

ARTICLE

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How Insights on Bounded Rationality Could Inform the International Law of Environmental Assessments

Eva van der Zee¹

¹Institute of Law and Economics, Hamburg University, Hamburg, Germany

Corresponding author: eva.leora.van.der.zee@uni-hamburg.de

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Abstract

This article assesses how the bounded rationality of the public, planning authorities, and experts distorts the environmental assessment (EA) process and how the international law on EAs could overcome such distortions. Data was gathered through the analysis of relevant law and policy documents, as well as authoritative court texts. This article concludes that the current international law on EAs does not sufficiently take behavioral insights into account. Several ways as to how insights on bounded rationality could be incorporated into the international law on EAs are discussed.

Keywords: Behavioral governance; environmental assessment legislation; international law; bounded rationality; debiasing techniques

A. Introduction

Environmental assessments (EAs) have spread globally to the national legal systems of over a hundred countries,¹ many international conventions, protocols, and agreements.² In addition,

Eva van der Zee is a Junior Professor in International Law with a Focus on Behavioral Law and Economics at the Institute of Law and Economics, Hamburg University. Her research interests cover the role and interrelation of formal and informal regulatory systems in promoting sustainable development.

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¹See generally NEIL CRAIK, THE INTERNATIONAL LAW OF ENVIRONMENTAL IMPACT ASSESSMENT: PROCESS, SUBSTANCE AND INTEGRATION (2008); BARRY SADLER, ENVIRONMENTAL ASSESSMENT IN A CHANGING WORLD: EVALUATING PRACTICE TO IMPROVE PERFORMANCE, INTERNATIONAL STUDY OF THE EFFECTIVENESS OF ENVIRONMENTAL ASSESSMENT: FINAL REPORT. CANADA: CANADIAN ENVIRONMENTAL ASSESSMENT AGENCY (1996); JONATHAN B. WIENER, MICHAEL D. ROGERS, JAMES K. HAMMITT, PETER H. SAND, INFORMATION DISCLOSURE, in THE REALITY OF PRECAUTION: COMPARING RISK REGULATION IN THE UNITED STATES AND EUROPE (2011).

²See generally Richard K. Morgan, *Environmental Impact Assessment: the State of the Art*, 30 IMPACT ASSESSMENT & PROJECT APPRAISAL (2012); Convention on Environmental Impact Assessment in a Transboundary Context, Feb. 25, 1991, 1989 U.N.T.S. 309 (Espoo Convention), https://unece.org/DAM/env/eia/documents/legaltexts/Espoo_Convention_authentic_ENG.pdf; Convention on Wetlands of International Importance, Feb. 2, 1971, 996 U.N.T.S. 245, <https://treaties.un.org/doc/Publication/UNTS/Volume%20996/volume-996-I-14583-English.pdf>; Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, June 25, 1998, 40 U.N.T.S.

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they have been considered by the International Court of Justice (ICJ) as a requirement under general international law.³ The underlying idea of EAs is that before the authorization of an activity—a plan, policy, program, or project—is granted, the potential impact of environmentally harmful activities should be analyzed.⁴ As such, an EA is the assessment of the environmental effects of an action undertaken prior to the decision made by the government or on behalf of the government to authorize the proposed activity.

Planning authorities—entities with the power to authorize an activity, such as governments or lending institutions—could still decide to authorize an activity despite an EA indicating it would lead to environmental harm. Studies show, however, that EAs increase the likelihood that such decisions will be more protective of the environment.⁵ As such, EAs are assumed to allow those responsible for deciding on the authorization of an activity to make trade-offs consciously and intelligently between environmental harm and other interests in a particular case.⁶ Procedural rules could, then, improve the effectiveness of EAs to prevent environmental harm.

The procedural rules underlying current domestic and international regimes of EA, including existing literature on the obligation to undertake an EA in international law, are heavily influenced by rational choice theory.⁷ Rational choice theory contends that individuals are predominantly influenced by instrumental rationality.⁸ In doing so, actors are assumed to order their behavior to maximize the likelihood of achieving their individually defined goals.⁹ By following this rationale, private actors are assumed to engage in self-serving lobbying to persuade similarly self-serving planning authorities to make decisions that advance individual self-interest without regard to collective costs.¹⁰ Public review and judicial review by independent judges are then regarded as the best way to prevent planning authorities from making self-serving decisions at the expense of the collective.¹¹

This approach embraces the political and value-based nature of EAs. It has also encouraged deliberative and collaborative approaches to EA processes by promoting stakeholder engagement and public participation.¹² Deliberative and collaborative models of EA have heavily influenced

2161, <https://unece.org/DAM/env/pp/documents/cep43e.pdf>; United Nations Framework Convention on Climate Change, Sept. 5, 1992, 1771 U.N.T.S. 32, http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf; United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397, https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf; Protocol on Environmental Protection to the Antarctic Treaty, Oct. 4, 1991, 2942 U.N.T.S. 5778, <https://treaties.un.org/doc/Publication/UNTS/Volume%202941/volume-2941-A-5778.pdf>; Espoo Convention, Sept. 10, 1997, 1989 U.N.T.S. 309; Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context, July 11, 2010, 50 U.N.T.C. 2685; UNEP Res. GC14/25, 17 June 1987, endorsed by the UN General Assembly (GA Res. 42/184, 11 December 1987); OPERATIONAL POLICY/BANK PROCEDURE/4.01: ENVIRONMENTAL ASSESSMENT (1999), <http://web.worldbank.org>; UNITED NATIONS, RIO DECLARATION ON ENVIRONMENT AND DEVELOPMENT 1992, Principle 17; ILC Draft Articles on Prevention of Transboundary Harm from Hazardous Activities of 2001, Article 7.

³See Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica), Judgment, 2015 I.C.J. 706, para. 104 (Dec. 16); Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua) 2015 I.C.J. 708, para. 107 (Dec. 16); Pulp Mills in the River Uruguay (Argentina v. Uruguay), Judgment, 2010 ICJ 82, para. 204 (Apr. 20).

⁴CRAIK, *supra* note 1.

⁵John H. Knox, *The Myth and Reality of Transboundary Environmental Impact Assessment*, 96 AM. J. INT'L L. 317 (2002).
⁶*Id.*

⁷Morgan, *supra* note 2.

⁸See generally Richard Posner, *Rational Choice, Behavioral Economics, and the Law*, 50 STAN. L. REV. 1551 (1997).

⁹See generally Vincent Ostrom & Elinor Ostrom, *Public Choice: A Different Approach to the Study of Public Administration*, 31 PUB. ADMIN. REV. 203 (1971).

¹⁰Jeffrey Rachlinski & Cynthia Farina, *Cognitive Psychology and Optimal Government Design*, 87 CORNELL L. REV. 551 (2002).

¹¹*Id.*

¹²See generally Hugh Wilkins, *The Need for Subjectivity in EIA: Discourse as a Tool for Sustainable Development*, 23 ENV'T IMPACT ASSESS. REV. 401 (2003); Bo Elling, *Rationality and Effectiveness: Does EIA/SEA Treat Them as Synonyms?*, 27 IMPACT ASSESSMENT & PROJECT APPRAISAL 121 (2009); Tim Richardson, *Environmental Assessment and Planning Theory: Four Short Stories About Power, Multiple Rationality, and Ethics*, 25 ENV'T IMPACT ASSESS. REV. 341 (2005).

EA legislation in many (inter)national legal systems.¹³ The role of bounded rationality of those involved in the EA process remains, however, underexplored in theories underlying EA legislation. This is problematic because experiments indicate that bounded rationality creates fundamental vulnerability errors leading to predictable patterns of mistakes.¹⁴ As such, public and judicial review may not lead the court to order the planning authority to cancel the authorization of an initiative likely to cause environmental harm, because the bounded rationality of the public, the courts, and experts may lead them not to spot insufficient and/or inadequate EA reports that may itself be caused by bounded rationality.

This article aims to examine how insights on bounded rationality could improve the procedural rules of the international law on EAs. To achieve this aim, this article examines the development of the obligation to undertake an EA in international law in Section B, how the international law on EAs could affect behavior in Section C, and how insights on bounded rationality are and could be incorporated in international EA commitments based on a textual analysis of international EA commitments in Section D. The focus of the textual analysis is on the United Nations Environment Programme Goals and Principles of Environmental Impact Assessments (UNEP Goals), the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention), the Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context (SEA Protocol), the IFC's Performance Standards, the World Bank Group (WBG) Environmental and Social Framework (ESF), and the Equator Principles. These international instruments are the leading international regulatory instruments providing detailed procedural requirements on EAs. The article ends with a conclusion and discussion in Section E.

