

1 Rights of Nature and Ecosystem Approach

An Introduction

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The need to abandon the fairy tale of sustainable development

In 1972, the first United Nations Conference on Human Environment was celebrated in Stockholm, where, for the first time, the international community took notice of the existence of an environmental crisis. Consequently, the United Nations Environment Programme (UNEP) was created to lead the way for humanity to solve its environmental problems. Almost fifty years later, in 2021, UNEP recognized that the global environmental outlook had worsened, instead of improving, and that currently we must talk about a polycrisis: “Three interconnected crises – climate change, biodiversity loss and pollution – are putting our economic and social well-being at risk [...] Furthermore, they also risk irreversibly changing our relationship with the natural world”.¹ From that moment on, the ‘triple crisis’ has been considered the most important challenge for humanity to tackle in the next years.²

Strange to say in a historical moment in which we are living, as Pope Francis very clearly pointed out, ‘a Third World War fought to pieces’,³ still the environment, or the triple crisis we have referred to, remains the real ‘global’ problem humanity has to face: nobody can declare to be ‘neutral’ with respect to the triple crisis, nor decide to ignore the problem because it does not affect him/her, or decide to solve it on his/her own. For as much as we can do to escape from it, *we are* part of the problem.

Yet, humanity has only recently begun to consider it seriously as a problem. Moreover, as Leura Dalla Riva has pointed out in the introduction to her chapter, the environment has not been considered a problem *per sé*, but as an

- 1 “For people and planet: the United Nations Environment Programme strategy for 2022–2025 to tackle climate change, loss of nature and pollution” (UNEP/EA.5/3/Rev.1, 17 February 2021), § 2. See also: *Corte interamericana de derechos humanos, caso Pueblo Indígena U’wa y sus miembros vs. Colombia, sentencia de 4 de julio de 2024 (Fondo, Reparaciones y Costas)*, § 304.
- 2 *Corte interamericana de derechos humanos, Opinión consultiva n. 32/2025, de 29 de mayo 2025, “Emergencia climática y derechos humanos”*, § 42.
- 3 <https://www.rainews.it/articoli/2023/05/papa-francesco-viviamo-la-terza-guerra-mondiale-combattuta-a-pezzi-b6b0c330-806c-437e-8a08-848078f7b18b.html>.

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obstacle to human development. In fact, the 1972 Stockholm Conference was dedicated to the 'human' environment. It was an anthropocentric approach, as only problems which could be associated with the adjective 'human' were noteworthy to be put on the agenda. Before that moment, the environment (without adjectives) was relevant only for those researchers who studied natural sciences: humans and nature were still divorced, the former considered as subjects, the latter treated as an object, or a set of goods or resources, to be owned, sold, used, exploited.

In the 19th century, however, a new scientific branch was born, ecology, which invited humanity to rethink its own relationship with nature, on the basis of the pioneering research of Alexander von Humboldt, who, in his seminal opus *Cosmos*, whose first volume was published in 1845, considered nature as a totality ('the unity in diversity'⁴), defining her as the integrity and harmony among all its living and non-living elements.⁵ So, the mechanistic phase in the history of humanity⁶ was apparently arriving at its end, superseded by an ecosystem approach to life.

Nonetheless, this Copernican revolution did not affect the everyday life of men and women still for a long time. After the two world wars, humanity was concentrated on her own, in establishing a new hierarchical international order between nations. Winners worked on strengthening their economic powers over losers and on creating allegiances with non-allied countries, against their political competitors; as new colonizers, they were establishing their patronage over 'underdeveloped' nations.⁷ All this legitimized under the umbrella of international law: first, with the 1919 Covenant of the League of Nations, which entrusted 'the well-being and development of such peoples' to advanced nations as 'a sacred trust of civilization' (art. 22); then, in 1944, with the institution of the so-called Bretton Woods' system of international 'cooperation' for development; in 1947, with the signature of the General Agreement on Tariffs and Trade (GATT); and in 1958, with the creation of the UN Development Programme.⁸ Consequently, development became the keyword of the first two postwar decades, understood as 'economic growth', 'with the raising of GDP as the number one imperative.'⁹

4 Alexander von Humboldt, *Il Cosmo. Saggio di una descrizione fisica del mondo* (vol. 1, Italian translation: Stamperia del Vaglio 1850), available at <https://archive.org/details/img64A46ocr>. Original title: *Kosmos – Entwurf einer physischen Weltbeschreibung* (Cotta 1845–62).

5 Ulrich Grober, *Sustainability. A Cultural History* (Green Books 2012) 104.

6 Fritjof Capra, *The Turning Point: Science, Society, and the Rising Culture* (Bantam Books 1982).

7 See the so-called 'Point Four Programme' by the new U.S. President Harry Truman, available at <https://www.trumanlibrary.gov/education/presidential-inquiries/challenge-international-aid>.

8 Gilbert Rist, *The History of Development. From Western Origins to Global Faith* (3rd ed., Zed Books York 2008), in part. chapter 5.

9 Ibid 79. See also Wolfgang Sachs, 'Foreword. The Development Dictionary Revisited', in Ashish Kothari et al. (eds.), *Pluriverse. A Post-Development Dictionary* (Tulika Books 2019) XI.

In 1987, fifteen years after the Stockholm Conference, the UN, through its Commission on Environment and Development, released the well-known Brundtland Report ‘Our Common Future’,¹⁰ where the oxymoron of ‘sustainable development’ was first created. The famous definition ‘Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs’ matched the ecological concept of *sustainability*, with the economic concept of *development*, letting everybody understand that economic growth could be obtained while achieving social equality and maintaining the ecological integrity of the planet.

After almost forty years of developmental policies, we should know they were doing magic with words, as the failure in achieving the Sustainable Development Goals¹¹ and the current triple crisis both demonstrate.

In fact, little changed with the concept of ‘sustainable development’: GDP remained the only parameter to measure development until 1990, when the Human Development Index (HDI) was created, which integrated a nation’s income with longevity and education, offering a more comprehensive approach in understanding what ‘development’ is.¹² Only in 2022, the HDI was integrated by a Planetary Pressures-adjusted Human Development Index, which takes into consideration carbon dioxide emissions per person (production-based) and material footprint per capita, to account for the human pressure on the planet needed to generate ‘human development’.

Still, this history of development remains focused on human well-being, with a solid base on income, and a recent attention to human capabilities. The three pillars of sustainable development, clearly stated in the 2002 Johannesburg Declaration on Sustainable Development – economic development, social development, and environmental protection – do not play the same role in shaping the concept, which was not coined with the aim of protecting the environment, but to guarantee the primacy of (economic) development, even in front of social and environmental deterioration.¹³ The unsustainability of

10 A/42/427-AR, 4 August 1987, available at <https://digitallibrary.un.org/record/139811?v=pdf>.

11 See the data of “The Sustainable Development Goals Report 2025”, available at <https://unstats.un.org/sdgs/report/2025/>.

