

ARTICLE

The Latent Potential of Cumulative Effects Concepts in National and International Environmental Impact Assessment Regimes

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First published online 2 November 2022

Abstract

Most modern-day environmental issues are caused by the complex aggregation and interaction of numerous actions contributing to large-scale problems, from biodiversity loss to climate change. Environmental impact assessments (EIAs) consider how projects contribute to these cumulative environmental problems. This article firstly evaluates the theoretical importance of cumulative effects concepts for EIA. It reveals their potential to spotlight values embedded in decision making and to illuminate, as a lighthouse would, types of harm from broad-ranging, typically unregulated, activities. A large-scale global survey of national EIA laws and multilateral environmental agreements then shows that cumulative effects concepts are legally relevant for most national EIA frameworks. This prevalence suggests that better implementation of cumulative effects provisions may help EIA law to deliver more significant benefits than previously appreciated. Evaluating a sample of EIA provisions shows that cumulative effects concepts can contribute to different stages of an EIA, but that using these concepts across all EIA stages would maximize their potential to achieve the theoretical benefits identified. From theoretical and practical legal perspectives, cumulative effects concepts have significant latent potential – perhaps transformational potential – to address cumulative environmental change through EIA regimes at national and international levels. However, without better implementation, the latent potential of these laws to address cumulative environmental problems is likely to remain unrealized. By shedding light on the extent of national and international legal frameworks that adopt cumulative effects concepts, and their differences, this article highlights the significant learning potential between legal regimes to aid improved implementation.

Keywords: Cumulative effects, Cumulative impacts, Environmental impact assessment, International environmental law, Comparative environmental law

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Funding to assist this research was provided by the Australian Research Council (DE180101154). The article benefited from thoughtful feedback from Amanda Cravens, Nicola Ulibarri and Anne Siders, research assistance from Lucas Volfneuk, and the helpful comments and suggestions of two anonymous reviewers for *TEL*. All errors remain those of the authors.

1. INTRODUCTION

Many of our most intractable environmental problems involve cumulative environmental harm, from a changing climate caused by high concentrations of greenhouse gas emissions to biodiversity lost as a result of the incremental clearing of native vegetation. These types of harm occur when multiple individual adverse environmental impacts interact and aggregate. Regulating these ‘cumulative effects’ is increasingly important for environmental protection.

Sources of such impacts include large-scale public and private projects, such as new infrastructure, resources developments or housing. Globally, waves of new infrastructure are anticipated to aid post-pandemic economic recovery,¹ renewable energy transitions,² and economic development in the global south.³ Without care and legal clarity, these projects will create serious cumulative effects.

Environmental impact assessment (EIA) offers one way of considering and controlling the impacts of major projects. EIA originated in the United States’ (US) National Environmental Policy Act of 1969,⁴ then spread to various US states, with other countries following suit in the 1970s and 1980s.⁵ 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.⁶

EIA law may require consideration of cumulative effects. A representative definition of cumulative effects – from the many that exist – 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

¹ See, e.g., Prime Minister of Australia, ‘Address – CEDA’s State of the Nation Conference’, 15 June 2020, available at: https://parlinfo.aph.gov.au/parlInfo/download/media/pressrel/7396163/upload_binary/7396163.pdf;fileType=application%2Fpdf#search=%22media/pressrel/7396163%22; Executive Office of the President, ‘Accelerating the Nation’s Economic Recovery from the COVID-19 Emergency by Expediting Infrastructure Investments and Other Activities’, Executive Order 13927, 4 June 2020, 85 *Federal Register*, pp. 35165–70, available at: <https://www.federalregister.gov/documents/2020/06/09/2020-12584/accelerating-the-nations-economic-recovery-from-the-covid-19-emergency-by-expediting-infrastructure>.

² See generally C.A. Caine, ‘The Race to the Water for Offshore Renewable Energy: Assessing Cumulative and in-Combination Impacts for Offshore Renewable Energy Developments’ (2020) 32(1) *Journal of Environmental Law*, pp. 83–110.

³ See generally A. Bebbington et al., ‘Opinion: Priorities for Governing Large-Scale Infrastructure in the Tropics’ (2020) 117(36) *Proceedings of the National Academy of Sciences of the United States of America*, pp. 21829–33.

⁴ N. Craik, *The International Law of Environmental Impact Assessment: Process, Substance and Integration* (Cambridge University Press, 2008), p. 23; T. Yang, ‘The Emergence of the Environmental Impact Assessment Duty as a Global Legal Norm and General Principle of Law’ (2019) 70(2) *Hastings Law Journal*, pp. 525–72, p. 530.

⁵ Craik, *ibid.*, pp. 23–4.

⁶ R. Therivel & G. Wood, ‘Introduction’, in R. Therivel & G. Wood (eds), *Methods of Environmental and Social Impact Assessment*, 4th edn (Routledge, 2017), pp. 1–19; United Nations Environment Programme (UNEP), *Environmental Impact Assessment Training Resource Manual*, 2nd edn (UNEP, 2002), p. 100, available at: <https://wedocs.unep.org/handle/20.500.11822/26503>.

(in combination) which arise from the interaction between effects of a development plan, programme or project, on different components of the environment'.⁷

EIA that includes cumulative effects assessment (CEA) differs from 'regular' EIA in important ways. It involves, at least to some extent, identifying other actors and actions in the past, present, and reasonably foreseeable future. By contrast, regular EIA does not disaggregate actions; instead, it may consider the overall effects of those actions as environmental 'context' or 'existing circumstances'.⁸ Thus, CEA highlights not only the metaphorical 'thousand cuts', but also who wields (and has wielded, and will wield) the knife. Secondly, considering other actors in space and time expands the spatial and temporal boundaries of EIA that includes CEA relative to regular EIA.⁹ CEA also alters EIA investigations by considering whether 'individually minor effects will be collectively significant',¹⁰ illuminating relatively small, potentially unregulated effects that regular EIA may otherwise disregard. Finally, CEA also emphasizes non-linear responses, such as impacts that become amplified or exponentially greater as a result of other development activities and natural background changes in environmental conditions.¹¹ By contrast, 'traditional' EIA tends to conceptualize a single source of impact in isolation,¹² potentially misrepresenting to decision makers and the public the true extent of environmental harm. Considering cumulative effects 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.¹³

At least 180 countries prescribe some type of EIA in national law,¹⁴ as do several treaties and customary international laws.¹⁵ There is increased comparative legal debate about CEA in EIA.¹⁶ However, no comprehensive survey has explored the

⁷ M. Broderick, B. Durning & L.E. Sánchez, 'Cumulative Effects', in Therivel & Wood, n. 6 above, pp. 649–78, at 650.

⁸ R. Nelson, 'Breaking Backs and Boiling Frogs: Warnings from a Dialogue between Federal Water Law and Environmental Law' (2019) 42(4) *University of New South Wales Law Journal*, pp. 1179–214, at 1199.

⁹ F.C. Jones, 'Cumulative Effects Assessment: Theoretical Underpinnings and Big Problems' (2016) 24(2) *Environmental Reviews*, pp. 187–204, at 195.

¹⁰ *Ibid.*, p. 189.

¹¹ C.K. Contant & L.L. Wiggins, 'Defining and Analyzing Cumulative Environmental Impacts' (1991) 11(4) *Environmental Impact Assessment Review*, pp. 297–309, at 299–303.

¹² B. 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*, pp. 29–57, at 38.

¹³ Nelson, n. 8 above, p. 1211.

¹⁴ Yang, n. 4 above, p. 560; see also [Figure 1](#) (note that different numbers in [Figure 1](#) result from using different search criteria).

¹⁵ International Court of Justice (ICJ), *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, Judgment, 20 Apr. 2010, *ICJ Reports* (2010), p. 14 (*Pulp Mills*).

¹⁶ See, e.g., M.M. Foley et al., 'The Challenges and Opportunities in Cumulative Effects Assessment' (2017) 62 *Environmental Impact Assessment Review*, pp. 122–34. For some recent exceptions to this see T.S. Aung, T.B. Fischer & S. Luan, 'Evaluating Environmental Impact Assessment (EIA) in the Countries along the Belt and Road Initiatives: System Effectiveness and the Compatibility with the Chinese EIA' (2020) 81 *Environmental Impact Assessment Review*, article 106361, pp. 1–10; K. Swangjang, 'Comparative Review of EIA in the Association of Southeast Asian Nations' (2018) 72 *Environmental Impact Assessment Review*, pp. 33–42; P. Walker & R. Irarrázabal, 'Los efectos acumulativos y el Sistema de Evaluación de Impacto Ambiental' (2016) 6 *Revista de Derecho Ambiental*, pp. 67–91;

domestic and international legal adoption of provisions that address cumulative effects or their theoretical implications. Such a survey is warranted given the widespread use of EIA and the ‘untapped potential in existing laws to address environmental change’.¹⁷ While other forms of law also consider cumulative effects, such as strategic environmental assessment (SEA) and regional-scale assessments,¹⁸ their use is comparatively rare,¹⁹ which would reduce the potential impact of including CEA in these processes as compared with EIAs.

This article investigates the potential of cumulative effects concepts in EIA law to address cumulative environmental change. This investigation proceeds on two fronts, applying theoretical and practical legal lenses to two sub-questions. Firstly, as a matter of theory, how might cumulative effects concepts²⁰ help to address cumulative environmental change through EIA law? Secondly, practically, to what extent do existing EIA laws adopt cumulative effects concepts, thereby laying the legal foundations for delivering the identified theoretical benefits? To answer these questions, we cover EIA under national laws and multilateral environmental agreements (MEAs). EIA regimes at both levels are important components of the global ‘constellation’²¹ of theories and laws related to EIA, and are interlinked. Throughout, we also reflect on the impact of poor implementation in realizing the potential of cumulative effects concepts in EIA law to address cumulative environmental change. We offer several law-related methods of encouraging better implementation, with a focus on forms of cooperation and cross-regime lesson learning.

