

ARTICLE

Strengthening Environmental Decision Making through Legislation: Insights from Cognitive Science and Behavioural Economics

Eva van der Zee* 

First published online 4 May 2023

Abstract

The environmental assessment literature has neglected the distorting effect of cognitive and unconscious motivational biases (CUMB) in environmental assessment processes. This is problematic because CUMB are present in most, if not all, decision-making situations and can significantly distort decision-making processes. This article assesses how debiasing techniques are, or should be, incorporated in (supra)national environmental assessment legislation. The Dutch case study undertaken for this article shows that EU and Dutch legislation do not sufficiently incorporate debiasing techniques to ensure sound environmental decision making. Furthermore, the extent to which Dutch legislation incorporates debiasing techniques was found to be decreasing. Based on these findings, the article presents ways to incorporate debiasing techniques in environmental assessment legislation more generally, and in EU and Dutch legislation in particular.

Keywords: Environmental assessments, Expert decision making, Cognitive bias, Behavioural economics, European Union, the Netherlands

1. INTRODUCTION

The rationale behind environmental assessment (EA)¹ is that the impact of (potentially) environmentally harmful activities should be analyzed before authorization of an

* Institute of Law and Economics, Hamburg University, Hamburg (Germany).
Email: eva.leora.van.der.zee@uni-hamburg.de.

This article is part of the project ‘Law, Planning Theory, and Environmental Assessments’, which is funded by the Ideen- und Risikofonds of Hamburg University. Thanks to Anne van Aaken, Michael Faure, and anonymous *TEL* reviewers for helpful and insightful comments.
Competing interests: The author declares none.

¹ EA is used in this article as a portmanteau term for environmental impact assessment (EIA) and strategic environmental assessment (SEA). An EIA is carried out at the project stage, while a SEA is carried out at the planning stage. As CUMB may appear regardless of whether the assessment is carried out at the project or planning stage, the distinction is not relevant for this article.

activity (such as a plan, policy, programme, or project) is granted.² The value of EA in assessing environmental impact has been recognized by the European Union (EU),³ in the national legal systems of over one hundred countries,⁴ as well as by a large number of international conventions, protocols, and agreements.⁵ Furthermore, EA has been considered by the International Court of Justice (ICJ) as a requirement under general international law.⁶

EA is often considered a rationalist support mechanism for planning authorities when deciding on whether to approve a proposed activity.⁷ As such, it is assumed to provide an independent evaluation of all relevant information for planning authorities in reaching a decision to best achieve a chosen objective.⁸ Empirical insights show, however, that planning authorities are subject to cognitive and unconscious motivational

² N. Craik, *The International Law of Environmental Impact Assessment: Process, Substance and Integration* (Cambridge University Press, 2008), p. 2.

³ Art. 2 of Directive 2014/52/EU on the Assessment of the Effects of Certain Public and Private Projects on the Environment [2014] OJ L 124/1 (EIA Directive); Art. 1 of Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment [2001] OJ L 197/30 (SEA Directive); European Commission, *Interpretation of Definitions of Project Categories of Annex I and II of EIA Directive* (European Union, 2015), p. 5; Case C-287/98, *Linster*, 19 Sept. 2000, ECLI:EU:C:2000:468, para. 52; Case C-486/04, *Commission v. Italy*, 23 Nov. 2006, ECLI:EU:C:2006:732, para. 36; Case C-420/11, *Leth*, 14 Mar. 2013, ECLI:EU:C:2013:166, para. 28. European Commission, Directorate-General for Environment, *Implementation of Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment* (European Communities, 2004), p. 4.

⁴ See generally, Craik, n. 2 above; B. Sadler, *Environmental Assessment in a Changing World: Evaluating Practice to Improve Performance, International Study of the Effectiveness of Environmental Assessment – Final Report* (Canadian Environmental Assessment Agency, 1996); P. Sand, 'Information Disclosure', in J.B. Wiener et al. (eds), *The Reality of Precaution: Comparing Risk Regulation in the United States and Europe* (Routledge, 2011), pp. 499–617.

⁵ See, e.g., Convention on Wetlands of International Importance, Ramsar (Iran), 2 Feb. 1971, in force 21 Dec. 1975, available at: <https://treaties.un.org/doc/Publication/UNTS/Volume%20996/volume-996-I-14583-English.pdf>; United Nations Framework Convention on Climate Change (UNFCCC), New York, NY (United States (US)), 9 May 1992, in force 21 Mar. 1994, available at: <https://unfccc.int>; United Nations Convention on the Law of the Sea (UNCLOS), Montego Bay (Jamaica), 10 Dec. 1982, in force 16 Nov. 1994, available at: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf; Convention on Environmental Impact Assessment in a Transboundary Context, Espoo (Finland), 25 Feb. 1991, in force 10 Sept. 1997, available at: https://unece.org/DAM/env/eia/documents/legaltexts/Espoo_Convention_authentic_ENG.pdf; Protocol on Environmental Protection to the Antarctic Treaty, Madrid (Spain), 4 Oct. 1991, in force 14 Jan. 1998, available at: <https://treaties.un.org/doc/Publication/UNTS/Volume%202941/volume-2941-A-5778.pdf>; Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, Aarhus (Denmark), 25 June 1998, in force 30 Oct. 2001, available at: <https://unece.org/DAM/env/pp/documents/cep43e.pdf>.

⁶ ICJ, *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, Judgment, 20 Apr. 2010, *ICJ Reports* (2010), p. 14, at 82–3; *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)* and *Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica)*, Judgment, 16 Dec. 2015, *ICJ Reports* (2015), p. 655, at 706.

⁷ R.K. Morgan, 'Environmental Impact Assessment: The State of the Art' (2012) 30(1) *Impact Assessment and Project Appraisal*, pp. 5–14.

⁸ *Ibid.*; S. Kingston, V. Heyvaert & A. Čavoški, *European Environmental Law* (Cambridge University Press, 2017), pp. 381–2; C. Jones, S. Jay & P. Slinn, 'Environmental Assessment: Dominant or Dormant?', in J. Holder & D. McGillivray (eds), *Taking Stock of Environmental Assessment: Law, Policy and Practice* (Routledge-Cavendish, 2007), pp. 17–44, at 35–7.

bias (CUMB) when they process information,⁹ including the kind of information contained in EAs. Cognitive biases are a systematic discrepancy between the ‘correct’ answer in a judgmental task, given by a formal normative rule, and the decision maker’s actual answer to such task. Unconscious motivational biases are those in which judgments are unconsciously influenced by the (un)desirability of events, consequences, outcomes, or choices.¹⁰

Furthermore, planning authorities are not the only ones involved in the EA process. Consultancy firms often write EA reports, sometimes in consultation with the public and advisers, to inform planning authorities of environmental impacts.¹¹ Research shows that these actors also suffer from CUMB, even when they are experts.¹² As a result, CUMB may, through various ways, distort the capacity of EAs to guide planning authorities to take environmental effects duly into account in decision making.

Public and judicial review are often regarded as the best ways to prevent planning authorities from making decisions that do not take environmental effects duly into account.¹³ However, the public, as well as the judiciary,¹⁴ have been found to be subject to CUMB as well.¹⁵ As such, public and judicial review may not be sufficiently effective to prevent or correct decisions where environmental concerns are not duly taken into account. For example, empirical studies indicate that people systematically make decisions based on whether they are capable of constructing a coherent story, regardless of the amount and quality of the data on which the story is based.¹⁶ As public and judicial review feed off the information generated by the EA and communicated in the EA report, the quality of EA processes needs to be as high as possible.

A rich body of scholarship already exists on how EA processes could be improved.¹⁷ This literature often draws upon multidisciplinary research in related fields of planning, psychology, economics, policy analysis and political science in the interest of theory building.¹⁸ The studies that draw from the broad field of behavioural science generally

⁹ Morgan, n. 7 above; C. Dunlop & C. Radaelli, ‘Overcoming Illusions of Control: How to Nudge and Teach Regulatory Humility’, in A. Alemanno & A.S. Sibony (eds), *Nudge and the Law* (Bloomsbury, 2015), pp. 139–58, at 141; G. Wood & J. Becker, ‘Discretionary Judgement in Local Planning Authority Decision Making: Screening Development Proposals for Environmental Impact Assessment’ (2005) 48(3) *Journal of Environmental Planning and Management*, pp. 349–71.

¹⁰ G. Montibeller & D. von Winterfeldt, ‘Cognitive and Motivational Biases in Decision and Risk Analysis’ (2015) 35(7) *Risk Analysis*, pp. 1230–51, at 1233.

¹¹ J. Glasson & R. Therivel, *Introduction to Environmental Impact Assessment* (Taylor & Francis, 2019), pp. 18–20.

¹² Montibeller & von Winterfeldt, n. 10 above, p. 1233.

¹³ J. Rachlinski & C. Farina, ‘Cognitive Psychology and Optimal Government Design’ (2002) 87(2) *Cornell Law Review*, pp. 549–615, at 551.

¹⁴ Ibid.; B. Englich, T. Mussweiler & F. Strack, ‘Playing Dice with Criminal Sentences: The Influence of Irrelevant Anchors on Experts’ Judicial Decision Making’ (2006) 32(2) *Personality and Social Psychology Bulletin*, pp. 188–200.

¹⁵ Morgan, n. 7; above; Wood & Becker, n. 9 above.