12 “Human development – or the human development approach – is about expanding the richness of human life, rather than simply the richness of the economy in which human beings live. It is an approach that is focused on people and their opportunities and choices”: available at <https://hdr.undp.org/about/human-development>. The 2005 UNESCO Convention on Cultural Diversity, at art. 3.5, recognizes that “culture is one of the mainsprings of development, the cultural aspects of development are as important as its economic aspects, which individuals and peoples have the fundamental right to participate in and enjoy”, but this did not affect the way the HDI was built.

13 Jorge E. Viñuales, *Re-orienting the Sustainable Development Snake* (Research Paper n. 16, Geneva 2013) 1–21, available at <https://www.graduateinstitute.ch/library/publications-institute/re-orienting-sustainable-development-snake>.

our patterns of production and consumption has today been recognized by every international institution, from the UN¹⁴ to the EU.¹⁵

So, it is necessary to abandon the fairy tale of sustainable development, to navigate sustainable alternatives,¹⁶ as denounced, again, by many international reports and studies.¹⁷ Borrowing from Fritjof Capra, we must shift to an ecological paradigm, to understand how the world works and adjust to it every dimension of our lives, starting from our economic model to our political and social organizations.¹⁸ It is at this crossroads that this book aspires to offer contributions to change the legal paradigm, investigating alternatives based on rights of nature (RON) and ecosystem approach.

In the preface to the book *Pluriverse. A Post-Development Dictionary*, the editors say: ‘What has been missing is a broad transcultural compilation of concrete concepts, worldviews, and practices from around the world, challenging the modernist ontology of universalism in favour of a multiplicity of possible worlds’.¹⁹ The research project which gave birth to this book incorporates in its title the word ‘transcultural’ with the same aim above.²⁰ As lawyers, we need to open our minds to revise the origins of the most traditional legal concepts and adapt them to a new form of relationship between humans and nature, what Capra and Mattei called the ‘ecology of law’,²¹ even if in that book, the challenge enshrined in the title was not brought to its ultimate frontiers.

14 UNEP/EA.5/3/Rev.1, 17 February 2021, cit., note 1.

15 “The main reason behind the climate and ecological crisis is an unsustainable pattern of production and consumption, the cumulative effect of an economic model where we design, manufacture, use, and then throw away, rather than reducing, reusing or recycling”: available at <https://ec.europa.eu/environment/stories/nature-needs-you/>.

16 Serena Baldin, ‘La sostenibilità ecologica e i principi eco-giuridici per la salvaguardia del sistema Terra’ (2022) 3 *Rivista di Diritti Comparati* 239–270.

17 “Under the current business-as-usual assumptions, the global economic system is projected to grow at around 3% annually, doubling in size by 2050. To accelerate the achievement of net-zero emissions, it will be essential to limit economic growth (in terms of physical demand) while ensuring welfare and shared prosperity”: IRENA, *World Energy Transitions Outlook 2024: 1.5°C Pathway* (International Renewable Energy Agency 2024), available for download: www.irena.org/publications; “The world is undergoing rapid change. Numerous drivers of change interact in a highly complex interplay of human needs, desires, activities and technologies (EEA, 2020) and contribute to the Great Acceleration in human consumption and environmental degradation. Human civilisation is currently profoundly unsustainable”: EEA, *Growth without Economic Growth*, 2021, available at: <https://www.eea.europa.eu/en/analysis/publications/growth-without-economic-growth>.

18 Fritjof Capra, *The Tao of Physics* (Shambhala Publications 1975). Italian translation: *Il Tao della fisica* (XXVII ed., Adelphi 2013) 356.

19 Ashish Kothari et al., ‘Preface’, in A. Kothari et al. (eds) (n 9) XVII.

20 “LUMEN – Law of natUre and huMan Ecosystem Approach: Modelling a traNscultural eco-legal framework”, a PRIN PNRR 2022 research project financed by the Italian Ministry of University.

21 Fritjof Capra and Ugo Mattei, *The Ecology of Law. Toward a Legal System in Tune with Nature and Community* (Berrett-Koehler Publishers 2015).

In the next section, we will reconstruct the philosophical and cultural basis of a holistic/ecosystem-based legal paradigm, which the RON represents. Then, we will try to frame RON into ecosystems thinking ('Systems thinking, ecosystem science, and the ecosystem approach') and as Tom Thumb, we will follow the crumbs of the ecosystem approach in international environmental law, with a focus on the Convention on Biological Diversity (CBD, 'The ecosystem approach as a legal principle'). In the conclusive remarks, we will highlight the slight differences in meaning that emerged in the use of the ecosystem approach in the various scientific contexts analyzed (philosophy, ecology, law), clarifying the *fil rouge* that unites all the chapters of this book as an innovative proposal for the construction of a transcultural eco-legal framework.

Earth jurisprudence and indigenous ecosophies: The cultural basis of RON

As the Italian philosopher Paolo Vidali reminds us, Western philosophy was born with the study of the *physis*, that is, of nature.²² The first Greek philosophers were wondering about the *arché* of the world, i.e. the fundamental principle of life. All the first books or pieces of work that we have inherited from the Greek classical culture were titled *On Nature*, because the *physis* was considered the astonishing transformation of the Chaos into Order. The first conception of nature was hylozoism, which presupposes the same 'nature' of everything because everything is permeated by the archetypal principle of life. So, humans had no privileged position in the ontological search of nature.

It is only with the Renaissance, and figures like Galileo Galilei, Descartes, and Isaac Newton, that a rigid separation between humans and nature was introduced and mechanism became the dominant Western worldview, at least until the 20th century.²³ In that century, new ethical and philosophical movements inspired by holism between humans and nature appeared.