B. The Development of the Obligation to Undertake an EA in International Law

The first formal incorporation of an EA in a legislative form was the National Environmental Policy Act of 1969 (NEPA) established in the United States (US) and enacted in 1970.¹⁵ The NEPA established an EA to guide the activities of Federal agencies whose actions had the power to affect people, communities, and the natural environment in significant ways.¹⁶ NEPA was in response to a rise in scientific and popular concern about contemporary environmental changes.¹⁷ Under the NEPA, federal agencies were responsible for producing a statement of environmental impacts to the public to demonstrate how environmental concerns were recognized and addressed.¹⁸

Soon after the enactment of NEPA, the concept of EA was raised in 1972 at the first world conference on the environment at the United Nations Conference on the Human Environment (UNCHE).¹⁹ Participants adopted a series of principles for managing the environment, including the Stockholm Declaration and the Action Plan for the Human Environment (APHE). While EA was left out of the final version of the Stockholm Declaration due to concerns raised by developing countries on the impact of EAs on their right to develop,²⁰ EA was included in several

¹³Morgan, *supra* note 2; SUZANNE KINGSTON, VEERLE HEYVAERT, ALEKSANDRA ČAVOŠKI, EUROPEAN ENVIRONMENTAL LAW (2017).

¹⁴See generally DANIEL KAHNEMAN, THINKING FAST AND SLOW (2011).

¹⁵See generally TIMOTHY O'RIORDAN & W.R. DERRICK SEWELL, PROJECT APPRAISAL AND POLICY REVIEW (1981).

¹⁶Morgan, *supra* note 2.

¹⁷See generally Lord Ashby, *Background to Environmental Impact Assessment*, ENVIRONMENTAL IMPACT ASSESSMENT. FARNBOROUGH, UK: SAXON HOUSE (1976).

¹⁸Morgan, *supra* note 2.

¹⁹Declaration of the United Nations Conference on the Human Environment, *Stockholm Declaration*, UN Doc. A/Conf.48/14/Rev.1 (June 16, 1972), reprinted in 11 ILM 1416 (1972).

²⁰Philippe Sands, *Biological Diversity*, in PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW 580 (Philippe Sands ed., 2003); STEVEN BERNSTEIN, THE COMPROMISE OF LIBERAL ENVIRONMENTALISM 43 (2001); Louis Sohn, *The Stockholm Declaration on the Human Environment*, 14 HARV. INT'L. L. J. 431 (1973).

recommendations contained in the APHE.²¹ After the 1972 UNCHE, EA references continued to be incorporated into instruments produced by the United Nations (UN).²² The institutionalization of EA has progressed steadily ever since. Today, EAs are recognized in many international conventions, protocols, and agreements.²³ These international EA instruments have different forms and shapes, ranging from detailed to general requirements, from legally binding to non-legally binding, and from treaties to initiatives by international institutions.

The most well-known legally binding international EA commitment is the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention). The Espoo Convention, which entered into force in 1997, is a regional international treaty specific to Europe, signed under the United Nations Economic Commission for Europe (UNECE). The UNECE comprises of fifty-six member states, including all EU countries and some non-EU countries, such as the Russian Federation, Turkey, and the US. In 2014, the First Amendment to the Espoo Convention entered into force, opening up the Convention to accession by UN Member States not members of the UNECE. Another update took the form of the Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context (SEA Protocol), which entered into force in 2010 with thirty-three Parties. The SEA Protocol augments the Espoo Convention by ensuring that individual Parties integrate EAs into their activities at the earliest stages, such as the planning stage.

The Espoo Convention has been relied upon in international litigation in several instances.²⁴ Though, in practice and outside Europe, international EA requirements created by international institutions, such as the UNEP Goals and WBG's policies, have been of greater weight in international litigation.²⁵ UNEP was an early pioneer of general EA principles and training resources. The UNEP is an international organization that coordinates the environmental activities of the UN. In fulfillment of its mandate to develop principles and guidelines of international environmental law, the UNEP began, in 1993, a process to establish the details of a set of elaborated EA requirements.²⁶ The resulting UNEP Goals and Principles of Environmental Impact Assessment (UNEP Goals) were issued in 1987, creating a set of foundational principles for EA.²⁷ ICJ judges have cited the UNEP Goals as evidence of state practice.²⁸

Additionally, at least one ICJ judge has also cited the WBG EA practices to confirm the status of EA in actual practice.²⁹ The World Bank Group (WBG) was the first multilateral development bank to require EAs for relevant lending operations through its Operational Policy/Bank Procedures. While the WBG Operational Policy and Bank Procedures were initially influential

²¹Report of the United Nations Conference on the Human Environment, *Stockholm*, UN Doc. A/Conf.48/14/Rev.1 (June 16, 1972) at 7, Recommendations 51, 61.

²²U.N. GAOR, 27th Sess., 2112th mtg., at 42, U.N. Doc A/RES/2995(XXVII) (Dec. 15, 1972); UNEP 1978 Principle 4; UNEP Draft Principles of Conduct (1978); UN. GAOR, 37th Sess., 27th plen. U.N. Doc. A/37/PV.48 (Nov. 9, 1982).

²³United Nations, *supra* note 2; the Convention on Wetlands of International Importance; the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters; United Nations Framework Convention on Climate Change, *supra* note 2; the United Nations Convention on the Law of the Sea, *supra* note 2; the Protocol on Environmental Protection to the Antarctic Treaty, *supra* note 2. ESPOO 1991 convention, *supra* note 2; and its 2003 protocol on strategic environmental assessment; UNEP Goals and Principles; WBG's ESF; 1992 Rio Declaration, principle 17; ILC Draft Articles on Prevention of Transboundary Harm from Hazardous Activities of 2001, Article 7.

²⁴See e.g., *MOX Plant Case (Ireland v. United Kingdom)*, Provisional Measures, 41 ILM 405 (2002).

²⁵See generally Alan Boyle, *Developments in the International Law of Environmental Impact Assessments and their Relation to the Espoo Convention*, 20 REV. EUR. CMTY. & INT'L ENVTL. L. 227 (2011).

²⁶CRAIK, *supra* note 1, at 92.

²⁷UNITED NATIONS ENVIRONMENT PROGRAMME, SUSTAINABLE DEVELOPMENT GOAL 2: ZERO HUNGER (2015); UNITED NATIONS ENVIRONMENT PROGRAMME, SUSTAINABLE DEVELOPMENT GOAL 3: GOOD HEALTH AND WELL-BEING (2015).

²⁸See Judge Weeramantry and Ad Hoc Judge Palmer's statements in Request for an Examination of the Situation in Accordance with Paragraph 63 of the Court's 1974 Judgment in the Case Concerning Nuclear Tests (New Zealand v. France) Case 1995 I.C.J. 288, paras. 344, 412 (Sept. 22).

²⁹See Case Concerning the Gabcikovo-Nagymaros Project (Hungary v. Slovakia), Judgment, 1997 ICJ 4, 111, note 78 (Sept. 25) (indicating Judge Weeramantry stated that this confirms the status of the principle in actual practice).

in ensuring EA practice in lending operations, the WBG's share of major project funding declined significantly in the 1990s.³⁰ Many large projects were funded from other sources and escaped the WBG's EA requirements. To solve this problem, the WBG moved on via the activities of its private-sector arm: the International Finance Corporation (IFC). Though, for those projects that did not escape the WBG's EA requirements, the WBG launched an updated Environmental and Social Framework (ESF) in 2018. The ESF sets out the WBG's commitments to sustainable development, replacing its earlier Operational Policy and Bank Procedures.

The IFC encourages private sector financial institutions to adopt similar requirements for EAs when making their own funding decisions. In 2012, the IFC produced Performance Standards on environmental and social sustainability (IFC's Performance Standards), accompanied by guidance notes and references for each standard. These performance standards influenced EA requirements for lending institutions. For example, the EA requirements of the European Bank for Reconstruction and Development, the Asian Development Bank, the African Development Bank, and the European Investment Bank are modeled after these standards.³¹ Furthermore, the Equator Principles, a private-sector initiative launched on June 4, 2003, based on the IFC's performance standards, provides EA requirements for financial institutions regarding funding decisions on major projects over a financial threshold of \$10 million. The Equator Principles were recently revised and republished in July 2020.