¹⁶ D. Kahneman, *Thinking Fast and Slow* (Farrar, Straus and Giroux, 2011), pp. 85–6.

¹⁷ The EA literature is a highly developed, international field with many dedicated journals (e.g., *Environmental Impact Assessment Review*), textbooks, and evaluation studies about performance.

¹⁸ Some examples include F. Retief et al., ‘Exploring the Psychology of Trade-Off Decision-Making in Environmental Impact Assessment’ (2013) 31(1) *Impact Assessment and Project Appraisal*, pp. 13–23; R.V. Bartlett & P.A. Kurian, ‘The Theory of Environmental Impact Assessment: Implicit Models

focus on research on bounded rationality. These studies argue that planning authorities face ambiguous and poorly defined problems, limited time, skills and resources, as well as incomplete information about alternatives, the baseline, consequences of supposed alternatives, range of values, preferences, and interests.¹⁹ In this context, the concept of satisficing has been widely discussed in EA scholarship.²⁰

However, the EA literature has neglected more recent insights from behavioural science almost completely, most notably the insights on CUMB. This is problematic because CUMB are hard-wired and are therefore present in most, if not all, decision-making situations.²¹ Nevertheless, many scholars emphasize the distorting effects of political bias in EA.²² While political biases are indeed often found to be the predominant behavioural bias in major consequential decisions and projects,²³ experimental psychologists have shown that political bias directly amplifies CUMB. For example, powerful people are affected more strongly by CUMB than the less powerful.²⁴ Moreover, those affected by CUMB tend not to be aware of this and often blame unexpected outcomes on political bias or issues outside their control.²⁵

of Policy Making' (1999) 27(4) *Policy and Politics*, pp. 415–33; D.P. Lawrence, 'Planning Theories and Environmental Impact Assessment' (2000) 20(6) *Environmental Impact Assessment Review*, pp. 607–25; T. Nitz & A.L. Brown, 'SEA Must Learn How Policy-Making Works' (2001) 3(3) *Journal of Environmental Assessment Policy and Management*, pp. 329–42; M. Nilsson & H. Dalkmann, 'Decision Making and Strategic Environmental Assessment' (2001) 3(3) *Journal of Environmental Assessment Policy and Management*, pp. 305–27; L. Kørnøv & W.A.H. Thissen, 'Rationality in Decision- and Policy-Making: Implications for Strategic Environmental Assessment' (2000) 18(3) *Impact Assessment and Project Appraisal*, pp. 191–200.

¹⁹ J. Forester, 'Bounded Rationality and the Politics of Muddling Through' (1984) 44(1) *Public Administration Review*, pp. 23–31, at 23–4; Montibeller & von Winterfeldt, n. 10 above; E. Holden, 'Planning Theory: Democracy or Sustainable Development? Both (But Don't Bother About the Bread, Please)' (1998) 15(4) *Scandinavian Housing and Planning Research*, pp. 227–47; A. Bond et al., 'A Game Theory Perspective on Environmental Assessment: What Games Are Played and What Does This Tell Us about Decision Making Rationality and Legitimacy?' (2016) 57 *Environmental Impact Assessment Review*, pp. 187–94; A. Bond et al., 'Explaining the Political Nature of Environmental Impact Assessment (EIA): A Neo-Gramscian Perspective' (2020) 244 *Journal of Cleaner Production*, pp. 46–53; 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; Kørnøv & Thissen, n. 18 above.

²⁰ 'Satisficing' means that individuals in an organization such as a planning authority, when confronted with decision making under uncertainty, choose alternatives that are 'good enough' in the light of available information and goals, rather than strive to achieve the optimal decision: Bartlett & Kurian, n. 18 above; Morgan, n. 7 above; Wood & Becker, n. 9 above; H.A. Simon, 'A Behavioral Model of Rational Choice' (1955) 69(1) *The Quarterly Journal of Economics*, pp. 99–118; H. Simon, 'Rational Choice and the Structure of the Environment' (1956) 63 *Psychological Review*, pp. 129–38.

²¹ For an overview, see B. Flyvbjerg, 'Top Ten Behavioral Biases in Project Management: An Overview' (2021) 52(6) *Project Management Journal*, pp. 531–46.

²² *Ibid.*; Bond et al. (2020), n. 19 above; G. Gigerenzer, 'The Bias Bias in Behavioral Economics' (2018) 5(3–4) *Review of Behavioral Economics*, pp. 303–36, at 324.

²³ Flyvbjerg, n. 21 above; Montibeller & von Winterfeldt, n. 10 above, p. 1231.

²⁴ M. Weick & A. Guinote, 'When Subjective Experiences Matter: Power Increases Reliance on the Ease of Retrieval' (2008) 94(6) *Journal of Personality and Social Psychology*, pp. 956–70; C. Anderson & A.D. Galinsky, 'Power, Optimism, and Risk-Taking' (2006) 36(4) *European Journal of Social Psychology*, pp. 511–36, at 529; A. Guinote & T.K. Vescio, *The Social Psychology of Power* (Guilford Press, 2010).

²⁵ B. Flyvbjerg, M.K. Skamris Holm & S.L. Buhl, 'How (In)accurate Are Demand Forecasts in Public Works Projects? The Case of Transportation' (2005) 71(2) *Journal of the American Planning Association*, pp. 131–46, at 138–40.

So far, only a few studies have focused on insights into CUMB in EA generally, and EA legislation more specifically. These studies provide insights into the practice of sustainability assessments, a deeper understanding of its effectiveness in trade-off decision making,²⁶ as well as how insights into CUMB could be integrated into the international law of EA.²⁷ This article takes a different approach by assessing how debiasing techniques are, or should be, incorporated at the (supra)national level to debias CUMB in the EA process.

This study is timely as jurisdictions have been or are currently reducing legal requirements in the EA process, known as ‘streamlining’.²⁸ These streamlining efforts often reduce the requirements of three important debiasing techniques: (i) strengthening expertise, (ii) nominal group decision making, and (iii) frequent feedback loops. These debiasing techniques are important because they tackle a few instances of CUMB that frequently appear in decision-making processes, most notably:

- *WYSIATI* (‘what you see is all there is’) refers to the observation that people construct opinions based on presented information, even if they are aware that that information is biased or one-sided.²⁹ To make matters worse, those confronted with biased or one-sided information are more confident about their conclusions than those confronted with balanced information.³⁰ This cognitive bias could, for example, lead planning authorities to decide in favour of a polluting activity presented positively by the initiator of a plan or project.
- The *overconfidence* bias occurs when the decision maker provides estimates for a given parameter above the actual performance or when the range of variation they provide is too narrow.³¹ This cognitive bias could occur, for example, at the EA preparation stage when an expert is asked to provide a probability distribution.
- The *confirmation* bias occurs when there is a desire to confirm one’s belief, leading to unconscious selectivity in the acquisition and use of evidence.³² This motivational bias could, for example, unconsciously lead planning authorities to fail to take all relevant alternatives adequately into account in the EA process.

²⁶ Retief et al., n. 18 above; F. Retief et al., ‘Key Learnings from Psychology for Sustainability Assessment’, in A. Morrison-Saunders, J. Pope & A. Bond (eds), *Handbook of Sustainability Assessment* (Edward Elgar, 2015), pp. 403–24; Kørnøv & Thissen, n. 18 above.

²⁷ E. van der Zee, ‘How Insights on Bounded Rationality Could Inform the International Law of Environmental Assessments’ (2022) 23(3) *German Law Journal*, pp. 395–412. On the international law of EA more generally see Craik, n. 2 above.

²⁸ A. Bond et al., ‘Impact Assessment: Eroding Benefits through Streamlining?’ (2014) 45 *Environmental Impact Assessment Review*, pp. 46–53; K.D. Jesse, ‘Een Hernieuwd Perspectief of Milieueffectenrapportage: Over de Inhoudelijke Invloed van M.E.R. op de Besluitvorming en Enkele Mogelijkheden ter Flexibilisering’ (Ph.D. thesis, Tilburg University, Tilburg (The Netherlands), 27 June 2008), p. 178; TK 2004-2005, 29 383, nr. 25, pp. 1–2.

²⁹ Kahneman, n. 16 above, p. 264; L.A. Brenner, D.J. Koehler & A. Tversky, ‘On the Evaluation of One-Sided Evidence’ (1996) 9(1) *Journal of Behavioral Decision Making*, pp. 59–70.

³⁰ Brenner, Koehler & Tversky, n. 29 above.

³¹ Montibeller & von Winterfeldt, n. 10 above.

³² R.S. Nickerson, ‘Confirmation Bias: A Ubiquitous Phenomenon in Many Guises’ (1998) 2(2) *Review of General Psychology*, pp. 175–220.

- The *optimism* bias occurs when the desirability of an outcome leads to an increase in the extent to which it is expected to occur.³³ This motivational bias could lead decision makers unconsciously to underestimate the environmental impact of an activity.