Forerunner of a holistic approach to the relation between humans and nature was Aldo Leopold, founder of the so-called 'Ethic of the Earth'. In his seminal book, *A Sand County Almanac*, after an introspective and intimate story about his own personal experience with nature in his 'Shack' and all over the U.S., he lays out in a short and exquisite chapter the foundations of his new ethic. His position is set on conservation, as the prevalent environmental protection framework in that period in the U.S. However, he criticizes many aspects of the current policies, starting from the need to demonstrate the economic value of species to justify their conservation. Moreover, he underlines

22 Paolo Vidali, *Storia dell'idea di natura. Dal pensiero greco alla coscienza dell'Antropocene* (Mimesis 2022) 22.

23 Fritjof Capra and Ugo Mattei (n 20). Italian translation: *Ecologia del diritto. Scienza, politica, beni comuni* (Aboca 2017) 66.

the fact that conservation policies have not been able to save many species from extinction. He denounces the absence of a land ethic, recognizing that the human-land relation is still only economic.²⁴ Ethic, he says, is a limitation of the freedom of action of the individual in the name of the recognition that the individual is a member of a community. 'The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land'.²⁵ Nature, or the land in Leopold's language, is a biotic community where humans are no more conquerors, but citizens. But Leopold's land ethic is not only based on ecological knowledge. It is fully enshrined in conscience, so in love for nature. 'No important change in ethics was ever accomplished without an internal change in our intellectual emphasis, loyalties, affections, and convictions'.²⁶ This explains why Leopold's book is a piece of poetry, as much as a philosophical and ecological writing. 'We can be ethical only in relation to something we can see, feed, understand, love, or otherwise have faith in'.²⁷ He matches a strong ecological knowledge, painting land as a complex flux of vital energy as the trophic chain, with a deep ecological conscience.

His baton was picked up in the next century by Thomas Berry, considered the founder of Earth Jurisprudence. Professor of History of Religions, but also a theologian and philosopher, in his many books and articles he defended the need for an ecological reorientation of humans' minds. He supported the idea that human beings share a universal coding with the grass, stones, other animals, the Earth, stars, and the other planets, expressed in the curvature of the Universe, that possesses an impressive re-generative and creative energy. He wrote: 'Our human destiny is integral with the destiny of the earth'.²⁸ Rediscovering this common destiny and living a harmonious life on Earth on an egalitarian basis for all humans and non-humans was still possible for him.

The most highly influential Earth Jurisprudence author today is probably Cormac Cullinan, Berry's disciple and a South African lawyer. With his best-seller *Wild Law: A Manifesto for Earth Justice*,²⁹ he tried to strengthen and further develop Berry's ideas. His aim is to build up a new legal framework, to be applicable both to humans and non-humans, in a way that could guarantee an opportunity to exist and develop for every species, respecting the ecological interaction between all the elements that compose the Earth's Ecosystem. He

24 Aldo Leopold, *A Sand County Almanac & Other Writings on Ecology and Conservation* (The Library of America 2013) 172.

25 Ibid.

26 Ibid 177.

27 Ibid 180.

28 Thomas Berry, *The Dream of the Earth* (Sierra Club Edition 1990) XIV; Thomas Berry, *The Sacred Universe. Earth, Spirituality, and Religion in the Twenty-first Century* (Columbia University Press 2009) 81 and 135.

29 Cormac Cullinan, *Wild Law. A Manifesto for Earth Justice* (Siber Ink & Green Books 2022). Italian translation: *I diritti della Natura – Wild Law* (Piano B, 2012).

speaks of ‘wild law’, in the sense that law should reflect the natural rules that govern ‘wildness’, which is usually considered outside the legal order. The premise of his argumentation is that nature must be considered as a whole, and human beings as part of nature, whereas the actual legal paradigm puts humans above all other creatures and separates them from nature, as an autonomous and independent subject.³⁰ The legal consequence of this holistic approach is the recognition of RON.

Well before the RON movement had gained the current emphasis and diffusion, a Chilean lawyer tried to convince his colleagues and public authorities to recognize legal personhood for nature, as an imperative ‘*para estructurar un auténtico Derecho Ecológico*’ (to create a real ecological law).³¹ Godofredo Stutzin exposed for the first time his revolutionary ideas in 1977, five years after the publication by Christopher Stone of his article ‘Should trees have standing’.³² Like Stone and Berry, his reflections and arguments are incredibly contemporary. He listed four arguments to justify his thesis: the human interest to protect the environment; the intergenerational argument; aesthetic and affective arguments; and finally, the ecosystem argument, that is the intrinsic value of nature.³³ He was the first one to propose the label ‘Ecological Law’ for a legal system that should have guaranteed protection for nature, independently from humans’ interests. Already in the 1970s, he fully managed the ecosystems thinking, being aware of the complexity and interconnectedness of the biosphere.

So far, we have considered the history of Western philosophical thought. RON are an intercultural concept, and their recent emergence at the beginning of the 21st century is due to the constitutional battle of indigenous people, mainly in Latin America, as Ecuador was the first constitution to incorporate RON into the legal order. Indigenous cosmovisions all over the world share a monistic relationship between human beings and what Westerners call ‘nature’. Many of those people do not even have an equivalent for ‘nature’ in their language, as they have no reason to consider nature separately from themselves. Their cosmovision, or in Descola’s theory, their own ontology (how they conceptualize the relationship between the self and the other) is built upon a similar interiority (animism), and sometimes also a common corporality (totemism) between humans and non-humans.³⁴ So, in their worlds, there is no fracture among all living forms and their environment. They care

30 Ibid 59.

31 Godofredo Stutzin, ‘Un imperativo ecológico: reconocer los derechos de la naturaleza’ (1984) 1(1) *AMB. y DES.* 97–114, in part. 97.

32 Christopher D. Stone, *Should Trees Have Standing?* (William Kaufmann 1974).

33 Stutzin (n. 26) 100.

34 Philippe Descola, *Oltre natura e cultura* (Raffaello Cortina Editore 2021) 144. See also my reflections in ‘Diritti della natura nei nuovi costituzionalismi del Global South: riflessi sulla teoria dei formanti’ (2023) 58(2) *DPCE Online* 153–183, available at: <https://www.dpceonline.it/index.php/dpceonline/article/view/1882>.

for nature because they are nature, or, in Maori's words, referring to a specific ecosystem, 'we are the river and the river is ourselves'.³⁵

Finally, also in the main Oriental philosophical and religious traditions, such as Hinduism, Buddhism and Taoism, we can find an understanding of the universe based on the idea of interconnection and interdependence of all things,³⁶ where reality is subsumed under the idea of 'relationality'.³⁷ Dynamism is the other core characteristic of the material and spiritual world: the cosmic dance of Shiva; the harmonic process of creation of *yin* and *yang*, represented by the *Tao*, the route; the universal interconnection described in the *Avatamsaka sūtra*; they all presuppose the constant flux of life, where every part has no meaning by itself, but only as a net of relations.³⁸

This short promenade into the history of human thought has demonstrated that a monistic/holistic/ecosystem approach about the relationship between humans and nature is widespread in most human cultures and is at the basis of the rise of the RON movement in the last two decades.