The remainder of the article is structured as follows. Section 2 considers the importance of cumulative effects concepts in major EIA theories. It finds that cumulative effects provisions ‘spotlight’ value-laden aspects of EIA and illuminate, as a lighthouse would, a broader set of potentially harmful activities beyond the activity that triggered the EIA, including activities across boundaries. The article then moves to its main contribution, a systematic global survey of EIA laws containing cumulative effects provisions. Section 3 undertakes this survey at the national level, analyzing the major

J.A.T. de Barros & A.A. Pereira, ‘Impactos Cumulativos Não São Analisados Em Estudos de Impactos Ambientais No Estado de Minas Gerais’ (2019) 13(1) *Revista Geografica Academica*, pp. 105–15.

¹⁷ A. Garmestani et al., ‘Untapped Capacity for Resilience in Environmental Law’ (2019) 116(40) *Proceedings of the National Academy of Sciences of the United States of America*, pp. 19899–904, at 19899.

¹⁸ See, e.g., B. Noble & K. Nwanekezie, ‘Conceptualizing Strategic Environmental Assessment: Principles, Approaches and Research Directions’ (2017) 62 *Environmental Impact Assessment Review*, pp. 165–73, at 166, 169; S. Marsden, ‘Strategic Environmental Assessment of Australian Offshore Oil and Gas Development: Ecologically Sustainable Development or Deregulation?’ (2016) 33(1) *Environment and Planning Law Journal*, pp. 21–30, at 23.

¹⁹ M.S. Peters & M. Kumar, ‘Strategic Environmental Assessment: Experience, Status and Directions’ (2012) 21(2) *European Energy & Environmental Law Review*, pp. 92–8, at 93; M. Fundingsland Tetlow & M. Hanusch, ‘Strategic Environmental Assessment: The State of the Art’ (2012) 30(1) *Impact Assessment and Project Appraisal*, pp. 15–24, at 17 (referring to 60 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).

²⁰ We use the term ‘cumulative effects concepts’ rather than ‘cumulative environmental assessment’ where we refer to legal provisions that have a broader function than merely assessing cumulative effects (see Section 3.2 below).

²¹ V. Heyvaert & T.F.M. Etty, ‘Introducing Transnational Environmental Law’ (2012) 1(1) *Transnational Environmental Law*, pp. 1–11, at 6.

areas in which these provisions vary and discussing corresponding implications. It finds cumulative effects provisions in most national EIA laws (113 national laws), which provide a wide foundation for delivering the theoretical benefits of cumulative effects concepts, though there are definitional and functional differences between these provisions. Section 4 conducts this survey and examines these factors in the context of MEAs, finding ten MEAs that adopt such provisions, then considers points of intersection between national law and MEAs. Section 5 synthesizes key findings from the theoretical analysis and global survey, and highlights opportunities for further research.

2. THEORETICAL UNDERSTANDINGS OF EIA AND THE PLACE OF CUMULATIVE EFFECTS CONCEPTS

Considering major EIA theories reveals that cumulative effects concepts significantly expand the capacity of EIA to address key theoretical concerns and achieve theoretical benefits relevant for addressing cumulative environmental change.

2.1. Rationales for EIA: Theoretical Models

EIA is traditionally considered a purely technical-rational exercise, whereby decision makers objectively,²² rationally²³ and systematically examine all the relevant information produced by the EIA process to reach the ‘correct’ decision about the acceptability of a project.²⁴ This neutrality is conveyed by impact statements that emphasize scientific techniques, using value-free terms such as the ‘public interest’.²⁵ From this apolitical view,²⁶ public participation is valued purely for producing additional information.²⁷

Over time, these assumptions of complete rationality have been increasingly questioned,²⁸ recognizing that EIA unavoidably involves political decisions²⁹ about prioritizing conflicting interests.³⁰ Determining the significance of an environmental impact

²² J.F. Benson, ‘What is the Alternative? Impact Assessment Tools and Sustainable Planning’ (2003) 21(4) *Impact Assessment and Project Appraisal*, pp. 261–80, at 262.

²³ J. Parkin, *Judging Plans and Projects* (Ashgate, 1993), pp. 89–94.

²⁴ Craik, n. 4 above, p. 38; P.J. Culhane, H.P. Friesema & J.A. Beecher, *Forecasts and Environmental Decisionmaking: The Content and Predictive Accuracy of Environmental Impact Statements* (Westview Press, 1987), pp. 14–15.

²⁵ J. Holder, *Environmental Assessment: The Regulation of Decision-Making* (Oxford University Press, 2006), pp. 24–5; Parkin, n. 23 above, pp. 135–7.

²⁶ B.C. Karkkainen, ‘Toward a Smarter NEPA: Monitoring and Managing Government’s Environmental Performance’ (2002) 102(4) *Columbia Law Review*, pp. 903–72, at 912, 925.

²⁷ R.V. Bartlett & P.A. Kurian, ‘The Theory of Environmental Impact Assessment: Implicit Models of Policy Making’ (1999) 27(4) *Policy & Politics*, pp. 415–33, at 418.

²⁸ M. Cashmore, ‘The Role of Science in Environmental Impact Assessment: Process and Procedure versus Purpose in the Development of Theory’ (2004) 24(4) *Environmental Impact Assessment Review*, pp. 403–26, at 418.

²⁹ F. Sandbach, *Environment, Ideology and Policy* (Wiley-Blackwell, 1980), p. 104.

³⁰ S. Owens, T. Rayner & O. Bina, ‘New Agendas for Appraisal: Reflections on Theory, Practice, and Research’ (2004) 36(11) *Environment and Planning A: Economy and Space*, pp. 1943–59, at 1945–6; Craik, n. 4 above, p. 38; R.V. Bartlett, ‘The Rationality and Logic of NEPA Revisited’, in R. Clark & L. Canter (eds), *Environmental Policy and NEPA: Past, Present, and Future* (St Lucie Press, 1997), pp. 51–60, at 52–4.

is especially subjective,³¹ despite increasingly standardized practices.³² Commentators also question the resource-intensity and plausibility³³ of exhaustively compiling information to make perfect predictions *ex ante*,³⁴ and criticize the lack of emphasis on follow-up monitoring and adaptive responses.³⁵ These critiques aim to reconceptualize the EIA process as less positivist³⁶ and more deliberative,³⁷ potentially transforming the views of individuals, institutions, and societies.

Many EIA theories (grouped as ‘transformational theories’) recognize that EIA processes involve difficult choices and diverse participants.³⁸ Seen thus, EIA can transform stakeholders’³⁹ interests by raising awareness of broader social interests and the common good,⁴⁰ and reconfiguring their interests through deliberation to be more aligned with community-minded, environmental values.⁴¹ EIA processes can shift the values of public institutions – such as environmental agencies, planning authorities and private institutions⁴² – as well as the values of individuals.⁴³ EIA can also be seen as a domestic or international process of ‘negotiation, bargaining and compromise among organized groups’ that compete to realize their values.⁴⁴ However, transformational theories are criticized for involving time- and resource-intensive processes without guaranteeing constructive outcomes,⁴⁵ and exaggerating the potential of participatory processes to shift values⁴⁶ and drive competing interests to agreement.⁴⁷

³¹ S. Briggs & M.D. Hudson, ‘Determination of Significance in Ecological Impact Assessment: Past Change, Current Practice and Future Improvements’ (2013) 38 *Environmental Impact Assessment Review*, pp. 16–25, at 19, 21.

³² *Ibid.*, pp. 18–20.

³³ Culhane, Friesema & Beecher, n. 24 above, pp. 81–5, 96–116.

³⁴ Karkkainen, n. 26 above, pp. 906–7, 925–6; see also Sandbach, n. 29 above, pp. 95–6.

³⁵ Karkkainen, n. 26 above, pp. 926–7; Craik, n. 4 above, p. 39.

³⁶ Parkin, n. 23 above, pp. 112–7.

³⁷ C. Adelle & S. Weiland, ‘Policy Assessment: The State of the Art’ (2012) 30(1) *Impact Assessment and Project Appraisal*, pp. 25–33, at 29; D.P. Lawrence, ‘Planning Theories and Environmental Impact Assessment’ (2000) 20(6) *Environmental Impact Assessment Review*, pp. 607–25, at 619–21.

³⁸ Owens, Rayner & Bina, n. 30 above, pp. 1947–8.

³⁹ For our purposes, we use the terms ‘the public’, ‘participants’ and ‘stakeholders’ interchangeably; for in-depth discussion of these terms see A.N. Glucker et al., ‘Public Participation in Environmental Impact Assessment: Why, Who and How?’ (2013) 43 *Environmental Impact Assessment Review*, pp. 104–11, at 109.

⁴⁰ H. Wilkins, ‘The Need for Subjectivity in EIA: Discourse as a Tool for Sustainable Development’ (2003) 23(4) *Environmental Impact Assessment Review*, pp. 401–14, at 408–9.

⁴¹ Craik, n. 4 above, pp. 40–1.

⁴² R.V. Bartlett, ‘Ecological Reason in Administration: Environmental Impact Assessment and Green Politics’, in R. Paehlke & D. Torgerson (eds), *Managing Leviathan: Environmental Politics and the Administrative State*, (University of Toronto Press, 2005), pp. 47–58, at 54–6; Bartlett & Kurian, n. 27 above, pp. 425–6.

⁴³ Holder, n. 25 above, pp. 27, 197–8.

⁴⁴ Bartlett & Kurian, n. 27 above, p. 423.

⁴⁵ Owens, Rayner & Bina, n. 30 above, p. 1949.

⁴⁶ Holder, n. 25 above, p. 29.

⁴⁷ Owens, Rayner & Bina, n. 30 above, p. 1950; see also Bohman, who outlines critiques of deliberative processes generally (his analysis is not constrained to EIA) and responds to them: J. Bohman, *Public Deliberation: Pluralism, Complexity, and Democracy* (The MIT Press, 1996).

2.2. Rationales for EIA: International Legal Principles

Another theoretical source underpinning EIA are principles of international law. Internationally, EIA is theorized to implement the no-harm principle (which requires states to take reasonable steps to prevent significant transboundary environmental harm⁴⁸) and the duty of state cooperation⁴⁹ (which requires states to notify and consult with states which may experience environmental impacts resulting from the originating state's proposed project⁵⁰). These focus on the participatory and deliberative elements of EIA processes⁵¹ and can be considered integrated rather than mutually exclusive obligations.⁵² The duty of state cooperation creates a good-faith obligation which requires states to genuinely engage in consultations and attempt to resolve other states' objections, while stopping short of giving those other states veto power over the originating state's proposed activities.⁵³ This echoes the domestic expectation that decision makers genuinely consider environmental issues, generally without requiring them to reach a specific outcome.⁵⁴ At both the domestic and international levels, these duties are procedural.