The efforts to streamline EA legislation are especially problematic when non-legal means are not sufficiently effective in coordinating human behaviour to overcome CUMB in the EA process. Introducing legal means, then, can be helpful in influencing individual and state behaviour as a result of possible sanctions imposed (such as fines, requirements for supplementary assessments, or reputation damage caused by transparency requirements).³⁴ Furthermore, even without sanctions, legal means can have an expressive effect. Empirical studies confirm that actors tend to internalize values expressed by law and obey out of internal respect for the law.³⁵ Legal means can also provide a focal point, creating a social norm around which actors can coordinate their behaviour.³⁶

This article adopts an exploratory research design, taking the Netherlands as a case study, to understand whether EA legislation at the (supra)national level incorporates sufficient debiasing techniques and whether further legislation is needed. The Netherlands served as a case study for three reasons. Firstly, formally introduced in 1987,³⁷ the EA process is well established in the Netherlands and is often considered a frontrunner in good EA practices and legislation.³⁸ Its requirements often exceeded the requirements of the EU Directives, which set the minimum requirements for EA in the EU. Secondly, the Netherlands, being a Member State of the EU, has to comply with the two main EU Directives regulating EA in the EU: the EIA and the SEA Directives.³⁹ As such, the case study provides insight into how the EU Directives are implemented at the Member State level. Thirdly, since 2005, a clear trend has been visible where the Netherlands is increasingly streamlining its legal requirements to make them similar to the minimum requirements set by EU legislation on EAs.⁴⁰ Many other jurisdictions have also streamlined legal requirements in the EA process.⁴¹ A behavioural explanation for this is that minimum legal standards, such as those set by the EU, run the

³³ R.L. Dillon, R. John & D. von Winterfeldt, 'Assessment of Cost Uncertainties for Large Technology Projects: A Methodology and an Application' (2002) 32(4) *Interfaces*, pp. 52–66.

³⁴ O.E. Williamson, *Markets and Hierarchies: Analysis and Antitrust Implications: A Study in the Economics of Internal Organization* (Free Press, 1975).

³⁵ R. Cooter, 'Expressive Law and Economics' (1998) 27(S2) *The Journal of Legal Studies*, pp. 585–607, at 589; R. Cooter, 'Do Good Laws Make Good Citizens? An Economic Analysis of Internalized Norms' (2000) 86(8) *Virginia Law Review*, pp. 1577–601.

³⁶ R.H. McAdams, 'A Focal Point Theory of Expressive Law' (2000) 86(8) *Virginia Law Review*, pp. 1649–729.

³⁷ Besluit Milieueffectrapportage, 20 May 1987, *Staatsblad* 1987.

³⁸ C. Wood, *Environmental Impact Assessment: A Comparative Review* (Routledge, 2003), pp. 64–8.

³⁹ See n. 3 above.

⁴⁰ Jesse, n. 28 above, p. 178; TK 2004-2005, 29 383, nr. 25, n. 28 above, pp. 1–2. The Netherlands is currently streamlining its environmental legislation, which includes legislation on EAs. The exact date of the entry into force of the new legislation has been changed 5 times, the most recent date being 1 Jan. 2024; see Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 'Voortgangsbrieff implementatie Omgevingswet januari 2023', 26 Jan. 2023.

⁴¹ Bond et al., n. 28 above.

risk of being considered as ‘anchors’ to which no further effort is required, thereby possibly weakening Member State motivation to take additional measures.⁴² Insights into how the EU could improve its EA legislation to ensure a baseline of good EA practices, leaving a role for Member States to put new and better practices into place, is therefore needed. As such, this case study provides preliminary insights into whether streamlining could adversely affect the emergence of CUMB in the EA process, and whether the minimum requirements set by EU legislation on EAs are sufficient to overcome CUMB.

To achieve the aim, this article, firstly, explains the methodology (Section 2). Section 3 then provides a brief overview of the various elements of an EA that are often mandated by EA legislation, focusing in particular on EU and Dutch legislation. Section 4 explains the three debiasing techniques studied in this article in depth in three subsections: expertise (4.1), group decision making (4.2), and feedback loops (4.3). Each subsection focuses on how these debiasing techniques are incorporated into EU and Dutch legislation as well as in practice (drawing from existing studies as well as from the case study). Recommendations on how to strengthen these debiasing techniques – through EA legislation more generally, and EU and Dutch law specifically – are presented at the end of each subsection. Section 5 concludes and provides avenues for further research.

2. METHODOLOGY

A case study design was chosen as it allows an in-depth analysis of a specific phenomenon in its local context.⁴³ Furthermore, a case study design is especially suitable for exploratory research, in which understanding is the primary objective, and the phenomenon under investigation is difficult to quantify, not well understood and needs to be studied.⁴⁴ Data for the case study was gathered through (i) the analysis of academic literature, relevant law and policy documents, as well as authoritative court texts; and (ii) semi-structured interviews in December 2019 with 11 actors involved in the Dutch EA process.⁴⁵

The interviews were aimed at obtaining a deeper understanding of the EA process, especially whether non-legal debiasing techniques were used in practice to sufficiently overcome CUMB (arguably making further legislation redundant). Textual data was collected using a comprehensive search for articles and books through several databases, such as Web of Science, GoogleScholar, Curia, the jurisprudence database of

⁴² A. van Aaken & T. Broude, ‘The Choice Architecture of International Law-Making for Global Public Goods: Behavioural Insights’, Think Piece prepared for the Expert Roundtable on Behavioural Science and the Governance of Global Public Goods, 4 Apr. 2022 (on file with the author); W.W. Buzbee, ‘Asymmetrical Regulation: Risk, Preemption, and the Floor/Ceiling Distinction’ (2007) 82(6) *New York University Law Review*, pp. 1547–619.

⁴³ R.K. Yin, *Case Study Research and Applications: Design and Methods*; (SAGE, 2017); B. Flyvbjerg, ‘Five Misunderstandings about Case-Study Research’ (2006) 12(2) *Qualitative Inquiry*, pp. 219–45.

⁴⁴ *Ibid.*

⁴⁵ See the [Appendix](#) in the online Supplementary Materials for the interview guide.

the Netherlands Commission for EA (NCEA), and online libraries. Search words included ‘environmental (impact) assessment’, ‘strategic environmental assessment’, ‘EIA Directive’, ‘SEA Directive’, together with ‘cognitive bias’, ‘motivational bias’, ‘bounded rationality’, ‘human decision making’ and ‘expert decision making’, as well as the Dutch translation of these search terms. Snowballing was used to find additional literature, relevant law and policy documents, and court texts.⁴⁶

The interviewees were selected based on the parties mentioned in the EIA Directive, the SEA Directive, and Dutch EA legislation. Interviewees were identified using snowball sampling techniques, and were selected based on their expertise, role, and practical experience with the EU and Dutch EA processes. The interviewees were four government employees at the local, regional, and state levels (acting as authority or initiator), four consultants from consultancy firms of small, medium, and large capacity involved in EA report preparation; one government employee of the Directorate-General for the Environment of the European Commission responsible for EA implementation by the EU Member States, and two employees of the NCEA. The interviews were held one-on-one at the office of the interviewee and lasted for about 60 minutes.

An open-ended theory-building approach was used, which started during the data collection stage and involved several iterative cycles.⁴⁷ The data analysis involved coding, categorizing, and abstracting to higher-level concepts.⁴⁸ A concept-driven approach was used, where data is reported based on the relevance for understanding whether expertise, nominal group decision making, and feedback loops are sufficiently stimulated in the EA process. All data passages that were informative in terms of understanding where CUMB may play a role in the EU and Dutch EA processes or where debiasing techniques are used were coded in MAXQDA (See the [Appendix](#) in the online Supplementary Materials). During the data analysis, I constantly iterated back and forth between the textual and interview data.

An important limitation of qualitative research, such as case studies and semi-structured interviews, is that of double hermeneutics: the researcher may influence the people or the topic being studied and the other way around.⁴⁹ Reflexivity is generally understood as awareness of this double hermeneutics.⁵⁰ To reduce the possibility that my biases and hypotheses influenced the interviewees, I avoided words such as ‘psychology’, ‘cognitive’, ‘rational’, ‘tunnel vision’ or ‘behavioural’ during the interviews and in any prior correspondence. Instead, I focused on prompting, probing and encouraging the interviewees to share their views of their experience with EA by

⁴⁶ C. Noy, ‘Sampling Knowledge: The Hermeneutics of Snowball Sampling in Qualitative Research’ (2008) 11(4) *International Journal of Social Research Methodology*, pp. 327–44.

⁴⁷ A. Strauss & J. Corbin, *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory* (SAGE, 1998).

⁴⁸ D.A. Gioia, K.G. Corley & A.L. Hamilton, ‘Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology’ (2012) 16(1) *Organizational Research Methods*, pp. 15–31.

⁴⁹ J.F. Gilgun, ‘Lived Experience, Reflexivity, and Research on Perpetrators of Interpersonal Violence’ (2008) 7(2) *Qualitative Social Work*, pp. 181–97.

⁵⁰ B. Probst, ‘The Eye Regards Itself: Benefits and Challenges of Reflexivity in Qualitative Social Work Research’ (2015) 39(1) *Social Work Research*, pp. 37–48; L.M. Brogden, ‘Double Hermeneutic’, in A.J. Mills, G. Durepos & E. Wiebe (eds), *Encyclopedia of Case Study Research* (SAGE, 2010), pp. 322–4.

asking them to give concrete examples of EAs that they thought went well or not so well, followed by questions on why they thought this was the case.