Up to now, we have approached the topic from a philosophical/ethical/religious side. We will now turn to hard science, to complete the epistemological approaches which can be used to justify the purpose of this book, that is building a new transcultural eco-legal framework.

Systems thinking, ecosystem science, and the ecosystem approach

In many of his bestsellers, the physicist Fritjof Capra describes the emergence of (eco)systems thinking as an epistemic turmoil, a new scientific paradigm³⁹ to study and understand life on Earth. He personally used this approach to formulate a comprehensive theory of living systems, considering organisms, societies, and ecosystems as interconnected and interdependent systems. This new scientific paradigm is more than holistic; it is ecological in a broad sense: holism considers every object as a whole; ecology, moreover, considers the relationship of every object with the environment, thus understanding it as a whole-system object.⁴⁰

35 Sasha Bourgeois-Gironde, *Être la rivière* (Puf 2020) 17.

36 Capra (n 17) 118 and 149; Marcello Ghilardi, 'L'idea di natura nel pensiero sino-giapponese', in Marcello Ghilardi, Giangiorgio Pasqualotto, and Paolo Vidali (eds.), *L'idea di natura tra Oriente e Occidente* (Editrice Morcelliana 2022) 101.

37 Capra (n 17) 237.

38 Ghilardi (n 31) 101; Giangiorgio Pasqualotto, 'Buddismo ed ecosofia', in Ghilardi, Pasqualotto, and Vidali (n 31) 139–140.

39 In normal use, a paradigm is an accepted model or pattern. For Thomas Kuhn, paradigms have two characteristics: «Their achievement was sufficiently unprecedented to attract an enduring group of adherents away from competing modes of scientific activity. Simultaneously, it was sufficiently open-ended to leave all sorts of problems for the redefined group of practitioners to resolve». Kuhn Thomas S., *The Structure of Scientific Revolutions* (University of Chicago Press 1962) 10.

40 Fritjof Capra, *La rete della vita. Una nuova visione della natura e della scienza* (Bur 2001) 17. Original title: *The Web of Life* (Doubleday-Anchor Book 1996).

The development of systems thinking occurred mainly between the 19th and 20th centuries and was nurtured by the contribution of scientists from different branches, such as organismic biology, quantum physics, and non-linear algebra, Gestalt psychology, and ecology. Systems thinking is apt to study complex non-linear problems, substituting the consideration of single events and their causes with the study of patterns and structures of the whole system.⁴¹

Following Capra's description,⁴² the main principles of systems thinking are:

- 1) Focus shifts from the parts to the whole. A system's properties belong to the system, not to its parts, so that if the system is decomposed into its parts, its essential properties are lost.
- 2) A system can be composed of different hierarchical levels of complexity. The properties of each level are called 'emergent', because they come from the relationship generated among the subordinate layers.
- 3) The properties of the parts must be understood in their relationship with the environment in which they interact.
- 4) The parts, or the 'objects', should be understood as a web of relations. Relations determine the role of each part within the system. So, systems thinking is also 'web thinking'.
- 5) Systems thinking focuses on processes, which determine the structures of living entities.

Ecology is the science that studies ecosystems through the interaction of the different layers in which life is organized, starting from the individual (organism) and passing through populations and communities. The merit of this new approach is mainly to be recognized to the Odum brothers, Eugene and Howard.⁴³ The textbook of Eugene Odum on ecology (1953 and 1959)⁴⁴ is still a masterpiece and a reference for all contemporary ecologists, and it was organized around the concept of ecosystems. This word had already been used by different ecologists in the previous decades, but it was from Odum's work that the concept became a fundamental of ecology and ecosystem science became one of the most important fields of ecology. Another publication

41 Francesco Gonella, 'Basics of Systems Thinking', unpublished.

42 Ibid 48–49.

43 Kathleen C. Weathers, David L. Strayer, and Gene E. Likens (eds), *Fundamentals of Ecosystem Science* (2nd ed., Academic Press 2021) 22 and 323. See also: Joel B. Hagen, *An Entangled Bank: The Origins of Ecosystem Ecology* (Rutgers University Press 1992); Frank B. Golley, *A History of the Ecosystem Concept in Ecology: More than the Sum of Its Parts* (Yale University Press 1993) 272; Sharon E. Kingsland, *The Evolution of American Ecology, 1890–2000* (Johns Hopkins University Press 2005).

44 Eugene P. Odum, *Fundamentals of Ecology* (1st ed., W.B. Saunders 1953); Eugene P. Odum and Howard T. Odum, *Fundamentals of Ecology* (2nd ed., W.B. Saunders 1959).

of reference was the article by Francis Evans (1956)⁴⁵ where he suggested to use the ecosystem as the basic unit in ecology.

This is the scientific framework in which the ecosystem became the key concept for the study of the Earth System (ES) considered as a ‘living entity’, following the Gaia theory of Lovelock and Margulis.⁴⁶ An ecosystem represents the relations between biotic and abiotic elements in a specific space;⁴⁷ sets of ecosystems compose a biome, and all together they form the biosphere, that subtle layer of the Earth in which life has been able to develop.

The rise of (eco)systems thinking was not only a matter of theory but showed to be useful to address many practical problems in different fields of life, from economy to environmental science, the two strictly interrelated, with the latter depending on the development of the first.

In economy, Peter Senge, Senior Lecturer, Sloan School of Management MIT, and cofounder of the Academy for Systemic Change, is at the forefront of organizational learning. He is applying systems thinking to study and improve the performance of organizations and institutions, including private companies. He proposes new management systems based on the idea that the organization can learn from its members and the environment where it operates. He dedicates his efforts ‘on promoting shared understanding of complex issues and shared leadership for healthier human systems’,⁴⁸ so pursuing sustainable development.⁴⁹

In the same wake as the use of systems thinking within sustainable development policies is the concept of ‘ecosystem services’. ‘Ecosystem services are the many different benefits that ecosystems provide to people’.⁵⁰ Again, the concept embeds a strict anthropocentric perspective, in the sense that ecosystems are valued and, as a consequence, protected, only as far as they offer a benefit for humans and to the extent of the economic value it has been recognized to them;⁵¹ moreover, this has already led to the commodification of nature, as happened with the carbon market or water trading market.⁵²

45 Francis C. Evans, ‘Ecosystem as the Basic Unit in Ecology’ (1956) 123 *Science* 1127–1128.

46 James E. Lovelock and Lynn Margulis, ‘Atmospheric Homeostasis by and for the Biosphere: The Gaia Hypothesis’ (1974) 26(1–2) *Tellus, Series A* 2–10.

47 Antonio Pusceddu, Gianluca Sarà, and Pierluigi Viaroli, *Ecologia* (Utet 2020) 12.

48 <https://mitsloan.mit.edu/faculty/directory/peter-m-senge>.

