3

Law and Cumulative Environmental Problems

A Landscape for Analysis

3.1 INTRODUCTION

A broad landscape of laws can help deliver the CIRCle Framework functions of conceptualization, information, regulatory intervention, and coordination, which this book argues are vital to address cumulative environmental problems.[1] This chapter provides a bird's eye view of this landscape, not aiming to be comprehensive, but to point to some major topographical features, as it were. I argue that rather than just a zoomed-in view of environmental impact assessment ("EIA") – the original Western legal context for developing the terminology of cumulative effects – a broad range of laws and policies can and must deal with cumulative environmental problems.[2] Assessing how existing laws deal with any given cumulative environmental problem also requires navigating this much broader regulatory landscape.

Section 3.2 sketches the broad landscape of key domestic legal areas that can help address cumulative environmental problems – the scene for much of the book's later discussion of legal mechanisms. Section 3.3 provides a brief supplementary discussion of international legal mechanisms. Each of the four chapters that follows explores a CIRCle Framework function using illustrative mechanisms from around the world and across many legal areas. Since so many areas of law influence cumulative environmental problems, Section 3.4 presents a simple "compass" for navigating this landscape. This helps to orient

[1] See Chapter 2 for the derivation of the CIRCle Framework of regulatory functions for regulating cumulative environmental problems.

[2] Legal rules and concepts can also impede legal responses to these problems. The main focus here, though, is how laws intentionally seek to address cumulative environmental problems.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

and structure an inquiry into a cumulative environmental problem. It also alerts regulatory designers to the typical advantages and disadvantages of different areas of law in delivering the CIRCle Framework functions of conceptualization, information, regulatory intervention, and coordination.

3.2 THE DOMESTIC LEGAL LANDSCAPE

Though we might think of EIA as the source of cumulative impact-related laws, to start building a more panoramic view of laws relevant to cumulative environmental problems, I take several steps back. I start by examining how traditional and customary laws may help address cumulative impacts, before considering the role of EIA, including strategic environmental assessment ("SEA") law. Widening our gaze, I then discuss how cumulative impacts appear in broader environmental and natural resources laws, and in public law more generally. Finally, I briefly consider the role of international law and the policies of international organizations (particularly development banks) in dealing with cumulative environmental impacts.

3.2.1 *The Traditional and Customary Law Canvas of Cumulative Effects Concepts*

Discussions of cumulative impacts and the law commonly not only center on EIA but also start there. But traditional and First Nations' environment-related laws are both a chronologically more accurate starting point and, in many cases, a source of law of continuing importance. For brevity, I use the term "traditional laws" to embrace the laws of Indigenous and other traditional peoples.

A substantial legal literature urges involving Indigenous and traditional peoples in environment-related laws, but traditional laws themselves warrant attention in the context of cumulative environmental problems. Indeed, traditional laws may speak to all four CIRCle Framework functions, influencing:

- the conceptualization of what we should restore or protect from cumulative harm, including special places, practices, and relationships between people and their environments, which traditional laws may link in unique ways;[3]

[3] See Section 4.2.2 for a discussion about links between people and the environment in law.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

- sources of information and appropriate ways of accessing information relevant to predicting or measuring environmental harms, drawing on traditional knowledges;[4]
- legal obligations to protect against and remedy cumulative environmental harm, for example, by engaging obligations related to cultural rights;[5] and
- coordination, for example, by engaging potentially affected Indigenous and traditional peoples as important partners, with whom other governments coordinate in undertaking these functions.[6]

Take the Nguni principle of *ubuntu* in southern Africa,[7] which has been described as "both the African principle of transcendence for the individual, and the law of the social bond."[8] The individual is seen as "intertwined with others from the beginning of life":[9] "[w]e come into the world obligated to others, and in turn these others are obligated to us, to the individual."[10] *Ubuntu* also implies responsibility to past and future generations,[11] and a commitment to democratically building a "shared representation of reality."[12] Such values and practices of interdependence are clearly relevant to conceptualizing linked human communities affected by cumulative harm, and to allocating responsibilities in a way that is more collective than individualistic.

Traditional laws appear in or influence contemporary formal laws in several ways that address cumulative environmental problems. "Pluralist" laws may directly reflect concepts from traditional laws that are relevant to cumulative impacts, including through recognizing Indigenous rights or customary law and reflecting Indigenous values in international environmental law

[4] See Section 5.3.1.
[5] See, e.g., Table 4.2, row 3.
[6] See, e.g. Section 4.1.2.
[7] For a critical review of scholarly consideration of *ubuntu*, see generally Ephraim Taurai Gwaravanda, "*Ubuntu* Environmental Ethics: Conceptions and Misconceptions" in Munamato Chemhuru (ed), *African Environmental Ethics: A Critical Reader* (Springer Nature 2019) 79, 79–92. Gwaravanda counsels against a generalized approach to *ubuntu* environmental ethics in favour of recognizing diverse related versions.
[8] Drucilla Cornell and Nyoko Muvangua, "Introduction: The Re-Cognition of uBuntu" in Drucilla Cornell and Nyoko Muvangua (eds), *Ubuntu and the Law: African Ideals and Postapartheid Jurisprudence* (Fordham University Press 2011) 1–28, 3.
[9] Ibid 8.
[10] Ibid 3.
[11] Aïda C. Terblanché-Greeff, "Ubuntu and Environmental Ethics: The West Can Learn from Africa when Faced with Climate Change" in Munamato Chemhuru (ed), *African Environmental Ethics: A Critical Reader* (Springer Nature 2019) 93–109, 99.
[12] Cornell and Muvangua, "Introduction: The Re-Cognition of uBuntu", 8.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

regimes.[13] In this vein, *ubuntu* is recognized as a justiciable constitutional principle central to South African constitutional rights.[14] Less directly, traditional laws may influence the implementation of contemporary formal law and policy, including by Indigenous and traditional peoples participating in processes for implementing laws and policies under formal coordination mechanisms.[15] Just as importantly, in introducing new regulatory approaches to deal with cumulative impacts, regulatory designers should carefully consider how any proposal would interact with traditional and customary laws and avoid any potential adverse effects on customary rights.[16]