C. The Potential Behavioral Effect of International Law on EAs

The requirements set by these international EA instruments are primarily based on domestic EA practices³² and, hence, on insights derived from planning theory.³³ Planning theory provides theoretical frameworks for the application of group planning. Group planning aims to coordinate behavior when, if left to their own devices, people will not coordinate their behavior effectively.³⁴ Concerning the natural environment, group planning may be needed. One may have reasons to worry that an initiator of a proposed activity will not take environmental impacts duly into account, be it due to lack of expertise, the complexity of the activity, or the lack of incentives based on different preferences or values. Therefore, some form of group planning may be valuable to achieve a shared plan so that environmental impacts are considered in decision-making processes.³⁵

Group planning does not always require the incorporation of a legal system. Some communities are capable of coordinating behavior effectively without a legal system present.³⁶ When non-legal means do not coordinate human behavior effectively, legal institutions could help communities to overcome the complexity, contentiousness, and arbitrariness of communal life.³⁷ Legal activity is, thus, a form of group planning.³⁸ Different theories exist on how international legal means coordinate behavior. The most prominent theory on how international law coordinates state behavior is that states are pulled towards compliance by considerations of legitimacy and distributive justice.³⁹ Other scholars have focused on the role of emotions, most notably

³⁰See generally Morgan, *supra* note 2.

³¹See generally JOHN GLASSON & RIKI THERIVEL, INTRODUCTION TO ENVIRONMENTAL IMPACT ASSESSMENT (2019).

³²See generally Knox, *supra* note 5.

³³Morgan, *supra* note 2.

³⁴RACHEL WEBER & RANDALL CRANE, THE OXFORD HANDBOOK OF URBAN PLANNING 26 (2012).

³⁵SCOTT J. SHAPIRO, LEGALITY 134 (2011).

³⁶See generally ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION (2015); ROBERT C. ELLICKSON, ORDER WITHOUT LAW: HOW NEIGHBORS SETTLE DISPUTES (1994).

³⁷SHAPIRO, *supra* note 35, at 155.

³⁸*Id.*

³⁹Anne van Aaken, *Behavioral Aspects of the International Law of Global Public Goods and Common Pool Resources*, 112 AM. J. INT'L L. 56 (2018) (referring to THOMAS M. FRANCK, FAIRNESS IN INTERNATIONAL LAW AND INSTITUTIONS (1995)); THOMAS M. FRANCK, THE POWER OF LEGITIMACY AMONG NATIONS (1990); OONA H. HATHAWAY & HAROLD HONGJU KOH,

feelings of shame, that pull states into compliance with international law.⁴⁰ The expressive theory of international law is another approach to test state compliance with international law. Following the expressive theory of international law, states are pulled into compliance as the international law expresses a value that states internalize.⁴¹ Essentially, international law can trigger self-enforcement mechanisms that foster legal compliance.

Moreover, international law can provide a focal point, creating a social norm around which states can coordinate their behavior.⁴² Notwithstanding the theories behind the effect of international law on state behavior, state practice shows that international EA requirements are often incorporated into existing domestic EA frameworks,⁴³ indicating the potential effect of international EA requirements on domestic EA law and policy. Therefore, incorporating behavioral insights in international law may help coordinate state behavior towards effective EAs.

International legal means on EAs do not, however, only target states. For example, the ESF, the IFC's Performance Standards, and the Equator Principles target the initiator of the activity, the borrower, through sanctions and control systems (e.g. withholding financial means from proposed activities not meeting the set EA requirements.⁴⁴ Furthermore, these requirements may also have an expressive effect on the behavior of initiators.⁴⁵

As international legal means on EAs could affect behavior, and hence, the extent to which EAs ensure that the potential impact of environmentally harmful activities are analyzed before the authorization of an activity, insights on how EA processes work is needed. The most common theory of how EA processes work is derived from rationalist or synoptic planning theory.⁴⁶ This theory considers EAs as a rationalist, decision-support model.⁴⁷ The unit of analysis is the planning authority, which is the authority empowered by law to exercise spatial planning functions for a particular area. The theoretical basis of this rationalist model is that planning authorities are considered to have a well-defined problem, multiple alternatives to consider, full baseline information, complete information about the consequences of each alternative, full information about the values and preferences of citizens, and fully adequate time, skill, and resources.⁴⁸ This rationalist model strongly influenced the current form of EAs in many countries, treaties, and international EA regimes.⁴⁹

Scholars already criticized the rationalist model in the mid-twentieth century, arguing that planning authorities are rationally bounded—they face ambiguous and poorly defined problems, as well as incomplete information about alternatives, the baseline, the consequences of supposed alternatives, the range of values, preferences, and interests.⁵⁰ Furthermore, the bounded rationality

FOUNDATIONS OF INTERNATIONAL LAW AND POLITICS (2005); Harold Hongju Koh, *Why Do Nations Obey International Law?*, 106 YALE L. J. 2599 (1997).

⁴⁰See generally Peter Huang, *International Environmental Law and Emotional Rational Choice*, 31 J. L. STUD. 237 (2002).

⁴¹See generally Robert Cooter, *Expressive Law And Economics*, 27 J. L. STUD. 589 (1998).

⁴²Richard H. McAdams, *A Focal Point Theory of Expressive Law*, 86 VA. L. REV. (2000); Alex Geisinger & Michael Ashley Stein, *A Theory of Expressive International Law*, 60 VAND. L. REV. 77 (2007).

⁴³CRAIK, *supra* note 1, at Chapter 2.

⁴⁴OLIVER E. WILLIAMSON, *MARKETS AND HIERARCHIES: ANALYSIS AND ANTITRUST IMPLICATIONS: A STUDY IN THE ECONOMICS OF INTERNAL ORGANIZATION* (1975).

⁴⁵See generally Cass R. Sunstein, *On the Expressive Function of Law*, 144 U. PA. L. REV. 2021 (1996).

⁴⁶Robert V. Bartlett & Priya A. Kurian, *The Theory of Environmental Impact Assessment: Implicit Models of Policy Making*, 27 POL'Y & POL. 416 (1999).

⁴⁷Morgan, *supra* note 2, at 7.

⁴⁸John Forester, *Bounded Rationality and the Politics of Muddling Through*, 44 PUB. ADMIN. REV. (1984), at 23–4; Edward Banfield, *Ends and Means in Planning*, in *A READER IN PLANNING THEORY* (Andreas Faludi ed., 1973); Erling Holden, *Planning Theory: Democracy or Sustainable Development?—Both (But Don't Bother About the Bread, Please)*, 15 SCANDINAVIAN HOUS. & PLAN. RSCH. 230 (1998).

⁴⁹Morgan, *supra* note 2, at 7.

⁵⁰Forester, *supra* note 48, at 23–24; Gilberto Montibeller & Detlof von Winterfeldt, *Cognitive and Motivational Biases in Decision and Risk Analysis*, 35 RISK ANALYSIS 1230 (2015); Holden, *supra* note 48.

model holds that planning authorities have limited time, skills, and resources.⁵¹ For example, individuals in an organization are found to use satisficing—they choose alternatives that are ‘good enough’ when confronted with decision-making under uncertainty because these alternatives exceed aspirations levels on all goals.⁵² The concept of satisficing has been widely discussed in EA scholarship, often leading to the conclusion that, due to the political and value-based nature of EAs, satisficing only plays a minor role.⁵³

Since the start of the twenty-first century, the focus of studies on bounded rationality shifted from observing how relatively competent agents work around their cognitive limitations when confronted with difficult tasks, for example, through satisficing,⁵⁴ to conducting experiments studying the subtle processes of mental framing that can cause cognitive illusions even in simple tasks and even among experts.⁵⁵ Human judgment and decision-making are, then, often described in terms of “System One” and “System Two” processing.⁵⁶ System One operates quickly and intuitively, using mental shortcuts—also known as heuristics—to help to make decisions and judgments quickly without spending a lot of time researching and analyzing information.⁵⁷ People use System One in most of their daily tasks. System One may be overridden by a more deliberate and slower processing mode, known as System Two. System Two processing requires rigorous mental activity, employing rules that are explicitly learned.⁵⁸ While both systems are usually very effective, they may result in systematic and predictable deviations from the assumptions of rational choice theory. These deviations are also known as cognitive and unconscious motivational biases.