Others argue that EIA contributes to the non-discrimination principle,⁵⁵ obliging a state to 'apply their environmental laws without discriminating between internal environmental harm and environmental harm to areas external to the state'.⁵⁶ Related to this is the equal access principle, which states that all potentially affected people should have equal access to participatory decision-making processes regardless of whether they live inside the state or not.⁵⁷

The non-discrimination principle does not directly act to strengthen environmental laws, but rather ensures that existing environmental laws and decision-making processes are applied to transboundary situations.⁵⁸ Conversely, the no-harm principle

⁴⁸ *Pulp Mills*, n. 15 above, p. 204; Y. Tanaka, 'Obligation to Conduct an Environmental Impact Assessment (EIA) in International Adjudication: Interaction between Law and Time' (2021) 90(1) *Nordic Journal of International Law*, pp. 86–121, at 89–94; A.Z. Cassar & C.E. Bruch, 'Transboundary Environmental Impact Assessment in International Watercourse Management' (2003) 12(1) *New York University Environmental Law Journal*, pp. 169–244, at 189; C.J. Bastmeijer & T. Koivurova, 'Transboundary Environmental Impact Assessment: An Introduction', in C.J. Bastmeijer & T. Koivurova (eds), *Theory and Practice of Transboundary Environmental Impact Assessment* (Martinus Nijhoff, 2008), pp. 1–27, at 7; O. Elias, 'Environmental Impact Assessment', in M. Fitzmaurice, D.M. Ong & P. Merkouris (eds), *Research Handbook on International Environmental Law* (Edward Elgar, 2010), pp. 227–42, at 228; P. Sands & J. Peel, *Principles of International Environmental Law*, 4th edn (Cambridge University Press, 2018), p. 206.

⁴⁹ Sands & Peel, *ibid.*, p. 215.

⁵⁰ Craik, n. 4 above, pp. 68–72.

⁵¹ N. Craik, 'The Duty to Cooperate in the Customary Law of Environmental Impact Assessment' (2020) 69(1) *International and Comparative Law Quarterly*, pp. 239–59, at 251–7.

⁵² Craik, n. 4 above, p. 82.

⁵³ *Ibid.*, pp. 69–71.

⁵⁴ S. Jay et al., 'Environmental Impact Assessment: Retrospect and Prospect' (2007) 27(4) *Environmental Impact Assessment Review*, pp. 287–300, at 290.

⁵⁵ J.H. Knox, 'The Myth and Reality of Transboundary Environmental Impact Assessment' (2002) 92(2) *American Journal of International Law*, pp. 291–319, at 311–6.

⁵⁶ *Ibid.*, p. 300; Craik, n. 4 above, p. 55.

⁵⁷ Knox, n. 55 above, p. 300; Craik, n. 4 above, p. 55.

⁵⁸ Craik, n. 4 above, pp. 56–7.

provides more scope for improving existing environmental laws and standards, as it focuses on the possibility and existence of environmental harm.⁵⁹

2.3. *Theoretical Contributions of Cumulative Effects Concepts: A Spotlight and Lighthouse in EIA*

Cumulative effects concepts in EIA carry benefits across these different theoretical rationales for EIA: the technical-rational approach, the transformational approach, the no-harm principle, and the non-discrimination principle. Cumulative effects improve EIA as a technical-rational exercise by producing more comprehensive information about the circumstances surrounding a proposed project, better informing how a decision maker evaluates central EIA concepts like environmental significance.⁶⁰ Courts have found that even a relatively small amount of additional environmental impact on an already degraded environment should be considered cumulatively significant, given existing levels of harm.⁶¹

The existing literature focuses largely on the technical-rational benefits of CEA, but is beginning to recognize its transformational potential.⁶² we build on the latter discussion here. By expanding the temporal and spatial boundaries of EIA under the requirement to consider relevant past and future activities, CEA forces a decision maker to transparently consider matters that are central to value judgements implicit in EIA and conceptualize the common good. A broader temporal view encourages more explicit consideration of appropriate historical baselines (for example, past ecological conditions in ‘pristine’ pre-colonial times *versus* contemporary pre-project conditions) to consider whether effects are significant, and may reveal value judgements about desired resulting ecological conditions.⁶³ An extended future orientation speaks to a broader focus on future generations and intergenerational equity. Australian judges have recognized this link in cases interpreting the principle of intergenerational equity to require decision makers to consider cumulative impacts,⁶⁴ and reduce the cumulative effects of climate change.⁶⁵ Through requiring more explicit decisions (relative to ‘regular EIA’) related to value-rich issues, such as baselines and the interests of future generations, cumulative effects provisions invite deliberation about environmental values and the common good in a way that the transformational approach theorizes may shift the values of the public and institutions – or at least expose differences for contestation.

⁵⁹ *Ibid.*, pp. 82–3.

⁶⁰ For an example of how cumulative impacts assessment affects the determination of environmental significance see C.H. Eccleston, ‘Assessing Cumulative Significance of Greenhouse Gas Emissions: Resolving the Paradox – The Sphinx Solution’ (2010) 12(2) *Environmental Practice*, pp. 105–15, at 106.

⁶¹ *San Francisco Baykeeper, Inc. v. State Lands Commission*, 242 Cal.App.4th 202, 223–4 (2015); *Kings County Farm Bureau v. City of Hanford*, 221 Cal.App.3d 692, 718–21 (1990); see generally *ibid.*

⁶² Jones, n. 9 above, pp. 190–2.

⁶³ R. Nelson, ‘Big Time: An Empirical Analysis of Regulating the Cumulative Environmental Effects of Coal Seam Gas Extraction under Australian Federal Environmental Law’ (2019) 36(5) *Environmental and Planning Law Journal*, pp. 531–51, at 533.

⁶⁴ *Gray v. Minister for Planning* (2006) NSWLEC 720, para. 122 (Gray J).

⁶⁵ *Taralga Landscape Guardians Inc v. Minister for Planning* (2007) 161 LGERA 1, para. 74 (Preston CJ).

In theory, the wider spatial scope that inheres in cumulative effects concepts also expands geographically the public wishing to participate in EIA, potentially in national and transnational contexts. This may engage more diverse values and visions of the common good in line with the transformational theories outlined above. In the national context, this could arise if, relative to ‘regular EIA’, cumulative effects-inclusive EIA recasts the impacts of a project as extending over a wider area and potentially having an impact on more diverse populations. The theoretical implications of this geographic expansion would be most profound in the case of a project that would be conceived as having effects confined to a single jurisdiction under regular EIA, but where applying cumulative effects concepts triggers a geographic expansion in scope that recasts that proposal as having transboundary effects. This spatial revision of the understanding of affected people occurs, for example, where an emissions-intensive project is conceived to contribute to cumulative emissions causing climate change that affects other states. For example, the Federated States of Micronesia challenged rebuilding a coal power plant in the Czech Republic, reasoning that it required a transboundary EIA.⁶⁶ Recasting the effects of the Czech power plant as transboundary would imply that the Micronesian state or public should participate in the EIA process. This would bring in a different culture and values, and perhaps thereby boost the deliberative and transformational potential of the EIA process, whether it is conceived to be underlain by the no-harm principle (conceptualized in combination with the duty of state cooperation)⁶⁷ or the non-discrimination principle (linked to the equal access principle).

In sum, nationally and internationally, cumulative effects concepts have the potential to act as a metaphorical spotlight because they force assessments to identify more explicitly ideas about baselines and environmental significance used in the assessment, revealing underlying values that can remain hidden in regular EIA. Not only can cumulative effects better reveal these values, they magnify the theoretically transformational potential of EIA by potentially spotlighting and including more spatially and temporally diverse communities than ‘regular’ EIA, increasing opportunities to contest the revealed values and visions of the ‘common good’ embedded in decision making.

Cumulative effects concepts also provide wide-angled illumination akin to a light-house, revealing otherwise potentially overlooked sources of harm and aggregate harm. This boosts the power of EIA to trigger deliberation that may influence environmental law beyond EIA – for example, habitat protection, natural resources permitting, or pollution control rules. Cumulative effects provisions inherently facilitate revelations about environmentally harmful actors beyond the proponent (‘other past, present and reasonably foreseeable future activities’). This may trigger transformational political agitation and contestation to regulate these broader actors differently, for example, by introducing new permitting processes. ‘Regular’ EIA may also produce this effect, as in Australia, where EIA for a major coal mine in the habitat of an endangered

⁶⁶ P.A. Lopes, ‘FSM vs. Czech: A New Standing for Climate Change’ (2009) 10 *Sustainable Development Law & Policy*, pp. 24–60.

⁶⁷ Craik, n. 4 above, p. 82.

finch species highlighted how wider environmental laws had failed to constrain vegetation clearing that had led to its decline.⁶⁸ However, cumulative effects provisions would arguably produce this effect more reliably as, by definition, they involve examining the effects of other activities beyond the instant proposal. This influence of cumulative effects concepts also helps to address criticism regarding EIA, which focuses on a single proposed project rather than considering the regulation of harmful projects more generally.⁶⁹

For developing economies where EIA is the sole or major environmental law,⁷⁰ cumulative effects concepts have special value in enabling agitation for expanded environmental controls.⁷¹ Other processes might also build awareness about harmful unregulated activities, but cumulative effects provisions within EIA may enable enforceable requirements⁷² and involve large projects of an attention-grabbing nature to drive public interest and debate.

3. CUMULATIVE EFFECTS PROVISIONS IN NATIONAL EIA LAWS

While the ‘spotlight’ and ‘lighthouse’ potential of cumulative effects provisions could constitute significant ‘untapped potential in existing laws to address environmental change’,⁷³ this potential is affected by the extent of the adoption of these provisions and their precise content. Here we explore the national legal foundations for delivering these benefits, reporting the results of a systematic global assessment of the prevalence of cumulative effects concepts in national EIA laws.