3.2.2 *EIA, SEA, and Western Scientific Cumulative Effects Concepts*

All-embracing versus narrow and selective, the contrast between some traditional laws and project-level EIA law could not be greater. Project-level EIA originated in the United States National Environmental Policy Act of 1969,[17] then spread to various US states, with other countries following suit in the 1970s and 1980s.[18] EIA is now globally ubiquitous.[19]

Globally, most national EIA laws include a cumulative impacts provision.[20] These provisions occur in the laws of all major legal traditions: common law (as in Canada, United Kingdom), civil law (as in France, Italy), Islamic law (as in Saudi Arabia, Mauritania), and mixed systems

[13] Benjamin J. Richardson, *The Ties That Bind: Indigenous Peoples and Environmental Governance* (Osgood Hall Law School of York University 2008) 25–27; Hilmer J. Bosch, Joyeeta Gupta and Hebe Verrest, "A Water Property Right Inventory of 60 Countries" (2021) 30 *Review of European, Comparative and International Environmental Law* 263–274, 265–267.

[14] Cornell and Muvangua, "Introduction: The Re-Cognition of uBuntu", 7–8, 10.

[15] E.g., Chapter 2, n 142 (cumulative impacts guidance context); Table 7.4, row 3 (water planning context).

[16] See generally Barbara van Koppen, "Water Allocation, Customary Practice and the Right to Water: Rethinking the Regulatory Model" in Malcolm Langford and Anna F. S. Russell (eds), *The Human Right to Water: Theory, Practice and Prospects* (CUP 2017) 57–83, 73.

[17] Neil Craik, *The International Law of Environmental Impact Assessment: Process, Substance and Integration* (CUP 2008) 23; Tseming Yang, "The Emergence of the Environmental Impact Assessment Duty as a Global Legal Norm and General Principle of Law" (2018) 70 *Hastings Law Journal* 525–572, 530.

[18] Craik, *International Law of EIA*, 23–24.

[19] Neil Craik, "The Assessment of Environmental Impact" in Emma Lees and Jorge E. Viñuales (eds), *The Oxford Handbook of Comparative Environmental Law* (OUP 2019) 876–899, 895–896.

[20] Rebecca Nelson and L. M. Shirley, "The Latent Potential of Cumulative Effects Concepts in National and International Environmental Impact Assessment Regimes" (2023) 12 *Transnational Environmental Law* 150–174, 160–161.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

(as in Malta, Zimbabwe); they occur less frequently in Asia and Australasia at the national level.[21]

The EIA process involves several stages, including "screening" a project to determine the need for environmental assessment; "scoping" to determine key elements of the environment expected to be impacted, relevant baseline conditions and alternatives to the project; substantive prediction and evaluation of impacts of the project (environmental assessment); public participation; the final decision; and follow-up.[22] EIA laws often define cumulative impacts and require them to be considered at several of these stages. A representative definition of cumulative effects – from the many that exist in EIA law – is effects "that result from additive effects caused by other past, present, or reasonably foreseeable actions together with the plan, programme, or project itself and synergistic effects (in combination) which arise from the interaction between effects of a development plan, programme or project, on different components of the environment."[23]

The concept of cumulative impact performs different roles in the EIA processes envisioned by different legislative schemes. First, cumulative impacts may be a screening criterion, which must be considered to determine whether a project requires any form of environmental assessment at all. For example, EIA may be required if a project falls into a named category (like a power plant) or is likely to create cumulative impacts.[24] An alternative formulation is to require EIA for a development proposal that is likely to "significantly" affect the environment, which requires considering, among other things, "the potential for cumulative environmental impacts."[25] As a screening criterion, cumulative impacts provisions theoretically may be highly influential: They expand the use of EIA outside its usual bounds if they trigger EIA requirements for activities of a category or scale that is usually exempt.

[21] Ibid.

[22] Riki Therivel and Graham Wood, "Introduction" in Riki Therivel and Graham Wood (eds), *Methods of Environmental and Social Impact Assessment* (Routledge 2018) 1–19; United Nations Environment Programme (UNEP), "Environmental Impact Assessment Training Resource Manual" (2002) 100, https://wedocs.unep.org/handle/20.500.11822/26503.

[23] Martin Broderick, Bridget Durning and Luis E. Sánchez, "Cumulative Effects" in Riki Therivel and Graham Wood (eds), *Methods of Environmental and Social Impact Assessment* (4th edn, Routledge 2017) 649–678, 650.

[24] See Table 6.3, row 1.

[25] Environmental Impact Assessment Regulations 1994 (Marshall Islands), art. 4(vi) "significant effect". For a distinct but related approach, see Environmental Impact Assessment Regulations 1989 (Federated States of Micronesia), arts. 1.3(a) (definition of cumulative impact), (b) (definition of effects includes cumulative impacts), 4.1 (comprehensive EIA required in event of likely significant cumulative impacts).