Cognitive biases are a systematic discrepancy between the correct answer and the actual answer in a judgmental task.⁵⁹ For example, the workings of System One tend people to jump to conclusions even in the face of minimal information, known as WYSIATI (“what you see is all there is”).⁶⁰ As such, people construct opinions based on the presented information, even if they are aware that the information is biased or one-sided. To make matters worse, those confronted with biased or one-sided information are more confident about their conclusions than those confronted with balanced information.⁶¹ WYSIATI could, for example, lead planning authorities to authorize an activity based on biased information.

⁵¹Forester, at 23–24. See also JAMES MARCH & HERBERT SIMON, ORGANIZATIONS (1958); CHARLES PERROW, COMPLEX ORGANIZATIONS (1972).

⁵²Herbert Simon, *A Behavioral Model of Rational Choice*, 69 Q. J. ECON. 99 (1955); Herbert Simon, *Rational Choice and the Structure of the Environment*, 63 PSYCH. REV. 129 (1956).

⁵³Bartlett & Kurian, *supra* note 46; Morgan, *supra* note 2; Graham Wood & Julia Becker, *Discretionary Judgement in Local Planning Authority Decision Making: Screening Development Proposals for Environmental Impact Assessment*, 48 J. ENV'T PLAN. MGMT. 349 (2005).

⁵⁴Jonathan Bendor, *Herbert A. Simon: Political Scientist*, 6 ANN. REV. POL. SCI. 440 (2003).

⁵⁵*Id.* at 440–41.

⁵⁶See generally SHELLY CHAIKEN & YAACOV TROPE, DUAL-PROCESS THEORIES IN SOCIAL PSYCHOLOGY (1999); KAHNEMAN, *supra* note 14; EYAL ZAMIR & DORON TEICHMAN, BEHAVIORAL LAW AND ECONOMICS (2018); Daniel Kahneman & Shane Frederick, *Representativeness Revisited: Attribute Substitution in Intuitive Judgment*, in HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT (2002); Jonathan Evans, *Dual-Processing Accounts of Reasoning, Judgment, and Social Cognition*, 59 ANN. REV. PSYCH. 255 (2008); Keith E. Stanovich & Richard F. West, *Individual Differences in Reasoning: Implications for the Rationality Debate?*, 23 BEHAV. & BRAIN SCI. 645 (2000).

⁵⁷See generally Daniel Kahneman, *A Perspective on Judgment and Choice—Mapping Bounded Rationality*, 58 AM. PSYCH. 697 (2003); Fritz Strack & Roland Deutsch, *Reflective and Impulsive Determinants of Social Behavior*, 8 PERS. & SOC. PSYCH. REV. 220 (2004).

⁵⁸ZAMIR & TEICHMAN, *supra* note 56.

⁵⁹See generally DETLOF VON WINTERFELDT & WARD EDWARDS, DECISION ANALYSIS AND BEHAVIORAL RESEARCH. (1986).

⁶⁰KAHNEMAN, *supra* note 14, at 264.

⁶¹See generally Lyle A. Brenner, Derek J. Koehler & Amos Tversky, *On the Evaluation of One-Sided Evidence*, 9 J. BEHAV. DECISION MAKING 59 (1996).

Motivational biases are judgments influenced by the (un)desirability of events, consequences, outcomes, or choices.⁶² Many motivational biases are unconscious.⁶³ An example of an unconscious motivational bias is the confirmation bias which occurs when there is a desire to confirm one's belief, leading to unconscious selectivity in acquiring and using evidence.⁶⁴ This bias could, for example, lead planning authorities to not take all alternatives adequately into account when deciding on the authorization of an activity.

The degree to which individuals are susceptible to cognitive and unconscious motivational biases depends on their level of expertise. Behavioral research shows that experts are superior to novices in nearly every aspect of cognitive functioning, from memory and learning to problem-solving and reasoning.⁶⁵ Additionally, experts often show high, outstanding, and exceptional performance that is domain-specific, stable over time, and related to experience and practice.⁶⁶ As such, if the planning authorities have no sufficient expertise, external experts could be included in the EA process to improve the decision-making. Still, even if experts would outperform novices, so-called experts or consultants may not always be true experts. For example, Member States of the EU have reported challenges regarding the expertise of consultants and planning authorities when preparing good quality EAs.⁶⁷ When consultants or planning authorities have never dealt with an EA before or with the environmental impact under consideration, they may lack sufficient expertise. Furthermore, research shows that increasing expertise in the EA process may not necessarily improve decision-making, as behavioral studies show that experts also have worrying cognitive and unconscious motivational biases.⁶⁸

Examples of cognitive biases to which also experts may be susceptible include the anchoring bias and the myopic problem representation bias. The anchoring bias occurs when the estimation of a numerical value is based on an initial value, which is insufficiently adjusted to provide the final answer.⁶⁹ This bias could lead those predicting environmental impact to anchor alternatives on an initial set.⁷⁰ Another cognitive bias to which experts may be susceptible is the myopic problem representation bias, which occurs when an oversimplified problem representation is adopted based on an incomplete mental model of the decision problem.⁷¹ The myopic problem representation bias could, for example, lead an expert involved in predicting environmental impact to generate an incomplete problem description of the impact.

Additionally, examples of unconscious motivational biases to which also experts may be susceptible include the confirmation bias as discussed above, the optimism bias, and the

⁶²See generally Ziva Kunda, *The Case for Motivated Reasoning*, 108 PSYCH. BULL. 480 (1990); Daniel C. Molden & Edward T. Higgins, *Motivated thinking*, in THE OXFORD HANDBOOK OF THINKING AND REASONING (Keith J. Holyoak & Robert G. Morrison eds., 2011).

⁶³See generally Montibeller & von Winterfeldt, *supra* note 50.

⁶⁴See generally Raymond S. Nickerson, *Confirmation Bias: A Ubiquitous Phenomenon in Many Guises*, 2 REV. GEN. PSYCH. 175 (1998).

⁶⁵See generally J.R. ANDERSON, *COGNITIVE SKILLS AND THEIR ACQUISITION* (1981); James Shanteau, *Competence in Experts: The Role of Task Characteristics*, 53 ORG. BEHAV. & HUM. DECISION PROCESSES 252 (1992); Michélenne T. H. Chi, *Two Approaches to the Study of Experts' Characteristics*, in THE CAMBRIDGE HANDBOOK OF EXPERTISE AND EXPERT PERFORMANCE (2006); Britta Herbig & André Büssing, *The Role of Explicit and Implicit Knowledge in Work Performance*, 46 PSYCH. SCI. 408 (2004); Rachlinski & Farina, *supra* note 10, at 558–61.

⁶⁶Britta Herbig & Andreas Glöckner, *Experts and Decision Making: First Steps towards a Unifying Theory of Decision Making in Novices, Intermediates and Experts*, MAX PLANCK INSTITUTE FOR RESEARCH ON COLLECTIVE GOODS RESEARCH PAPER SERIES 2 (2009).

⁶⁷Council Directive 2001/42 of June 27, 2001, Study Concerning the Preparation of the Report on the Application and Effectiveness of the SEA Directive, 2001 O.J. (L 197) 30 (EC), https://ec.europa.eu/environment/eia/pdf/study_SEA_directive.pdf.

⁶⁸Montibeller & von Winterfeldt, *supra* note 63.

⁶⁹See generally Amos Tversky & Daniel Kahneman, *Judgment under Uncertainty: Heuristics and Biases*, 185 SCI. 1124 (1974).

⁷⁰See generally RALPH L. KEENEY, *VALUE-FOCUSED THINKING: A PATH TO CREATIVE DECISIONMAKING* (1996).

⁷¹Montibeller & von Winterfeldt, *supra* note 63.

undesirability of a negative event or consequence bias. The optimism bias occurs when the desirability of an outcome leads to an increase in the extent to which it is expected to occur.⁷² The optimism bias could impact the estimates of probabilities of future outcomes of activities by novices and in expert foresight. Closely related to the optimism bias is the undesirability of a negative event or consequence bias when there is a desire to be cautious, prudent, or conservative in estimates related to harmful consequences.⁷³ This could lead to distorted long-term estimations of future events by novices and in expert foresight.