3. A BRIEF OVERVIEW OF ENVIRONMENTAL ASSESSMENT LEGISLATION

Most EA legislation includes requirements on screening, scoping, EA report preparation, review, decision making, and follow-up. These requirements will be explained briefly below, including more specific requirements at the EU and Dutch levels. A simplified overview of the requirements common to EU and Dutch legislation is provided in [Figure 1](#) and below.

The step that precedes most EAs, *screening*, serves to determine whether a proposed activity requires further identification and prediction of environmental impacts through an EA.⁵¹ Most EA legislation, including EU and Dutch law, include two approaches to screening: case-by-case examination, and thresholds. The planning authority is responsible for undertaking one of these approaches depending on the characteristics of the proposed activity.

Case-by-case examination involves the appraisal of the characteristics of activities against a checklist of criteria.⁵² The use of thresholds involves placing activities in categories and setting thresholds for each activity (for example, relating to scale, anticipated impacts, or location).⁵³ Dutch legislation specifies an exhaustive list, based on the mandatory lists provided by the EU,⁵⁴ for activities that meet certain thresholds which always require an EA.⁵⁵ Dutch law requires a case-by-case examination for those activities not meeting the thresholds of the positive lists by the authority.⁵⁶

If an EA is warranted, the process may start with *scoping*, which may be undertaken by the initiator and the planning authority. During scoping, the content and extent of the matters to be covered in the EA are specified before the environmental impacts are predicted.⁵⁷ Following identification of possible environmental impacts (by the initiator of the plan or project, or through a scoping process) prediction of likely environmental impacts is required in *preparing the EA report*. Consultancy firms usually conduct the preparation of EA reports.

The public is typically empowered to *review* the final EA report.⁵⁸ Some jurisdictions, such as the Netherlands and Canada, also mandate expert review of the final EA report. The Canadian approach, whereby a panel appointed by the Ministry of the Environment is mandated to review the final EA report, inspired the establishment

⁵¹ Wood & Becker, n. 9 above, pp. 352–3; Craik, n. 2 above, p. 133.

⁵² Glasson & Therivel, n. 11 above, p. 86.

⁵³ *Ibid.*

⁵⁴ For projects: Annex I EIA Directive; for plans: Art. 3(2) SEA Directive.

⁵⁵ *Besluit Milieueffectrapportage 1987*, n. 37 above, C and D lists.

⁵⁶ Annex III EIA Directive; Annex II SEA Directive; *Wet Milieubeheer (Wm)*, s. 7.16.

⁵⁷ Glasson & Therivel, n. 11 above, p. 88.

⁵⁸ For projects to the public concerned: Art. 6(3)(b) EIA Directive, *Algemene Wet Bestuursrecht (Awb)*, s. 3.4; for plans to the public: Arts 6(1)–(2) SEA Directive, s. 3.4 *Awb*.

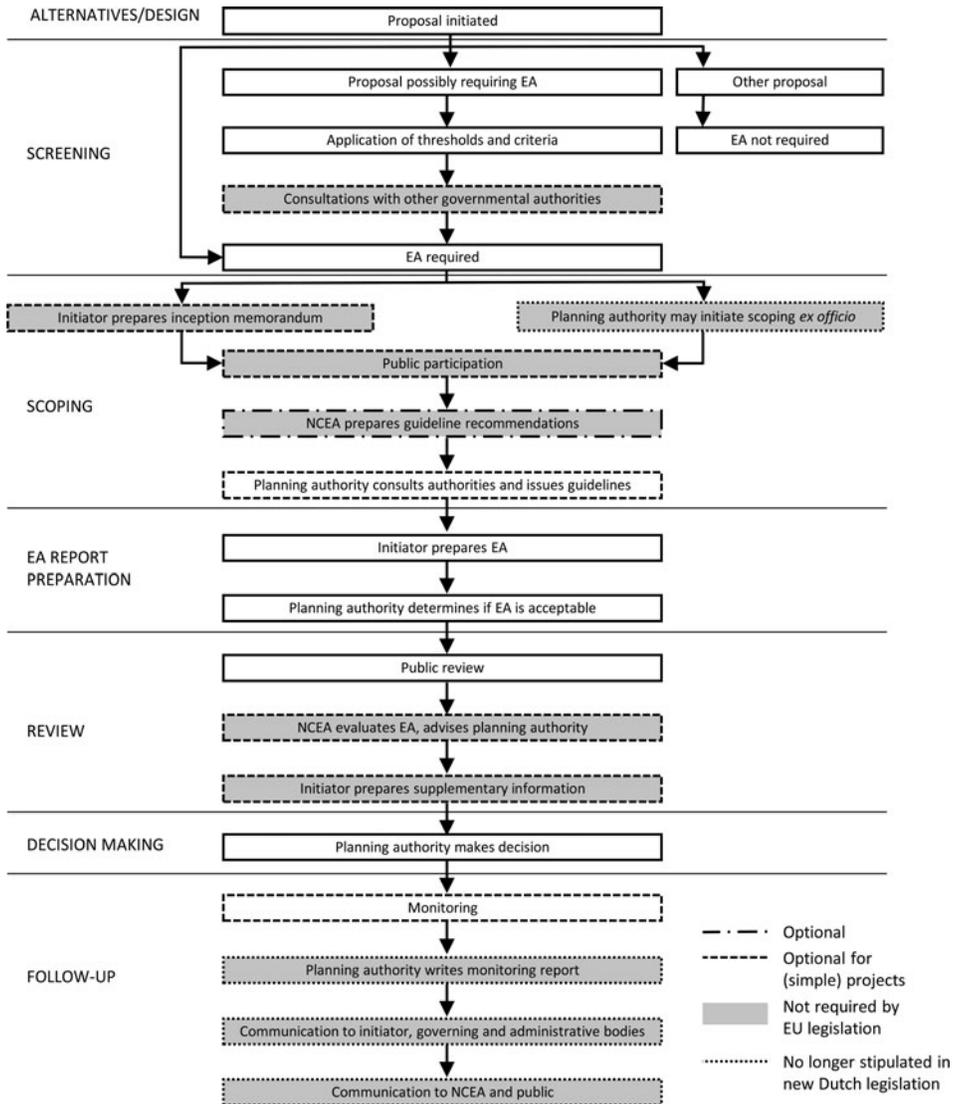


Figure 1. Main Steps in EU and Dutch Legislation on EA

Source: Adapted from C. Wood, *Environmental Impact Assessment: A Comparative Review* (Routledge, 2014), Chs 3 and 5.

of the NCEA in the Netherlands.⁵⁹ The NCEA is a permanent independent foundation responsible for monitoring the scientific quality of EA reports in the Netherlands. Upon request, the NCEA assembles an ad hoc working group of university professors,

⁵⁹ Although Canada inspired the establishment of the NCEA, the Canadian approach differs in that the panel is appointed by the Ministry of the Environment: Tweede Kamer der Staten Generaal (1984), ‘Uitbreiding van de Wet Algemene Bepalingen Milieuhygiëne’, 16 814, p. 11; An Act to Enact the Impact Assessment Act and the Canadian Energy Regulator Act, to Amend the Navigation Protection Act and to Make Consequential Amendments to Other Acts, S.C. 2019, c. 28, Art. 36(1).

research institutes, and consultancy firms to monitor the scientific quality of a specific EA report.⁶⁰ Once established, the working group may give, and is sometimes mandated to give non-binding advice throughout the EA process.

Thereafter, the EA report is communicated to the planning authority to *decide* on the authorization of the activity. The final step in the EA process is *follow-up*, which usually consists of monitoring, evaluation, management, and communication.⁶¹ *Monitoring* involves the measuring and recording of physical, social, and economic variables associated with development impacts.⁶² *Evaluation* compares impacts predicted in an EA with those that occur after development consent is given in order to assess whether the impact prediction performs satisfactorily.⁶³ *Management* refers to taking appropriate action in response to issues raised from the monitoring and auditing activities.⁶⁴ Finally, *communication* informs stakeholders of the results of the EA monitoring, evaluation, and management activities.⁶⁵

4. INTRODUCING DEBIASING TECHNIQUES INTO EA LEGISLATION

This section explains three debiasing techniques and their application to EA in depth: expertise (4.1), group decision making (4.2) and feedback loops (4.3). Each subsection starts with an explanation of the specific debiasing technique, followed by how the debiasing technique is incorporated into EU and Dutch legislation and operates in practice. Each subsection concludes with recommendations on how to strengthen the relevant debiasing technique in EA legislation generally, and EU and Dutch legislation specifically.

4.1. *Debiasing Technique 1: Strengthening Expertise*

Strengthening expertise explained

Research from cognitive science and behavioural economics shows that experts (those who by training and experience have more knowledge than the general population)⁶⁶ are superior to novices in nearly every aspect of cognitive functioning, from memory and learning to problem solving and reasoning.⁶⁷ Experts often show high,

⁶⁰ Commissie MER (2018), 'Protocol Onafhankelijkheid'.

⁶¹ J. Arts, P. Caldwell & A. Morrison-Saunders, 'Environmental Impact Assessment Follow-Up: Good Practice and Future Directions: Findings from a Workshop at the IAIA 2000 Conference' (2001) 19(3) *Impact Assessment and Project Appraisal*, pp. 175–85; Glasson & Therivel, n. 11 above, p. 172; A. Morrison-Saunders et al., 'Reflecting on, and Revising, International Best Practice Principles for EIA Follow-Up' (2021) 89 *Environmental Impact Assessment Review*, article 106596, pp. 1–10.