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

For projects that require EIA, cumulative impacts influence a second role, scoping, by affecting the type of environmental assessment required. For example, if the project "generates cumulative and/or indirect and/or synergistic effects," this may trigger a requirement to carry out an environmental impact study involving deeper analysis.[26] It may also "upgrade" the assessment type required to a more publicly contestable form of assessment.

The third, and most obvious, role of the concept of cumulative impacts is that of cumulative impact assessment (CIA): influencing the substantive content of the environmental assessment. This is expressed in diverse ways in different statutes: the assessment must, or may (variously) require a description of the "cumulative impacts" of the proposed project;[27] the "cumulative and synergistic" consequences of the project;[28] or the "cumulative and synergistic impacts and the induced risks" of the project.[29] Theoretically speaking, this is the stage at which the deepest inquiry into cumulative impacts would be expected.

Finally, cumulative effects may be included in an EIA law's definition of environmental harm,[30] impact,[31] or effect.[32] This has potentially further-reaching application not only to all stages of EIA but also the post-EIA process. For example, where a proponent must monitor a project's ongoing impacts, this could require analysis to understand these impacts in light of the cumulative impacts of other projects. This highlights the challenges associated with findable, accessible, interoperable, and reusable data, discussed earlier,[33] to facilitate this continuing analysis.

EIA that includes CIA differs from "regular" EIA in important ways. Firstly, it involves, at least to some extent, identifying other actors and actions in the past, present, and reasonably foreseeable future that impact the same element

[26] Decreto N° 123, Reglamento del Proceso de Evaluaci ón de Impacto Ambiental [Decree No. 123 – Regulations on the Process of Environmental Impact Assessment] 2009 (Panama) arts. 18, 24.

[27] Environment Impact Assessment Regulations (South Africa) 2014 app 1 cl 3(1)(j)(i); Environmental Impact Assessment Act (Republic of Korea) 2011 (as amended to 2019) art. 4(5); Decreto Presidencial n. 117/20 Regulamento Geral de Avaliação de Impacte Ambiental e do Procedimento de Licenciamento Ambiental [Presidential Decree No. 117/20 General Regulation for Environmental Impact Assessment and Environmental Licensing Procedure (Angola) art. 10(1)(e), replacing Decreto no 51/04 Sobre a Avaliação de Impacto Ambiental [Decree No. 51/04 on Environmental Impact Assessment] 2020 (Angola)).

[28] Инструкция о порядке проведения оценки воздействия намечаемой деятельности на окружающую среду (ОВОС) в Кыргызской Республике [Instruction on Environmental Impact Assessment] 1997.

[29] Decreto Supremo N° 019-2009-MINAM [Decree No 019-2009-MINAM] (Peru) 2009 annex IV cl 5(b).

[30] Environment Act 2000 (Papua New Guinea) , as amended, s 2 "environmental harm" (a)(ii).

[31] Environment Act 1998 (Solomon Islands) s 2 "impact" (d).

[32] Miljöbalk [Environmental Code] 1998 (Sweden) ch 6 s 2.

[33] See Sections 2.2.2 and 5.3.3.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

of the environment. By contrast, regular EIA does not disaggregate actions; instead, it tends to consider the overall effects of those actions as environmental "context" or "existing circumstances."[34] Thus, CIA highlights not only the metaphorical "thousand cuts" but also who wields (and has wielded, and will wield) a sword. Secondly, considering other actors in space and time expands CIA-inclusive EIA's spatial and temporal boundaries relative to regular EIA.[35] CIA also alters EIA investigations by considering whether "individually minor effects will be collectively significant,"[36] illuminating relatively small, potentially unregulated effects that regular EIA may otherwise disregard. Finally, CIA also emphasizes nonlinear responses, such as impacts that become amplified or exponentially greater due to other development activities and natural background changes in environmental conditions.[37] By contrast, "traditional" EIA tends to conceptualize a single source of impact in isolation,[38] potentially underrepresenting to decision-makers and the public the true extent of likely environmental harm. Considering cumulative impacts exposes the true extent of a project's potential harm and, by revealing the full suite of contributors to the harm, also exposes more options for reducing aggregate environmental damage.[39]

Nelson and Shirley have argued elsewhere that these differences potentially produce two distinct benefits. They provide better technical information for a decision-maker by casting new light on the impacts of the proposed project in the context of other projects in the same environment. CIA also spotlights decisions about what matters, thereby inviting deliberation and exposing differences for contestation in a transparent way.[40]

Rather than EIA, which focuses on a single project, SEA law is often argued to be the more appropriate way to assess and manage cumulative impacts.[41]

[34] Rebecca Nelson, "Breaking Backs and Boiling Frogs: Warnings from a Dialogue between Federal Water Law and Environmental Law" (2019) 42 *University of New South Wales Law Journal* 1179–1214, 1199.

[35] F. Chris Jones, "Cumulative Effects Assessment: Theoretical Underpinnings and Big Problems" (2016) 24 *Environmental Reviews* 187–204, 195.

[36] Ibid 189.

[37] Cheryl K. Contant and Lyna L. Wiggins, "Defining and Analyzing Cumulative Environmental Impacts" (1991) 11 *Environmental Impact Assessment Review* 297–309, 299–303.