3.1. *Prevalence of Cumulative Effects Provisions in National EIA Laws*

Using a methodology similar to other large, global-scale comparative law surveys,⁷⁴ our search examined national EIA laws that apply to physical projects and that require CEA or otherwise include cumulative effects concepts⁷⁵ (both, for brevity, ‘cumulative effects provisions’). We researched the laws of 195 nations (or equivalent), excluding

⁶⁸ B. Smee, ‘Adani Mine: Environmental Laws Designed to Protect Black-throated Finch Led to Bird’s Decline’, 29 Jan. 2019, *The Guardian*, <https://www.theguardian.com/environment/2019/jan/30/adani-mine-environmental-laws-designed-to-protect-black-throated-finch-led-to-birds-decline>.

⁶⁹ R. Therivel & M.R. Partidário, *The Practice of Strategic Environmental Assessment* (Earthscan, 1996), pp. 8–9; C. Briffett, J.P. Obbard & J. Mackee, ‘Towards SEA for the Developing Nations of Asia’ (2003) 23(2) *Environmental Impact Assessment Review*, pp. 171–96, at 174–6.

⁷⁰ Yang, n. 4 above, p. 534.

⁷¹ E.g., in Chile and Colombia, EIA litigation is utilized to engage in public advocacy related to large-scale development projects: J. Barandiaran & S. Rubiano-Galvis, ‘An Empirical Study of EIA Litigation Involving Energy Facilities in Chile and Colombia’ (2019) 79 *Environmental Impact Assessment Review*, article 106311, pp. 1–10.

⁷² *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208 (1998), pp. 1214–6.

⁷³ Garmestani et al., n. 17 above, p. 19899.

⁷⁴ See, e.g., A.J. Carrillo & A.K. Nelson, ‘Special Report: Comparative Law Study and Analysis of National Legislation relating to Crimes Against Humanity and Extraterritorial Jurisdiction’ (2014) 46 *George Washington International Law Review*, pp. 481–530; Aung, Fischer & Luan, n. 16 above; Yang, n. 4 above; A. Donnelly, B. Dalal-Clayton & R. Hughes, *A Directory of Impact Assessment Guidelines*, 2nd edn (International Institute for Environment and Development, 1998).

⁷⁵ For discussion of these variants see Section 3.2.

the following: provincial and local laws; laws for strategic or regional environmental assessment; sector-specific laws;⁷⁶ and laws not available online.

We consulted the ECOLEX database⁷⁷ by inputting relevant keywords in appropriate languages;⁷⁸ national legislative websites, such as government gazettes;⁷⁹ international legal encyclopaedias⁸⁰ and other international materials;⁸¹ and other secondary legal sources to confirm our understanding. We required access to primary sources to confirm the presence of cumulative effects provisions, as secondary sources⁸² do not always differentiate between EIA and SEA.

Recognizing the importance of methodological reflection,⁸³ Appendix 1 details thoroughly our search process and its limitations. In summary, as with similar studies, the scope of this study precludes in-depth doctrinal analysis beyond a general discussion of key elements,⁸⁴ and we cannot confirm that a nation lacks a cumulative effects provision if we locate none (though our methodology raises this presumption).⁸⁵ Ultimately, we are likely to have underestimated the adoption of cumulative effects provisions because of the exclusions already mentioned. Appendix 2 summarizes the relevant provisions of national laws.

We found that most national EIA laws include a cumulative effects provision ('adopting jurisdictions', being 113 of the 186 countries that we confirmed to have a national EIA law, or 61%). Adopting jurisdictions are found on all inhabited continents, and across all major legal traditions (Figure 1): common law (as in the US, United Kingdom (UK)), civil law (as in France, Italy), Islamic law (as in Saudi Arabia, Mauritania), and mixed systems (as in Malta, Zimbabwe). Asia and Australasia have noticeably less legal coverage of the concept at the national level.

The high number and widespread nature of adopting jurisdictions are significant factors for the doctrinal, theoretical, and practical reasons outlined above. The prevalence of cumulative effects provisions could be argued to construct internationally accepted practice in EIA, influencing EIA practitioners and the interpretation of national EIA laws that requires a project proponent to apply international best

⁷⁶ E.g., Rules and Regulations to Implement Executive Order No. 79, 2012 (Philippines), s 3(d) (applies to mining). Cf. Yang, n. 4 above, p. 547 (inclusion of sectoral laws).

⁷⁷ 'ECOLEX: The Gateway to Environmental Law', available at: <https://www.ecolex.org>.

⁷⁸ The authors have a working knowledge of English, French, Spanish, Italian, Portuguese and German (used for the EIA laws of 145 countries) and used machine translation for relevant terms in other languages (for further details and justification, see Appendix 1). All translations are in accordance with the methodology outlined in Appendix 1, except where otherwise indicated.

⁷⁹ Located through the Law Library of Congress, 'Nations', available at: <https://www.loc.gov/law/help/guide/nations.php>.

⁸⁰ K. Deketelaere (ed.), *International Encyclopaedia of Laws: Environmental Law* (Kluwer, 1996).

⁸¹ Westlaw, 'International Materials', available at: [https://1.next.westlaw.com/Browse/Home/InternationalMaterials?transitionType=Default&contextData=\(sc.Default\)](https://1.next.westlaw.com/Browse/Home/InternationalMaterials?transitionType=Default&contextData=(sc.Default)); Environmental Law Alliance Worldwide, 'Environmental Law Matrix', available at: https://www.elaw.org/elm_old.

⁸² Yang, n. 4 above, p. 543 (survey sometimes relied exclusively on secondary sources).

⁸³ E. Fisher et al., 'Maturity and Methodology: Starting a Debate about Environmental Law Scholarship' (2009) 21(2) *Journal of Environmental Law*, pp. 213–50, at 226–8, 231–43.

⁸⁴ Yang, n. 4 above, p. 546. See below Sections 3.2 (in relation to national EIA laws) and 4.2 (in relation to MEAs).

⁸⁵ Carrillo & Nelson, n. 74 above, p. 490 and n. 19.



Figure 1 Nations with National-level Cumulative Effects Provisions in their EIA Laws ('Adopting Jurisdictions')

practice.⁸⁶ If well implemented, these widespread provisions should produce better information for EIA in a technical-rational sense.⁸⁷ Applying a transformational theoretical model of EIA, cumulative effects provisions in these countries have the theoretical potential to produce agitation for improved environmental protection both within and outside EIA.⁸⁸ Though poor implementation of these provisions probably prevents them from reaching this potential,⁸⁹ identifying adopting jurisdictions is a step towards realizing the potential. Knowing where cumulative effects provisions are adopted facilitates improving implementation through lesson learning between national legal regimes (including through civil society litigants learning about challenges to the adequacy of cumulative effects provisions, which is common in its original US context⁹⁰), especially between regional neighbours (see [Figure 1](#)) with similar environmental and social contexts and legal traditions.

3.2. Definitions and Functions of Cumulative Effect Concepts in National EIA Laws

Legal and scientific scholars have long highlighted problems in defining cumulative effects. Many condemn laws that fail to define cumulative effects for allowing excessive agency discretion and diverging judicial interpretation, which can confuse practitioners.⁹¹ They note that existing definitions vary, as can their interpretation,⁹² even within a single jurisdiction.⁹³ Some note that diversity borne of detail potentially carries advantages: it encourages ‘sharpening’ of concepts,⁹⁴ reduces ambiguity,⁹⁵ reduces the potential for inadvertently inconsistent interpretations between jurisdictions, and

⁸⁶ E.g., Environment Act 2007 (Afghanistan), Art. 21.

⁸⁷ See n. 22–37 above and accompanying text.

⁸⁸ See n. 62 to 69 above and accompanying text.

⁸⁹ For a discussion of implementation challenges see A. Olagunju et al., ‘Cumulative Effects Assessment Requirements in Selected Developed and Developing Countries’, in J.A. Blakley & D.M. Franks (eds), *Handbook of Cumulative Impact Assessment* (Edward Elgar, 2021), pp. 21–38.

⁹⁰ Nelson, n. 8 above, p. 1196.

⁹¹ G. Kamaras, ‘Cumulative Impact Assessment: A Comparison of Federal and State Environmental Review Provisions’ (1993) 57 *Albany Law Review*, pp. 113–44, at 118–9; V. Chartier-Hogancamp, ‘Analysis of Indirect and Cumulative Impacts: Do the Sierra Club v. FERC Opinions Signal a Limitation of NEPA’s Reach’ (2016) 32(2) *Journal of Land Use & Environmental Law*, pp. 599–622, at 614–8; A. Green, ‘Discretion, Judicial Review, and the Canadian Environmental Assessment Act’ (2001) 27 *Queen’s Law Journal*, pp. 785–808, at 795–9; L.M. Cooper & W.R. Sheate, ‘Integrating Cumulative Effects Assessment into UK Strategic Planning: Implications of the European Union SEA Directive’ (2004) 22(1) *Impact Assessment and Project Appraisal*, pp. 5–16, at 7.

⁹² Jones, n. 9 above, p. 189; Kamaras, n. 91 above, pp. 118–9; E.E. Prahler et al., ‘It All Adds Up: Enhancing Ocean Health by Improving Cumulative Impacts Analyses in Environmental Review Documents’ (2013) 33(3) *Stanford Environmental Law Journal*, pp. 351–420, at 364–6.

⁹³ P.N. Duinker et al., ‘Scientific Dimensions of Cumulative Effects Assessment: Toward Improvements in Guidance for Practice’ (2013) 21(1) *Environmental Reviews*, pp. 40–52, at 42; Foley et al., n. 16 above, pp. 124–5; generally J. Gunn & B.F. Noble, ‘Conceptual and Methodological Challenges to Integrating SEA and Cumulative Effects Assessment’ (2011) 31(2) *Environmental Impact Assessment Review*, pp. 154–60, at 156.

⁹⁴ Jones, n. 9 above, pp. 200–1.

⁹⁵ Z. Ma, D.R. Becker & M.A. Kilgore, ‘Barriers to and Opportunities for Effective Cumulative Impact Assessment within State-Level Environmental Review Frameworks in the United States’ (2012) 55(7) *Journal of Environmental Planning and Management*, pp. 961–78, at 964.

reveals important underlying values.⁹⁶ Conversely, overly simple definitions encourage imprecision and inconsistent implementation over time.⁹⁷ Others argue that consistency in at least some definitional elements is desirable.⁹⁸

One might expect similarity among cumulative effects provisions as a result of the standardizing effect of initiatives to promote good EIA principles by non-governmental organizations (NGOs) and others,⁹⁹ particularly pressure from Western donor agencies on ‘developing’¹⁰⁰ countries and countries in transition.¹⁰¹ EIA principles and training materials endorsed by the United Nations (UN) promote consideration of cumulative effects,¹⁰² as do the Equator Principles advanced by financial institutions.¹⁰³ However, these materials take a no-frills approach, merely listing cumulative impacts among the kinds of impact that an impact assessment should consider without defining the term.¹⁰⁴ Several African nations¹⁰⁵ use similar legislative language to that used in the UN principles,¹⁰⁶ though insufficient information on relevant legislative dates means we cannot confirm an international lineage.