It should be noted that the bounded rationality model described still carries the rationalist imprint: the normative rationalist model remains the ideal that can be achieved through debiasing techniques. Others have pointed out that the rationalist and the bounded rationalist models fail to recognize the political and value-based nature of planning.⁷⁴ This has encouraged deliberative and collaborative approaches to EA processes by promoting stakeholder engagement and public participation.⁷⁵ Deliberative and collaborative models of EA heavily influenced EA legislation, resulting in many legal systems, including the EU and its Member States, mandating public participation at different stages in the EA process.⁷⁶ In turn, these deliberative and collaborative models have been criticized for not recognizing sufficiently the issue of power relations between participants, which inevitably affect the ability of different groups of individuals to enter social negotiations equitably.⁷⁷ While deliberative and collaborative models of EA that take power relations into account are important to ensure legitimacy in environmental decision-making, the generation, organization, and communication of information will always be needed to take environmental effects duly into account in planning and decision-making. As such, elements of bounded rationality will continuously play a role.

D. How Insights on Bounded Rationality Are and Could Be Incorporated in International EA Commitments

To understand how insights on bounded rationality are and could be incorporated in international EA requirements, I have examined the requirements laid down in the Espoo Convention, the SEA Protocol, the UNEP Goals, the ESF, the IFC's Performance Standards, and the Equator Principles. I examined these requirements to understand their potential effect on overcoming bounded rationality through legislation. This section will discuss the results of the textual analysis per element of the EA processes, for example, screening, scoping, prediction of the environmental impact, decision-making by the planning authority, public participation, and monitoring.

I. Screening

Screening aims to determine whether an activity requires further identification and prediction.⁷⁸ There are two approaches to screening: the case-by-case examination and the use of thresholds. The case-by-case examination involves the appraisal of the characteristics of activities against a checklist of criteria.⁷⁹ The use of thresholds involves placing activities in categories and setting thresholds for each activity, such as scale, anticipated impacts, or location. Thresholds limit

⁷²See generally Robin L. Dillon, Richard John, and Detlof von Winterfeldt, *Assessment of Cost Uncertainties for Large Technology Projects: A Methodology and an Application*, 32 INTERFACES 52 (2002).

⁷³See generally Dariusz Dolinski, Wojciech Gromski, and Ewa Zawisza, *Unrealistic Pessimism*, 127 J. SOC. PSYCH. 511 (1987).

⁷⁴See generally Wilkins, *supra* note 12; Richardson, *supra* note 12.

⁷⁵See generally Wilkins, *supra* note 12; Elling, *supra* note 12.

⁷⁶See generally Morgan, *supra* note 2; KINGSTON, HEYVAERT & ČAVOŠKI, *supra* note 13.

⁷⁷Morgan, *supra* note 2; Richardson, *supra* note 12, at 343.

⁷⁸Wood & Becker, *supra* note 53, at 352–53; CRAIK, *supra* note 1, at 133.

⁷⁹GLASSON & THERIVEL, *supra* note 31, at 86.

the extent to which human judgment and decision-making are needed to decide whether an EA is required (there is a clear list available with clear thresholds), and hence reducing the impact of cognitive and unconscious motivational biases of the planning authorities at this stage. Only the Espoo Convention and the SEA Protocol set specific thresholds.⁸⁰ Thus, international EA commitments could improve their requirements on this front.

While thresholds may be effective in some countries—especially smaller countries with little environmental variety—inflexible and uniform thresholds may lead to inconsistencies in the actual degree of environmental protection achieved, given the variety of sensitivity in biophysical and social environments and the context-specific nature of significance issues.⁸¹ Resorting solely to thresholds in the screening phase may, thus, fail to ensure that environmental impacts are assessed. Therefore, besides using thresholds, ideally, case-by-case examinations should be used in EA processes. For example, most international EA commitments, the SEA Protocol, the ESF, the IFC's Performance Standards, and the Equator Principles, refer to case-by-case examinations.⁸² These commitments do, however, not include procedural obligations. An exception is the ESF and the IFC's Performance Standards that refer to the WBG's Environmental, Health, and Safety Guidelines (EHS Guidelines), which set some requirements for how screening should be conducted, such as identification through visual and historical operational information, as well as sampling and testing.⁸³ These requirements, however, focus on a rationalist understanding of gathering information, without acknowledging that the lending institution responsible for screening may have cognitive difficulty with such a procedure. Especially when those responsible for screening are inexperienced with EAs they will have more difficulty interpreting existing scientific evidence, and they will be more likely to jump to conclusions, as mentioned in Section C. Such a lack of expertise seems to be common even amongst developed countries.⁸⁴ Consequently, actors responsible for screening may jump to the conclusion that an EA is not needed, even though it should be or the other way around.

While some argue that training could overcome such overconfidence, others are not so optimistic. They argue that organizations may be better equipped to overcome the overconfidence bias as organizations tend to think slower.⁸⁵ As such, to reduce the impact of such overconfidence on the actors responsible for screening, gathering individuals knowledgeable about the decision—such as stakeholders, administrative bodies, and independent advisors—would be helpful to ensure that proposed actions that are likely to have a significant effect on the environment are assessed before they are approved. The international legal means examined for this article do not include awareness of the importance of such consultations.

II. Scoping

If an EA is warranted, the EA process may start with scoping. During scoping, the content and extent of the matters to be covered in the EA are specified before environmental impacts are predicted.⁸⁶ The SEA Protocol explicitly refers to scoping, requiring that each Party shall establish

⁸⁰ Espoo Convention, Appendix I, Feb. 25, 1991, 1989 U.N.T.S. 309; Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context (SEA Protocol), Annex I, May 21, 2003, 2685 U.N.T.S. 140.

⁸¹ Wood & Becker, *supra* note 53, at 368-69.

⁸² SEA Protocol, art. 5(1), ¶ 20, May 21, 2003, 2685 U.N.T.S. 140; INTERNATIONAL FINANCE CORPORATION, IFC PERFORMANCE STANDARDS ON ENVIRONMENTAL AND SOCIAL SUSTAINABILITY (2012); EQUATOR PRINCIPLES, *The Equator Principles*, <https://equator-principles.com/>.

⁸³ INTERNATIONAL FINANCE CORPORATION, ENVIRONMENTAL, HEALTH, AND SAFETY (EHS) GUIDELINES, para. 55.

⁸⁴ Council Directive 2001/42 of June 27, 2001, Study Concerning the Preparation of the Report on the Application and Effectiveness of the SEA Directive, 2001 O.J. (L 197) 30 (EC), https://ec.europa.eu/environment/eia/pdf/study_SEA_directive.pdf.

⁸⁵ KAHNEMAN, *supra* note 14, at 264.

⁸⁶ GLASSON & THERIVEL, *supra* note 79, at 88.

arrangements for determining relevant information to be included in the EA.⁸⁷ Furthermore, the SEA Protocol requires consultations with the authorities likely concerned by the environment because of their specific environmental or health responsibilities—often the Ministry of the Environment or an environmental agency.⁸⁸ The SEA Protocol also requires that each Party includes, to the extent appropriate, public participation at the scoping stage.⁸⁹ The ESF, the IFC's Performance Standards, and the Equator Principles also refer to scoping. Generally, the requirements stipulate that the initiator of the activity conducts scoping, in consultation with the lending institution, to identify and assess the potential environmental and social risks and impacts of the proposed activity.⁹⁰

From a behavioral perspective, consultations at the scoping stage may be effective in debiasing biases that may occur at the prediction stage, as referenced in Section D, subsection III. This includes the myopic problem representation bias, the confirmation bias, and the optimism bias to which experts may also be susceptible, as mentioned in (see Section C. For example, behavioral insights show that stimulating group interaction in nominal groups, where members generate ideas in isolation, before decisions are being made (e.g. before it is decided which environmental impacts to predict) outperform traditional brainstorming groups,⁹¹ making it an effective debiasing technique for these three biases.⁹² Initiating group interactions before environmental impacts are predicted could reduce the time needed for an EA by ensuring that the EA process focuses on key issues and is carried out efficiently as it reduces the risk of possible shortcomings in the final EA report due to the biases mentioned.⁹³ While there is a reference to consultations at the scoping stage in the SEA Protocol with agencies, the ESF, the IFC's Performance Standards, and the Equator Principles, all three with the lending institution, consultations should preferably also be conducted with the public and independent advisors.⁹⁴ Furthermore, initiating group interactions already at the scoping stage—and not only after the EA report has been submitted—reduces the risk of biased and one-sided EA reports, which are worrisome because, as discussed, behavioral insights show that people construct opinions based on the information presented, even if they are aware that the information is biased or one-sided, also known as WYSIATI.⁹⁵

III. Predicting the Environmental Impact

The ESF stipulates several procedural requirements for predicting the environmental impact: the prediction must be prepared by qualified and experienced persons for high and substantial risk projects, or when the initiator has limited capacity, independent specialists must carry out the prediction.⁹⁶ The appropriate methods and tools needed to identify and assess the potential environmental and social risks and impacts of the proposed project must be identified by the initiator in consultations with the lending institution.⁹⁷ There are no requirements, however, on when a person is considered qualified and experienced.

