

Intellectual Property in Times of Ecological Crisis

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The Rooibos plant grows naturally only within the fynbos biome of South Africa's Western and Northern Cape provinces, one of the world's richest biodiversity hotspots. For generations, Indigenous Khoi and San communities developed knowledge concerning the harvesting and use of Rooibos long before it became a globally traded commodity (Malgas et al., 2011). Today, Rooibos is protected through a Geographical Indication (GI). Biodiversity standards have been incorporated directly into product specifications, and after a decade-long struggle by indigenous knowledge holders, an Access and Benefit-Sharing agreement promises financial benefits to Indigenous communities whose knowledge contributed to the product's commercial success (Wynberg et al., 2023).

At first glance, Rooibos appears to be a success story for intellectual property (IP) and sustainable development. A place-based product receives legal protection, conservation objectives become integrated into governance structures, and Indigenous knowledge holders obtain formal recognition within international markets (Biénabe et al., 2009). However, a closer examination reveals a more complicated reality.

Most Rooibos cultivation remains concentrated in the hands of commercial landowners, processors and exporters continue to capture a substantial proportion of the value generated by international trade, and historical patterns of land dispossession remain largely untouched by GI protection. The GI protects the name “Rooibos”, but it cannot redistribute land ownership, reverse colonial histories, or guarantee ecological resilience in the face of climate change and monocropping pressures (Ives, 2017).

The Rooibos case exposes a broader contradiction at the heart of contemporary IP law. Legal systems have become increasingly sophisticated at protecting names, inventions, data, brands, and other intangible assets, while remaining remarkably limited in addressing the ecological and material conditions on which those assets depend.

This contradiction emerges at a moment of a planetary crisis.

Climate change, biodiversity loss, mass extinction, resource depletion, and deepening social inequality are increasingly understood not as isolated problems but as elements of a broader poly-crisis or meta-crisis in which multiple planetary boundaries are being crossed simultaneously (Braidotti, 2019; Machado de Oliveira, 2025). Terms such as poly-crisis, meta-crisis, and perma-crisis have emerged to describe a condition in which multiple interconnected crises converge, revealing deeper structural tensions within modern social, economic, and legal systems and producing a persistent state of uncertainty and instability (Machado de Oliveira, 2025, p. 33). The question confronting legal scholarship is therefore no longer simply whether existing legal institutions function effectively, but whether the assumptions upon which those institutions were built remain adequate for an age of ecological limits.

Increasingly, scholars argue that law is not merely failing to solve these crises but is structurally implicated in producing them (Natarajan & Dehm, 2022; Tsioumani & Rabitz, 2026).

Intellectual Property and the Ontology of Separability

Modern IP law, in the same way, reinforces the assumption that knowledge can be separated (extracted, decontextualised, and commodified) from the communities that produce it (Descola, 2024). Patents protect inventions, copyright protects creative expression, and trademarks protect commercial reputation. Across these regimes, knowledge is treated as discrete, ownable, transferable, and detachable from the social and ecological systems from which it emerges. They reproduce a colonial vision in which the inventor is seen as the source of innovation, while nature is reduced to a supplier of raw inputs.

This ontology mirrors what scholars describe as the human–nature divide or the “dis-ease of separability”, the assumption that humans exist as autonomous subjects acting upon an external natural world rather than existing within ecological relationships that sustain life itself (Machado de Oliveira, 2025, p. 20). This divide is deeply embedded within contemporary positivist legal systems.

Nature becomes an external object of management rather than a community of relationships (Dehm, 2022, p. 79). Forests become timber reserves or plantations. In Palestine, indigenous phrygana

ecosystems were replaced by Israeli settler colonists with monocultures of Jerusalem pine, transforming the landscape into a “fuel-rich store of combustible energy” (Nieuwenhuis & Joronen, 2026, p. 344). Rivers become water supplies, commodities to extract, or natural resources (Machado de Oliveira, 2025, p. 56). Soils become agricultural inputs. The “Green Revolution” in North Africa relied on the intensive use of chemical fertilisers and pesticides, treating the soil as a medium for industrial production rather than as a living biological community (El Nour, 2023). The living world becomes an inventory of natural resources awaiting transformation into commodities (Dehm, 2022, p. 77).