[38] Bruce Pardy, "In Search of the Holy Grail of Environmental Law: A Rule to Solve the Problem" (2005) 1 *McGill International Journal of Sustainable Development Law and Policy* 29–58, 38.

[39] Nelson, "Breaking Backs," 1211.

[40] Nelson and Shirley, "Latent Potential," 157–159.

[41] Morten Bidstrup, Lone Kørnøv and Maria Rosário Partidário, "Cumulative Effects in Strategic Environmental Assessment: The Influence of Plan Boundaries" (2016) 57 *Environmental Impact Assessment Review* 151–158, 151 (citing numerous studies that make this argument).

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

It enables a more proactive, strategic consideration of cumulative impacts over a longer term in a way that can analyze potential future scenarios resulting from different policy choices at a larger geographic scale and with greater opportunity for collaboration.[42] However, compared to EIA, SEA and its cousin, regional plans,[43] are used comparatively rarely.[44] Perhaps more troubling is the criticism that SEA sometimes seems to have little influence on decision-making.[45] The Great Barrier Reef case study explores this issue a decade after the Reef SEA, suggesting that, at least in that context, the SEA had a significant influence on interventions related to water quality.[46] Increasing interest in using SEA to structure the renewable energy transition highlights the importance of a pathway to increasing the impact of SEA.[47]

3.2.3 *Natural Resources, Pollution, Conservation, and Other Environment-Related Laws*

Many environmental threats simply do not trigger project-level EIA or SEA requirements. As a result, even if cumulative impacts requirements under these laws were formulated ideally in law on paper and implemented well in practice, they could not adequately address the real-world cumulative impacts on matters of concern to which those assessments were directed. This highlights the desirability of understanding and improving how cumulative impact considerations appear in broader areas of environment-related law, not as an "add-on," but as an integral part of these laws. While EIA and SEA laws are typically procedural in nature, geared toward producing information to inform

[42] Jones, "Cumulative Effects Assessment," 194–197.

[43] See, e.g., Bram Noble and Kelechi Nwanekezie, "Conceptualizing Strategic Environmental Assessment: Principles, Approaches and Research Directions" (2017) 62 *Environmental Impact Assessment Review* 165–173, 166, 169; S. Simon Marsden, "Strategic Environmental Assessment of Australian Offshore Oil and Gas Development: Ecologically Sustainable Development or Deregulation?" (2016) 33 *Environment and Planning Law Journal* 21–30, 23.

[44] Mary Peters and Manu Kumar, "Strategic Environmental Assessment: Experience, Status and Directions" (2012) 21(2) *European Energy and Environmental Law Review* 92–98, 93; Monica Fundingsland Tetlow and Marie Hanusch, "Strategic Environmental Assessment: The State of the Art" (2012) 30(1) *Impact Assessment and Project Appraisal* 15–24, 17 (referring to sixty countries having adopted SEA, though with no "exact overview" and a lack of clarity about whether this refers to adoption in law as opposed to policy).

[45] E.g., see generally Víctor Lobos and Maria Partidario, "Theory versus Practice in Strategic Environmental Assessment (SEA)" (2014) 48 *Environmental Impact Assessment Review* 34–46, esp. at 40.

[46] See Chapter 10.

[47] See generally Kelechi Nwanekezie, Bram Noble and Greg Poelzer, "Transitions-Based Strategic Environmental Assessment" (2021) 91:106643 *Environmental Impact Assessment Review* 1–10.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

decisions about large projects rather than changing interventions, environment-related laws in other areas provide for a broader range of functions in relation to a broader range of activities.

Take natural resources planning and management laws in domains such as water, forestry, fisheries, and hunting rights. These laws are natural legal venues for responding to cumulative impacts,[48] albeit on a single issue, because they provide scope to consider many individual impacts over a region covered by a plan. Perhaps the legal intervention that most clearly expresses the concept of cumulative impacts is a limit placed on resource extraction such as a cumulative total volume of water that may be withdrawn from a river.[49] These types of interventions may be accompanied by mechanisms to conceptualize precisely what should be protected and provide information and coordination relating to it, as shown by the many examples used later in this book.[50]

Rather than focusing on the aggregate effects of taking resources away from an environment, pollution law provides a further context for considering cumulative impacts by focusing on the aggregate effects of putting pollution into an environment. Mechanisms to limit aggregate pollution, like a "total maximum daily load" that limits the granting of pollution discharge licenses[51] are long-established. They now have newer legal siblings specifically designed to address cumulative impacts, such as risk-based "general environmental duties" that apply to all activities, regardless of size.[52] Like natural resources laws, many pollution laws have a narrow focus on individual "silos" of activities or impacts; this invites us to investigate how legal mechanisms can span these silos to consider cumulative impacts – a key question to which later chapters return.[53]

Laws that establish areas protected for conservation purposes may also include cumulative impact concepts, but in a way that recalibrates the focus to the "matter of concern" to be protected or restored, rather than the type of activity or impact that causes harm. The Great Barrier Reef case study demonstrates complex legal arrangements to protect a marine park, with a focus on cumulative impacts to the area from both marine and land-based

[48] Peter N. Duinker and Lorne A. Greig, "The Impotence of Cumulative Effects Assessment in Canada: Ailments and Ideas for Redeployment" (2006) 37 *Environmental Management* 153–161, 158.

[49] E.g., Nelson, "Breaking Backs," 1209–1210.

[50] See Chapter 4 (Conceptualization), Chapter 5 (Information), and Chapter 7 (Coordination).