The Equator Principles does not set requirements for the prediction per se, but it requires that an “independent environmental and social consultant” carry out an independent review of the

⁸⁷SEA Protocol, art. 7, May 21, 2003, 2685 U.N.T.S. 140.

⁸⁸*Id.* at arts. 7(2), 9(1); Council Directive, 2001/42 of June 27, 2001, art. 12(3), on the assessment of the effects of certain plans and programs on the environment, 2001 O.J. (L 197) para. 2.1 (EC).

⁸⁹SEA Protocol, art. 7(3), May 21, 2003, 2685 U.N.T.S. 140.

⁹⁰THE WORLD BANK, *The Environmental and Social Framework*, (2017) <https://thedocs.worldbank.org/en/doc/837721522762050108-0290022018/original/ESFFramework.pdf>, at n. 18 (ESF).

⁹¹See generally Norbert L. Kerr & Scott R. Tindale, *Group Performance and Decision Making*, 55 ANN. REV. PSYCH. (2004).

⁹²See generally Montibeller & von Winterfeldt, *supra* note 63.

⁹³GLASSON & THERIVEL, *supra* note 79, at 58.

⁹⁴*Id.* at 88.

⁹⁵See generally Brenner, Koehler & Tversky, *supra* note 61.

⁹⁶ESF, *supra* note 90, at para. 25.

⁹⁷*Id.* at 18 n. 18.

prediction for all high-risk projects and, as appropriate, substantial risk projects.⁹⁸ This consultant should also propose or opine on a suitable Equator Principles Action Plan (EPAP) to outline the gaps and commitments to meet the requirements or indicate a justified deviation. The Equator Principles clarify that the consultant should be somebody who demonstrates expertise in evaluating environmental and social risks and impacts relevant to the project.

While the ESF and the Equator Principles arguably require some level of expertise of those predicting the environmental impact, it should be noted that expertise does not guarantee solid predictions as experts can also be subject to cognitive and unconscious motivational biases when predicting the likely environmental impact in two instances: first, when predicting the likely magnitude of the impact and, second, when predicting the likely significance of that impact.

Several methods exist to predict the likely magnitude of the impact, for example, in mathematical models, computer-based models, physical and architectural models, computer graphics, expert judgments, and analog models.⁹⁹ Which prediction method is most appropriate in an EA depends on the impacts under consideration and is generally decided upon by those responsible for the prediction,¹⁰⁰ and, when the EFS applies, in consultation with the WBG.¹⁰¹ While the accuracy of the prediction may be affected because the future is uncertain,¹⁰² cognitive and unconscious motivational biases of those responsible for the prediction may also play a role. As discussed in Section D, subsection II, the scoping procedure may effectively function as a debiasing technique for the myopic problem representation bias, the confirmation bias, and the optimism bias, even when experts predict the likely magnitude of an impact. Including those responsible for the prediction already at the scoping stage could, therefore, be helpful. This is, however, not required by any of the assessed EA requirements.

Furthermore, behavioral insights show that using multiple experts with different points of view about hypotheses could debias the confirmation bias, the optimism bias, and the undesirability of a negative event or consequence bias.¹⁰³ The examined EA requirements do not explicitly require this. Rather, this is problematic as those responsible for the prediction are unlikely to include multiple experts with different points of view about hypotheses when predicting environmental impact. For example, while those responsible for the prediction, usually consultancy firms, often include a second reader at the prediction stage, often consultants of the same consultancy firm act as a first and second reader.¹⁰⁴ This may increase the risk of groupthink, a psychological phenomenon that may occur in organizations in which the desire for harmony or conformity may result in bounded rational or dysfunctional decision-making.¹⁰⁵ Only for those activities falling under the Espoo Convention, there is theoretically an increased likelihood that multiple experts with different points of view about hypotheses are included at the prediction stage, as the Espoo Convention allows affected Parties to participate in the EA procedure.¹⁰⁶

⁹⁸EQUATOR PRINCIPLES, *supra* note 82, at 7.

⁹⁹GLASSON & THERIVEL, *supra* note 31, at 86.

¹⁰⁰See generally A. RODRIGUEZ- BACHILLER & J. GLASSON, EXPERT SYSTEMS AND GEOGRAPHICAL INFORMATION SYSTEMS (2004).

¹⁰¹ESF, *supra* note 90, at 18. n. 18.

¹⁰²See generally Marlene E. Turner & Anthony R. Pratkanis, *Twenty-Five Years of Groupthink Theory and Research: Lessons from the Evaluation of a Theory*, 73 ORG. BEHAV. & HUM. DECISION PROCESSES 105 (1998).

¹⁰³Montibeller & von Winterfeldt, *supra* note 63, at 1235.

¹⁰⁴Eva van der Zee, *Institutional Solutions to Tunnel Vision in Environmental Decision-Making. An Analysis of Dutch Law and Policy on Environmental Assessments* (Working paper).

¹⁰⁵See generally Marlene E. Turner & Anthony R. Pratkanis, *Twenty-Five Years of Groupthink Theory and Research: Lessons from the Evaluation of a Theory*, 73 ORG. BEHAV. & HUM. DECISION PROCESSES 105 (1998).

¹⁰⁶Espoo Convention art. 3(3), Feb. 25, 1991, 1989 U.N.T.S. 309.

The second instance where experts may be subject to cognitive and unconscious motivational biases is when the likely significance of the impact is predicted. To predict the significance of the impact, weights are applied to the various impacts through interpretation and the application of value judgment.¹⁰⁷ Besides novices, experts may also be subject to cognitive and unconscious motivational biases when assessing significance. For example, behavioral studies identified the anchoring bias when experts predict the significance of an impact.¹⁰⁸ Empirical research indicates that to debias the anchoring bias amongst experts, anchors should be avoided altogether. If that is not possible, different experts who use different initial anchors should be used.¹⁰⁹ Again the Espoo Convention may have theoretically a debiasing effect in this context as it allows affected Parties to participate in the EA procedure.¹¹⁰

IV. Public Participation and Consultations

An often-discussed element of the EA process is that the public is informed about the activity and the likely environmental impact, as well as enabled to express their views.¹¹¹ Another important element of the EA includes consultations with the public concerned, governmental agencies, and experts. Such consultations can improve the quality, comprehensiveness, and effectiveness of environmental decision-making by reducing the impact of WYSIATI on the planning authorities responsible for authorizing (the funding of) an activity.¹¹² All examined international EA commitments include requirements on public participation and consultations after the EA report has been written.¹¹³

To ensure public participation and consultations on the EA report, the EA report needs to be comprehensible. This may be problematic because EA reports can be over 2000 pages,¹¹⁴ and may hence result in information overload for those willing to read them.¹¹⁵ To overcome this information overload and the possible lack of expertise by the planning authorities, a non-technical summary of the EA report may enable authorities to make a decision of good quality. Experts, such as consultancy firms, generally write these summaries after predicting the environmental impact. The non-technical summary is mandated by all examined EA requirements,¹¹⁶ except for the IFC's Performance Standards.

¹⁰⁷GLASSON & THERIVEL, *supra* note 79, at 86

¹⁰⁸See generally Gretchen B. Chapman & Eric J. Johnson, *Anchoring, Activation, and the Construction of Values*, 79 ORG. BEHAV. & HUM. DECISION PROCESSES 115 (1999).

¹⁰⁹Montibeller & von Winterfeldt, *supra* note 63.

¹¹⁰Espoo Convention art. 3(3), Feb. 25, 1991, 1989 U.N.T.S. 309.

¹¹¹It should be noted, however, that the notion that there is a duty to consult affected populations was rejected by the Judgment of this Court in the Pulp Mills case per Judge Bhandari. See Pulp Mills in the River Uruguay (Argentina v. Uruguay), Judgment, 2010 ICJ 82 (Apr. 20).

¹¹²See Section C above; KAHNEMAN, *supra* note 14, at 264.