49 Peter M. Senge, *The Necessary Revolution: How Individuals and Organizations are Working Together to Create a Sustainable World* (Breaaley 2008).

50 Science for Environment Policy, *Ecosystem Services and the Environment. In-depth Report 11* (DG Environment by the Science Communication Unit 2015) 3, available at: https://ecomilenio.es/wp-content/uploads/2015/10/ecosystem_services_biodiversity_IR11_2015_en.pdf.

51 On the criticism of the ecosystem services concept, see *ibid* 8.

52 “Risks and impacts of the commodification and financialization of water on the human rights to safe drinking water and sanitation”, Report presented to the 76th UN General Assembly by the Special Rapporteur on the human rights to safe drinking water and sanitation, Pedro

Finally, during the 1990s, another holistic concept became familiar in conservation literature: the ecosystem approach.⁵³ It suggested focusing not on single species' conservation because of the multiple factors and feedback loops that could influence the relationship between a species and its environment; instead, the ecosystem approach suggested focusing on ecological processes and systems. Furthermore, one of the main characteristics of the ecosystem approach is the active involvement of stakeholders in the conservation strategy, thus enhancing the role of local and traditional knowledge. In 2000, the concept was incorporated into the CBD framework. Since then, as Waylen et al. warned, 'the term has become increasingly popular, but its use is not always associated with the CBD's definition. Instead, it is linked with various initiatives relating to understanding or managing natural resources'.⁵⁴

In the previous and present sections, we have tried to collect, from different perspectives, arguments in favour of a monistic/holistic/ecosystem approach about the relationship between humans and nature. However, for the purpose of this book, it is fundamental to understand if and how this new approach has been incorporated into the legal system. In 'Earth Jurisprudence and indigenous ecosophies: the cultural basis of RON', we have already accounted for the RON foundation on Earth Ethics and Jurisprudence and indigenous/oriental ecosophies. In the next section, we will investigate the ecosystem approach as a legal principle.

The ecosystem approach as a legal principle

Among the non-binding declarations that have incorporated the (eco)systems thinking, we can mention the World Charter for Nature of 1982, which proclaims that every form of life is unique and has value, regardless of its worth to humans, and has a whole chapter dedicated to ecological integrity; and the Universal Declaration of the Rights of Mother Earth of 2010, which affirms that we are all part of Mother Earth, an indivisible, living community of inter-related and interdependent beings with a common destiny, inspired by indigenous cosmovisions.

When we consider binding instruments, the three most important treaties signed to counteract the negative environmental effects of the triple crisis all seem inspired by systems thinking and ecosystem science.

Arrojo Agudo, A/76/159, available at <https://www.ohchr.org/sites/default/files/Documents/Issues/Water/annual-reports/a-76-159-friendly-version.pdf>.

53 Tomas M. Koontz and Jennifer Bodine, 'Implementing Ecosystem Management in Public Agencies: Lessons from the U.S. Bureau of Land Management and the Forest Service' (2008) 22 *Conservation Biology* 60–69.

54 Kerry A. Waylen et al., 'The Need to Disentangle Key Concepts from Ecosystem-Approach Jargon' (2014) 28(5) *Conservation Biology* 1215–1224, at 1216. See also: Maria Hammer, 'Lost in Translation – Following the Ecosystem Approach from Malawi to the Barents Sea' (2023) 14 *Arctic Review on Law and Politics* 46–69.

UN Framework Convention on Climate Change (UNFCCC)'s preamble states: 'Acknowledging that change in the Earth's climate and its adverse effects are a common concern of humankind [...] Determined to protect the climate system for present and future generations'. Art. 2 and 3 consider the climate as a system: art. 2 'to achieve [...] stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system'; art. 3: '1. The Parties should protect the climate system for the benefit of present and future generations of humankind'.

The 2015 UN Paris Agreement, in its preamble, recalls RON and holistic indigenous worldviews: 'Noting the importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity, recognized by some cultures as Mother Earth, and noting the importance for some of the concept of "climate justice", when taking action to address climate change'. Moreover, within the text, there are different references to the obligation of all Parties to promote environmental integrity (in the preamble, in art. 4.13 and in art. 6.1 and 6.2).

However, it is within the legal framework of the CBD that international environmental law has incorporated the ecosystem approach as a binding principle.

The preamble of the CBD declares: 'Conscious of the intrinsic value of biological diversity and of the ecological, genetic, social, economic, educational, cultural, recreational and aesthetic values of biological diversity and its components'. The Convention first recognizes the 'intrinsic value' of biodiversity, seeming to embrace the ecosystems thinking.

However, that approach appears immediately in stiff competition with the concept of 'biological resources', which includes 'genetic resources, organisms or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity'. So, the convention shall constantly balance instances where biological diversity is protected as a critical element of the ES, while recognizing the principle of sovereign State rights over their own biological resources.

As already mentioned in the previous section, annex A of the 2000 *Report of the fifth meeting of the Conference of the Parties to the Convention on Biological Diversity* (UNEP/CBD/COP/5/23) explicitly included the ecosystem approach as a promising instrument to reach the goals of the Convention. For the first time, it offered a definition of the concept: 'An ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organization, which encompass the essential structure, processes, functions and interactions among organisms and their environment' (p. 104).⁵⁵ This definition was a synthesis deduced from the so-called

55 About the ecosystem approach see also: James J. Kay and Henry A. Regier, 'Uncertainty, Complexity, and Ecological Integrity: Insights from an Ecosystem Approach' in Philippe

1998 ‘Malawi principles’, twelve principles defined during a Workshop on the Ecosystem Approach held in Malawi and then presented at the 4th Conference of the Parties (COP) of the CBD, where participants tried to better explain how the ecosystem approach should be implemented. This approach also implied recognizing more relevance to the ecosystem practices of local communities, thereby strengthening their role in conservation projects (principle 11). This creates a strong connection with the understanding of the ecosystem approach within the CBD and the interculturality of RON, given their origins in indigenous peoples’ cosmovisions/ontologies.