[51] 33 U.S.C. § 1313(d).

[52] Table 6.3, row 2.

[53] See Section 6.5.1 (Connected decision-making) and Section 10.4.2.2 (Coordination as mutually reinforcing links between laws in a policy mix).

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

sources.[54] The South Tyrol case study focuses on incentive-based interventions to promote ecologically valuable grazing on Alpine grasslands, with a focus on those designated as valuable habitat under European legal instruments.[55] Numerous examples throughout the book illustrate how conservation laws address cumulative harm to things as diverse as the geysers of Yellowstone National Park in the United States, to wildlife on communal land in Tanzania, to the Kiribati Phoenix Islands Protected Area.[56] Emerging nature restoration laws, and, to some extent, rights of nature laws, focus on reversing a legacy of cumulative degradation to places and ecosystems.[57]

Coastal zone and marine spatial planning and land use planning, beyond protected areas, advance cumulative impact concepts by adopting a regional-scale view and covering multiple sources and types of impact. Coastal zone and marine spatial planning are well-established contexts for managing cumulative impacts.[58] Unlike EIA law, land use planning has the advantage of influencing many categories of development of many sizes in a region, rather than being restricted to large projects. However, both land use planning and EIA law scrutinize only new developments or changes in land use, rather than the ongoing impacts of existing uses. Nonetheless, land use laws provide scope for expressing cumulative impact concerns at the intersection of people and the environment. This is epitomized in the cumulative view of environmental justice – the accumulation of environmental and socioeconomic burdens – which is considered under land use and other areas of law in California, discussed further in the Central Valley case study.[59]

Later chapters of this book reveal a rich array of other environment-related legal mechanisms that contribute an important function to help deal with a cumulative environmental problem, whether or not they make explicit or implicit reference to cumulative impacts. Demonstrating this diversity, they include laws to incentivize traditional agricultural practices, limit the carbon embodied in buildings, manage traffic to reduce ambient air pollution, and publicize corporate reports on greenhouse gas emissions, among many others.

[54] See Chapter 9.
[55] See Chapter 10.
[56] Table 7.2, row 4; Table 6.3, row 3; Table 7.3, row 4.
[57] E.g., Regulation (EU) 2024/1991 of the European Parliament and of the Council of June 24, 2024, on nature restoration and amending Regulation (EU) 2022/869, OJ L 2024/1991, July 29, 2024; Nature Repair Act 2023 (Australia); Table 4.2, row 5.
[58] E.g., see generally Elizabeth Macpherson and others, "Designing Law and Policy for the Health and Resilience of Marine and Coastal Ecosystems – Lessons from (and for) Aotearoa New Zealand" (2023) 54 *Ocean Development and International Law* 200–252.
[59] See Section 8.3.2.2.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

3.2.4 *Cumulative Environmental Problems in Broader Public Law Settings*

Some legal scholars point to the narrowness of even these broader environmental and natural resources laws. These scholars warn of environmental risks posed by "concatenations of political, economic and cultural threats,"[60] and urge us to question more fundamental structures and practices of our society, and the laws that support them. Larger drivers of environmental change may link to legal arrangements that indirectly drive cumulative harm. For example, domestic advertising and other laws drive unsustainable food systems in a way that is difficult to address using isolated policy tools rather than more holistic interventions that address broader social, commercial, and political dimensions of the problem.[61] This view points to the potential for harnessing even broader public laws to deal with cumulative impacts, beyond specific environment-related statutes.

While a specific cumulative environmental problem will dictate which of these broader areas of law are most relevant in a way that is difficult to generalize or discuss here in detail, it is worth noting the general potential of constitutional laws. Constitutions provide for environmental values in diverse ways. Some provisions have potential to address cumulative harm by seeking to secure outcomes (e.g., a "healthy environment," secured by an enforceable right). Other, "contrajudicative" provisions provide for outputs, such as requiring legislation about an environmental matter in the case of a constitutional directive provision, which does not specify the outcome required[62] but nonetheless provides scope for action to address cumulative harms.

Enforceable constitutional human rights to a healthy environment form a relatively prominent vehicle for considering cumulative impacts that limit the right. The South African *Fuel Retailers* case connected, on one hand, an EIA-based statutory requirement to consider the cumulative impacts of a development on "the environment, socio-economic conditions and cultural heritage" with, on the other hand, the precautionary principle and South Africa's constitutional environmental right.[63] The decision-maker was found not to

[60] James R. May and Erin Daly, *Global Environmental Constitutionalism* (CUP 2013) 6.

[61] See generally Tanita Northcott and others, "Ecological Regulation for Healthy and Sustainable Food Systems: Responding to the Global Rise of Ultra-Processed Foods" (2023) 40 *Agriculture and Human Values* 1333–1358.

[62] See generally Lael K. Weis, "Environmental Constitutionalism: Aspiration or Transformation?" (2018) 16 *International Journal of Constitutional Law* 836–870.

[63] Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province and Others (Constitutional Court) (2007) 6 SA 4, [72]–[82].

