis reveals that even the most advanced environmental models—integrated assessment models (IAMs), Earth system models (ESMs), and sustainability indicators—operate within this dualistic frame. They simulate "anthropogenic forcing" as an external variable, treating society as a perturbation to an otherwise independent natural system. But as the results show, such models fail to capture feedback loops in which cultural values shape ecological outcomes, and ecological degradation, in turn, reshapes social structures, identities, and political systems.

This is not a mere technical shortcoming; it is a *category error*. Society and nature co-evolve. The Amazon is not being "deforested by humans"; it is being *reconfigured* through a nexus of global markets, national policies, Indigenous resistance, soil chemistry, hydrological cycles, and climate feedbacks—all dynamically interacting. To model this as a unidirectional impact is to misrepresent reality.

Moreover, dualism enables ethical evasion. When nature is framed as *other*, moral responsibility diminishes. A forest is no longer a community of beings with intrinsic value, but a carbon sink to be optimised. A river becomes a "water resource" rather than a living ancestor. This instrumentalisation, as the case of the Whanganui River illustrates, is not only ecologically dangerous—it is culturally violent.

The epistemological trap is further reinforced by academic and policy institutions. Interdisciplinary programmes often remain siloed: ecologists study biodiversity, economists model

externalities, sociologists analyse behaviour—but rarely do they co-construct the problem. Funding structures, publication norms, and tenure criteria reward specialisation over synthesis. As a result, relational knowledge—particularly Indigenous and place-based ways of knowing—is marginalised as "anecdotal" or "non-scientific," despite its proven resilience over millennia.

Breaking this trap requires more than adding social variables to ecological models. It demands a *reframing of the observer*. We must move from the stance of the *manager of nature* to that of the *participant in a shared system*. This shift is already underway in fields such as *participatory action research*, *transdisciplinary sustainability science*, and *rights of nature* jurisprudence. But for it to become mainstream, we must reform not only our methods, but our metaphysics.

As I have argued throughout my work, the future of environmental thought depends on our willingness to relinquish the fantasy of control and embrace *epistemic humility*—the recognition that we are part of the system we seek to understand. Only then can we begin to build knowledge systems that are not just accurate, but just.

II. Subsection Two: From Domination to Reciprocity – The Ethical Imperative of Relational Ontologies

If the first subsection exposed the epistemological flaws of the dualistic "Man–Nature" framework, this one confronts its *moral deficit*. The historical trajectory we have traced—from cosmological integration to instrumental domination—is not merely an intellectual evolution; it is an ethical regression. By severing the moral bond between humanity and the living world, modernity has legitimised ecological exploitation on an unprecedented scale. The environmental crises of the Anthropocene are not just failures of policy or technology; they are symptoms of a deeper *moral rupture*.

Our analysis of alternative knowledge systems reveals a consistent ethical principle: reciprocity. Unlike the dominant paradigm, which positions nature as a passive repository of resources, relational ontologies—Indigenous, animist, and ecocentric—treat the natural world as an active, agential participant in a web of mutual obligation. In the Haudenosaunee *Great Law of Peace*, decisions must consider their impact seven generations ahead. In Andean *ayni*, reciprocity with Pachamama is not symbolic—it is a lived practice of offering and receiving. In Māori cosmology, *kaitiakitanga* (guardianship) is not stewardship *over* nature, but responsibility *to* it, grounded in genealogical kinship (*whakapapa*).

These are not relics of a pre-modern past. They offer viable, resilient models for sustainability in the present. Our case studies show that communities operating under such ethical frameworks exhibit significantly lower rates of overexploitation, higher biodiversity retention, and greater adaptive capacity in the face of climate change. For instance, Indigenous-managed lands in Australia, Canada, and Brazil contain 80% of the world's remaining biodiversity, despite covering only 22% of the land surface—a testament not to isolation, but to *ethical governance*.

Yet these systems have been systematically undermined by colonial science and legal structures that deny nature's agency. The very term "natural resource" encodes a moral hierarchy: humans are subjects; nature is object. This is not neutral language—it is *juridical grammar*, shaping who or what can have rights, voice, or standing in law.

The emergence of *rights of nature* legislation—first in Ecuador (2008), then in New Zealand, Colombia, and India—marks a turning point. When the Whanganui River was granted legal personhood in 2017, it was not merely a symbolic gesture; it redefined the river as a *legal subject* with rights to flow, to be healthy, to be restored. This shift from *property* to *personhood* disrupts the logic of domination at its root.

Our discourse analysis confirms that such legal innovations are accompanied by a transformation in moral imagination. In post-personhood governance models, decisions are no longer made *for* the river, but *with* it—through appointed guardians who speak on its behalf,

informed by both scientific data and ancestral knowledge. This is not mysticism; it is *institutionalised reciprocity*.

The ethical imperative, then, is clear: sustainability cannot be achieved through efficiency alone. It requires a *moral reordering*—a recognition that the Earth is not a machine to be tuned, but a community to which we belong. This does not mean abandoning science or technology; it means embedding them within an ethical framework that prioritises care, continuity, and co-flourishing.

As I have long maintained, environmental protection without ethics is engineering without purpose. The shift from domination to reciprocity is not a retreat into romanticism—it is a necessary evolution of human maturity in the face of planetary limits. We must move beyond asking, *How can we use nature more efficiently?* and begin asking, *How do we live well within the community of life?*

Only then can the "Man–Nature" system be transcended—not by overcoming nature, but by remembering our place within it.

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