So, the ecosystem approach was introduced as a new methodology applicable by policymakers for the elaboration of *management strategies* of natural resources. This means that the ecosystem approach introduced into the CBD was considered an instrument applicable for the conservation of nature without changing the anthropocentric perspective of environmental law. Nature was still considered a human resource, to be conserved for the ecosystem services it offers to human beings. There is evidently a qualitative improvement in the management strategies, which may guarantee more chances of success in preserving species and ecosystems, due to a better understanding of the natural cycles and metabolism. However, the ecosystem approach integrated by the CBD remains far away from the RON perspective, where ecosystems are protected for their intrinsic values. This conclusion is also supported by the UN Millennium Ecosystem Assessment initiative (MA), started in 2001, whose focus was on assessing ‘the consequences of ecosystem change for human well-being and the scientific basis for action needed to enhance the conservation and sustainable use of those systems and their contribution to human well-being’. This assessment was conducted on the evaluation of ecosystem services.⁵⁶ Many scholars and practitioners noticed that ‘since the MA, much of the content and terminology in the CBD’s decisions and supporting documents has shifted to incorporate ecosystem services concepts’.⁵⁷

After the MA, the concept gained a lot of interest from policy-makers, governments, and international institutions, which supported other initiatives, such as the Economics of Ecosystems and Biodiversity for the UN or the Mapping and Assessment of Ecosystems and their Services initiative at EU level, with the aim of producing an economic evaluation of ecosystem services in different natural and geographic contexts.

Crabbé et al. (eds.), *Implementing Ecological Integrity: Restoring Regional and Global Environmental and Human Health* (NATO Science Series, Environmental Security, Kluwer 2000) 121–156; James J. Kay et al., ‘An Ecosystem Approach for Sustainability: Addressing the Challenge of Complexity’ (1999) 31(7) *Futures* 721–742; Jon Norberg, ‘Biodiversity and Ecosystem Functioning: A Complex Adaptive Systems Approach’ (2004) 49 (4, part 2) *Limnol. Oceanogr.* 1269–1277.

⁵⁶ <https://www.millenniumassessment.org/en/About.html#>.

⁵⁷ Waylen (n 49) 1220.

Even if introducing the (eco)systems thinking into various initiatives related to strategies for the conservation of biodiversity could be considered a meaningful step forward towards an ecological understanding of the relations between human beings and nature, many scholars have criticized the concept because ‘protection of ecosystem services may not guarantee protection of biodiversity’.⁵⁸ The need to move beyond economic valuation has been acknowledged by many parts, who support a shift towards an integrated valuation, which can incorporate multiple value systems. For instance, a more ‘ecological’ instrument to ‘measure’ the value of an ecosystem is *emergy* (with an ‘m’). The concept was introduced and its framework studied by Odum,⁵⁹ and some contemporary scholars think it would be a coherent approach with RON.⁶⁰

Notwithstanding the still anthropocentric nature of the ecosystem approach, the legal developments approved during the most recent CBD’s COP are bridging the gap between the latter and RON.

At the 7th COP, Member Countries considered that the implementation of the ecosystem approach to achieve the objectives of the Convention should be considered a priority, and they also published guidelines for better understanding the approach (COP 7 Decision VII/11, point 2).

The 10th COP adopted the Strategic Plan for Biodiversity 2011–2020, which included the so-called ‘Aichi Biodiversity Targets’, five strategic areas divided into twenty objectives to give greater impetus to the implementation of the Convention. The strategy stated that its vision was ‘a world of “Living in harmony with nature” where by 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people’ (COP 10 Decision X/2, point 11).

The 15th Conference of the Parties adopted, on 18 December 2022, the new Kunming-Montreal Global Biodiversity Framework (GBF), with revised targets for 2050. The GBF recognizes the interdependence of the concepts of ‘living in harmony with nature’, ‘ecosystem approach’ and ‘ecosystem services’:

Nature embodies different concepts for different people, including biodiversity, ecosystems, Mother Earth, and systems of life. Nature’s contributions to people also embody different concepts, such as ecosystem goods and services and nature’s gifts. Both nature and nature’s contributions to people are vital for human existence and good quality of life, including human well-being, living in harmony with nature, living well in balance and harmony with

58 Science for Environment Policy (n 45) 5.

59 Howard T. Odum and Eugene C. Odum, *Energy Basis for Man and Nature* (McGraw-Hill 1976).

60 Dario Padovan, Silvio Cristiano and Francesco Gonella, ‘Strategies of socio-ecological transition for a sustainable urban metabolism’ (2022) 4 *Frontiers in Sustainable Cities* 875912; see also Michele Carducci, Elif Şeyma Şişman, ‘La metrica della sostenibilità eco-sociale: l’analisi eMergetica come democrazia partecipata per la «non interferenza» umana sul sistema climatico’ (2025) 3 *Federalismi.it* 381–402.

Mother Earth. The framework recognizes and considers these diverse value systems and concepts, including, for those countries that recognize them, RON and rights of Mother Earth, as being an integral part of its successful implementation.⁶¹

Moreover, and for the first time, the GBF includes Mother Earth Centric Actions⁶² among the collective actions to be enhanced with financial resources from the GBF fund, following Target 19 among the Global Targets for 2030.

As the White Paper ‘Ecocentrism in the Global Biodiversity Framework’ illustrates, there are already many National Biodiversity Strategies and Action Plans (NBSAPs), which recognize the intrinsic value of nature (Spain, Australia, Slovenia, Fiji, and Aotearoa New Zealand).⁶³ The NBSAPs are the national instruments foreseen by the GBF with which each State describes its strategy to implement its specific commitments within the GBF. Thus, the recognition of the intrinsic value of nature is already binding for those States which have mentioned it in their NBSAPs.

The increasing importance of the ecosystem approach for the protection of biological diversity and the recognition by the GBF that RON are a coherent legal instrument to implement the principle is without any doubt a great advancement towards the shift from environmental to ecological law. In this book’s perspective, we also consider it to be an encouraging signal towards the possibility of building a comprehensive transcultural eco-legal framework.

Conclusions

As already explained in the rationale for the Volume, this book is the result of a common reflection originated by a call for papers on the subject matter of a national research project on ‘Law of nature and human Ecosystem approach: modelling a transcultural eco-legal framework’, co-directed by the editors. We gathered many legal researchers at the University of Florence, in November 2024, asking them to critically contribute to the hypothesis on which we had built our scientific proposal, which we have tried to explain both in the rationale and in this introduction. The paradigm of sustainable development is failing in its most important goal, that is guaranteeing our survival on the ES as

61 Sec. 7, lett. b), CBD/COP/DEC/15/4, 19 December 2022, available at: <https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf>.

62 “Ecocentric and rights-based approach enabling the implementation of actions towards harmonic and complementary relationships between peoples and nature, promoting the continuity of all living beings and their communities and ensuring the non-commodification of environmental functions of Mother Earth” (note 13 GBF).