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

have considered the cumulative effects of the "proliferation of filling stations" on the relevant aquifer, nor the cumulative socioeconomic impacts on existing filling stations, as it was required to do.[64]

More recently, in the German Constitutional Court, claimants in the *Neubauer* case successfully argued that Germany's failure to introduce a greenhouse gas emissions cap required by the Paris Agreement violated constitutional freedoms, which were informed by a directive provision that the state "shall protect the natural foundations of life and animals by legislation."[65] The Court found that future generations would bear a greater burden on account of the depletion of the available CO_2 budget (a cumulative concept) in a way that was not constitutionally justified. More timely transition to climate neutrality was required.[66]

Meanwhile, constitutional coordination provisions that provide for multiple levels of government to coordinate actions are important to cumulative environmental problems: These problems often engage multiple levels of government,[67] and coordinating functions is vital to an effective response.[68] The South Tyrol case study shows how a mosaic of legislative powers granted to national and provincial governments contribute to protecting Alpine grasslands, with associated coordination arrangements that deliver the constitutional principle of "loyal cooperation."[69]

3.3 THE INTERNATIONAL LEGAL LANDSCAPE

This book focuses mainly on domestic legal systems and contexts for regulatory design, but connections between national and international contexts are an important part of this picture. Indeed, international and supranational laws, norms, or institutions arise in each of the case studies. These range from the internationally informed human right to water in California, to the World Heritage status of the Great Barrier Reef, to the tangle of supranational and international law that influences Alpine grasslands in South Tyrol. For

[64] *Fuel Retailers*, [99].

[65] Grundgesetz für die Bundesrepublik Deutschland [Basic Law for the Federal Republic of Germany] 1949, as amended, art. 20a; *Bundesverfassungsgericht*, Order of the First Senate of March 24, 2021 – 1 BvR 2656/18.

[66] For a discussion of the case, see Agnes Hellner and Yaffa Epstein, "Allocation of Institutional Responsibility for Climate Change Mitigation: Judicial Application of Constitutional Environmental Provisions in the European Climate Cases Arctic Oil, Neubauer, and L'affaire Du Siècle" (2023) 35 *Journal of Environmental Law* 207–227, 216–220.

[67] See further Chapter 7, Section 7.2.

[68] Section 2.2.4.

[69] Section 10.4.2.3.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

completeness, this section sets out a brief analysis of the ways in which international legal arrangements deal expressly with cumulative environmental impacts, focusing on treaties and multilateral development bank policies.

3.3.1 *International Law*

EIA law began its migration from the domestic to the international realm in the 1970s,[70] developing early international statements on EIA.[71] The most broadly ratified EIA treaty, the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention),[72] is silent on whether its project-level EIA obligations extend to cumulative impacts. The Convention appears to assume that national laws will supply EIA procedures,[73] and includes cumulative impact concepts only in the context of SEA, rather than EIA.[74]

Other multilateral environmental agreements (MEAs) refer expressly to cumulative impacts in one of two ways. The first type applies to projects generally, mirroring national EIA laws. Notably, the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean (Escazú Agreement)[75] requires parties to make public "a description of the main environmental impacts of the project or activity and, as appropriate, the cumulative environmental impact."[76] By contrast, the geographically wider 1998 Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention)[77] does not expressly mention cumulative impacts, though related guidance does do so in a cursory way.[78]

[70] Craik, *International Law of EIA*, 90–91.

[71] An early iteration of international EIA policy was principle 17 of the Rio Declaration on Environment and Development (Rio Declaration), Rio de Janeiro (Brazil), June 3–14, 1992, UN Doc. A/CONF.151/26/Rev.1 (Vol. 1), June 14, 1992.

[72] Espoo, February 25, 1991, in force September 10, 1997.

[73] Ibid preamble, art. 1(v), (vi).

[74] G. Sander, "International Legal Obligations for Environmental Impact Assessment and Strategic Environmental Assessment in the Arctic Ocean" (2016) 31(1) *The International Journal of Marine and Coastal Law* 88–119, 98–99; R. L. Johnstone, "Evaluating Espoo: What Protection Does the Espoo Convention Offer the Arctic Marine Environment?" (2013) 5(1) *The Yearbook of Polar Law Online* 337–57, 350–351.

[75] Escazú, March 4, 2018, in force April 22, 2021.

[76] Article 7 (17)(b).

[77] Aarhus, June 25, 1998, in force October 30, 2001.

[78] Findings and recommendations with regard to communication ACCC/C/2008/31 concerning compliance by Germany, Aarhus Convention Compliance Committee, ECE/MP.PP/C.1/2014/8, 2014, [40], [61].

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

A second type of MEA containing cumulative impact provisions applies to specific regional environments or contexts, such as marine, coastal, and mountain environments.[79] The geographic limitation of these MEAs is arguably a strength: Like terrestrial and marine spatial planning at the domestic level, focusing on a mountain range or sea aligns with scientific aspirations that CIA occur at an ecologically relevant regional scale,[80] and may capture the extent of a distinct environment that experiences adverse effects. MEAs that expressly use cumulative impact concepts do so in different ways. Some require or suggest[81] that cumulative impacts be considered as a component of substantive environmental assessment.[82] Others use cumulative impact concepts to categorize areas for protection and propose activities for control.[83] As a further alternative, cumulative impacts expressly may be relevant to a duty to consult and cooperate with other Parties about activities.[84]

Finally, as the case studies later in this book illustrate, MEAs may provide for regulatory functions that help to address cumulative environmental problems even where their texts do not expressly mention cumulative impacts. A request from a Committee under the World Heritage Convention triggered an influential SEA of the Great Barrier Reef, which focused on cumulative impacts;[85] meanwhile, the Paris Agreement's climate target influenced Australia's statutory targets years after the SEA, which largely ignored climate mitigation despite the Reef's extreme vulnerability to climate change.[86] The Alpine Convention, a regional MEA, and several biodiversity-focused treaties are an important part of the picture of mechanisms that interventions that promote traditional grazing practices that support Alpine grasslands in South Tyrol, Italy.[87] Guidance documents produced by treaty bodies may also expressly call attention to