¹¹³UNITED NATIONS ENVIRONMENT PROGRAMME, PANEL UNVEILS 10 GUIDING PRINCIPLES IN CAMPAIGN TO REVIVE THE EARTH PRINCIPLE 7 (2021); Espoo Convention art. 4–5, 8; SEA Convention, art. 8; EQUATOR PRINCIPLES, *The Equator Principles EP4* Principle 5 (2020); ESF, *supra* note 90, at 22 para. 53; IFC's Performance Standards, para 34–35.

¹¹⁴See, e.g., the Dutch ROAD-project EA is 2344 pages. See ROAD-project fase 1 [Road-project phase 1], <https://www.rvo.nl/subsidies-regelingen/road-project-fase-1>.

¹¹⁵Information overload is that a wealth of information creates a poverty of attention. Herbert Simon, *Designing Organizations for an Information-Rich World*, in COMPUTERS, COMMUNICATIONS, AND THE PUBLIC INTEREST (M. Greenberger ed., 1970).

¹¹⁶UNITED NATIONS ENVIRONMENT PROGRAMME, PANEL UNVEILS 10 GUIDING PRINCIPLES IN CAMPAIGN TO REVIVE THE EARTH PRINCIPLE 4 (2021); Espoo Convention art. 3(3), app. II, Feb. 25, 1991, 1989 U.N.T.S. 309; SEA Protocol, ann. IV; ESS1—Annex 1.D.13(a); EQUATOR PRINCIPLES, *supra* note 82, at 10.

While such a summary may be appealing, it also runs the risk of oversimplifying the issues and trade-offs involved. Non-technical summaries often use a scoring grid to communicate the pros and cons of the proposed activity and the alternatives.¹¹⁷ These pros and cons are often communicated in the form of symbols—pluses and minus—or colors, with green to indicate a positive environmental impact, amber to indicate neutral environmental impact, and red to indicate a negative environmental impact. Interviews conducted with Dutch EA practitioners indicate that manipulation techniques are often used in the summary. For example, the colors purple and blue are used for environmental concerns or the plus-symbol is used for positive issues lumped together with some negative issues.¹¹⁸

This is problematic because those reading the report may underestimate serious environmental concerns presented in purple or blue or lumped together with positive attributes with a plus symbol. The reason for this is that colors and symbols have a communication value, carrying different associations and meanings.¹¹⁹ Colors are found to be the most influential.¹²⁰ Strong evidence is found of explicit and implicit associations of the color red with danger,¹²¹ the color green with safety,¹²² and blue with neutrality.¹²³ Roughly sixty-five to ninety percent of product and services assessments are built only on colors.¹²⁴

To improve early and effective participation, a list added as an annex to the examined requirements on good communication practices and/or visualizations in EAs could improve the quality of the information provided for public participation and consultations. This could, in turn, improve the quality, comprehensiveness, effectiveness, and legitimacy of environmental decision-making.

V. Decision-Making

After the EA is completed, the report needs to be communicated to the planning authority. The assessed EA requirements do not include requirements regarding the expertise of the planning authorities.¹²⁵ This is problematic because planning authorities often lack sufficient expertise

¹¹⁷GLASSON & THERIVEL, *supra* note 31, at 135.

¹¹⁸van der Zee, *supra* note 104.

¹¹⁹See generally Andrew J. Elliot & Markus A. Maier, *Color-in-context Theory*, 45 *ADVANCES EXPERIMENTAL SOC. PSYCH.* 61 (2012); Russell A. Hill & Robert A. Barton, *Red Enhances Human Performance in Contests*, 435 *NATURE* 293 (2005).

¹²⁰See generally Cathrine Jansson, Nigel Marlow & Matthew Bristow, *The Influence of Colour on Visual Search Times in Cluttered Environments*, 10 *J. MKTG. COMM'N* 183 (2004).

¹²¹See generally Karyn Pravossoudovitch, Francois Cury, Steve G. Young & Andrew J. Elliot, *Is Red the Colour of Danger? Testing an Implicit Red—Danger Association*, 57 *ERGONOMICS* 503 (2014); Atul B Borade, Satish V Bansod & Vivek R Gandhewar, *Hazard Perception Based on Safety Words and Colors: An Indian Perspective*, 14 *INT'L J. OCCUP. SAFETY & ERGONOMICS* 407 (2008); Curt C. Braun & N. Clayton Silver, *Interaction of Signal Word and Colour on Warning Labels: Differences in Perceived Hazard and Behavioural Compliance*, 38 *ERGONOMICS* 2207 (1995); Alphonse Chapanis, *Hazards Associated with Three Signal Words and Four Colours on Warning Signs*, 37 *ERGONOMICS* 265 (1994); L. J. Griffith & S. David Leonard, *Association of colors with warning signal words*, 20 *INT'L J. INDUS. ERGONOMICS* 317 (1997); S. David Leonard, *Does Color of Warnings Affect Risk Perception?*, 23 *INT'L J. INDUS. ERGONOMICS* 499 (1999).

¹²²See generally Tom Clarke & Alan Costall, *The Emotional Connotations of Color: A Qualitative Investigation*, 33 *COLOR RSCH. & APPLICATION* (2008).

¹²³See generally Laurence Jacobs, Charles Keown, Reginald Worthley & Kyung-II Ghymn, *Cross-cultural Colour Comparisons: Global Marketers Beware!*, 8 *INT'L MKTG. REV.* 21 (1991); Hannele Kauppinen-Räsänen & Harri T. Luomala, *Exploring Consumers' Product-Specific Colour Meanings*, 13 *INT'L J. QUALITATIVE MKT. RSCH.* 287 (2010); Thomas J. Madden, Kelly Hewett & Martin S. Roth, *Managing Images in Different Cultures: A Cross-National Study of Color Meanings and Preferences*, 8 *J. INT'L MKTG.* 90 (2000).

¹²⁴See generally Satyendra Singh, *Impact of Color on Marketing*, 44 *MGMT. DECISION* 783 (2006).

¹²⁵The requirements mostly focus on that a decision should be made impartially, that the EA report should be taken into account, and who should make the decision. The UNEP Goals states that the EA should be examined impartially prior to the decision. UNEP art. 6. The Espoo Convention stipulates that the Parties shall take due account of the outcome of the EA and the comments thereon received. UNEP art. 6. The SEA Protocol stipulates that each Party shall take the conclusions of the EA report into account when making a decision, as well as the measures to prevent, reduce or mitigate the adverse effected

to take an EA adequately into account in decision-making.¹²⁶ The non-technical summary discussed in Section D, subsection IV that is mandated by the UNEP Goals,¹²⁷ the Espoo Convention,¹²⁸ the SEA Protocol,¹²⁹ the ESF,¹³⁰ and the Equator Principles¹³¹ may be helpful to assist inexperienced planning authorities. Though non-technical summaries may oversimplify the issues and trade-offs involved,¹³² increasing the risk that planning authorities jump to conclusions, as mentioned in Section C. Furthermore, due to the communication value of colors and symbols, planning authorities may underestimate serious environmental concerns presented in purple or blue or lumped together with positive attributes with a plus symbol, as referenced in Section D, subsection IV.

To improve decision-making, expertise must be encouraged at the decision-making stage so that scoring grids do not influence inexperienced planning authorities in such a manner that underestimates environmental concerns. This could be done by encouraging or mandating the use of independent advisors at the decision-making stage.¹³³ Furthermore, to prevent those visual techniques from influencing planning authorities into underestimating environmental concerns, a list added as an Annex to the EA requirements—as proposed to improve public participation in Section D, subsection IV—would be helpful as well.

VI. Monitoring

Monitoring can be used to compare impacts predicted in an EA with those that occurred to assess whether the impact prediction performs satisfactorily.¹³⁴ As such, monitoring may improve learning. Learning may lead to fewer computational errors, quicker decisions, decreases the prevalence of strategies that lead to wrong solutions and increases the application of successful ones.¹³⁵ Learning may, thus, improve future environmental assessments and hence the extent to which proposed activities that are likely to have a significant effect on the environment are assessed before they are approved.

Monitoring is included in all examined EA requirements.¹³⁶ The ESF and the Equator Principles are, however, the only ones that refer to the importance of incorporating experts into the monitoring phase.¹³⁷ Such requirements could ensure a feedback loop if the same experts are used as those that predicted the environmental impact. Yet, this is not required by the ESF and the Equator Principles. Such a feedback loop is, however, important to improve EAs by introducing

identified in the EA report, and the comments received from public participation and the consultations with environmental and health authorities. UNEP art. 11. Under the ESF, the IFC's Performance Standards, and the Equator Principles the bank is responsible for making a decision that should be informed by the EA. EFS, *supra* note 90, at art. 1 ESS1 A.2; IFC Performance Standards, *supra* note 82; EQUATOR PRINCIPLES, *supra* note 82.