⁶² Glasson & Therivel, n. 11 above, p. 173;

⁶³ Ibid.; R. Buckley, 'Auditing the Precisions and Accuracy' (1991) 18 *Environmental Monitoring Assessment*, pp. 1–23.

⁶⁴ R. Marshall, J. Arts & A. Morrison-Saunders, 'Principles for EIA Follow-Up: International Principles for Best Practice EIA Follow-Up' (2005) 23(3) *Impact Assessment and Project Appraisal*, pp. 175–81.

⁶⁵ Glasson & Therivel, n. 11 above, p. 173.

⁶⁶ Rachlinski & Farina, n. 13 above, p. 558.

⁶⁷ J.R. Anderson, *Cognitive Skills and Their Acquisition* (Erlbaum, 1981); J. Shanteau, 'Competence in Experts: The Role of Task Characteristics' (1992) 53(2) *Organizational Behavior and Human*

outstanding, and exceptional performance that is domain-specific, stable over time, and related to experience and practice.⁶⁸

When planning authorities are inexperienced with EAs they may have more difficulty in interpreting existing scientific evidence and they may be more likely to suffer from WYSIATI ('what you see is all there is') at all stages of the EA process.⁶⁹ This may lead planning authorities to conclude that an EA is not needed, even though it should be (or the other way around), or to conclude that a biased EA report is adequate to inform decision making. In addition, when consultancy firms lack experience they may not deliver sound EA reports.

Requirements on expertise in EU and Dutch legislation

EU legislation, most notably the EIA Directive, sets requirements for expertise, in that it obliges planning authorities to have (access to) sufficient expertise in examining the EA report.⁷⁰ However, it is not clarified what 'sufficient expertise' entails; hence, it is the Member States that decide when authorities have (access to) sufficient expertise. The Netherlands strengthens expertise through NCEA review,⁷¹ which currently is required only for the final EA report for plans and complex projects.⁷² Requirements on mandatory NCEA review will be further stripped down with the entry into force of the new Dutch legislation on EA (Figure 1),⁷³ which will no longer mandate NCEA review for complex projects.⁷⁴

Decision Processes, pp. 252–66; M.T.H. Chi, 'Two Approaches to the Study of Experts' Characteristics', in K.A. Ericsson et al. (eds), *The Cambridge Handbook of Expertise and Expert Performance* (Cambridge University Press, 2006), pp. 21–30; B. Herbig & A. Büssing, 'The Role of Explicit and Implicit Knowledge in Work Performance' (2004) 46(4) *Psychology Science*, pp. 408–32; Rachlinski & Farina, n. 13 above, p. 558–61.

⁶⁸ B. Herbig & A. Gloeckner, 'Experts and Decision Making: First Steps towards a Unifying Theory of Decision Making in Novices, Intermediates and Experts' (2009) *Max Planck Institute for Research on Collective Goods Research Paper Series*, pp. 1–29, at 2; referred to by Kahneman as a 'collection of skills': Kahneman, n. 16 above, p. 241.

⁶⁹ Herbig & Gloeckner, n. 68 above, p. 2.

⁷⁰ Art. 5(3a) EIA Directive.

⁷¹ European Commission, Proposal for a Directive of the European Parliament and of the Council amending Directive 2011/92/EU on the Assessment of the Effects of Certain Public and Private Projects on the Environment 2012/0297, 26 Oct. 2012, COM(2012) 628 final.

⁷² Plans are subject to preparation and/or adoption by an authority at the national, regional or local level, or when it is prepared by an authority for adoption, through a legislative procedure by Parliament or the government, and which are required by legislative, regulatory or administrative provisions. A project is complex when the authority is also the initiator of the project. Furthermore, a project can be considered a complex project when it requires an assessment under the Nature Protection Act for Natura 2000 areas, a network of protected areas in all Member States of the EU. Other types of project are usually considered simple projects: Art. 2 SEA Directive; Joined Cases C-105/09 and 110/09, *Terre Wallone and Inter-Environnement Wallonie*, 17 June 2010, ECLI:EU:C:2010:355, para. 41; Case C-567/10, *Inter-Environnement Bruxelles and Others*, 22 Mar. 2012, ECLI:EU:C:2012:159, para. 31; ss. 7.12, 7.38 Wm.

⁷³ Ministerie van Buitenlandse Zaken en Koninkrijksrelaties, n. 40 above.

⁷⁴ 'Aan de Slag met de Omgevingswet', available at: <https://aandeslagmetdeomgevingswet.nl/regelgeving/instrumenten/milieueffectrapportage/verandert-mer>.

Expertise in EA practice

Sufficient expertise is often lacking in practice. For example, EU Member States report challenges regarding the expertise of authorities in preparing EAs of good quality.⁷⁵ As was found in the empirical data collected for this study, a government employee of the European Commission said:

If you are a municipality of medium level or a small region in a specific Member State, you may not have all the capacity to make a good decision. So, this is an issue in general, especially when Member States are not well equipped or if your personnel is cut and you don't you have dedicated persons to do something.

Interviews with the Dutch authorities confirmed this concern. For example, a governmental employee at the state level shared:

An EA often fails because a specific EA is not conducted that often. If you only have an EA regarding that theme every other year it is all new and unknown, which makes the risk for mistakes higher. Also, the authority is often somebody who has to decide on an EA only very irregularly.

In addition to the lack of expertise on the part of planning authorities, the technical knowledge and experience of the experts who predict the environmental impacts (often consultancy firms) are also often lacking.⁷⁶ The interviewees also frequently questioned their expertise. For example, a governmental employee at the regional level noted the problems experienced by EA consultancy firms in delivering sound EAs based on a lack of expertise:

Year after year, EA consultancy firms have more problems delivering EAs in which they see the linkages between the different components. This is not only because the world is becoming more complex; it is also because the consultants lack expertise.

Recommendations for incorporating expertise requirements in EA legislation

Expertise can be strengthened by mandating a permanent independent foundation in each Member State that is responsible for reviewing the scientific quality of EA reports and to consult throughout the different stages of the EA process. Other options for strengthening expertise in EA processes through legislation is by requiring specified academic degrees or industry accreditation of authorities and consultancy firms to ensure that such skills are obtained, or requiring them to have certain levels of experience in relatively predictable EAs.⁷⁷ Legislation could also ensure expertise by allowing only consultants on a list of

⁷⁵ European Commission, Directorate-General for the Environment, *Study concerning the Preparation of the Report on the Application and Effectiveness of the SEA Directive (Directive 2001/42/EC)* (European Union, 2016).

⁷⁶ European Commission, 'Report under Article 12(3) of Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment', 15 May 2017, COM(2017) 234 final, para. 2.1.

⁷⁷ Glasson & Therivel, n. 11 above, p. 161.

approved consultants/consultancies to carry out EAs.⁷⁸ However, such a list may be problematic as it may increase rent seeking and set barriers to market entry.⁷⁹

It should be noted that the European Commission proposed to give Member States the option either of having competent accredited experts to draw up an EA report, or having a specific commission of experts in place responsible for checking the EA report.⁸⁰ However, the Member States did not wish to have this option in the Directives: further regulation on this was ‘considered to increase the cost’ for the Member States. As such, ‘it is up to the Member State to say what type of diploma you need to have, how many years of experience’, according to the Commission interviewee. However, research indicates that an independent foundation would be likely to be cost-efficient, given that a main cause of the increased total costs of the EA process is when the EA does not provide adequate or relevant data. An independent foundation involved in the EA process could spot such inadequacies, reducing the need for supplementary information and, possibly, costly judicial review.⁸¹

The EU, therefore, should at least require Member States to install an independent foundation to check the EA report for plans and projects. Ideally, this foundation should be involved throughout the EA process to spot inadequacies at an early stage to avoid WYSIATI creeping into the process. The Netherlands could further improve its EA legislation by generally requiring review and consultation by the NCEA for all activities at all stages of the EA process.

4.2. *Debiasing Technique 2: Strengthening Group Decision Making*

Strengthening group decision making explained

While strengthening the expertise of authorities and consultancy firms may reduce, to some extent, the degree to which they are susceptible to WYSIATI, cognitive insights show that expertise alone is not sufficient to reduce many other examples of CUMB in decision making. Most notably, the confirmation, the optimism, and the overconfidence biases are notoriously difficult to overcome by training.⁸² As such, additional debiasing techniques are needed.

To reduce WYSIATI, the confirmation bias and the optimism bias, experiments show that groups are found to be well equipped to overcome these biases as groups tend to think more slowly.⁸³ Research indicates that groups of people are often

⁷⁸ *Ibid.*, p. 161.

⁷⁹ Rent seeking is the attempt to obtain benefits through lobbying at the cost of society; see G. Tullock, ‘The Welfare Costs of Tariffs, Monopolies, and Theft’ (1967) 5(3) *Economic Inquiry*, pp. 224–32; A.O. Krueger, ‘The Political Economy of the Rent-Seeking Society’ (1974) 64(3) *The American Economic Review*, pp. 291–303.

⁸⁰ European Commission, n. 71 above.

⁸¹ GHK Technopolis, ‘Evaluation on EU Legislation: Directive 85/337/EEC (Environmental Impact Assessment, EIA) and Associated Amendments – Final Report’, 14 Jan. 2008, available at: https://www.commissiomer.nl/docs/mer/diversen/os_evaluation_eu_regulation_2008.pdf; Glasson & Therivel, n. 11 above, pp. 86, 165–6.