[79] Nelson and Shirley, "Latent Potential," 21–22.
[80] Jones, "Cumulative Effects Assessment," 194–195 (especially note 35), 197.
[81] Convention on the Protection of the Marine Environment of the Baltic Sea Area, Helsinki, Finland (Helsinki Convention), April 9, 1992, in force January 17, 2000, art. 7(3).
[82] The Black Sea Biodiversity and Landscape Conservation Protocol to the Convention on the Protection of the Black Sea against Pollution (Black Sea Protocol), Sofia (Bulgaria), June 14, 2002, in force June 20, 2011, art. 6.
[83] Protocol on Environmental Protection to the Antarctic Treaty, Madrid, October 4, 1991, in force January 14, 1998, annex I art. 2(1)(b), annex V art. 4(2)(a).
[84] Ibid art. 6 (1)(d).
[85] Convention Concerning the Protection of the World Cultural and Natural Heritage, November 16, 1972, Paris, in force December 17, 1975, 1037 U.N.T.S. 151; see Section 9.3.1.
[86] Paris Agreement under the United Nations Framework Convention on Climate Change, December 12, 2015, in force November 4, 2016, 3156 U.N.T.S. 79; see Table 9.1.
[87] See Table 10.1.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

cumulative impacts even where the treaties themselves do not.[88] Like domestic laws, then, we see that international laws can focus on a matter of concern, impacts, and activities in a way that contributes to addressing cumulative environmental problems – not to speak of other treaties outside environmental regimes that indirectly influence cumulative harm.[89]

Beyond treaties, customary international law presents limitations for adopting cumulative impact concepts, at least for project-level environmental assessment. Forming consistent state practice[90] on including CIA in EIA and demonstrating accompanying *opinio juris* appear challenging. It is difficult to attribute state motivation to international obligation, and state practice requires action beyond treaty obligations[91] and technically excludes EIA undertaken by non-state entities.[92] In any case, the wealth of treaties that impose EIA obligations reduce the importance of a stand-alone customary obligation.[93]

3.3.2 *Multilateral Development Banks*

Policies of multilateral development banks ("banks") present a further context for considering international responses to cumulative environmental problems. Bank operational policies are not binding in the same way as national legislation and ratified MEAs, but these policies must be followed in the execution of individual funded development projects,[94] for example, assessing the environmental impact of constructing a hydroelectric dam. Operational policies use the concept of cumulative impacts in varied ways, sometimes without definitions.[95] Some policies suggest that EIA ought to

[88] E.g., see generally Sarah Court and others, *Guidance and Toolkit for Impact Assessments in a World Heritage Context* (UNESCO 2022).

[89] See generally Margaret A. Young, "Fragmentation" in Lavanya Rajamani and Jacqueline Peel (eds), *The Oxford Handbook of International Environmental Law* (OUP, 2021) 86–101.

[90] Michael Wood and Omri Sender, "Customary International Law," in Anne Peters and Rüdiger Wolfrum (eds), *Max Planck Encyclopedia of Public International Law* (OUP, 2025) [8]–[28].

[91] Craik, *International Law of EIA*, 124–125.

[92] Ibid 125.

[93] Ibid.

[94] World Bank, "The World Bank Environmental and Social Framework" (2017) ix, www.worldbank.org/en/projects-operations/environmental-and-social-framework.

[95] "Environmental and Safeguards Compliance Policy" (Banco Interamericano de Desarrollo/Inter-American Development Bank 2006) s B.3 pt 4.17; "Safeguard Policy Statement" (Asian Development Bank 2009) Policy Paper app 1 s D pt 1(4); "Environmental and Social Safeguards Policy" (Council of Europe Development Bank 2016) para 43.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

consider cumulative impacts;[96] others also link cumulative impacts to screening and scoping.[97]

The significance of these policies extends beyond individual projects; bank operational policies can also evolve into norms that influence or even bind third parties, such as investors, far beyond the parameters of discrete lending agreements.[98] For example, bank policies on cumulative impacts may be referenced in EIA documents for major projects in countries that are not borrowers, as has occurred for port developments on Australia's Great Barrier Reef.[99]

3.4 A COMPASS FOR THE REGULATORY LANDSCAPE

This chapter has argued that a great variety of laws can help address cumulative environmental problems. Indeed, realistically, no one type of law could single-handedly address the incremental, creeping degradation of environments that we care about. At the same time, ongoing degradation suggests that there are problems with how laws take up this challenge on paper or in practice – or both.

To diagnose gaps, weaknesses, and strengths, we need to cast a regulatory eye across a panoramic landscape of laws. We can orient ourselves by asking a simple question: What is the core purpose of this area of law, what is its focus? Reflecting on key differences in legal focus helps to structure an analysis across this landscape, as illustrated by the case study analyses. A law's focus also raises hypotheses for regulatory designers to consider about its advantages, disadvantages, and predispositions in relation to the CIRCle Framework functions of conceptualization, information, regulatory intervention, and coordination.

We can distinguish between laws that focus on a matter of concern (like a protected conservation area law or an endangered species law), from those that

[96] "Environmental and Safeguards Compliance Policy," s B.5 pt 4.19; "The World Bank Environmental and Social Framework," 18, 23; "Safeguard Policy Statement," para 50, app 1 s D pt 1 para 4.