The concept of IP reproduces this same logic in relation to knowledge.

Pharmaceutical patents frequently emerge from biodiversity and generations of interaction between communities and ecosystems, yet recognise only the final act of invention (Lai, 2025). Agricultural innovation depends upon pollinators, soils, water systems, microbial life, and accumulated farming knowledge that remain largely invisible within IP doctrine (Ghimire et al., 2025). Even artificial intelligence systems, often celebrated as examples of immaterial innovation, depend upon vast infrastructures of energy, water, minerals, rare earth metals, and labour (Hamouchene, 2023, p. 30).

The supposedly immaterial economy remains profoundly material.

Intellectual Property Expansion in an Age of Ecological Limits

These tensions emerge at the very moment that intellectual property continues to expand geographically through global trade governance. Over the past century and particularly following the establishment of the World Trade Organisation in 1995, IP has shifted from a fragmented and largely voluntary system of international cooperation (only for non-occupied and non-colonised states) to a universalised and enforceable regime of global obligations.

The TRIPS Agreement transformed IP into a central component of international trade law, while subsequent bilateral and regional agreements further consolidated these standards through so-called “TRIPS-plus” provisions. Historically contingent European and Anglo-American institutions increasingly became global norms, embedded within trade agreements and development programmes and frequently adopted by states as a condition of participation in international markets rather than through domestic political choice (Draho, 2002).

From this perspective, the expansion of IP resembles earlier processes of imperial and economic integration (Rahmatian, 2009). Legal traditions travel globally while presenting themselves as neutral, universal, and technically necessary. Yet IP systems emerge from specific social, economic, and ecological histories. Their global diffusion therefore raises important questions about institutional fit, distributive justice, and ecological sustainability.

The ecological crisis sharpens these concerns by revealing knowledge itself to be ecological and relational rather than autonomous and individual. Knowledge emerges through interactions among soils, climates, biodiversity, infrastructures, institutions, and communities, while innovation has always depended upon these more-than-human relationships (Lai, 2024; Sandström et al., 2024). Yet international law, particularly IP law, developed as though knowledge were the autonomous product of the human mind, obscuring the ecological and social conditions that make innovation possible. In this sense, the crisis exposes the limits of a legal imagination founded on separability and control and invites a shift toward legal frameworks that recognise knowledge as fundamentally embedded within ecological relations.

Rethinking Legal Research in Times of Crisis

The ecological crisis poses challenges not only for legal institutions but also for legal scholarship itself.

Legal research frequently privileges treaties, judgments, statutes, and institutional reports while treating ecological realities as background conditions rather than constitutive elements of social life. IP scholarship often reproduces this abstraction by analysing incentives, markets, and innovation while overlooking the ecological systems that make innovation possible in the first place.

The challenge is therefore not merely practical or institutional but onto-epistemological, requiring a reconsideration of the assumptions through which law knows, categorises, and governs the world. Can legal scholarship continue operating with assumptions of separability in an age increasingly defined by interdependence? Can IP continue to privilege ownership and exclusion within ecological systems that depend upon reciprocity and regeneration?

While the question of IP rights also applies to inventions generated by artificial intelligence, fundamental questions remain unexplored about the very concept of invention. The ecological crisis may demand an equally fundamental reconsideration of the assumptions that structure legal thought.

These questions emerged directly from ongoing research by the authors. Our work repeatedly reveals the limitations of approaches that treat IP as detached from the ecological, social, and historical conditions that sustain production and knowledge.

The Rooibos plant offers a useful reminder. Remove the climate, biodiversity, labour, knowledge, or landscape that sustain Rooibos, and the product itself disappears.

Perhaps IP law faces a similar lesson. Knowledge has never been separate from ecology. Law merely behaved as though it were.

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