⁸² Montibeller & von Winterfeldt, n. 10 above.

⁸³ Kahneman, n. 16 above, p. 264.

found to provide more objective, unbiased, and more complete and professional information than any well-trained expert could ever do alone.⁸⁴ This does not mean that groups cannot arrive at poor decisions; groups have been shown to make disastrous decisions with deadly consequences.⁸⁵ However, experiments show that, to optimize group decision making, stimulating group interaction in nominal groups (where members generate ideas in isolation) is an effective debiasing technique of CUMB difficult to overcome by training.⁸⁶ Nominal decision making is especially effective in overcoming groupthink, a psychological phenomenon often occurring in highly cohesive decision-making groups that are insulated from experts, perform limited search and appraisal of information, operate under directed leadership, and experience high-stress conditions.⁸⁷

Research shows that initiating group interactions at the scoping stage – that is, before environmental impacts are predicted, and preferably including the initiator, the authority, other relevant public agencies, the public, and independent advisers – could reduce the time needed for an EA by ensuring that the process focuses on key issues and is carried out efficiently.⁸⁸ Furthermore, it reduces the risk of possible shortcomings in the final EA report that may be caused by and may exacerbate CUMB. Therefore, initiating group interactions 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 can then aggravate CUMB, most notably WYSIATI, in the public, authorities, experts, and the judiciary.⁸⁹

Requirements for group decision making in EU and Dutch legislation

Both sets of legislation require group decision making at the screening, scoping, and review stages. At the screening stage, the EIA Directive considers it ‘good administrative practice’ to take ‘unsolicited comments’ into account,⁹⁰ and the European Commission stipulates the usefulness of consulting public authorities, stakeholders, experts or other planning authorities.⁹¹ However, when consultations are required (that is, for plans at

⁸⁴ M. Pečarič, ‘Can a Group of People be Smarter than Experts?’ (2017) 5(1) *The Theory and Practice of Legislation*, pp. 5–29; N.L. Kerr & R.S. Tindale, ‘Group Performance and Decision Making’ (2004) 55 *Annual Review of Psychology*, pp. 623–55; R.P. Larrick & J.B. Soll, ‘Intuitions about Combining Opinions: Misappreciation of the Averaging Principle’ (2006) 52(1) *Management Science*, pp. 111–27; P.R. Laughlin, ‘Collective Induction: Twelve Postulates’ (1999) 80(1) *Organizational Behavior and Human Decision Processes*, pp. 50–69; P.B. Paulus & B.A. Nijstad, *Group Creativity: Innovation through Collaboration* (Oxford University Press, 2003).

⁸⁵ Kerr & Tindale, n. 84 above, p. 640; J.P. Simmons et al., ‘Intuitive Biases in Choice versus Estimation: Implications for the Wisdom of Crowds’ (2010) 38(1) *Journal of Consumer Research*, pp. 1–15; B.A. Nijstad, *Group Performance* (Psychology Press, 2009).

⁸⁶ Montibeller & von Winterfeldt, n. 10 above; Kerr & Tindale, n. 84 above.

⁸⁷ I.L. Janis, *Crucial Decisions: Leadership in Policymaking and Crisis Management* (The Free Press, 1989); M.E. Turner & A.R. Pratkanis, ‘Twenty-Five Years of Groupthink Theory and Research: Lessons from the Evaluation of a Theory’ (1998) 73(2) *Organizational Behavior and Human Decision Processes*, pp. 105–15.

⁸⁸ Glasson & Therivel, n. 11 above, pp. 58, 88.

⁸⁹ Brenner, Koehler & Tversky, n. 29 above.

⁹⁰ Preamble para 29, EIA Directive.

⁹¹ European Commission, Directorate-General for Environment, D. Hansen, S. Fisker & U. Kjellerup, *Environmental Impact Assessment of Projects: Guidance on Screening (Directive 2011/92/EU as*

the EU level and, until the new legislation comes into force, also complex projects in the Netherlands), they are required only with governmental authorities.⁹²

Requirements at the scoping stage may enable nominal group decision making in the Netherlands: namely, the requirement for public participation when scoping is mandated.⁹³ However, scoping is required only for plans and complex projects at the Dutch level (under the forthcoming Dutch legislation only for plans).⁹⁴ In cases where scoping is not mandated initiators must request scoping themselves or, if the initiator does not make such a request, scoping can be initiated by the planning authority (known as scoping *ex officio*)⁹⁵ However, if scoping is not mandated, there are no requirements to include other relevant public agencies or independent advisers, which may strengthen group decision making. Furthermore, with the forthcoming Dutch legislation, planning authorities will no longer be able to initiate scoping *ex officio*,⁹⁶ leaving it for the initiator to decide whether scoping is undertaken for a project.

At the review stage, also, requirements exist that could enable nominal group decision making. Under both EU and Dutch EA legislation the public must have access to the EA report.⁹⁷ Furthermore, at the Dutch level NCEA review is required before it is sent to the authority to decide on authorization of the activity. However, this is required only for plans and, until the forthcoming legislation comes into force, complex projects.⁹⁸

Group decision making in EA practice

The case study indicates that, in practice, group decision making is not stimulated beyond legal requirements. This also follows from other research which indicates that Dutch EA tends to be carried out because there is a legal requirement to do so, not because actors choose to do so.⁹⁹ Generally, initiators fear the costs of scoping,¹⁰⁰ even though research indicates that sufficient scoping – which ideally includes the initiator, the authority, other relevant public agencies, the public, and independent advisers – reduces the total costs of EAs¹⁰¹ and

amended by 2014/52/EU) (EU Publications Office, 2017), para. 3.2, available at: <https://data.europa.eu/doi/10.2779/092377>

⁹² Arts 3(6) and 6(3) SEA Directive; s. 7.19 Wm.

⁹³ Ss. 7.9, 7.27(3)–(6) Wm.

⁹⁴ *Ibid.*, ss. 7.9, 7.27(3)–(6).

⁹⁵ *Ibid.*, s. 7.24(3).

⁹⁶ *Ibid.*, s. 7.24(3); Omgevingswet (Consolidated version 4 Oct. 2022), Art. 16.38.

⁹⁷ For projects to the public: Art. 6(3)(b) EIA Directive, s.3.4 Awb; for plans to the public: Arts 6(1)–(2) SEA Directive, s. 3.4 Awb.

⁹⁸ Ss. 7.12, 7.38 Wm.

⁹⁹ H. Runhaar et al., 'Environmental Assessment in The Netherlands: Effectively Governing Environmental Protection? A Discourse Analysis' (2013) 39 *Environmental Impact Assessment Review*, pp. 13–25; K. Kuijpers, 'Normen Versoepelen, Stankoverlast Slikken', *Investico*, 24 July 2019, p. 7, available at: <https://www.platform-investico.nl/artikel/normen-versoepelen-stankoverlast-slikken>.

¹⁰⁰ Glasson & Therivel, n. 11 above, p. 58.

¹⁰¹ *Ibid.*, p. 86. Frans Oosterhuis, 'Cost and Benefits of the EIA Directive: Final Report for DG Environment under Specific Agreement no. 07010401/2006/447175/FRA/G1', May 2007, pp. 1–74; F. Retief & B. Chabalala, 'The Cost of Environmental Impact Assessment (EIA) in South Africa' (2009) 11(1) *Journal of Environmental Assessment Policy and Management*, pp. 51–68; M. Cashmore et al., 'The

improves their quality.¹⁰² As such, it seems unlikely that initiators are sufficiently aware of the benefits of adequate scoping to initiate it without mandatory legislation. In addition, while NCEA review can be requested by the initiator or the planning authority at every stage of the EA process, the NCEA often is not involved if it is not mandated by law.¹⁰³ Therefore, reducing the requirements for mandatory NCEA review of final EA reports in respect of all plans and complex projects to plans only (as is envisaged with the forthcoming Dutch legislation) is likely to affect negatively the extent to which the NCEA will be involved in EA review. This can be illustrated by an amendment in 2010 that made NCEA review of final EA reports voluntary for simple projects.¹⁰⁴ Figure 2 shows that since 2010 the number of mandatory review procedures has declined (from over 250 in 2009 to only 50 in 2019), while the number of voluntary review procedures (where the authority requests the advice) has remained relatively stable. Similar effects may be expected when the new legislation takes force.

Consultancy firms, who often conduct the EA report preparation, also do not seem to stimulate nominal group decision making. For example, an interviewed employee of a small consultancy firm said: ‘Two sets of eyes always review the EA at our consultancy firm. This could be a senior or a medior employee, depending on the complexity of the assessment’. An interviewed employee at a large consultancy firm further explained that ‘[a]ll EAs will be read by a second reader’. While this, at least, adds one person to the decision-making process, it can hardly be considered a group. Furthermore, it should be noted that consultants are paid by the initiator. An NCEA employee noted: ‘In practice, EAs are all outsourced to consultancy firms. And if you pay for something ... “who pays the piper calls the tune”, as we sometimes say in jest’. This may increase the risks of many political biases. However, it may also increase the risk of groupthink.