[97] E.g. "Environmental and Social Policy" (European Bank for Reconstruction and Development, 2024) 15, 34.

[98] Galit A. Sarfaty, "The World Bank and the Internalization of Indigenous Rights Norms" (2005) 114 Yale Law Journal 1791, 1792–1793, 1800–1801; Ihsan Ugur Delikanli, Todor Dimitrov and Roena Agolli, *Multilateral Development Banks: Governance and Finance* (Springer 2018) 114.

[99] Advisian Worley Parsons Group, *Abbot Point Growth Gateway Project Environmental Impact Statement – Volume 2 Main Report* (August 17, 2015) 454 (citing International Finance Corporation definition of cumulative impacts), www.statedevelopment.qld.gov.au/__data/assets/pdf_file/0019/33544/abbot-pt-eis-vol-02-main-report.pdf.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

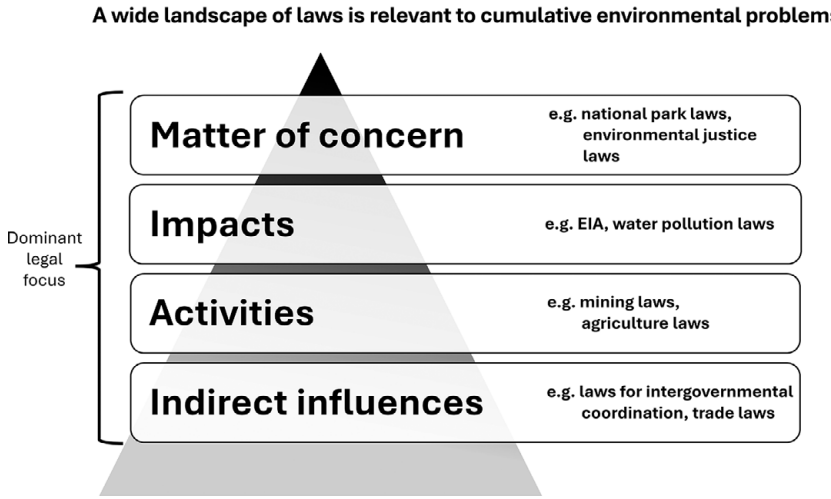


FIGURE 3.1 Laws relevant to regulating cumulative environmental problems

focus on specific kinds of activities (like mining, or farming) or impacts (like many EIA laws, pollution or natural resources laws), from those that have indirect influence, for example, by dealing with crosscutting institutional or coordination issues (as in allocating legislative powers over the environment among different levels of government, with associated rules for resolving disputes)[100] (Figure 3.1). These general distinctions are applied in each case study presented later in this book[101] as a way to chart an analytical course through many relevant laws, noting that in some cases a law may span these categories.

Determining the focus of a particular law can also point to potential areas of weakness that deserve the attention of regulatory designers. A law that focuses on a matter of concern may have strong mechanisms for conceptualization, but pay less attention to other CIRCle Framework functions. A law that focuses on coordination generally between levels of government (an indirect influence) may not provide much clarity about the regulatory functions that need coordination in an environmental context; and other like issues. The design of specific impact-focused laws, like those dealing with greenhouse gas emissions, may need more express attention to how they connect to laws that

[100] It would also be possible to draw this "indirect influence" category much wider, to include, for example, political campaign financing laws and other laws that influence the political power exercised by entities that undertake relevant activities, though doing so lies beyond this scope of the present work.

[101] See Section 8.3, Table 9.1, and Table 10.1.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005

deal with other types of impact than will be the case for project-focused laws, which inherently consider multiple impacts of a single project. This is the classic problem of legal "silos" obstructing connected decision-making, to which the chapter on regulatory intervention returns, and the Great Barrier Reef case study explores.[102]

3.5 CONCLUSION

This chapter has argued that a great variety of laws can usefully contribute to addressing cumulative environmental problems. These laws include the EIA and SEA laws that attract the attention of the literature that discusses cumulative impacts most prominently. But far broader laws are also relevant, including traditional and customary laws, natural resources allocation laws, laws for protected areas and species, terrestrial and marine planning, and broader public laws. International law and policy can also be an important part of this picture.

The regulatory landscape sketched here includes laws that have diverse core purposes and typical approaches. Regulatory designers might usefully consider these differences in their jurisdiction, and how they might present advantages and disadvantages in delivering CIRCle Framework functions.

Each cumulative environmental problem will engage a unique set of laws from across this broad regulatory landscape. Evaluating how these laws deal with a problem involves first finding them, then considering them together, including how different regulatory functions interact, and the degree to which they are integrated. The case study chapters illustrate this to examine different sets of functions using diverse collections of laws across all of the categories discussed here. Chapter 8 tackles groundwater sustainability in California, examining how conceptualization interacts with the other CIRCle Framework functions through a natural resources planning law. Chapter 9 focuses on the ecological health of the Great Barrier Reef in Australia, examining how SEA links information and regulatory intervention across diverse laws for protecting the Reef, addressing carbon and water pollution, and managing development activities. Finally, Chapter 10 explores how intervention and coordination – across multiple vertical levels of government, using laws that span nature protection, impact assessment, agriculture, landscape, and governance – protect biocultural landscapes in South Tyrol, Italy.

[102] See Sections 6.5.1 and 9.5.4.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 17 Nov 2026 at 02:48:59, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781009091930.005