Other adopting jurisdictions provide more detail but reveal significant definitional differences in the process of doing so. Analyzing a sample of the laws collated for this study suggests that definitions may diverge on core conceptual features of cumulative effects. Cumulative effects concepts theoretically expand the temporal scope of EIA, but while some definitions refer explicitly to effects accumulating with other

⁹⁶ Duinker et al., n. 93 above, p. 42.

⁹⁷ Gunn & Noble, n. 93 above, p. 156.

⁹⁸ Foley et al., n. 16 above, p. 128.

⁹⁹ Yang, n. 4 above, p. 540.

¹⁰⁰ M. Marara et al., ‘The Importance of Context in Delivering Effective EIA: Case Studies from East Africa’ (2011) 31(3) *Environmental Impact Assessment Review*, pp. 286–96, at 286–7. The World Bank, e.g., historically has exerted pressure through its ‘policy conditionality’ requirements and its operational policies: J. Cahn, ‘Challenging the New Imperial Authority: The World Bank and the Democratization of Development’ (1993) 6(1) *Harvard Human Rights Journal*, pp. 159–94, at 170–3; G. Sarfaty, ‘The World Bank and the Internalization of Indigenous Rights Norms’ (2004) 114 *Yale Law Journal*, pp. 1791–818, at 1796–801.

¹⁰¹ A. Cherp & A. Antypas, ‘Dealing with Continuous Reform: Towards Adaptive EA Policy Systems in Countries in Transition’ (2003) 5(4) *Journal of Environmental Assessment Policy and Management*, pp. 455–76, at 456.

¹⁰² UNEP, n. 6 above, pp. 248, 288, 557; UNEP, Resolution GC 14/25, ‘Goals and Principles of Environmental Impact Assessment’, 17 June 1987, UN Doc. UNEP/GC/DEC/14/25, Principle 4(d).

¹⁰³ Equator Principles, ‘Equator Principles III’, June 2013, Principle 2, Exhibit II(k), available at: https://equator-principles.com/wp-content/uploads/2017/03/equator_principles_III.pdf.

¹⁰⁴ UNEP, Resolution GC 14/25, n. 102 above, Principle 4(d).

¹⁰⁵ National Environment Management Act 1994 (Gambia), Art. 23(3)(e); Environmental (Impact Assessment and Audit) Regulations 2003 (Kenya), Art. 18(1)(h); Environmental Impact Assessment Regulations 1998 (Uganda), Art. 14(1)(h); Environmental Protection and Pollution Control (Environmental Impact Assessment) Regulations 1997 (Zambia), s. 11; Environmental Management Act 2002 (Zimbabwe), s. 99(c); Decreto-Legislativo n° 14/97 [Legislative Decree No. 14/97] (Cabo Verde) Annex I, Art. 4(1).

¹⁰⁶ The UNEP *EIA Training Resource Manual* (n. 6 above, p. 557) defines cumulative impacts more fully, in a very similar way to the original US regulatory definition: 40 C.F.R. § 1508.7. However, the influence of this Manual is less evident, the same definition having been adopted clearly in fewer jurisdictions, which have independent associations with the US, e.g. Federated States of Micronesia (FSM) and the Marshall Islands: Environmental Impact Assessment Regulations 1994 (Marshall Islands), Art. 4(e); Environmental Impact Assessment Regulations 1989 (FSM), Art. 1.3(a).

‘reasonably foreseeable’ actions,¹⁰⁷ others are silent on this future temporal component.¹⁰⁸ Identifying foreseeable future activities is labour-intensive,¹⁰⁹ and selecting an appropriate temporal scope requires careful consideration;¹¹⁰ this legislative silence, therefore, is undesirable.

Definitions also vary in the ‘accumulation’ of effects that they foresee. Scientists consider that ‘cumulative effects’ include simple linear aggregation and ‘synergistic effects’ (namely, ‘[t]otal effects that are qualitatively or quantitatively different from the sum of the effects of the individual disturbances’).¹¹¹ The legal picture is muddier, as has previously been noted in a small number of jurisdictions.¹¹² Some legislative provisions reflect the scientific view,¹¹³ but others use the terms ‘cumulative’ and ‘synergistic’ as distinct and separately defined concepts,¹¹⁴ and some use the term ‘synergistic’ exclusively.¹¹⁵ This may affect the basic scope of the concept: narrow, if it encompasses only simple additive effects or complex and interactive effects; or wider, if it includes both.

Taking a narrow view of the nature of accumulation, or a truncated or unclear temporal horizon, eschews the key scope-expanding benefits of cumulative effects provisions for EIA law,¹¹⁶ including its ‘spotlight’ function. Definitional inconsistencies also increase the complexity and cost for proponents acting in multiple national contexts,¹¹⁷ and invite disagreements about transboundary EIA processes. Just as importantly, inconsistencies may cause adopting jurisdictions or proponents to produce environmental data that is difficult to collate and compare, creating an obstacle to cooperative transboundary EIA as well as strategic assessments.¹¹⁸ This is significant, as insufficient environmental data is a major barrier to implementing cumulative effects

¹⁰⁷ Lei Sobre Avaliação Ambiental [Environmental Assessment Law] 2010 (Guinea-Bissau), Art. 5(15); Regulations (Marshall Islands), n. 106 above, Art. 4(e); Regulations (FSM), n. 106 above, Art. 1.3(a).

¹⁰⁸ See, e.g., Miljöbalk [Environmental Code] 1998 (Sweden), Ch. 6, s. 2.

¹⁰⁹ Duinker et al., n. 93 above, pp. 46–7; Jones, n. 9 above, p. 194.

¹¹⁰ J.N. Rumrill & L.W. Canter, ‘Addressing Future Actions in Cumulative Effects Assessment’ (1997) 12(4) *Project Appraisal*, pp. 207–18, at 207–14; L. Canter & B. Ross, ‘State of Practice of Cumulative Effects Assessment and Management: The Good, the Bad and the Ugly’ (2010) 28(4) *Impact Assessment and Project Appraisal*, pp. 261–8, at 265.

¹¹¹ Contant & Wiggins, n. 11 above, pp. 301–2.

¹¹² Broderick, Durning & Sánchez, n. 7 above, pp. 652–5.

¹¹³ Инструкция о порядке проведения оценки воздействия намечаемой деятельности на окружающую среду (ОВОС) в Кыргызской Республике [Instruction on Environmental Impact Assessments] 1997 (Kyrgyzstan), App. 7.

¹¹⁴ Decreto N° 123 – Reglamento del Proceso de Evaluación de Impacto Ambiental [Decree No. 123 – Regulations on the Process of Environmental Impact Assessment] 2009 (Panama), Art. 2. The UK also adopts the phrase ‘cumulative and synergistic effects’: Environmental Assessment of Plans and Programmes Regulations, S.I. 1633/2004, Sch. 2, para. 6.

¹¹⁵ Ley N° 19.300 – Ley sobre Bases Generales del Medio Ambiente [Law No. 19,300 – General Environmental Law] 1994 (Chile), Art. 2(h *bis*); Decreto 40 – Reglamento del Sistema de Evaluación de Impacto Ambiental [Decree 40 – Regulation of the Environmental Impact Assessment System] 2012 (Chile), Art. 18(f).

¹¹⁶ See Section 2.2.

¹¹⁷ Parliament of Australia, Standing Committee on Legal and Constitutional Affairs, *Harmonisation of Legal Systems: Within Australia and between Australia and New Zealand* (Commonwealth of Australia, 2006), pp. 5–9, 54, 132–5; *Enabling Trade: Valuing Growth Opportunities* (World Economic Forum, 2013) pp. 4, 20–21.

¹¹⁸ Gunn & Noble, n. 93 above, p. 156.

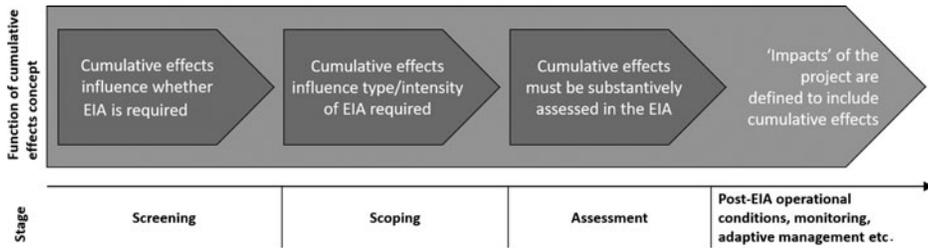


Figure 2 Functions of Cumulative Effects Concepts in National EIA Laws by Stage of the EIA Process

provisions.¹¹⁹ International frameworks could help to encourage consistent definitions and reduce such difficulties.¹²⁰

Definitions aside, the concept of cumulative effects performs different functions in the EIA processes envisioned by various legislative schemes (Figure 2, adopting generally accepted stages in EIA¹²¹). This fact appears to have gone unremarked in the literature thus far, but may affect the practical influence of the concept. Firstly, cumulative effects may be a screening criterion, which must be considered in determining if a project requires any form of environmental assessment at all. EIA may be required, for example, if a project falls within a named category (such as a power plant) or is likely to create cumulative effects.¹²² 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, 'whether the action is related to other actions with individually insignificant but cumulatively significant impacts'.¹²³

As a screening criterion, cumulative effects provisions could have high impact: they could 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. Indeed, on one view of cumulative effects, causing minor harm to an already degraded environment should automatically be considered significant.¹²⁴ This supports the transformational significance of cumulative effects provisions for EIA if projects are considered significant and caught by a screening test only because the screening includes cumulative effects, as this triggers greater public participation and contestation about activities that usually escape such scrutiny.

¹¹⁹ Ma, Becker & Kilgore, n. 95 above, p. 970.