Furthermore, while both EU and Dutch EA legislation require the public to have access to the EA report,¹⁰⁵ such access can contribute to nominal decision making only when the public understands the report.¹⁰⁶ During the interviews, consultants seemed to be well aware of the importance of how the EA report is communicated,

Interminable Issue of Effectiveness: Substantive Purposes, Outcomes and Research Challenges in the Advancement of Environmental Impact Assessment Theory’ (2004) 22(4) *Impact Assessment and Project Appraisal*, pp. 295–310; E. Leknes, ‘The Roles of EIA in the Decision-Making Process’ (2001) 21(4) *Environmental Impact Assessment Review*, pp. 309–34; L. Canelas et al., ‘Quality of Environmental Impact Statements in Portugal and Spain’ (2005) 25(3) *Environmental Impact Assessment Review*, pp. 217–25; I. Pölonen, ‘Quality Control and the Substantive Influence of Environmental Impact Assessment in Finland’ (2006) 26(5) *Environmental Impact Assessment Review*, pp. 481–91.

¹⁰² G. Wood, J. Glasson & J. Becker, ‘EIA Scoping in England and Wales: Practitioner Approaches, Perspectives and Constraints’ (2006) 26(3) *Environmental Impact Assessment Review*, pp. 221–41; Environment Agency, ‘Handbook for Scoping Projects: Environmental Impact Assessment’, 18 Jan. 2012; Glasson & Therivel, n. 11 above, p. 86; Oosterhuis, n. 101 above, p. 14.

¹⁰³ Ministerie van Infrastructuur en Waterstaat, ‘Milieueffectenrapporten in Nederland: Kwaliteit en Kwantiteit’, 22 Jan. 2020.

¹⁰⁴ InfoMil, ‘Hoe is M.E.R. Ontstaan?’, available at: <https://www.infomil.nl/onderwerpen/integrale/mer/procedurehandleiding/index/ontwikkelingen>.

¹⁰⁵ For projects to the public: Art. 6(3)(b) EIA Directive, s. 3.4 Awb; for plans to the public: Arts 6(1)–(2) SEA Directive, s. 3.4 Awb.

¹⁰⁶ N. Hartley & C. Wood, ‘Public Participation in Environmental Impact Assessment: Implementing the Aarhus Convention’ (2005) 25(4) *Environmental Impact Assessment Review*, pp. 319–40, at 333.

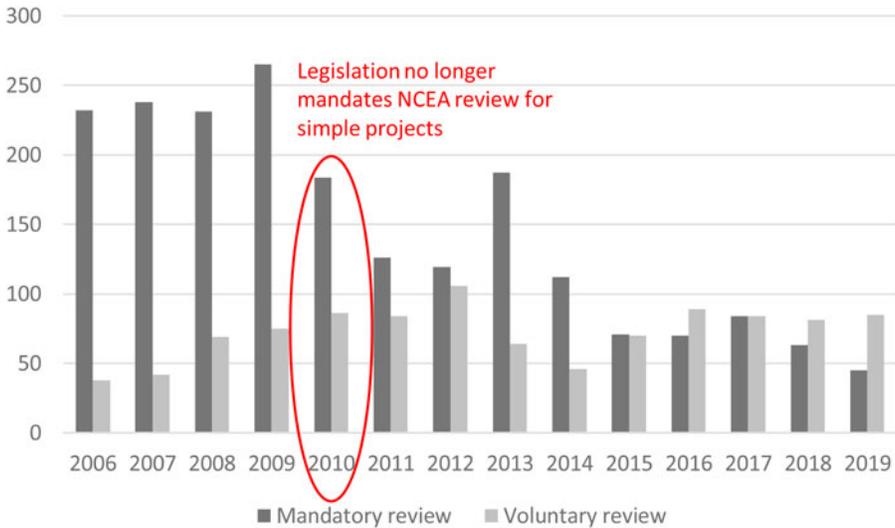


Figure 2. Number of Mandatory and Voluntary NCEA Reviews of EA Reports per year (based on NCEA Annual Reports 2006–2019)

stating that ‘you have to communicate at the right time the right amount of information’ and you must be aware of ‘your audience and how you approach them’. Furthermore, EA reports can be over 1,000 pages long,¹⁰⁷ and may result in information overload.¹⁰⁸ To overcome this overload, a non-technical summary of the EA report may help the public and the public authority to better understand the environmental impacts of an activity. In line with EU legislation, Dutch law requires a non-technical summary.¹⁰⁹ Consultancy firms generally write this summary after predicting the environmental impact. The scholarly literature shows that non-technical summaries often use a scoring grid to communicate the pros and cons of the proposed activity and the alternatives.¹¹⁰ These pros and cons are often communicated in the form of symbols (plus and minus) or colours (green to indicate a positive environmental impact, amber to indicate neutral environmental impact, and red to indicate a negative environmental impact). Several interviewees confirmed that this also occurs in the Netherlands. For example, an employee of a small consultancy firm said:

With every environmental concern, we write something off as a plus-plus in a scoring grid. If nothing is expected to happen to the environment [for that specific concern] we will write it down as a zero. And in between we use zero minus, and minus and you describe that as well. So, for example, zero minus means there is an effect on the environment but it can be

¹⁰⁷ E.g., the EA report for the Borssele kavels I runs to 1,117 pages, available at: <https://www.commissierner.nl/docs/mer/p29/p2965/2965-060mer-kavel1.pdf>.

¹⁰⁸ Information overload occurs when a wealth of information creates a poverty of attention: H. Simon, ‘Designing Organizations for an Information-Rich World’, in M. Greenberger (ed.), *Computers, Communications, and the Public Interest* (The Johns Hopkins Press, 1970), pp. 37–72.

¹⁰⁹ Art. 5(1e) EIA Directive; Art. 5(1) in conjunction with Annex I(j) SEA Directive; ss. 7.7(i), 7.23(1e) Wm.

¹¹⁰ Glasson & Therivel, n. 11 above, p. 135.

easily mitigated. We also often work with colours. The reason we communicate like this is to create an overview. Sometimes an EA is a thousand pages long, and you want that all underlying information is available, but you also want an overview. These scoring grids are meant to create an overview.

While such a summary may be appealing to overcome information overload in the public and the public authority, it also runs the risk of oversimplifying or misrepresenting the issues and trade-offs involved.¹¹¹ As such, the technical summary may increase the risk of WYSIATI – especially in those who, because of limited expertise, rely more on the technical summary, which may include authorities, the public, and the judiciary. For example, a governmental employee at the local level said:

One of the tricks often used is using different colours. If you use red, that is a signalling colour, it seems very serious. But if you use purple or blue ... blue does not seem serious at all. Sometimes you see in these reports that serious environmental concerns are presented in blue or pastel. Nowhere is specified which colours you are allowed to use. It makes a difference whether alarm bells will ring or not, depending on which colours are used.

An interviewee with the NCEA confirmed this:

Sometimes they use colours, or smileys – a happy and a sad one, or plusses and minuses. But how they reach these plusses and minuses is a trade of its own. Sometimes the text does not correlate with the plusses or minuses at all. Sometimes they lump several issues together, most of them positive, and some of them negative. It creates a distorted picture when they communicate that with a plus. These are things that we pay attention to.

The public may underestimate environmental concerns when serious environmental concerns are presented in purple or blue, or lumped together with positive attributes with a symbol, as colours and symbols have a communication value, carrying different associations and meanings.¹¹² Colours are found to be the most influential.¹¹³ Strong evidence is found of explicit and implicit associations of the colour red with danger,¹¹⁴ the colour green with safety,¹¹⁵ and blue with neutrality.¹¹⁶ Approximately 65 to 90%

¹¹¹ Ibid.

¹¹² A.J. Elliot & M.A. Maier, 'Color-in-context Theory' (2012) 45 *Advances in Experimental Social Psychology*, pp. 61–125; R.A. Hill & R.A. Barton, 'Red Enhances Human Performance in Contests' (2005) 435(7040) *Nature*, p. 293.

¹¹³ C. Jansson, N. Marlow & M. Bristow, 'The Influence of Colour on Visual Search Times in Cluttered Environments' (2004) 10(3) *Journal of Marketing Communications*, pp. 183–93.

¹¹⁴ K. Pravossoudovitch et al., 'Is Red the Colour of Danger? Testing an Implicit Red–Danger Association' (2014) 57(4) *Ergonomics*, pp. 503–10; A.B. Borade, S.V. Bansod & V.R. Gandhewar, 'Hazard Perception Based on Safety Words and Colors: An Indian Perspective' (2008) 14(4) *International Journal of Occupational Safety and Ergonomics*, pp. 407–16; C.C. Braun & N.C. Silver, 'Interaction of Signal Word and Colour on Warning Labels: Differences in Perceived Hazard and Behavioural Compliance' (1995) 38(11) *Ergonomics*, pp. 2207–20; S. David Leonard, 'Does Color of Warnings Affect Risk Perception?' (1999) 23(5) *International Journal of Industrial Ergonomics*, pp. 499–504.

¹¹⁵ T. Clarke & A. Costall, 'The Emotional Connotations of Color: A Qualitative Investigation' (2008) 33(5) *Color Research & Application*, pp. 406–10.