¹²⁶van der Zee, *supra* note 104; Council Directive 2001/42 of June 27, 2001, Study Concerning the Preparation of the Report on the Application and Effectiveness of the SEA Directive, 2001 O.J. (L 197) 30 (EC), https://ec.europa.eu/environment/eia/pdf/study_SEA_directive.pdf.

¹²⁷UNITED NATIONS ENVIRONMENT PROGRAMME, PANEL UNVEILS 10 GUIDING PRINCIPLES IN CAMPAIGN TO REVIVE THE EARTH PRINCIPLE 4 (2021).

¹²⁸Espoo Convention, app. II.

¹²⁹SEA Protocol, ann. IV.

¹³⁰ESF, *supra* note 90, at 25.

¹³¹EQUATOR PRINCIPLES, *supra* note 82, at 10.

¹³²GLASSON & THERIVEL, *supra* note 31, at 81.

¹³³See Netherlands Commission for Environmental Assessments (NCEA) (1987).

¹³⁴In this case, it is often referred to as environmental impact auditing. GLASSON & THERIVEL, *supra* note 31, at 173.

¹³⁵See generally Jörg Rieskam & Philipp E. Otto, *SSL: A Theory of How People Learn to Select Strategies*, 135 J. EXPERIMENTAL PSYCH. GEN. 207 (2006).

¹³⁶UNITED NATIONS ENVIRONMENT PROGRAMME, PANEL UNVEILS 10 GUIDING PRINCIPLES IN CAMPAIGN TO REVIVE THE EARTH PRINCIPLE 10 (2021); Espoo Convention art. 7; SEA Protocol, at 12; ESF, *supra* note 90, at 21–22; IFC's Performance Standard, para. 22; EQUATOR PRINCIPLES, *supra* note 82, at 9–10 (2020).

¹³⁷ESF, *supra* note 90; EQUATOR PRINCIPLES, *supra* note 82, at 7.

feedback to learn from experience and to avoid the constant ‘reinventing of the wheel’ in EAs.¹³⁸ Currently, there seems to be a lack of interest or awareness amongst those involved in the EA process of the value of monitoring: the EA process is often considered only to include the period before and until an activity is authorized is given.¹³⁹

E. Conclusion and Discussion

While insights on bounded rationality have been discussed extensively in the mid-twentieth century in planning theories that informed current EA processes, recent insights on bounded rationality have not yet been incorporated in studies analyzing the role of law in the EA process. This article provided a greater understanding of the role of bounded rationality in environmental decision-making as well as a deeper understanding of the potential of international law to improve the EA process.¹⁴⁰ It was found that cognitive and unconscious motivational biases are less likely to distort the EA process when (1) individuals knowledgeable about the decision—such as stakeholders, administrative bodies, and independent advisors—are gathered at the screening stage, if no thresholds are set beforehand, and at the scoping stage; and when (2) multiple experts with different points of view about hypotheses, alternative points of view, and who use different anchors, are incorporated at the scoping and prediction stage (e.g. by installing an independent advisory commission).¹⁴¹ Furthermore, it was found that a list added as an Annex in international EA requirements—stipulating good practice or requirements on visualizations—could reduce misuse of associations in the non-technical summary. Additionally, this article emphasized the importance of expertise in the EA process. To overcome a lack of expertise in the EA process strengthening monitoring practices, accreditation of experts, and review by independent advisors of the EA report, would be helpful.

These suggestions are generally not taken into account in the international law on EAs. This is problematic, because research shows that these insights are generally not considered in practice either.¹⁴² Because international EA requirements are often incorporated into existing domestic EA frameworks,¹⁴³ incorporating debiasing techniques already at the international stage may ultimately improve EA practice. Furthermore, incorporating these debiasing techniques in the regulations of lending institutions may improve EA practice more directly.

Incorporating these suggestions may of course increase initial costs of carrying out environmental studies and writing the EA, as well as costs for reviewing the EA and commenting on it, which are borne by planning authorities, (although these costs can often be charged to the initiator) and sometimes by the public.¹⁴⁴ These costs would, however, still be relatively low: the costs of a proper EA are estimated to be between a tenth of a percent to one percent of the total costs of the proposed activity.¹⁴⁵ Furthermore, the leading cause of delay of the EA

¹³⁸GLASSON & THERIVEL, *supra* note 31, at 174.

¹³⁹*Id.* at 171.

¹⁴⁰See Table 1 for an overview.

¹⁴¹See Dutch National Commission for Environmental Assessment, www.commissiemer.nl.

¹⁴²GLASSON & THERIVEL, *supra* note 31, at 85.

¹⁴³CRAIK, *supra* note 1, Chapter 2.

¹⁴⁴GLASSON & THERIVEL, *supra* note 31, at 85.

¹⁴⁵See generally Francois Retief & Bennett Chabalala, *The Cost of Environmental Impact Assessment (EIA) in South Africa*, 11 J. ENV'T ASSESS. POL'Y & MGMT. 51 (2009) Frans Oosterhuis, *Costs and Benefits of the EIA Directive: Final Report for DB Environment Under Specific Agreement* (2007), no. 07010401/2006/447175/FRA/G1, <https://ec.europa.eu/environment/eia/pdf/Costs%20and%20benefits%20of%20the%20EIA%20Directive.pdf>; COWI, Study concerning the report on the application and effectiveness of the EIA Directive (2009), Final report to the European Commission, DG ENV. Kongens Lyngby, Denmark, https://ec.europa.eu/environment/archives/eia/pdf/eia_study_june_09.pdf; GLASSON & THERIVEL, *supra* note 31, at 85.

Table 1. Biases and debiasing techniques in the assessed EA requirements

	Cognitive/unconscious motivational bias	Debiasing technique	Debiasing technique(s) included per legal instrument					Equator Principles
			UNEP	ESPOO	SEA	IFC	ESF	
Screening	WYSIATI of planning authority (PA)	Thresholds; Gathering individuals knowledgeable about decision in case-by-case examination	X	Thresholds	Thresholds	X	X	X
Prediction	Myopic problem representation bias; confirmation bias; optimism bias; anchoring bias in experts	Stimulating group interaction in nominal groups; Improve expertise; Using multiple experts with alternative points of view, different hypotheses, and different anchors; Monitoring; Feedback loop	Monitoring	Allows affected Parties to participate in the EA procedure; Monitoring	Scoping with agencies and public; Monitoring	Scoping with lending institution; Monitoring	Scoping with lending institution; Only qualified and experienced person may prepare the EA; Independent specialists must carry out EA for high and substantial risk projects or when initiator has limited capacity; the appropriate methods and tools needed to identify and assess the potential environmental and social risks and impacts of the proposed project must be identified by the initiator in consultations with the lending institution; Monitoring by experts	Scoping with lending institution; Independent Environmental and Social Consultant must carry out an independent review of the EA process to assist the Equator Principles Financial Institutions (EFPIs) due diligence and determination of Equator Principles compliance (only for high-risk projects and, if appropriate, substantial risk projects); Monitoring by experts
Decision-Making	Information overload; implicit association by PA	Non-technical summary; Advisory commission; List annexed to EA legislation prohibiting misuse of certain visualizations in non-technical summary	Non-technical summary	Non-technical summary	Non-technical summary	X	Non-technical summary	Non-technical summary
Public participation	Information overload; implicit association by public	Non-technical summary; List annexed to EA legislation prohibiting misuse of certain visualizations in non-technical summary	Non-technical summary	Non-technical summary	Non-technical summary	X	Non-technical summary	Non-technical summary

process and, hence, increased total costs, is where the EA does not provide adequate or relevant data, resulting in the need for supplementary information and, possibly, judicial review.¹⁴⁶ Good EA processes, that are not or only to a limited extent distorted by cognitive and unconscious motivational biases, can prevent such delays and lower the risk that future—and potentially costly—environmental impacts are overlooked.

¹⁴⁶Commission Directive, Evaluation of EU legislation—85/337/EEC (Environmental Impact Assessment, EIA) and associated amendments. Brussels: DG Enterprise and Industry; GLASSON & THERIVEL, *supra* note 31, at 86, 165–66.