¹²⁰ See Section 4.

¹²¹ N. Craik, 'The Assessment of Environmental Impact', in E. Lees & J.E. Viñuales (eds), *The Oxford Handbook of Comparative Environmental Law* (Oxford University Press, 2019), pp. 876–99, at 885–95; Yang, n. 4 above, pp. 529–30, 546–9.

¹²² Decree on Environmental Impact Assessment No. 112/PM 2010 (Lao People's Democratic Republic), Art. 6(2).

¹²³ Environmental Impact Assessment Regulations 2007 (Maldives), Art. 2(1) ('significantly'). For a similar example, see Regulations (Marshall Islands), n. 106 above, Art. 4(vi) ('significant effect').

¹²⁴ See generally C.H. Eccleston, 'Applying the Significant Departure Principle in Resolving the Cumulative Impact Paradox: Assessing Significance in Areas that Have Sustained Cumulatively Significant Impacts' (2006) 8(4) *Environmental Practice*, pp. 241–50. See also n. 61 in relation to judicial approaches to this matter.

For projects that require EIA, cumulative effects influence a second function – scoping – by affecting the type of environmental assessment required. For example, a project that ‘generates cumulative and/or indirect and/or synergistic effects’, may trigger a requirement to carry out an environmental impact study involving deeper analysis.¹²⁵ If considering cumulative effects results in an ‘upgrade’ to a more publicly contestable and more scientifically rigorous form of assessment, it improves both the technical-rational credentials and the transformational capacity of EIA law.

The third, and most obvious function of the concept of cumulative effects is that of CEA, which influences the substantive content of the environmental assessment. This is expressed in diverse ways in different statutes: the EIA must (or may) require a description of the ‘cumulative impacts’ of the proposed project;¹²⁶ the ‘cumulative and synergistic properties’ of the project;¹²⁷ the ‘cumulative and synergistic impacts and the induced risks’ of the project;¹²⁸ or ‘any accumulation of environmental impacts as a result of current or future activities’.¹²⁹ This variation may have the same practical implications as the definitional inconsistencies described earlier.¹³⁰ Theoretically, this is the stage at which the deepest inquiry into cumulative effects would be expected, setting the stage for the ‘spotlight’ and ‘lighthouse’ functions.

Finally, cumulative effects may be included in an EIA law’s definition of environmental harm,¹³¹ impact¹³² or effect.¹³³ 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 the ongoing impacts of a project, this could require analysis to understand these impacts in the light of the cumulative effects of other projects on the ground. Practical matters are likely to influence the real-world potential of this function. From the technical-rational perspective, post-approval monitoring data needs to be aggregated with other relevant data to understand relative contributions to environmental decline, but administrative structures like data warehouses are not always in place to facilitate this aggregation.¹³⁴ From the transformational perspective, post-

¹²⁵ Decreto N° 123 (Panama), n. 114 above, Arts 18, 24.

¹²⁶ Environment Impact Assessment Regulations 2014 (South Africa), App. 1 Cl. 3(1); 환경영향평가법 [Environmental Impact Assessment Act] 2011 (Republic of Korea), Art. 4(5).

¹²⁷ Decreto No. 51/04 Sobre A Avaliação de Impacto Ambiental [Decree No. 51/04 on Environmental Impact Assessment] (Angola), Art. 7(2.3); Instruction on Environmental Impact Assessments (Kyrgyzstan), n. 113 above, Art. 8(e).

¹²⁸ Decreto Supremo N° 019-2009-MINAM [Decree No. 019-2009-MINAM] 2009 (Peru), Annex IV, Cl. 5(b).

¹²⁹ قرار مجلس الوزراء رقم (٣٧) لسنة ٢٠٠١ في شأن الأنظمة لللائحة التنفيذية للقانون الاتحادي رقم (٢٤) لسنة ١٩٩٩ في شأن حماية البيئة وتنميتها [Executive Regulations on Environmental Protection and Development] (United Arab Emirates), App. 2, s. M.

¹³⁰ See nn. 98, 117–20 above and accompanying text.

¹³¹ Environment Act 2000 (Papua New Guinea), s. 2(d) (‘environmental harm’).

¹³² Environment Act 1998 (Solomon Islands), s. 2(a)(ii) (‘impact’).

¹³³ Miljöbalk (Sweden), n. 108 above, Ch. 6, s. 2.

¹³⁴ R. Nelson, ‘Water Data and the Legitimacy Deficit: A Regulatory Review and Nationwide Survey of Challenges Considering Cumulative Environmental Effects of Coal and Coal Seam Gas Developments’ (2019) 23(1) *Australasian Journal of Water Resources*, pp. 24–34, at 29–30, 32.

approval monitoring data must be accessible to allow for public oversight of cumulative impacts but, equally, this is not always the case.¹³⁵

The varying potential legal functions of cumulative effects concepts are at least as significant as varying definitions of cumulative effects, for similar reasons: the depth of analysis might vary significantly, lessons learned in one jurisdiction may not translate to another to help to improve implementation, and differences may obstruct productive intersections among national and international laws (Section 4.3). Differences in national approaches may also produce different expectations about EIA content among contracting parties to MEAs, which may require resolution.

4. CUMULATIVE EFFECTS PROVISIONS IN MULTILATERAL ENVIRONMENTAL AGREEMENTS

The adoption of cumulative effects provisions in MEAs further builds the legal foundations for realizing the theoretical potential of cumulative effects concepts. MEAs that adopt cumulative effects provisions could also help to improve national implementation by collecting and diffusing states parties' experiences of implementing cumulative effects provisions.

4.1. *Prevalence of Cumulative Effects Provisions in MEAs*

EIA law began its migration from domestic contexts to the international realm during the 1970s¹³⁶ in early international statements on EIA.¹³⁷ The most broadly ratified EIA treaty – the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention)¹³⁸ – which contributes to customary international law as regards EIA,¹³⁹ is silent on whether its EIA obligations extend to cumulative effects:¹⁴⁰ the Convention appears to assume that national laws will supply EIA procedures.¹⁴¹ International jurisprudence is silent on the matter of cumulative effects, and international EIA scholarship tends to discuss it only in passing,¹⁴² noting the

¹³⁵ Ibid., p. 28.

¹³⁶ Craik, n. 4 above, pp. 90–1.

¹³⁷ An early iteration of international EIA policy was Principle 17 of the Rio Declaration on Environment and Development (Rio Declaration), Rio de Janeiro (Brazil), 3–14 June 1992, UN Doc. A/CONF.151/26/Rev.1 (Vol. 1), available at: https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_CONF.151_26_Vol.I_Declaration.pdf.

¹³⁸ Espoo (Finland), 25 Feb. 1991, in force 10 Sept. 1997, available at: https://treaties.un.org/pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVII-4&chapter=27&clang=_en; it has been opened for signature beyond Europe – see Decision II/14, 7 Aug. 2001, in force 26 Aug. 2014, available at: https://unece.org/DAM/env/eia/documents/legaltexts/1st_amendment_en.pdf.

¹³⁹ A. Boyle, 'Developments in the International Law of Environmental Impact Assessments and Their Relation to the Espoo Convention' (2011) 20(3) *Review of European, Comparative & International Environmental Law*, pp. 227–31. A fuller discussion of cumulative effects concepts in the context of customary international law lies outside the scope of this article.

¹⁴⁰ See n. 157 below and accompanying text.

¹⁴¹ Espoo Convention, n. 138 above, Preamble, Art. 1(v), (vi).

¹⁴² See, e.g., Sands & Peel, n. 48 above, p. 672; Yang, n. 4 above, pp. 529, 548; Craik, n. 4 above, p. 141.

occasional presence of cumulative effects provisions in some international EIA instruments¹⁴³ and suggesting that their implementation may be weak.¹⁴⁴

The prevalence and operation of cumulative effects provisions in MEAs appear to be understudied, and this is an important gap. While some consider that international EIA obligations are not intended to be prescriptive,¹⁴⁵ we suggest that cumulative effects concepts are not mere procedural detail. Rather, they are a central factor that influences whether EIA can reach its theoretical potential (see Section 2): at minimum, cumulative effects concepts ought to inform debates about the content of international EIA obligations.

Analogous to our investigation of domestic laws, our study sought to understand which nations have consented to consider cumulative effects under the terms of an MEA, and the prevalence of those MEAs. We also reflect on the extent to which parties to these MEAs have adopted national cumulative effects provisions and implications for implementing the relevant MEAs and creating productive national-international links.

We searched for references to cumulative effects concepts in the text of MEAs housed on the International Environmental Agreements Database Project (University of Oregon (US)),¹⁴⁶ which is often used for large-scale environmental law research.¹⁴⁷ Similar limitations apply to those discussed above for the analysis at national level.¹⁴⁸ Appendix 1 further details our search methods. Appendix 2 provides agreement- and nation-specific information about entry into force, signature and ratification.

¹⁴³ E.g., N. Craik, 'Transboundary Environmental Impact Assessment in North America: Obstacles and Opportunities', in Bastmeijer & Koivurova, n. 48 above, pp. 93–117, at 105 (regarding an agreement between the US and Canada on the conservation of the Porcupine Caribou herd); K. Bastmeijer & R. Roura, 'Environmental Impact Assessment in Antarctica', in Bastmeijer & Koivurova, n. 48 above, pp. 174–219, 181.

¹⁴⁴ Bastmeijer & Roura, *ibid.*, pp. 198, 208–9, 213; see generally T. Koivurova et al., 'Synthesis', in T. Koivurova & P. Lesser (eds), *Environmental Impact Assessment in the Arctic: A Guide to Best Practice* (Edward Elgar, 2016), pp. 202–22.

¹⁴⁵ Craik, n. 4 above, pp. 90, 93, 124, 131.

¹⁴⁶ R.B. Mitchell, 'International Environmental Agreements (IEA) Database Project', University of Oregon (US), available at: <https://iea.uoregon.edu>. Our focus on cumulative impacts excluded MEAs that are otherwise relevant to EIA, but that do not incorporate concepts of cumulative impacts in the project context, such as the Espoo Convention (n. 138 above) and the Convention on Biological Diversity (Rio de Janeiro (Brazil), 5 June 1992, in force 29 Dec. 1993, available at: <https://www.cbd.int/doc/legal/cbd-en.pdf>). Similarly, our focus on EIAs rather than SEAs excluded MEAs that require CEA in that latter context, such as the Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context, Kiev (Ukraine), 21 May 2003, in force 11 July 2010, available at: <https://unece.org/fileadmin/DAM/env/eia/documents/legaltexts/protocol-english.pdf>.