¹¹⁶ H. Kauppinen-Räsänen & H.T. Luomala, 'Exploring Consumers' Product-Specific Colour Meanings' (2010) 13(3) *Qualitative Market Research: An International Journal*, pp. 287–308; T.J. Madden, K. Hewett & M.S. Roth, 'Managing Images in Different Cultures: A Cross-National Study of Color Meanings and Preferences' (2000) 8(4) *Journal of International Marketing*, pp. 90–107.

of product and services assessments are built on colours only.¹¹⁷ As such, while a non-technical summary may be a helpful tool to inform the public and the public authority, it becomes useless when visualizations falsely trigger certain associations which may increase the prevalence of CUMB.

Recommendations for incorporating requirements on group decision making in EA legislation

Ideally, nominal decision making should be required at all stages of the EA process (Figure 1). This includes nominal group interactions earlier in the EA process, including whether an activity requires further identification and prediction (screening), which alternatives should be examined (scoping), and the methods to be used for preparing the EA report.

EU and Dutch legislation on EA should include at least the requirement to consult independent actors who are knowledgeable about the decision in nominal groups at the screening, scoping and EA report preparation stages. Legislation could further specify which actors should be consulted; preferably these should include the initiator, relevant stakeholders, relevant administrative bodies, and independent advisers such as the NCEA.

Furthermore, to improve early and effective public participation, legislation should require independent review of the EA report for all activities, given the crucial importance of independent review to overcome the possible CUMB of those reading the report. Alternatively, a list added as an annex to EA legislation on good communication practices and/or requirements regarding visualizations in EAs could, for example, improve the quality of the information provided to the public. This, in turn, could improve the quality, comprehensiveness, effectiveness, and legitimacy of environmental decision making.

4.3. *Debiasing Technique 3: Strengthening Feedback Loops*

Strengthening feedback loops explained

An important CUMB that is remarkably difficult to overcome, even among experts, is the overconfidence bias.¹¹⁸ This could result in those involved in the EA to underestimate the environmental concerns of a given activity. To reduce overconfidence in experts, cognitive science and behavioural economics show that frequent feedback is helpful. For example, research shows that the aspect of daily feedback makes weather forecasters remarkably accurate at weather prediction.¹¹⁹ EA follow-up – such as

¹¹⁷ S. Singh, 'Impact of Color on Marketing' (2006) 44(6) *Management Decision*, pp. 783–9.

¹¹⁸ B. Fischhoff, 'Debiasing', in D. Kahneman, P. Slovic & A. Tversky (eds), *Judgment under Uncertainty: Heuristics and Biases* (Cambridge University Press, 1982), pp. 422–44; R.P. Larrick, K.A. Burson & J.B. Soll, 'Social Comparison and Confidence: When Thinking You're Better than Average Predicts Overconfidence (and When It Does Not)' (2007) 102(1) *Organizational Behavior and Human Decision Processes*, pp. 76–94.

¹¹⁹ D. von Winterfeldt & W. Edwards, *Decision Analysis and Behavioral Research* (Cambridge University Press, 1986). On the importance of feedback loops in Multi-Criteria Decision Analysis – a well-known

monitoring, evaluation, management, and communication (see Section 3) – may create such feedback loops.

Requirements on feedback loops in EU and Dutch legislation

EU and Dutch EA legislation contain very limited requirements for feedback loops. The SEA Directive requires Member States to monitor the significant environmental effects of the implementation of plans.¹²⁰ The EIA Directive stipulates that Member States shall determine the procedures regarding the monitoring of significant adverse effects of projects on the environment,¹²¹ thus allowing Member States to decide whether monitoring is needed (if no other legislation exists that mandates monitoring). Dutch law requires the planning authority to monitor the environmental impacts of plans and complex projects,¹²² although it is up to the planning authority to decide when and how such monitoring will take place. For simple projects, the initiator is responsible for the monitoring if the planning authority so requires.¹²³

Current Dutch law stipulates that, if monitoring has taken place for an activity, the monitoring report (which is required to be written by the relevant public authority)¹²⁴ needs to be communicated to the initiator of the project, the governing bodies, and administrative bodies designated by law or by various ministries to advise on reaching the decision.¹²⁵ A report that concerns the environmental impact of a plan or complex project must also be communicated to the NCEA and the public.¹²⁶ Forthcoming Dutch legislation will no longer require planning authorities to write a monitoring report.¹²⁷

Feedback loops in practice

Research on EA more generally indicates a lack of interest or awareness among those involved in the EA process of the value of follow-up: the EA process is often considered to cover only the period before and until the planning authority makes its final decision.¹²⁸ This also followed from the interviews, where only one interviewee, a governmental employee at the Dutch local level, mentioned the importance of monitoring and the lack of monitoring requests:

method in EA: V. Ferretti et al., 'Testing Best Practices to Reduce the Overconfidence Bias in Multi-criteria Decision Analysis', in *Proceedings of the 49th Annual Hawaii International Conference on System Sciences* (2016), pp. 1547–55.

¹²⁰ Art. 10 SEA Directive.

¹²¹ Art. 8a(4) EIA Directive.

¹²² S.7.39 Wm.

¹²³ *Ibid.*, s. 7.41 in conjunction with s. 7.37(1f).

¹²⁴ Ss. 7.39, 7.41 Wm.

¹²⁵ *Ibid.*

¹²⁶ S. 7.39(2) Wm, in conjunction with s. 3.12(1)–(2) Awb.

¹²⁷ 'Aan de Slag met de Omgevingswet', n. 74 above.

¹²⁸ Glasson & Therivel, n. 11 above, p. 171; J. Arts et al., 'The Effectiveness of EIA as an Instrument for Environmental Governance: Reflecting on 25 Years of EIA Practice in the Netherlands and the UK' (2012) 14(4) *Journal of Environmental Assessment Policy and Management*, pp. 1–40, p. 31.

Monitoring is incredibly important. And in the Netherlands, it is still optional, not mandatory [for projects]. Nobody looks at it either. Nobody demands it. There is no environmental inspector that comes to me and asks ‘Where is your latest monitoring report?’ It just doesn’t happen.

Furthermore, the interviews indicated that, in practice, when monitoring does happen, consultancy firms are not in the feedback loop. This is problematic as research indicates a vital need to introduce feedback to learn from experience and to avoid the constant ‘reinventing of the wheel’ in EAs.¹²⁹

Recommendations for incorporating feedback loops in EA legislation

Legislation could be strengthened by providing further requirements for the communication of follow-up,¹³⁰ most importantly by requiring a monitoring report (which is not required at the EU level and will no longer be required in the Netherlands with the new legislation).¹³¹ Importantly, this monitoring report should be communicated to expert groups, such as the NCEA, and to consultancy firms, as they are often involved in the prediction of environmental impact.

5. CONCLUSION

While (bounded) rationality and political bias have been discussed extensively in the EA literature, recent insights on CUMB have not yet been fully explored. This article provided a selective review of how three debiasing techniques – expertise, nominal group decision making, and frequent feedback loops – are, or should be, incorporated into (supra)national EA legislation. This article shows that neither EU nor Dutch legislation (yet) incorporates these debiasing techniques sufficiently. Specifically, the article underlines the importance of action at the EU level, as Member States, including the Netherlands, are increasingly reducing their requirements on debiasing techniques to bring their legislation more in line with the minimum requirements set by the EU. The article, therefore, recommends that EA legislation generally, and EU and Dutch legislation in particular, mandate (i) an independent foundation to check the EA report for plans and projects; (ii) nominal decision making at all stages of the EA process; and (iii) the communication of a monitoring report to expert groups and consultancy firms.

These recommendations are expected to improve environmental decision making; increase the impact of EAs on the design of initiatives and their modifications; and reduce the costs of delay, judicial review, and environmental harm. Furthermore, these recommendations should be incorporated, given that the emergence of CUMB in the EA process reduces the effectiveness of public and judicial review as the enforcement mechanism of sound environmental decision making, for two reasons. Firstly, if authorities have the political will and the power to make sound environmental

¹²⁹ Glasson & Therivel, n. 11 above, p. 174.

¹³⁰ Morrison-Saunders et al., n. 61 above.

¹³¹ Ss. 7.39, 7.41 Wm; ‘Aan de Slag met de Omgevingswet’, n. 74 above.

decisions, they may fail to do so as a result of CUMB in the EA process. This may exacerbate CUMB in the public and the judiciary, in particular the WYSIATI bias. Secondly, initiators, as well as authorities that do not have the political will to make sound environmental decisions, may misuse the CUMB of the public and the judiciary to promote activities that harm the environment.

This article provides a better understanding of how insights from cognitive science and behavioural economics could be used to inform EA legislation. However, despite the impressive empirical evidence accumulated on CUMB and their potential debiasing techniques, cognitive research has been criticized for its lack of precision, refinement, and progress at the theoretical level.¹³² Future research, therefore, is needed to develop theoretical frameworks and to refine hypotheses through empirical studies. In the context of this article, further research should experimentally test whether and to what extent CUMB may appear among those specifically involved in the EA process, as well as the role of different types of debiasing technique (such as voluntary or mandatory requirements) in affecting human behaviour.

Supplementary material. The supplementary material for this article can be found at: <https://doi.org/10.1017/S2047102523000031>.

¹³² For an overview, see K. Fiedler & M. von Sydow, 'Heuristics & Biases: Beyond Tversky & Kahneman's (1974) Judgment under Uncertainty', in M. Eysenk & D. Groome (eds), *Revisiting the Classical Studies* (SAGE, 2015), pp. 146–61. See also Gigerenzer, n. 22 above.