63 Earth Law Center (ELC), Rights of Mother Earth, Lawyers for Nature, End Ecocide Sweden, and Keystone Species Alliance, *Ecocentrism in the Global Biodiversity Framework. Rights of Nature/Mother Earth, Mother Earth Centric Actions, and the Intrinsic Value of Nature in the Global Biodiversity Framework and NBSAPs* (2024), available at: https://static1.squarespace.com/static/55914fd1e4b01fb0b851a814/t/66fc15972d808310fe64250c/1727796635329/Advisory+Whitepaper+COP16_Final.pdf.

a species. Environmental law has contributed to this failure because the concept of sustainable development has been incorporated into the international and national legal systems, thus becoming a binding principle. However, the ontological divide between humans and nature that the concept of sustainable development presupposes is a serious obstacle for the ecological conversion⁶⁴ we need for the transformative change⁶⁵ in our model of production and consumption, which is the main cause of the triple crisis we are living.

Sustainable development strategies imply the adaptation of natural systems to human economic interests, and this perspective is today reflected in the legal balancing of interests in climate and environmental litigation. The failure of this type of economic and legal system requires lawyers to abandon traditional schemes and concepts and adapt the legal order to the natural one. To do so, from a methodological perspective, it is necessary for lawyers to acquire an ecological education, nurtured both by modern Western science and traditional knowledge of indigenous peoples. As shown in the second section of this introduction, different human cultures can offer solid bases for a shift towards a holistic/ecosystem understanding of the relationship between human beings and nature. Ecology of knowledge is at the basis of this research.

Then, in all edited books it is fundamental to guarantee a common denominator to all contributions, which we have already highlighted in the rationale: the awareness that the construction of a just and sustainable human society necessarily involves the imitation of the relationships and processes that characterize living systems.⁶⁶ For the jurist, this implies applying ecosystems thinking in the construction of a different environmental legal system, internationally and nationally, so that the underlying paradigm is transformed from merely ‘environmental’ into ‘ecological’. This is in line with what has been requested of policymakers by UNEP, in the report ‘Making peace with nature’, which analyzes and summarizes all the most recent international reports on the triple global crisis and the actions to be taken to remedy it:

Strong environmental laws would protect ecosystems and the human enjoyment of a healthy environment, bolstered by consistent enforcement of laws and independent judiciaries. These three sets of governance interventions have been called the ‘levers’ of transformation to reflect their power to effect change at the specified leverage points and also more broadly.⁶⁷

64 Encyclical letter *Laudato si’* of the Holy Father Francis on Care for our Common Home, 24 May 2025, available at https://www.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html.

65 Karen O’Brien et al. (eds.), *IPBES Summary for Policymakers of the Thematic Assessment Report on the Underlying Causes of Biodiversity Loss and the Determinants of Transformative Change and Options for Achieving the 2050 Vision for Biodiversity of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (IPBES Secretariat 2024).

66 See Carducci and Şeyma Şişman (n 55) 382.

67 United Nations Environment Programme, *Making Peace with Nature: A Scientific Blueprint to Tackle the Climate, Biodiversity and Pollution Emergencies* (UNEP 2021) 25, available at

Finally, in this introduction, we have tried to bridge the rationale and the contributions by offering an explanation about the principal terms and concepts on which our research, and consequently this book, were built: RON and ecosystem approach.

RON are not the main topic of this book. They have entered into the discussion because of their holistic origins. As we have tried to explain in ‘Earth Jurisprudence and indigenous ecosophies: the cultural basis of RON’, due both to their philosophical and traditional background, RON presuppose an ecosystem understanding of the relation between human beings and nature. RON are one of the most prominent instruments to enforce natural laws into human legal systems.

As for the ecosystem approach, ‘Systems thinking, ecosystem science, and the ecosystem approach’ has illustrated its scientific origins and its different application in management strategies for the protection of biodiversity. Technically speaking, the ecosystem approach defined by the CBD and illustrated in ‘The ecosystem approach as a legal principle’ has a very specific scope of application, within the objectives of the Convention. Moreover, we have seen that as a conservationist management strategy, it is still inspired by the dualistic *rationale* of sustainable development, even if the last normative developments in the GBF indicate a decisive approach to a monistic conception of the relationship between humans and nature, and so to RON.

So, when in our research project and in this book, we refer in general terms to an ‘ecosystem approach’, we are referring to ecology, systems thinking, and ecosystem science. The aim of building a transcultural eco-legal framework can be reached only through an ecosystem approach, in the sense that: first of all, the scientific, philosophical, and ethical background on which it is rooted is the idea of interdependence and interconnectedness between all things in our ES, where humans and nature co-exist and co-evolve; secondly, the legal system must be re-shaped following the natural laws that govern the ES.

References

- Bagni S., ‘Diritti della natura nei nuovi costituzionalismi del Global South: riflessi sulla teoria dei formanti’ (2023) 58(2) *DPCE Online* 153–183. Available at: <https://www.dpceonline.it/index.php/dpceonline/article/view/1882>.
- Baldin S., ‘La sostenibilità ecologica e i principi eco-giuridici per la salvaguardia del sistema Terra’ (2022) 3 *Rivista di Diritti Comparati* 239–270.
- Berry T., *The Dream of the Earth* (Sierra Club Edition 1990).
- Berry T., *The Sacred Universe. Earth, Spirituality, and Religion in the Twenty-first Century* (Columbia University Press 2009).
- Bourgeois-Girond S., *Être la rivière* (Puf 2020).