¹⁴⁷ See, e.g., J. Balsiger & M. Prys, 'Regional Agreements in International Environmental Politics' (2016) 16(2) *International Environmental Agreements: Politics, Law and Economics*, pp. 239–60; R.B. Mitchell, 'International Environmental Agreements: A Survey of Their Features, Formation, and Effects' (2003) 28(1) *Annual Review of Environment & Resources*, pp. 429–61; J. Hollway & J. Koskinen, 'Multilevel Bilateralism and Multilateralism: States' Bilateral and Multilateral Fisheries Treaties and Their Secretariats', in E. Lazega & T.A.B. Snijders (eds), *Multilevel Network Analysis for the Social Sciences: Theory, Methods and Applications* (Springer, 2016), pp. 315–32.

¹⁴⁸ See Section 3.1.

We found that 102 of the 195 nations investigated are bound by one or more of the 10 MEAs (or corresponding protocols) that are in force and contain a cumulative effects provision.¹⁴⁹ This expands the suite of nations bound to consider cumulative effects: 30 nations lack a cumulative effects provision in their national EIA law, but are bound by at least one MEA that includes such a provision.¹⁵⁰

MEAs adopt cumulative effects concepts in two forms. The first type applies to projects generally, mirroring the national EIA laws discussed in Section 3. Most notable is the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean (Escazú Agreement),¹⁵¹ which entered into force in April 2021. Like the 1998 Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention),¹⁵² the Escazú Agreement applies Principle 10 of the 1992 Rio Declaration on Environment and Development, which covers public access to environmental information and public participation in decision-making processes.¹⁵³ In its relevant part, Article 7(17)(b) of the Escazú Agreement requires parties to make public ‘a description of the main environmental impacts of the project or activity and, as appropriate, the cumulative environmental impact’. A clear way to implement this article in national EIA law would be to adopt a CEA provision—our national legal study (Section 3) suggests that 12 of 33 eligible state parties presently lack any national cumulative effects provision,¹⁵⁴ demonstrating the potential influence of this Agreement.

The CEA provision in the Escazú Agreement may also influence other international EIA initiatives. These include Aarhus Convention guidance and the non-binding Bali Guidelines,¹⁵⁵ both of which cursorily address cumulative effects.¹⁵⁶ The Espoo

¹⁴⁹ We include in this figure the Member States of the EU in relation to MEAs signed by the EU.

¹⁵⁰ A further 5 nations appear to lack a national EIA law, but are state parties to an MEA containing a CEA provision. Such nations may undertake EIA pursuant to subnational legislation or policy; see Appendix 2 for details of these countries.

¹⁵¹ Escazú (Costa Rica), 4 Mar. 2018, in force 22 Apr. 2021, available at: <https://www.cepal.org/en/subsidiary-bodies/regional-agreement-access-information-public-participation-and-justice/text-regional-agreement>.

¹⁵² Aarhus (Denmark), 25 June 1998, in force 30 Oct. 2001, available at: <https://unece.org/DAM/env/pp/documents/cep43e.pdf>.

¹⁵³ Rio Declaration, n. 137 above, Principle 10; J. Ebbesson, ‘Principle 10’, in J.E. Viñuales (ed.), *The Rio Declaration on Environment and Development: A Commentary* (Oxford University Press, 2015), pp. 287–308, at 291–2.

¹⁵⁴ Signature is open to 33 ‘Annex 1’ countries. The following of these lack national legislative CEA provisions (* indicates signed; ** indicates signed and ratified): Antigua and Barbuda**, Argentina**, Cuba, Dominica*, El Salvador, Grenada*, Haiti*, Honduras, Jamaica*, Saint Kitts and Nevis**, Saint Vincent and the Grenadines**, Venezuela.

¹⁵⁵ UNEP, ‘Guidelines for the Development of National Legislation on Access to Information, Public Participation and Access to Justice in Environmental Matters’, Feb. 2010, available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/22925/Bali%20Guidelines%20for%20the%20Development%20of%20National%20Legislation%20on%20Access%20to%20information%2c%20Public%20Participation%20and%20Access%20to%20Justice%20in%20Environmental%20Matters.pdf?sequence=1&isAllowed=y>.

¹⁵⁶ UN Economic and Social Council, Aarhus Convention Compliance Committee, ‘Findings and Recommendations with regard to Communication ACCC/C/2008/31 concerning Compliance by Germany’, 20 Dec, 2013, UN Doc. ECE/MP.PP/C.1/2014/8, paras 40, 61, available at: https://unece.org/fileadmin/DAM/env/pp/compliance/CC-45/ECE_MP.PP_C.1_2014_8_eng.pdf.

Convention includes cumulative effect concepts only in the context of SEA rather than regarding EIA.¹⁵⁷

The second type of MEA containing cumulative effects provisions in the context of EIA applies to specific regional environments or contexts, such as marine and coastal environments; these include addressing marine pollution generally,¹⁵⁸ coastal zone management in the Mediterranean,¹⁵⁹ the biodiversity of the Black Sea,¹⁶⁰ the Caribbean,¹⁶¹ the Carpathian Mountains,¹⁶² the environment of Antarctica,¹⁶³ and the Baltic Sea.¹⁶⁴ The geographic limitation of these MEAs is arguably a strength, not a weakness: focusing on a specific mountain range or sea aligns with scientific aspirations that CEA occur at an ecologically relevant regional scale,¹⁶⁵ capturing the extent of a distinct environment that experiences adverse effects. Regional MEAs also offer benefits for intersecting national and international regimes through tiering,¹⁶⁶ and

¹⁵⁷ 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*, pp. 88–119, at 98–9; 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*, pp. 337–57, at 350–1.

¹⁵⁸ Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter of 29 December 1972 (Waste Dumping Protocol), London (UK), 7 Nov. 1996, in force 24 Mar. 2006, Annex 5, available at: <https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/PROTOCOLAmended2006.pdf>.

¹⁵⁹ Protocol on Integrated Coastal Zone Management in the Mediterranean (Mediterranean ICZM Protocol), Madrid (Spain), 21 Jan. 2008, in force 24 Mar. 2011, Art. 19, available at: <https://paprac.org/iczm-protocol>; Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (Mediterranean Biodiversity Protocol), Barcelona (Spain), 10 June 1995, in force 12 Dec. 1999, Art. 17, available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/3005/95ig6_7_spa_protocol_eng.pdf?sequence=1&isAllowed=y.

¹⁶⁰ 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), 14 June 2002, in force 20 June 2011, Art. 6, available at: http://www.blacksea-commission.org/_convention-protocols-biodiversity.asp.

¹⁶¹ Protocol concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Area (SPAW Protocol), Kingston (Jamaica), 18 Jan. 1990, in force 17 June 2000, Art. 13(1), available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/27271/SPAW%20Protocol-en.pdf?sequence=1&isAllowed=y>.

¹⁶² Protocol on Sustainable Tourism to the Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Tourism Protocol), Bratislava (Slovakia), 27 May 2011, in force 29 Apr. 2013, Arts 21–23, available at: http://www.carpathianconvention.org/tl_files/carpathiancon/Downloads/01%20The%20Convention/Protocols%20in%20pdf/Protocol%20on%20Sustainable%20Tourism_adopted.pdf; Protocol on Conservation and Sustainable Use of Biological and Landscape Diversity to the Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Biodiversity Protocol), Kiev (Ukraine), 22 May 2003, in force 28 Apr. 2010, Art. 1, available at: http://www.carpathianconvention.org/tl_files/carpathiancon/Downloads/01%20The%20Convention/1.1.2.1%20BiodiversityProtocolFinalsigned.pdf.

¹⁶³ Protocol on Environmental Protection to the Antarctic Treaty (Antarctic Environmental Protocol), Madrid (Spain), 4 Oct. 1991, in force 14 Jan. 1998, Art. 3(2)(c)(ii); Annex 1, Arts 2(1)(b), 3(2)(f), available at: <https://www.ats.aq/e/protocol.html>.

¹⁶⁴ Convention on the Protection of the Marine Environment of the Baltic Sea Area (Baltic Sea Convention), Helsinki (Finland), 9 Apr. 1992, in force 17 Jan. 2000, Art. 7(3), available at: <https://helcom.fi/about-us/convention>.

¹⁶⁵ Jones, n. 9 above, pp. 194–5 (especially n. 35), 197.

¹⁶⁶ 'Tiering', in EIA parlance, refers to formal processes for adopting consistent norms and providing for information flows between different levels of regional- and project-level governance; see generally Gunn & Noble, n. 93 above, p. 154.

allow for the implementation of tailored thresholds of acceptable harm.¹⁶⁷ To fulfil this promise, regional MEAs should offer policy guidance on considering cumulative effects,¹⁶⁸ which addresses capacity building in the 30 nations that are bound by an international cumulative effects commitment but lack an equivalent national provision, in addition to settling any existing divergent national cumulative effects definitions and functions (Section 3.2).

4.2. *Definitions and Functions of Cumulative Effects Concepts in Multilateral Environmental Agreements*

Cumulative effects provisions are far less detailed and varied in MEAs than in national EIA laws. No relevant MEA defines ‘cumulative effects’, or ‘cumulative’ generally.¹⁶⁹ In terms of function, the vast majority of MEAs use cumulative effects concepts in the context of CEA as a required or suggested¹⁷⁰ component of the substantive environmental assessment,¹⁷¹ but apparently overlook the other functions identified in Section 3.2. An exception is the Protocol on Environmental Protection to the Antarctic Treaty.¹⁷² As well as requiring cumulative effects in a substantive environmental assessment,¹⁷³ it uses cumulative effects concepts to categorize areas for protection and proposed activities for control,¹⁷⁴ and inform a duty to consult and cooperate with other parties about activities.¹⁷⁵ By generally omitting cumulative effects concepts from screening, scoping and post-assessment processes, MEAs may have reduced opportunities to gain the theoretical benefits outlined in Sections 2.2 and 3.2. They may even contribute to confusing variation in these concepts vis-à-vis their national use.