- Capra F., and Mattei U., *The Ecology of Law. Toward a Legal System in Tune with Nature and Community* (Berrett-Koehler Publishers 2015). Italian translation: *Ecologia del diritto. Scienza, politica, beni comuni* (Aboca 2017).
- Capra F., *La rete della vita. Una nuova visione della natura e della scienza* (Bur 2001). Original title: *The Web of Life* (Doubleday-Anchor Book 1996).
- Capra F., *The Tao of physics* (Shambhala Publications 1975). Italian translation: *Il Tao della fisica* (XXVII ed., Adelphi 2013).
- Capra F., *The Turning Point: Science, Society, and the Rising Culture* (Bantam Books 1982).
- Carducci, M. and Şeyma Şişman E., Elif, ‘La metrica della sostenibilità eco-sociale: l’analisi eMergetica come democrazia partecipata per la «non interferenza» umana sul sistema climatico’ (2025) 3 *Federalismi.it* 381–402.
- Cullinan, C., *Wild Law. A Manifesto of Earth Justice* (Siber Ink & Green Books 2022). Italian translation: *I diritti della Natura – Wild Law* (Piano B, 2012).
- Descola, P., *Oltre natura e cultura* (Raffaello Cortina Editore 2021). Original title: *Par-delà nature e culture* (Gallimard 2005).
- Earth Law Center (ELC), Rights of Mother Earth, Lawyers for Nature, End Ecocide Sweden, and Keystone Species Alliance, *Ecocentrism in the Global Biodiversity Framework. Rights of Nature/Mother Earth, Mother Earth Centric Actions, and the Intrinsic Value of Nature in the Global Biodiversity Framework and NBSAPs* (2024). Available at: https://static1.squarespace.com/static/55914fd1e4b01fb0b851a814/t/66fc15972d808310fe64250c/1727796635329/Advisory+Whitepaper+COP16_Final.pdf.
- Evans, F. C., ‘Ecosystem as the Basic Unit in Ecology’ (1956) 123 *Science* 1127–1128.
- Ghilardi, M., ‘L’idea di natura nel pensiero sino-giapponese’, in Marcello Ghilardi, Giangiorgio Pasqualotto, and Vidali Paolo (eds.), *L’idea di natura tra Oriente e Occidente* (Editrice Morcelliana 2022).
- Golley, F. B., *A History of the Ecosystem Concept in Ecology: More than the Sum of Its Parts* (Yale University Press 1993).
- Gonella, F., ‘Basics of Systems Thinking’, unpublished.
- Grober, U., *Sustainability. A cultural history* (Green Books 2012).
- Hagen, J. B., *An Entangled Bank: The Origins of Ecosystem Ecology* (Rutgers University Press 1992).
- Hammer, M., ‘Lost in Translation – Following the Ecosystem Approach from Malawi to the Barents Sea’ (2023) 14 *Arctic Review on Law and Politics* 46–69.
- Kay, J. J., and Regier, H. A., ‘Uncertainty, Complexity, and Ecological Integrity: Insights from an Ecosystem Approach’ in Philippe Crabbé et al. (eds.), *Implementing Ecological Integrity: Restoring Regional and Global Environmental and Human Health* (NATO Science Series, Environmental Security, Kluwer 2000) 121–156.
- Kay, J. J. et al., ‘An Ecosystem Approach for Sustainability: Addressing the Challenge of Complexity’ (1999) 31(7) *Futures* 721–742.
- Kingsland, S. E., *The Evolution of American Ecology, 1890–2000* (Johns Hopkins University Press 2005).
- Koontz, T. M., and Bodine, J., ‘Implementing Ecosystem Management in Public Agencies: Lessons from the U.S. Bureau of Land Management and the Forest Service’ (2008) 22 *Conservation Biology* 60–69.

- Kothari, A. et al., 'Preface', in Ashish Kothari et al. (eds.), *Pluriverse. A Post-Development Dictionary* (Tulika Books 2019).
- Kuhn, T. S., *The Structure of Scientific Revolutions* (University of Chicago Press 1962).
- Leopold, A., *A Sand County Almanac & Other Writings on Ecology and Conservation* (The Library of America 2013).
- Lovelock, J. E., and Margulis L., 'Atmospheric Homeostasis by and for the Biosphere: The Gaia Hypothesis' (1974) 26(1–2) *Tellus, Series A* 2–10.
- Norberg, J., 'Biodiversity and Ecosystem Functioning: A Complex Adaptive Systems Approach' (2004) 49(4, part 2) *Limnology and Oceanography* 1269–1277.
- O'Brien, K. et al. (eds.), *IPBES Summary for Policymakers of the Thematic Assessment Report on the Underlying Causes of Biodiversity Loss and the Determinants of Transformative Change and Options for Achieving the 2050 Vision for Biodiversity of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (IPBES Secretariat 2024).
- Odum, E. P., and Odum, H. T., *Fundamentals of Ecology* (2nd ed., W.B. Saunders 1959).
- Odum, E. P., *Fundamentals of Ecology* (1st ed., W.B. Saunders 1953).
- Odum, H. T., and Odum, E. P., *Energy Basis for Man and Nature* (McGraw-Hill 1976).
- Padovan, D., Cristiano, Silvio, and Gonella, F., 'Strategies of Socio-ecological Transition for a Sustainable Urban Metabolism' (2022) 4 *Frontiers in Sustainable Cities* 875912.
- Pasqualotto, G., 'Buddismo ed ecosofia', in M. Ghilardi, G. Pasqualotto, and P. Vidali (eds.), *L'idea di natura tra Oriente e Occidente* (Editrice Morcelliana 2022).
- Pusceddu, A., Sarà, G., and Viaroli, P., *Ecologia* (Utet 2020).
- Rist, G., *The History of Development. From Western Origins to Global Faith* (3rd ed., Zed Books York 2008).
- Sachs, W., 'Foreword. The Development Dictionary Revisited', in Ashish Kothari et al. (eds.), *Pluriverse. A Post-Development Dictionary* (Tulika Books 2019).
- Science for Environment Policy, *Ecosystem Services and the Environment. In-depth Report 11* (DG Environment by the Science Communication Unit 2015). Available at: https://ecomilenio.es/wp-content/uploads/2015/10/ecosystem_services_biodiversity_IR11_2015_en.pdf.
- Senge, P. M., *The necessary revolution: how individuals and organizations are working together to create a sustainable world* (Brealey 2008).
- Stone, C. D., *Should Trees Have Standing?* (William Kaufmann 1974).
- Stutzin, G., 'Un imperativo ecológico: reconocer los derechos de la naturaleza' (1984) 1(1), *AMB. y DES.*, 97–114.
- United Nations Environment Programme, *Making Peace with Nature: A Scientific Blueprint to Tackle the Climate, Biodiversity and Pollution Emergencies* (UNEP 2021), available at <https://www.unep.org/resources/global-assessments-synthesis-report-path-to-sustainable-future>.
- Vidali, P., *Storia dell'idea di natura. Dal pensiero greco alla coscienza dell'Antropocene* (Mimesis 2022).
- Viñuales, J. E., 'Re-orienting the Sustainable Development Snake' (Research Paper n. 16, Geneve, 2013) 1–21. Available at <https://www.graduateinstitute.ch/library/publications-institute/re-orienting-sustainable-development-snake>.

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- von Humboldt, A., *Il Cosmo. Saggio di una descrizione fisica del mondo* (vol. 1, Italian translation, Stamperia del Vaglio 1850). Available at <https://archive.org/details/img64A46ocr>. Original title: *Kosmos – Entwurf einer physischen Weltbeschreibung* (Cotta, 1845-62).
- Waylen, K. A. et al., ‘The Need to Disentangle Key Concepts from Ecosystem-Approach Jargon’ (2014) 28(5) *Conservation Biology* 1215–1224.
- Weathers, K.C., Strayer, D.L., and Likens, G E. (eds.), *Fundamentals of Ecosystem Science* (2nd ed., Academic Press 2021).