More positively, contracting parties to an MEA that includes cumulative effects provisions could improve implementation of CEA by encouraging cooperative exchange of

¹⁶⁷ Craik, n. 4 above, pp. 58–9.

¹⁶⁸ Secretariat of the Antarctic Treaty, ‘Guidelines for Environmental Impact Assessment in Antarctica’, Antarctic Treaty Consultative Meeting XXXIX, Resolution 1, 12 June 2016, para. 3.3.3.

¹⁶⁹ A list of all MEAs considered can be found in [Appendix 2](#).

¹⁷⁰ Baltic Sea Convention, n. 164 above, Art. 7(3).

¹⁷¹ Waste Dumping Protocol, n. 158 above, Annex 5, s. 18; Carpathian Tourism Protocol, n. 162 above, Arts 21(1), 22(1), 23(1); Carpathian Biodiversity Protocol, n. 162 above, Art. 22(1); Mediterranean ICZM Protocol, n. 159 above, Art. 19(3); Mediterranean Biodiversity Protocol, n. 159 above, Art. 17; Black Sea Protocol, n. 160 above, Art. 6; SPAW Protocol, n. 161 above, Art. 13(1); Escazú Agreement, n. 151 above, Art. 7 paras (2), (17)(b); Protocol for the Protection of the Marine and Coastal Environment of the Western Indian Ocean from Land-Based Sources and Activities, Nairobi (Kenya), 31 Mar. 2010, not yet in force, Art. 13(1), available at: <https://www.nairobiconvention.org/clearinghouse/sites/default/files/Eng-Final%20Act%20of%20the%20Conference%20of%20the%20Plenipotentiaries%20for%20the%20Adoption%20of%20the%20LBSA%20Protocol%20-%20Adopted%20in%20Nairobi%20C%20Kenya%20on%2031%20March%202010.pdf>; Agreement on the Conservation of Nature and Natural Resources, Kuala Lumpur (Malaysia), 9 July 1985, not yet in force, Art. 11(a), available at: <https://cil.nus.edu.sg/wp-content/uploads/2019/02/1985-Agreement-on-the-Conservation-of-Nature-and-Natural-Resources-1-1.pdf>.

¹⁷² N. 163 above.

¹⁷³ *Ibid.*, Art. 3(2)(c)(ii); Annex I, Art. 3(2)(f).

¹⁷⁴ *Ibid.*, Annex I, Art. 2(1)(b); Annex V, Art. 4(2)(a).

¹⁷⁵ *Ibid.*, Art. 6(1)(d).

best practices between contracting parties, as others have suggested.¹⁷⁶ It would also be beneficial to identify best practices across MEAs, including ways to resolve different national approaches to CEA that may use different definitions and functions of cumulative effects concepts (Section 3.2).

4.3. *Cumulative Effects Concepts between National and International Regimes: Five Areas of Intersection*

National and international EIA regimes are mutually influential,¹⁷⁷ with several implications for cumulative effects provisions. Firstly, extensive national adoption of such provisions justifies greater consideration of cumulative effects concepts in articulating customary EIA obligations and general principles of law,¹⁷⁸ including required assessment procedures and the criteria relating to the significance of any likely adverse transboundary impact.¹⁷⁹

Secondly, national laws could provide ‘exemplars’ for MEAs¹⁸⁰ on formulating and implementing cumulative effects provisions.

Thirdly, and conversely, non-adoption of cumulative effects provisions in national law may affect how a state performs its international obligations relating to transboundary harm. At the extreme, in the absence of these provisions, a state may not consider a project to have transboundary effects or may overlook a project’s potential to have a significant transboundary impact, in that considering a project in isolation may mean using a higher threshold for a finding of ‘significant’ impact.

Fourthly, MEAs that include cumulative effects concepts may influence national EIA practices, directly when they are implemented domestically,¹⁸¹ or indirectly if domestic EIA legislation engages international conventions as a decision-making consideration.¹⁸²

Fifthly, regional MEAs can influence national-level EIAs by formally linking or ‘tiering’ with cumulative effects provisions in national EIA laws, or encouraging more informal cooperation between contracting parties, who may require information from other states to complete CEAs. Valuable information, such as regionally adopted data standards¹⁸³

¹⁷⁶ Bastmeijer & Roura, n. 143 above, p. 219.

¹⁷⁷ Craik, n. 4 above, pp. 23–5.

¹⁷⁸ A similar approach was taken in Yang, n. 4 above.

¹⁷⁹ See, e.g., Espoo Convention, n. 138 above, App. III, Art. 1(c). For discussion of various CEA functions see above nn. 121–133 and accompanying text.

¹⁸⁰ Craik, n. 4 above, p. 25.

¹⁸¹ J. Crawford & I. Brownlie, *Brownlie’s Principles of Public International Law* (Oxford University Press, 2019), pp. 45–6.

¹⁸² See, e.g., Procedimiento de Evaluación Ambiental [Environmental Assessment Procedure] from the Compendio de Reglamentos y Procedimientos Para Autorizaciones Ambientales de la República Dominicana [Compendium of Regulations and Procedures for Environmental Authorizations in the Dominican Republic] 2014 (Dominican Republic), Annex B.

¹⁸³ Particularly valuable in this context are the ‘FAIR data principles’, according to which data should be findable, accessible, interoperable and reusable: M.D. Wilkinson et al., ‘The FAIR Guiding Principles for Scientific Data Management and Stewardship’ (2016) 3(1) *Scientific Data*, pp. 1–9; data with these characteristics is particularly important for CEA, given that the process inherently involves understanding how the effects of multiple projects, for which data will have been collected by different parties, will aggregate.

and thresholds of acceptable environmental harm,¹⁸⁴ can flow from regional plans to project assessments, and assessments can identify policy concerns for regional attention.¹⁸⁵ Though tiering is considered EIA best practice,¹⁸⁶ disagreements about methodology and a lack of good model examples obstruct implementation.¹⁸⁷ Regional MEAs could address these challenges by encouraging cross-regime learning through processes among contracting parties for formal deliberation, coordination about data sharing, agreed methods, and potential links to regional plans under MEAs.¹⁸⁸

5. CONCLUSION

Cumulative effects concepts are widely adopted in national laws – by at least 113 nations, 61% of nations that have national EIA laws. They are adopted internationally, to a degree previously unremarked, in 10 MEAs that bind 102 nations. This prevalence establishes a solid foundation for these regimes to deliver important theoretical benefits collectively in two ways: (i) as a ‘spotlight’ on value judgements tied to time and space, including thresholds of significance for environmental effects; (ii) as a wide-beam ‘lighthouse’ that illuminates the adverse effects of ‘other’ actions that contribute to the same types of harm as the proposed project, potentially triggering political agitation for wider environmental regulation.

From theoretical and practical legal perspectives, therefore, cumulative effects concepts have significant latent potential – perhaps transformational potential – to address cumulative environmental change through EIA regimes nationally and internationally. However, without better implementation, the latent potential of these laws to address cumulative environmental problems is likely to remain unrealized. Methods to encourage improved implementation are needed.

One potential challenge to implementation is the variety of definitions and functions of cumulative effects concepts in EIA processes among national jurisdictions. These differences pose challenges for forming clear, consistent, internationally and regionally applicable principles, and forming links between legal regimes. Differences also complicate compliance efforts by project proponents who operate across jurisdictions. These differences also limit the potential for useful diffusion of experience.

Cumulative effects provisions are understudied in a transnational context, and merit further research. A future research agenda could encompass empirical investigations of the benefits of cumulative effects provisions theorized here; experience in implementing treaty-based cumulative effects provisions; the implementation of guidelines for

¹⁸⁴ Gunn & Noble, n. 93 above, p. 158.

¹⁸⁵ *Ibid.*

¹⁸⁶ *Ibid.*

¹⁸⁷ *Ibid.*

¹⁸⁸ See, e.g., UNEP, ‘Strategic Action Programme for the Conservation of Biological Diversity (SAP BIO) in the Mediterranean Region’, 2003, available at: <https://wedocs.unep.org/handle/20.500.11822/862?show=full>; ‘HELCOM Baltic Sea Action Plan’, HELCOM Ministerial Meeting, Krakow (Poland), 15 Nov. 2007, available at: https://www.helcom.fi/wp-content/uploads/2019/08/BSAP_Final.pdf.

considering cumulative effects under MEAs; and bilateral approaches to EIA.¹⁸⁹ Empirical research on the practical significance of cumulative effects-inclusive EIA laws could also consider the number of assessments made under them and other measures of the strength of their implementation.¹⁹⁰ An investigation is also warranted of the flow of legal concepts between the national and international contexts (or the reverse), which appears to defy the caution of comparative lawyers against a ‘cut and paste’ approach to transplanting legal provisions.¹⁹¹ The roles of non-state actors also emerge as ripe for future exploration, including the potential role of advocacy organizations in political agitation in response to revelations emerging from cumulative effects provisions, and the extent to which financial institutions adopt cumulative effects concepts in their operational procedures and approaches to policy conditionality.¹⁹² While EIA law is unlikely to supply a complete solution for cumulative environmental change, lessons from cumulative effects concepts in diverse EIA contexts nationally and internationally will be an important part of the evolving legal picture.

SUPPLEMENTARY MATERIAL

The supplementary material for this article can be found at: <https://doi.org/10.1017/S2047102522000243>.

¹⁸⁹ See, e.g., Craik, n. 143 above, pp. 105 (regarding an agreement between the US and Canada on the conservation of the Porcupine Caribou herd), and 181.

¹⁹⁰ EIAs undertaken pursuant to MEAs are not typically aggregated in an accessible way. An exception is the EIA database of the Antarctic Environment Protocol, n. 163 above: Secretariat of the Antarctic Treaty, ‘EIA Database’, available at: <https://www.ats.aq/devAS/EP/EIAList?lang=e>.

¹⁹¹ See, e.g., P. Legrand, ‘The Impossibility of “Legal Transplants”’ (1997) 4(2) *Maastricht Journal of European and Comparative Law*, pp. 111–24; O. Kahn-Freund, ‘On Uses and Misuses of Comparative Law’ (1974) 37(1) *The Modern Law Review*, pp. 1–27.

¹⁹² See discussion of donor agencies and Equator Principles, nn. 100–3 above and accompanying text.